# URBAN POLICY FOR RENEWABLE ENERGY: CASE STUDIES OF NEW YORK AND LONDON

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**Declaration**

I declare that the work presented in this thesis is entirely my own.

Stephen A. Hammer
December 2005

# ABSTRACT

**Stephen A. Hammer**
**"Urban Policy for Renewable Energy: Case Studies of New York and London"**

Despite growing attention to the issue of urban 'sustainability' and steady increases in the overall use of different renewable power technologies around the world, cities tend to have very low levels of 'green' power use or renewables technology deployment within their borders. Through field interviews and literature reviews, this thesis examines the factors that both help and hinder this situation, using New York City and London as case studies. New institutionalism and urban regime theories provide the analytical lenses through which the empirical research is viewed. Each theory examines this issue from a different perspective, with new institutionalism particularly adept at identifying explanations linked to the electric power sector's highly regulated policy environment. Urban regime theory (URT) emphasizes understanding who is involved in the policy-making and implementation process, and how their involvement influences any outcomes. Originally, URT was developed to analyze urban growth coalitions and other urban economic development activities, although researchers have more recently posited its applicability to a wide range of fields, including urban environmental policy-making. When examining energy policy-making in both London and New York, however, a traditional URT approach falls short because it does not easily accommodate the influence of formal regulatory mechanisms in shaping outcomes. By modifying URT, however, so it adopts aspects of a new institutionalist approach, highly compelling and comprehensive explanations for local energy policy and program decisions can be obtained. This thesis concludes by detailing circumstances under which this type of "Constrained" regime analysis is appropriate, and how its methodology differs from that of traditional urban regime theory.

**ACKNOWLEDGEMENTS**

Undertaking a PhD program as a 'mature' student – 3700+ miles from home -- brought many challenges. Uprooting myself from family and friends in New York, and relocating to London for large blocks of time imposed burdens on many, a fact I willingly acknowledge. It goes without question that the greatest costs were borne by my wife Ginger and two daughters, Julia and Claire. But the gifts you gave to me as I pursued this long-held dream …the gifts of time, love, support, and space, proved both necessary and invaluable as I worked my way through this difficult but rewarding process. I will always be extraordinarily grateful for these gifts of yours, and this dissertation is dedicated to the three of you. And to Peggy, the Paasches, the Wassermans, the Lowe-Portes and those friends and family members who helped out when I was away, thank you as well.

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Despite the appreciation I show to so many people for their assistance and support on this thesis, ultimately it is my work, and any errors of omission, interpretation, or fact are entirely my own.

SH
New York City
December 2005

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## FREQUENTLY USED ACRONYMS

| | |
|---|---|
| AC | Alternating current |
| ALG | Association of London Governments |
| CEB | Central Electricity Board |
| CEGB | Central Electricity Generating Board |
| CHP | Combined heat and power |
| DC | Direct current |
| DG | Distributed generation (sometimes known as distributed resources) |
| DDC | New York City Department of Design and Construction |
| DNO | Distribution Network Operator |
| DTI | UK Department of Trade and Industry |
| EC | European Commission |
| EDC | New York City Economic Development Corporation |
| EfW | Energy-from-waste |
| EIA | US Department of Energy, Energy Information Administration |
| ESCO | Energy service company |
| ETSU | Energy Technology Support Unit |
| EU | European Union |
| FERC | US Federal Energy Regulatory Commission |
| FOE | Friends of the Earth |
| GLA | Greater London Authority |
| GLC | Greater London Council |
| GOL | Government Office for London |
| GW | Gigawatt |
| GWh | Gigawatt hour(s) |
| IEA | International Energy Agency |
| kV | KiloVolt(s) |
| kW | Kilowatt |
| kWh | Kilowatt hour(s) |
| LCCA | London Climate Change Agency |
| LDA | London Development Authority |
| LDF | Local Development Framework |
| LEP | London Energy Partnership |
| LPAC | London Planning and Advisory Committee |
| LRC | London Research Centre |
| LSx | London Sustainability Exchange |
| MW | Megawatt(s) |
| MWh | Megawatt hour(s) |
| NETA | New Electricity Trading Agreement |
| NFFO | Non-Fossil Fuel Obligation |
| NI | New Institutionalism |
| NRDC | Natural Resources Defense Council |
| NREL | National Renewable Energy Laboratory |
| NYBC | New York Building Congress |
| NYC | New York City |
| NYPA | New York Power Authority |
| NYPIRG | New York Public Interest Research Group |
| NYISO | New York Independent System Operator |

| | |
|---|---|
| NYS | New York State |
| NYSERDA | New York State Energy Research and Development Authority |
| NYSRC | New York State Reliability Council |
| ODPM | UK Office of the Deputy Prime Minister |
| OECD | Organization for Economic Co-operation and Development |
| OFGEM | UK Office of Gas and Electricity Markets |
| PIU | UK Performance and Innovation Unit |
| PPG | Policy Planning Guidance |
| PPS | Policy Planning Statement |
| PSC | New York State Public Service Commission |
| PURPA | Public Utility Regulatory Policy Act |
| PV | Solar photovoltaic |
| REC | Renewable Energy Certificate(s) |
| RFP | Request for Proposals |
| RO | Renewables Obligation |
| ROC | Renewables Obligation Certificate(s) |
| RPS | Renewable Portfolio Standard |
| SBC | System benefit charge |
| SDS | London Spatial Development Strategy (also known as the London Plan) |
| UDP | Unitary Development Plan(s) |
| UK | United Kingdom |
| URT | Urban regime theory |
| US | United States of America |

## INTRODUCTION

This thesis examines the logic of renewable electricity policy-making in two world cities, New York City and London. Although mankind has harnessed natural energy flows for thousands of years, interest in the use of renewable power in urban areas has dramatically increased during just the last 10-15 years. One explanation is growing attention to the larger issue of urban sustainability, a subject highlighted at the 1992 Earth Summit in Rio de Janeiro. One policy initiative coming out of Rio was Local Agenda 21, which specifically focused on the role cities can play in reversing global climate change (UNCED, 1992). Groups like Energie-Cités and the International Council for Local Environmental Initiatives have taken up the banner of local action and are fostering information sharing between communities interested in enacting more 'climate-friendly' policies.

Policy-makers, energy system developers, and consumers are looking at renewably-generated power in cities for other reasons as well. Over the past few years, the damaging financial consequences of energy price volatility have led many cities to fear for their local economy (Benson, 2002). Energy diversification through the deployment and use of renewable power can provide a hedge against price spikes (Wiser, Bolinger, & St. Clair, 2005), particularly during peak electricity demand periods. Other cities are responding to concerns about energy security, believing it makes sense to generate power locally using technologies that do not rely on imported fuel sources. Post-September 11th fears of terrorist attacks on nuclear power plants and liquid natural gas terminals near cities raise a completely different set of energy security and public health concerns (Hall Hayes, 2005; Hebert, 2005; Lyman, 2004). Finally, cities are also concerned about the localized emission impacts of power production, including air quality in the vicinity of power plants. In many cities, these facilities are found near low income or predominately minority communities, giving rise to claims of environmental racism. (For example, see Living on Earth, 2005). Renewables thus represent a more acceptable way of generating power because they emit zero or low levels of pollutants (Boyle, 2004).

The decision to explore renewable energy policy agendas and practices in cities was originally driven by my parochial interest in environmental policy-making in New

York City. For many years prior to beginning my doctoral research, I was an active participant in this policy arena, focused primarily on waste policy matters. This is a very contentious policy area given that waste management facilities – like electric power plants – are rarely seen as desirable neighbors. Exploring how a city like New York approaches policy-making related to newer, cleaner, and 'sexier' power generation technologies thus provides an interesting analogue to my previous professional work. London is paired with New York City in this analysis because of the obvious parallels between the cities. Both enjoy 'world city' status (Sassen, 2001), are roughly the same size, and represent financial and cultural powerhouses that hold considerable sway over the countries and continents where they are located.

There is a much broader value to a focus on cities than my parochial interests, however, borne out of the fact that cities are an important part of the global energy equation. The Organization for Economic Co-operation and Development (OECD) estimates cities account for 60-80% of the total energy demand in OECD-member countries (Capello, Nijkamp, & Pepping, 1999). As the world is growing increasingly urbanized (United Nations, 1999), the proportion of global energy use consumed in cities will likely rise as well. Improving our understanding of the dynamics of local energy policy-making takes on new relevance given these trends. Policy-makers and practitioners seeking to expand the deployment and use of renewable power in other cities can gain insights from how things work – or don't work – in London and New York. Local circumstances will inevitably be unique, meaning policy or market responses may need to differ. Nonetheless, this analysis will highlight the types of questions that must be asked in cities to fully understand which market, political, or policy forces have the greatest influence on local renewables deployment and use decisions. Any progress on renewables deployment and use in these world cities can have a ripple effect, influencing behavior in other urban areas near and far.

Urban energy policy-making also commands our attention because growing interest in renewable power and other forms of distributed power generation raises comparisons with the earliest days of electricity generation and electricity market development. It was at this time, during the late 19th century, when local authorities were directly involved in the development and oversight of the industry. Because of the power generation technologies in use at the time, electric utilities were essentially neighborhood propositions (Hyman, 1985), and multiple systems were required to serve an entire city. Within two decades, however, a backlash against local control had occurred, prompted by the actions of corrupt local officials seeking to personally cash in on their ability to grant rights to provide electric service in a designated geographic area (Schap, 1986). First in New York, and then elsewhere, local regulatory control of the electric industry was eliminated and shifted to state and national government, lessening the potential for corruption. As the technology used by the electric industry evolved, facilitating larger service territories, state and federal control also facilitated interconnections *between* cities, creating ever-more complex networks and market structures.

Today, renewables are shifting the energy discussion back to a very local perspective, focused on generation at or near the point of energy use. Does this mean that local policy-makers are adjusting their policies to reflect a new or shifting paradigm? Perhaps more appropriately, are local policy-makers even capable of adjusting energy policies and markets to accommodate renewables, given the type of regulations, market structures, and political coalitions that have been built up in support of the electric power industry for the last century? This final question is important as communities seek to develop local sustainability plans. They must recognize which policy-making capacities are clearly within their control, and where their behavior may be constrained by state or federal level policies and programs. State and federal level officials seeking to pursue progress on climate change and other energy-related issues can also learn from an urban-level analysis, as it can highlight areas where state and federal laws and programs can or should be changed to enhance local performance.

I must be clear in emphasizing that my research is not intended to be normative in that regard, however. Devolving authority from the state or federal level to local authorities also brings with it some risks. Local authorities are electorally accountable to local interests, so their policies may take on a very parochial tint. One of the benefits of state or national level action is that it can rise above these neighborhood-level concerns to enact policies and programs beneficial to much larger populations and geographic areas. State and federal level action can also be important to ensure market players face a level playing field, rather than a hodge-podge of rules that vary from one locality to another.

**Theoretical Approach**

The analytic approach employed in this thesis has been heavily influenced by the work of Gibbs and Jonas (2000), the first researchers to posit in a meaningful way the idea that urban regime theory (URT) can be applied to the subject of environmental policy-making in a city. For nearly twenty years, URT has been recognized as a technique adept at dissecting urban governance, aiding our understanding of how policy decisions are made at the local level. Central to URT is the idea that there is a coalition of public and private interests – a regime – that dominate the local policy arena. Thanks to the knowledge, financial or other resources coalition members have individually and collectively, URT argues the regime shapes local policy-making and program activity in a very observable direction (Brown, 1999; Mossberger & Stoker, 2001). Urban regime theory was first applied to examine the actions of business-led coalitions in US cities, but since then the technique has been used to explicate local decision-making on a range of policy topics in cities around the world.

Gibbs and Jonas note the lack of empirical work applying regime theory to energy and environmental policy-making, however, and this thesis thus serves to fill this research gap. Beyond merely employing the technique, however, I will also seek to interrogate three questions posed by Gibbs & Jonas (2000) that would broaden our understanding of how regimes form and operate. These questions are:

- Can environmental regimes operate separately from pro-development regimes?
- How has policy localization activated processes of regime formation around environmental issues?
- Under what conditions do local interests mobilize around environmental policy, and how does this shape the character of a governing coalition or partnership?

The first question is perhaps the most important, as it seeks to clarify whether multiple policy coalitions drive agenda-setting in a city, or whether a single hegemonic regime covers multiple policy areas. This question is important from a theoretical perspective because regime analyses have traditionally examined a single policy area in isolation, ignoring who dominates the debate on other important policy matters in a city. If multiple regimes do exist, this gives rise to questions of how they carve up policy responsibilities, and what occurs if regimes clash on the direction or implementation of new policies. Gibbs and Jonas' other questions are important to researchers seeking to distill fundamental lessons about regime behavior across geographic or temporal contexts, or across different policy arenas. This thesis will not pursue this type of comparative analysis, but will answer these questions based on what we observe in New York and London.

One weakness of Gibbs & Jonas' article was its failure to discuss how researchers should address one of the chief complaints about URT – its localist nature, meaning its failure to account for larger or extra-local cultural, political, or policy influences on decision-making (Ferman, 1996; Lauria, 1994). In the area of energy and environmental policy, market regulation is a common methodological approach so it is important to recognize the extent to which extra-local regulatory influences shape local regime behavior. In this thesis, I offer guidance on this subject, suggesting how the standard URT model could be changed to better accommodate such circumstances. A second theoretical approach, new institutionalism, provides the foundation for these changes. New institutional analyses focus on formal and informal rules, standard operating procedures, cultural norms and religious beliefs that can influence behavior (Alt & Shepsle, 1998; Lowndes, 2001; Weber, 1978). By blending a systems-oriented new institutional approach with the more overtly political focus of URT, I end up with an analytic model that should identify the full range of factors influencing local agenda-setting and program behavior. I field test this blended model in both case studies, assessing what improvements it offers over the traditional URT model.

**Structure of this Thesis**

This thesis starts with a broad, macro-level picture of electricity markets and regulation in the United States (US) and United Kingdom (UK) and then narrows its focus until we achieve a ground-level perspective on energy policy and deployment decisions in New York City and London. As part of the macro-level portrait in Chapter 1, the development of the electric power industry is profiled, as is the history of electric utility regulation.[1] There have been several important changes along both paths, some caused by technological factors, and others more political in nature, that have influenced the shape of today's electricity marketplace. These changes were critical in defining who has responsibility for policy-making, oversight, or the delivery of electric services to customers. Given the growing emergence of the European Union (EU) as a policy-making force that influences UK regulations and policies, EU rules are also discussed.

The role of cities in the overall energy policy and market picture is also introduced in Chapter 1. It is here that we see our first evidence that cities can have a limited capacity to act on electricity issues, as authority once the province of local government was usurped by state or federal level authorities for the sake of greater market coherence or to combat political corruption. This theme that local authorities have constrained powers becomes increasingly prevalent and important over the course of this thesis.

Because my research question focuses on local renewable energy policy-making, Chapter 2 then shifts the discussion to provide a similar high-level portrait of renewable power markets, technologies, and trends. Although 'new' renewable power technologies (Grubb, 1995) such as solar, wind, small hydro, biomass, and tidal and geothermal power systems currently provide but a small fraction of global electricity supply, policy and business trends point toward improving prospects for these technologies. The technologies best suited to urban deployment are discussed, as are the strategies cities employ to expand their use of renewable power. This chapter provides context for the situation in New York City and London by creating a baseline for deployment and policy trends against which each city can be measured.

Chapters 1 and 2 lay bare the fact that cities engaged in renewable energy policy-making face a difficult task, given the multiple tiers of stakeholders and the complex regulatory and market environment. Techniques well-suited to exploring complex

[1] This thesis covers the historical record up through approximately March 2005.

systems of urban governance are thus called for in this analysis. Chapter 3 explains in detail why my decision to blend regime theory with new institutionalism makes sense, referencing specific facts in the first two chapters that support the choice of these two analytic approaches. Chapter 4 builds on this, discussing the specific methods I employed to complete each case study, and explaining why these are the most appropriate techniques for my research. In general, each case study relies on literature reviews tailored to each city, and lengthy telephone conversations and in-person, semi-structured interviews with policy elites. The focus of the literature review was on the energy policy track record in each city; information on or analysis of the local political environment; and background information describing state and federal policies and programs relevant to each city's energy market. Interview questions were tailored to reflect the unique knowledge of each expert. In some cases the interviews preceded portions of the literature review, meaning the interviews provided important background information that was then pursued further with a detailed literature search. In other cases, interviews were used to synthesize or clarify information found in the literature review. Finally, interviews were used to obtain original insights into local politics, policies, or energy markets in each city. A total of 86 interviews were carried out between the two case studies.

Chapters 5-7 and 8-10 represent the heart of this thesis, detailing energy policy-making practices in New York City and London respectively. Each case study consists of three parts. The first section moves beyond the macro-level portrait presented in Chapters 1 and 2 to detail the energy landscape in each city. Topics covered include the history of local electricity development; fuel sources, including the current role of renewables; pricing trends; and how the local electric grid operates. The second section of the case study emphasizes policy, reviewing local, state, and national regulatory structures, policies, and funding schemes that specifically impact energy decisions in each city. The second section also identifies key stakeholders involved in local energy decision-making. The final chapter of each case study applies my theoretical model to examine which factors have most significantly influenced – either positively or negatively – the direction of renewables policy-making and the deployment and use of renewable power in each city. This third section ties together all of the information previously presented to attempt to deduce the 'logic' of local action.

In Chapter 11, I recap my findings from each case study, and draw more general conclusions that may be of interest to future policy-makers and researchers. Key here is my review of the modified regime model, where I discuss how well the model worked; where changes should be made to clarify or further enhance its applicability; and what future researchers should look for when applying the model to their own work. I also revisit the questions posed by Gibbs and Jonas and suggest new avenues for research that build on my work in this thesis.

# CHAPTER 1
# Electricity Markets and Policy – The Big Picture

## Electric Utilities – An Early History

The modern electric utility industry has its origins in the 1880s. Although its New York cousin tends to get more credit, the first steam-powered utility designed to serve multiple customers was established by the English Edison Company at 57 Holburn Viaduct in London. Equipped with generators designed by Thomas Edison, and using a direct current (DC) system design licensed from Edison, the facility commenced operations on 11 April 1882, lighting streetlights, hotels, stores, restaurants and other private buildings in central London (Hughes, 1983). Using similar equipment, Edison followed this a few months later with a facility near Wall Street in New York City. Strategically located to attract the attention of the nearby financial community and the *New York Times* newspaper, the Pearl Street facility began operation on 4 September 1882, supplying power to 85 customers using 400 lamps (Hyman, 1985).

For the next few years, electric service remained largely a "community affair" (Smeloff & Asmus, 1997, p 9). This was due to the use of low-voltage DC technology, which could transmit power up to two miles (Hyman, 1985). In addition, power companies could not yet "step up" or "step down" the voltage on their lines, meaning that different generators and wiring systems were used for street lighting (which relied on arc lights) and home and office lighting (which used incandescent fixtures.) Westinghouse's invention of single-phase alternating current (AC) in the late 1880s changed this, meaning that power plants no longer needed to be built adjacent to large individual or sets of users (Jacobson, 2000). First in Germany and then at Niagara Falls on the US/Canada border, AC power systems were established that transported power from remote locations to the central city, and interest in these systems spread quickly.

Utilities operating DC plants worked hard to maintain their market stake, arguing that low voltage made their systems safer. The debate was amplified by the use of alternating current in the first publicly sanctioned execution by electrocution at a New York State prison in 1890. A publicity campaign backed by Edison and other DC-powered utility owners following this event raised the question: "Do you want the executioner's current in your home and running through your streets?" (Hughes, 1983, p 108).

The growth in electrical demand ultimately helped settle the question of which technology would win out. Early users tended to be wealthy individuals who installed lighting for its prestige value. Gordon (1981, p 23) notes that party invitations often touted electric light as an enticement, a treat on par with dinner and dancing. Wealthy homeowners and businesses also preferred the "clean" light offered by the new technology. Gas lighting was explosive and gave off smoke, acidic fumes, and humidity that harmed fabrics and furnishings. Lighting was only the start, however, and Edison and others spent a great deal of time conjuring new ways to encourage the public to consume electricity.

Demand really didn't build until street railway systems were electrified (Smeloff & Asmus, 1997). Battery-powered trolley systems had been created in the 1830s, but they worked poorly, and horse-drawn railways dominated the local transit scene in many cities for decades. Electrification changed everything. By the early 1890s, electric trolleys were operating in 850 cities across the US (Smeloff & Asmus, 1997), reshaping the urban landscape by allowing the development of "streetcar suburbs" that were now only a manageable trolley ride away from the city center, rather than a full day's travel (Nye, 1990).

Electrical demand by these transit, or "traction," systems played a critical role in changing the shape and nature of the utility industry. Originally, many streetcar companies operated their own power generation plants rather than purchasing power from local utilities. Samuel Insull, who ran Edison Electric in Chicago, found that traction loads peaked at different times from his residential and business customers, meaning he could use his existing generators to provide power more cheaply than the streetcar companies could produce it for themselves (Nye, 1990). Insull's technique of "load balancing" residential and business demand was soon widely replicated across the US and Europe.

As the price of electricity came down, demand increased, creating a spiral effect that forced utilities to invest in new equipment and then work to build demand to ensure that the system was fully utilized. In the US, many utilities and transit companies invested in amusement parks, which were large users of electricity at night and on weekends and holidays, periods when surplus capacity typically existed in the power system (Nye, 1990).

In the 1890s and early 1900s, utilities also worked to build household demand for electricity. Commonwealth Edison opened an "Electric Shop" in downtown Chicago, showcasing domestic appliances on the first floor and motor-driven industrial machinery in the basement (Hughes, 1983, p 223). Displays included such new appliances as electric irons, electric stoves and ovens, vacuum cleaners, electric refrigerators, and washing machines, all of which were invented between 1893 and 1908.

On both continents, many cities featured large lighting spectacles designed to attract customers to certain businesses or business districts (Nye, 1990). World's fairs and other large public exhibitions also proved to be important showcases for electricity. Nye (1990, p 34) notes these events profoundly affected the middle class of America, "providing a model for the transformation of their own communities, which could only seem dark and drab when they returned home."

**The Early 1900s – The Push for Government Intervention Begins**

Although the industry had always required some measure of government oversight, the level of intervention by different government agencies increased dramatically in the early 1900s. This involvement manifested itself in many different ways. In both the US and the UK, World War I brought significant changes as larger power plant projects were initiated to feed the wartime demand for electricity. In the US, the War Industries Board ordered individual utility networks to interconnect to help raise the load factor in certain regions where wartime industries were prominent (Hughes, 1983). In the UK, the Department of Electric Power Supply, a division of the Ministry of Munitions, decided which power plants could expand, and where interconnections could occur. The department also authorized loans to help companies expand capacity exclusively for war-related purposes (Hannah, 1979).

Outside the context of war, there grew a social agenda. In the 1930s, US President Franklin D. Roosevelt pushed for large-scale hydropower systems in response to concerns about price gouging by private utilities, and in an effort to bring power to rural areas. The distances between rural customers often made it unprofitable for companies to extend service there, so Roosevelt called for public subsidies, proclaiming "Electricity is no longer a luxury, it is a definite necessity" (Nye, 1990, p 304).

A third reason for government involvement was economic. For instance, in 1917, the UK Board of Trade realized the electric supply system –involving 438 individual power plants – had to be completely reorganized, as it was hampering both the war effort and national economic growth. The Electricity (Supply) Act 1919 and the follow-up Electricity (Supply) Act 1926 standardized voltage, phase, and frequency along distribution and transmission systems across the UK, and authorized the development of new generation capacity. Creation of a national grid began in 1929 and was largely completed in 1934, with impressive results. By 1938, generation costs had fallen 24%, and the amount of unprofitable, unused capacity had declined dramatically.

**The Origins of Government Regulation**

Any discussion of government involvement in the early history of the electric utility industry would be incomplete without addressing government regulation. The unique characteristics of the early technology and its status as a natural monopoly were responsible for the imposition of regulation in the late 1800s and early 1900s.

Economists explain natural monopolies occur where there is declining marginal cost for each additional unit of output, meaning costs are minimized by having a single firm operate the system or provide the service (Surrey, 1996). In practical terms, this means it doesn't make sense to allow many firms to compete in the electric marketplace because it is inefficient to have anyone other than a single firm run wiring around a city and into the homes and businesses of end users. Changing service providers would conceivably require the constant digging up of streets to lay new electrical cable, or the stringing of new electrical wiring above the street on tall poles. Similarly, electric generation equipment is hugely expensive, and most electric supply firms would be unwilling to invest in new or bigger technology designed to lower operating costs without some guarantee that they have the customers lined up to buy their power.

Electric utility regulations therefore bring order to the marketplace by limiting the number of firms allowed to deliver electric services in a community, and by imposing operating requirements on them to ensure that service quality remains high.

The early days of electric utility regulation in the US, however, were less about marketplace coherence and more about trying to eliminate corruption and price gouging. The first attempt at regulation, imposed at the municipal level, established a franchise system. Designed to limit the number of companies operating in a geographic area, the system also provided fertile ground for graft. Franchises "were often drafted by political bosses in such a way as to favour the franchisee at the expense of 'consumer interests'; these favourable provisions were offered in exchange for kickbacks to politicians under a wave of corruption that touched virtually every major city in the nation" (Schap, 1986, p 21).

State-level regulation was needed, and Edison Electric's Insull was among its earliest proponents. Insull recognized the industry was best treated as a natural monopoly, as competing power lines and plants increased the cost of delivering electricity (Smeloff & Asmus, 1997). In 1898, he argued state oversight would legitimize the status of utilities as natural monopolies; lower the cost of borrowing money by eliminating fears that utilities would lose market share; lessen competition for capital; and lessen or eliminate kickbacks to local politicians over franchise rights (Hirsh, 1999).

In 1907, an influential report endorsing state regulation of electric monopolies was issued by the National Civic Federation, a group that included Insull and the well-known American banker J.P. Morgan (Smeloff & Asmus, 1997). Progressive Era politicians jumped on the bandwagon, envisioning regulatory commissions "manned by politically neutral experts who could administer laws using rational and scientific approaches" (Hirsh, 1999, p 30). The idea also was endorsed by investment bankers, manufacturers of electrical equipment, and other stakeholders who could benefit from a continued and rational expansion of the electric utility industry. That same year, New York and Wisconsin imposed state regulation, and by 1935, electric utility regulations existed in 37 of the 48 states and the District of Columbia (Jacobson, 2000, p 76).

The federal government played only a modest role in regulating public utilities, passing no significant legislation until the 1935 Federal Power Act created what is today known as the Federal Energy Regulatory Commission (FERC). FERC's forerunner was focused largely on hydropower development and its role in promoting rural electrification.

The earliest efforts to regulate the industry in the UK predate the industry itself. In 1881, Minister of Trade Joseph Chamberlain proclaimed, "The supply of gas and of water, electric lighting, and the establishment of tramways must be confined to very few contractors. They involve interference with the streets, and with the rights and privileges of individuals. They cannot, therefore, be thrown open to free competition, but must be committed under stringent conditions and regulations, to the fewest hands" (Hannah, 1979, p 23). Accordingly, the Electric Lighting Act 1882 empowered Chamberlain's Board of Trade to issue a license or provisional order authorizing the supply of electricity to any area by any local government authority or company; and to grant powers to install a supply system, including breaking up streets to lay electrical wiring. The law also established price ceilings.

Licenses and the erection of overhead wiring could be granted only with local authority consent (Chesshire, 1996; Electricity Council, 1977). Licenses were for a period not to exceed seven years, although they could be renewed. The most controversial aspect of the law was a reversionary purchase clause that entitled local authorities to purchase utility systems at a written-down value after a period of 21 years. This clause was blamed for retarding development among speculators concerned about investing in short-term enterprises (Hannah, 1979). These arguments proved persuasive to Parliament, which subsequently extended the purchase clause provision to 42 years in the Electric Lighting Act 1888, after which the rate of utility development jumped considerably.

The previously mentioned 1926 Electricity (Supply) Act was the next significant piece of legislation in the UK The regulatory board it created, the Central Electricity Board (CEB), forced many uneconomical utilities out of business, and determined many other aspects of their operation, including the voltage, phase, and frequency at which their systems generated power. Smaller systems that generated power strictly for local use, however, remained beyond its control. And even though the CEB had shown that rationalization of the system could bring significant benefits, municipal and private owners remained skeptical that mergers were in their best interest. As a result, immediately after World War II, the incoming Labour government faced a quandary.

With many of the franchises guaranteed by the 1888 Act coming to an end, Central Government faced the prospect that franchises would simply be renewed by local authorities, tying government's hands as it sought to rebuild the country. Because a rational electric system was seen as an important precondition to rebuilding and economic expansion (Chesshire, 1996), the government decided to nationalize the electric power industry, believing that "public ownership at the national level was...a superior alternative to public ownership at the municipal level" (Newbery, 1999, p 111). The Labour Party had proposed nationalization in 1932, but World War II impeded implementation. With Labour's return to power in 1945, they were now in a position to put the idea into effect.

Under the Electricity Act 1947, the British Electricity Authority (BEA) was established with responsibility for central coordination and policy direction of the industry. The BEA also assumed control of the 297 power stations feeding 560 different utility operations then in place in England, Wales, and southern Scotland. Fourteen independent Area Electricity Boards (12 in England and Wales; two in southern Scotland) were created with responsibility for planning and operating the distribution system, which included supply, metering, billing, and customer service. In 1955 the system was changed slightly, as the BEA was replaced by two statutory bodies, the Electricity Council, with responsibility for research and development, finance, policy coordination, and advising Central Government; and the Central Electricity Generating Board (CEGB), responsible for power station operation, the construction of new facilities, and management of the high-voltage (above 132 kV) national grid. Under the structure of this system, the CEGB and area boards were autonomous of the Electricity Council (Chesshire, 1996; Gordon, 1981). This new system largely remained intact until the late 1980s.

### Restructuring the Marketplace – Liberalization Comes to the Electric Utility Industry

Between World War II and the 1970s, market trends in the US and in the UK were relatively similar. Post-war economic expansion fueled dramatic growth in electricity demand. In the US, the demand for electricity grew at twice the rate of the economy (Hyman, 1985). High-voltage transmission systems expanded their reach, and power plants grew ever larger. Technical progress on both counts led to a steady decline in the price of power. The mix of fuels powering these plants also began to change, as nuclear power technology came on line in the 1950s and 1960s, and was viewed as a potentially revolutionizing technology.

The ground shifted under the industry in the 1970s. Technological stasis was one important reason (Hirsh, 1999). For nearly 90 years, engineers steadily increased the efficiency of the generation systems, capturing ever-higher proportions of the chemical energy embodied in the fuel powering the generators. By the 1970s, efficiency increases were leveling off, and the economies of scale offered by ultra-large (1200+ megawatt) power plants began to disappear as the cost of operating and maintaining these high-tech facilities grew faster than the value of the additional energy production.

In the US, the Arab oil embargo and the resulting price shock on many oil-based electrical generation systems also had a big impact, prompting the public to rethink their electrical consumption. The conservation message was amplified by the nascent environmental movement, which stressed the environmental benefits of reduced energy use. Although the overall rate of electrical use did not decline, the rate of growth did, and many utilities responded by cutting back on their plans for new or expanded facilities (Grubb & Vigotti, 1997).

New environmental laws in the US and many European countries also increased costs at many power plants, as pollution restrictions forced generators to add expensive emissions control equipment. Some environmental laws made the siting of new power plants more difficult, with complicated environmental impact reports slowing down the approval process and creating new opportunities for public input. Finally, the accident at Three Mile Island raised questions about the safety and environmental impacts of nuclear power technology, upending expansion plans that were only beginning to see fruition.

In the United States, the first step toward market liberalization came in 1978, when President Jimmy Carter signed the Public Utility Regulatory Policies Act (PURPA), a law designed to reduce electricity use and open the market to new sources of electric power. Section 210 of PURPA, Cogeneration and Small Power Production, had the greatest impact on the industry, ending monopoly control of electrical supply. The electric generation market was opened to independent producers, and regulated utilities were required to buy all of the electricity sold by these firms.

PURPA also established a fee structure, requiring utilities to pay for this power at a rate not to exceed the "incremental cost" of the power, defined as how much the utility would pay to generate the power itself or purchase it from another source (Hirsh, 1999). Although the total contribution to the national electricity supply remained relatively small, PURPA has had a significant effect on independent power generation. Between 1978 and 1995, independent power contributions to the transmission and distribution grid increased by 3,600%. Perhaps the most significant impact of PURPA, however, was how it weakened the justification for the special natural monopoly status granted to electric utilities (Hirsh, 1999). PURPA did so by spurring development of new technologies and systems that came to be seen as comparable or superior to the old-style, large, centralized power production facility. By the early 1990s, policy-makers began to reconsider the wisdom of granting unique status to regulated utilities.

The 1992 Energy Policy Act took the first step, opening the marketplace even further by eliminating restrictions that inhibited independent generators and existing regulated utilities from competing in certain markets. Since then, 22 states and the District of Columbia have taken the next step and adopted retail competition statutes, although two subsequently repealed these programs (Edison Electric Institute, 2003). Worth noting is that these efforts to open markets have focused only on the *production* of electricity, while delivery via transmission and distribution lines remains a regulated natural monopoly, under the control of the FERC.

By leaving deregulation to the states, however, the 1992 Energy Policy Act has left the US with a hugely complicated marketplace. The market in some states looks much as it did in the early 1990s, while others have essentially the same generation capacity but new ownership of these facilities, as many utilities sought to voluntarily divest themselves of their power plants. In other states, divestiture was forced upon utilities as a way of ensuring that they did not gain undue advantages for power generated by their own facilities. In still other states, there has been a surge in the number of independent power producers selling to the grid, some of whom utilize renewable energy technologies.

The future of deregulation in the US was thrown into flux by the 2000-2001 energy debacle in California. Although California's 1996 deregulation law was designed to lower prices, which historically were 40% higher than the rest of the country, the outcome has been far different. During 2000-2001, a confluence of events conspired to result in rolling power blackouts, bankruptcy filings by the state's largest utilities, and institutional chaos that will take years to untangle (Jurewitz, 2002; Woo, 2001). Regulatory rules were quickly rewritten, and then rewritten again, as policy-makers and energy planners tried to stave off financial disaster.

California's problems began after a dry winter in the Pacific Northwest limited the amount of hydropower available. But that was only one of several factors. Years of divestiture in plant capacity by local utilities, combined with a lack of new construction by independent providers, exacerbated the problem. So did surging natural gas prices, complex wholesale market rules, gaming by market players seeking higher returns, and political battles between state and federal officials. Since then, considerable time has been spent analyzing what happened, who (or what) was at fault, and how the system must be changed to prevent a recurrence and to deal with financial aftershocks. The answers are still not clear, but observers say the California crisis has significantly slowed the pace of deregulation in many states, as well as in many countries around the globe (Navarro & Shames, 2003).

**Market Liberalization in Europe – It All Begins With the UK**

The UK was the first country in Europe to undertake a restructuring of the electricity marketplace. Long a goal of the Conservative Party, privatization of state industries had been under way since Margaret Thatcher assumed power in 1979. It was her belief that state ownership stifled innovation and allowed managers to use outdated business practices, harming their competitiveness in the global marketplace (Thomas, 1996). Electricity privatization first was proposed in 1987, after some of the other major British utilities already had been liberalized, including the state-run telephone and gas systems. There was widespread recognition that electricity market liberalization would be more challenging, however, as the industry was four times larger than the total asset base of all industries privatized by the Thatcher administration to that point (Thomas, 1997).

Adding to the challenge was the fact there were no good models to follow. What *was* known was that the UK wanted to avoid simply transferring assets from public to private ownership, without establishing any competitive mechanism (Thomas, 1996). There were other goals as well, less explicitly stated, including raising cash for the Treasury, giving the public the opportunity to make money, breaking the power of the coal mining unions (who could bring the electricity industry to its knees with a work stoppage), and giving the industry the capacity to borrow freely on the capital markets. Publicly-owned industries could not borrow money on their own, because it was seen as virtually the same thing as government borrowing (Thomas, 1997; Young, 2001).

A 1988 government white paper laid out the first details of how the system would work. The twelve existing distribution and supply operations in England and Wales would be sold intact, but they would be forced to separate distribution from supply.

The CEGB was to be divided into three parts: a high-voltage transmission operation, which would operate as a separate company known as the National Grid Company; and two companies (National Power and PowerGen) that would divide up the existing generation capacity and compete with one another.

National Power would assume control of 70% of the generation capacity, including all nuclear power plants. PowerGen would operate the remaining 30%. National Power was given greater control of non-nuclear facilities in order to offset the high cost of nuclear power operation and ensure survival in the market (Thomas, 1997; Young, 2001).

The proposal included four other important elements:

- An Office of Electricity Regulation (OFFER) would be created to initially oversee supply issues and permanently oversee distribution and transmission.
- A Non-Fossil Fuel Obligation (NFFO) would require that distribution companies purchase non-fossil fuel power. Theoretically, this was designed to promote renewable energy, but it also could be used to support the purchase of nuclear power.
- A Fossil Fuel Levy of 10% would be assessed on all power sales in the UK to compensate nuclear power plants for the high cost of operation.
- A Power Pool would be created to achieve production at the lowest cost. Each day, power generators would submit information specifying how much they would charge to provide power during each 30-minute block of time the following day. Power supply companies also would be asked to project their demand over the course of the day, and the Pool then would select among the bids to ensure the best price for a full 24-hour period. Each generator then would be notified how much power to generate the next day.

By the time the Electricity Act 1989 was approved, most of the initial proposal had been agreed upon – the exception being ownership of nuclear power plants. It had become clear that these facilities would not sell without the government agreeing to cover their long term liability risk (Thomas, 1996). An agreement was reached to place all 12 nuclear power stations under the control of a fourth firm, Nuclear Electric, which would be a 100% government-owned company. Once this change was made, it was necessary to adjust the generation plant allocation between National Power and PowerGen, resulting in a 60/40 split (Newbery, 1999). Had more time been available, the overall system may have been structured differently, but the Thatcher government was under pressure to complete privatization before the next general election. Dividing power generation among more competitors would have taken too long, so the three-firm system was adopted (Young, 2001).

In March 1990, the newly revamped marketplace began operation, and since then it has achieved many of its original goals. In real terms, the rates charged to both domestic and industrial users have declined between 25% and 40%. The sale of system assets brought the Treasury roughly £12.7 billion between 1990 and 1995. The influence of the mining unions has been diminished, as the reliance on coal-fired power plants has dropped dramatically. Today, more than 35% of all power in the UK is generated using combined-cycle gas turbines, a technology that didn't even exist in the late 1980s. Coal's share dropped from 63% in 1989 to 35% in 2000 (deOliveira & Tolmasquim, 2004, p 13).

In the two years after retail competition was fully implemented, more than 38% of all domestic customers had switched suppliers at least once (Electricity Association, 2002). There also have been dramatic changes in how the marketplace operates and is regulated. As of 2003, no single player controlled more than 25% of total capacity, a function of an increase in the number of independent power producers, increased electricity imports from Scotland and France, and regulatory rulings that forced PowerGen and National Power and the Regional Electricity Companies to divest themselves of generation capacity (Woo, Lloyd, & Tishler, 2003).

Given the growing use of natural gas as a fuel source in power plants, in 2000 the government merged OFFER with OFGAS, the gas regulator, to create the Office of Gas and Electricity Markets (OFGEM). In 1998, subsidies to the nuclear power industry from the Fossil Fuel Levy (FFL) were eliminated. Monies from a reduced FFL are now used to support power generation from renewable sources.

Perhaps most importantly, the Utilities Bill (2000) that created OFGEM also scrapped the Power Pool, replacing it with the New Electricity Trade Agreement (NETA). Whereas the Pool relied on centralized decision-making about plant dispatch, or which plants would be used to generate power for the grid, NETA relies on direct bilateral agreements between power supply companies and power plant operators to govern most planning decisions. NETA operates like other commodity markets, trading electricity in forward, futures, and short-term markets. Contracts can be structured to cover almost any period of time, ranging from a single day to several years, greatly enhancing financial stability. As with the Pool, NETA participants must notify the National Grid about their planned generation output or expected demand for the next day, in 30-minute increments. Participants must submit a final estimate 3.5 hours ahead of when the power is actually needed or produced, along with a description of the level of payment they would accept to deviate from this demand or output (Electricity Association, 2002). Suppliers and customers may offer load reductions in direct competition with power generators. The Grid then makes adjustments totaling less than 2% of the overall demand to ensure the system remains in balance. To prevent gaming and to promote improved plant operations, the Grid operator can penalize participants for using (or generating) more or less power than expected. Since NETA became operational, it has been credited with reducing both base load and peak pricing by more than 20% (OFGEM, 2002b).

**Electricity and Electric Utilities – A Municipal Perspective**

The record in both Europe and the United States makes clear the close links among the early history of electric utility development, regulation, and urban-level politics and policy-making. Utilities first were created in cities, reflecting both the limitations of the direct current technology in use at the time and the desire to maximize profits by minimizing wiring long distances between customers.

Cities exerted influence over the industry in many different ways. Local-level regulation, generally in the form of exclusive geographic service rights, was one of the earliest influences, required to manage the wiring of homes and businesses in a way that protected public safety and the integrity of public thoroughfares. Local eminent domain powers were frequently exercised on behalf of utilities attempting to reduce costs by stringing wire across private property rather than following established public thoroughfares (Schap, 1986).

The profit and price controls that came with the awarding of exclusive geographic franchises helped reduce corruption, but did not eliminate it entirely. Instead, new avenues for corruption were established, this time by public officials eager to grab some of the financial reward that came with awarding exclusive service rights. Some municipalities opted for city-run utilities, believing they minimized the opportunity for corruption and provided cost savings to local consumers, otherwise known as voters.

The prominence and impact of municipally-run systems has differed between the US and UK. In the US, the number of municipal electric systems peaked at nearly 3,100 in the early 1920s, far outpacing the number of privately managed utilities, but ultimately serving fewer customers. Shortly thereafter, as efforts were made to link transmission networks, many municipalities found that local energy costs could be reduced by relying on larger privately run systems, and the number dropped to approximately 1,900 utilities, where it remained roughly constant between 1930 and 1980 (Schap, 1986, p 11). Today, the American Public Power Association claims more than 2,000 local utilities as members, serving nearly 20 million customers (APPA, 2005). Although municipal systems continue to serve some large cities – including Los Angeles, San Antonio, Sacramento, Seattle, and Austin, Texas – most utilities serve small towns, with nearly 60% serving fewer than 3,000 customers (APPA, 2003).

Originally, most public systems were in the power generation business, but over time, it became increasingly common for utilities to simply act as conduits selling power generated by federal, state, and privately-operated power generation facilities. This trend continues today, as more than two-thirds of the public power systems in the US are distribution-only utilities, purchasing power at wholesale rates for resale to the general public. Research by the US Department of Energy has found that residents and businesses served by public power systems generally pay rates averaging 15% less than those paid by private utility customers (APPA, 2003).

The impact of municipal electric utilities has been felt more significantly in the UK, where local authorities a century ago moved quickly to establish their own power generation and distribution operations. In many cases, they saw how profitable private electricity ventures could be, and they used the powers granted them by the 1882 and 1888 Electricity Acts to take over franchises operating in their areas.

Leslie Hannah, author of the authoritative history of the pre-1948 UK electric industry, notes that "provincial civic pride" and the need to fund increasingly complex local government operations were the principal driving factors behind the public utility movement, along with the desire to keep voters happy by creating government employment opportunities and ensuring the lowest possible electricity pricing (Hannah, 1979, pp 23, 215). During the years between the two world wars, public utilities were handling two-thirds of electricity sales nationwide; at the end of the 1930s, there were only four cities or towns in the United Kingdom with populations exceeding 60,000 that did *not* have municipally owned utilities.

Municipalities also were moving aggressively to protect their "milch cow" (Hannah, 1979, p 216), scheming to increase residential demand while opposing private undertakings in outlying communities that might someday be annexed by the city. However, the parochial interests of each municipality ultimately drove the push for nationalization in the mid-1940s, as local employment considerations, the availability of local fuel sources, and the power needs of local traction systems or industrial users led to individual, and often incompatible, system designs. Once the system was nationalized, the 600+ municipal and private operations in the UK were bought out by Central Government, bringing to an end the era of municipally-run utilities.

Because the industry had been nationalized, the UK avoided the difficult question of how to treat municipal utilities under market liberalization. In the US, for instance, municipal utilities don't pay taxes; they have access to lower-cost, tax-exempt debt; and they have preferential access to cheap power from federal hydropower facilities. As states grapple with how to change the marketplace, private utilities argue municipal operations should be forced to forgo these advantages, placing them on an equal footing with privately run utilities (Moore, 2000).

It is perhaps too soon to conclude that deregulation favors municipal systems. Still, there is a slight trend toward municipalization over the past decade, with twelve new municipal utilities serving communities previously served by private utilities, and only two examples of the opposite. In addition, as of 2002, more than 100 communities were analyzing the switch to public power (APPA, 2002).

Private-sector critics charge that this reflects a desire by many cities to gain access to a new revenue stream, and in some cases is an attempt to evade responsibility for stranded costs of the old privately owned system. Advocates of municipalization counter that deregulation is forcing private utilities to focus less on their customers and more on their investors, and any trend toward municipalization is simply an attempt by local governments to preserve quality for their constituencies (APPA, 2002; Moore, 2000).

**Conclusion**

Any analysis of urban energy policy-making must begin with a review of the larger energy marketplace, because the macro-level dynamics of this industry ultimately influence the direction and type of policy responses developed by local authorities. We will very clearly see this in both the New York and London case studies.

To begin, we must recognize that for the better part of a century, the electric power industry has been predicated upon several basic principles, all of which are closely linked. First, the system operates in a highly regulated manner, under the auspices of state or national level officials. It wasn't always this way, however. In the early days of the electric power industry, electric power generation and distribution systems were small in scale and cities had significant total control over the conduct of the local marketplace. To limit the tangled web of electric wires above and below the ground, local authorities placed strict limits on who had the right to operate a utility in a given neighborhood. The right to grant or sell franchise rights also created conditions ripe for corruption, however, and pressure built to consolidate oversight powers at the state or federal level. Although there have been some significant course corrections along the way, this regulatory schema has survived largely intact for the better part of a century. Even in cities with municipal utilities, many fundamental powers over rate-setting and service obligations rest with the state or national-level regulators.

Second, as a natural monopoly, cost efficiencies have long been a goal of this sector. By building bigger power plants, and by balancing loads from larger and larger groups of customers, utilities and regulators alike worked to deliver ever-cheaper electric power to consumers. Until the 1960s, these results were achieved on a fairly consistent basis, arguably becoming a societal norm. For the 20-30 years after that, however, prices began to inch upwards, as power plant designs simply couldn't deliver the same efficiency gains as they had in the past. When combined with oil price shocks, the imposition of new environmental controls, and more-expensive-than-expected new nuclear power technologies, the stage was set for a significant market restructuring, which was delivered in the 1990s with the promise – yet again – of lower electricity prices.

Third, grid 'coherence' was an important precursor to the cost efficiencies. After much debate, the industry and regulators finally settled on certain system characteristics (AC power, fixed voltage and frequency levels, etc.) that allowed grids operated by different utilities to interconnect with one another. Grid coherence also presumed a standardized operating model, involving the one-way flow of electricity from large central station power plants to end-users. Market structures and regulations built up around this operating paradigm, which went virtually unchallenged until the 1970s and 1980s when distributed power systems returned to the scene. These had first been deployed in the early days of the electric power industry, with systems located on-site at the point where the electricity was needed.

What do these underlying principles have to do with renewable energy policy-making in cities? Plenty! In the case studies that follow, I argue that the regulated market environment in both London and New York actively disempowers local policy-makers, limiting their ability to develop or implement policies that could increase the deployment or use of renewable power. This outcome should come as no surprise, as a lessening of local control was the specific intent of those seeking to vest regulatory powers at the state or national level back in the early 1900s. Market restructuring efforts during the 1990s may have shifted certain responsibilities around to different stakeholders, but they did nothing to enhance the powers of local policy-makers.

Second, as I discuss more fully in Chapter 2, electricity from renewable sources tends to cost more than power from large central-station nuclear or fossil fuel-fired power plants. To the extent society has grown accustomed to and prefers cheaper forms of power, then renewables may face an inherently uphill battle in the marketplace. In my two case studies, we'll see how both New York and London seem vexed by the cost of renewable power. London is moving to actively promote its use, but the Mayor's new energy strategy is largely silent on the cost issue, simply recommending that householders and developers avail themselves of subsidies from Central Government. In New York City, similar subsidies are available, but the cost of renewable power nonetheless appears to loom as a more overt impediment, dissuading policy-makers from giving these technologies more active consideration.

Finally, the grid design issue has presented a challenge to the renewables industry since the 1970s, and continues to this day. In Chapter 7, I posit how technology 'lock-in' has occurred, slowing renewables deployment in New York City and perhaps influencing how policy-makers view renewables as a local energy solution. In other words, in all of these cases, we begin to see links between the larger electricity policy and market landscape and the logic of local action. In the next chapter, we'll continue this macro-level view, narrowing our scope to focus more explicitly on how renewable power fits into the overall energy picture.

# CHAPTER 2
# Focus on the Future – Renewable Sources of Power[2]

## Introduction

Chapter 1 was technology agnostic, focusing on general electricity market conditions rather than the landscape facing any specific type of power generation technology. The goal of this thesis, however, is to analyze decision-making related to renewable power system deployment and use in urban areas. This chapter therefore looks at the current policy and market environment related to 'new' renewable power technologies, explicitly examining: why and the extent to which renewable energy has gained a foothold in the energy supply picture; what policies have been promulgated at the macro level in the US and the EU that will affect renewable electricity development[3]; how the liberalization of electricity markets affect the prospects for renewables; and how municipalities view renewables from a policy perspective. This information provides key background context for the case studies, as several of the issues introduced here take on particular urgency as factors influencing local decision-making in London and New York City. The cost of power has already been noted as one important issue. Another is the way state and national renewables support programs have been structured. Both issues receive considerable attention in Chapters 6 and 9, as the failure of these programs to account for differences between the technologies deployed in urban and rural areas ultimately proves problematic for urban policy-makers and system developers.

## The Rise of Renewables

Mankind has relied on naturally occurring phenomena to provide mechanical power for over 2,000 years. Windmills and watermills were used for grain grinding, as well

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[2] For the purposes of this research, I am using a modified version of the definition developed by the UK Renewable Energy Advisory Group, which defined renewable energy as "the term used to cover those energy flows that occur naturally and repeatedly in the environment [that] can be harnessed for human benefit" (Alexander, 1996). As I am more narrowly focused on renewable forms of electric power generation, rather than all forms of renewable energy, I will limit my research to electricity produced by technologies harnessing energy flows that occur naturally and repeatedly in the environment, including solar, wind, and tidal power; small hydro systems; geothermal; and biomass-based power sources, all of which are well-suited to an urban context.
[3] UK-level renewables policies are dealt with in depth in Chapter 6 as part of the London case study.

as for textile production as early as 4,000 years ago. With the advent of electricity, however, only hydropower was able to make the switch and effectively compete against fossil fuel-based electrical generation systems during the 20th century. The intermittency of wind and the relatively small scale of the wind turbines available early in the century meant these systems could not compete economically, and wind power schemes were largely extinct in most industrial countries by the middle of the 20th century (Cassedy, 2000).

Circumstances were different for hydropower systems, which over the course of the 20th century gained a prominent place in the world's electricity supply picture. During the 1920s and 1930s, hydropower systems supplied fully 43% of the world's electricity (United Nations, 1952), and even today, large-scale hydropower contributes 16% of the world's supply (IEA, 2004c, pp 193, 234). Large-scale hydropower is extremely cost effective, producing some of the least expensive electricity available today. Hydro dams also are credited with reducing flooding risks, creating recreational opportunities, and storing water for public water supply or agricultural purposes. It is therefore somewhat ironic that as renewable power systems are growing in favor, large-scale hydropower is not. New projects such as the Three Gorges Dam in China are criticized for the threats they present to ecosystems and areas of great natural beauty, as well as the problems associated with the displacement of communities located in the eventual flood plain. In an era when terrorism concerns are heightened, large dams also are seen as an inviting target, because of the havoc dam failure can wreak downstream.

Instead, since the 1980s, attention has increasingly focused on generating electricity from new types of highly efficient wind turbines, small-scale (or mini) hydro projects, and newer technologies, including solar photovoltaics, tidal power systems, geothermal power, and biomass-based electricity schemes. The drive for these "new" renewables (Grubb, 1995, p xi) stems from a variety of explanations:

- *Environmental and public health concerns*: Concerns over excessive pollution from electric power plants have been around for decades. The Great London Smog in December 1952 sparked changes in power plant management practices after it was determined that coal burning was the culprit (Nagourney, 2003). The environmental movement that gained steam in the 1970s brought many of these same concerns to a head in other countries, resulting in air quality rules that forced electric utility operators to clamp down on smokestack emissions. Despite reductions in emission levels, the impacts are still significant, with one recent study estimating that coal- and oil-fired power plant emissions in the European Union cause an estimated $70 billion of harm to human health, buildings, and food crops each year. Most of the damage comes in the form of respiratory illnesses and deaths attributable to airborne particles released by these facilities (Krewitt, Heck, Trukenmuller, & Friedrich, 1999). Renewable power sources are seen as one way around such problems, as they represent "cleaner" forms of technology that produce electricity with little or no emissions.

- *Climate change concerns*: Completely separate from public health issues has been a growing scientific anxiety about the gradual warming of the earth's atmosphere. These concerns have grown from the analysis of data systematically collected since the late 1950s, and the results were conclusive enough by 1990 that a UN-convened Intergovernmental Panel on Climate Change issued a call for international action to address the problem (Grubb, Vrolijk, & Brack, 1999). At the 1992 Rio Earth Summit, the first step was negotiated, asking industrialized countries to reduce greenhouse gas emissions to 1990 levels by the end of 2000. As a result, many countries implemented energy efficiency measures, promoted renewable power use, and shifted to higher levels of natural gas use (Geller, 2003). It quickly became clear that the targets called for would not be achieved, however, and efforts were launched to obtain legally binding, quantifiable commitments by industrial countries. Issued in 1997, the so-called Kyoto Protocol established a reduction target for a "basket" of greenhouse gases to be achieved by the years 2008-2012. Although individual countries are free to choose the best way to achieve such reductions, in industrialized countries it will inevitably include changes in electric power-generation practices, as this sector generates roughly one-third of all greenhouse gas emissions, primarily from the burning of fossil fuels in large-scale power plants (Grubb et al., 1999). The agreement, an amendment to the United Nations Framework Convention on

Climate Change, came into force in February 2005, following formal ratification by Russia, the 141st country to do so. Notably absent from the list is the United States, which has argued the agreement is flawed and that changes necessary to achieve suggested reduction levels are too costly (BBC, 2005).

- *Security Risks*: The 1973 Arab oil embargo was just one of 14 significant oil supply disruptions to occur worldwide in the last 50 years (Geller, 2003). But it was one of the most noteworthy in terms of reminding industrialized western nations of the extent to which their economy is dependent upon a steady flow of oil and gas from sources over which they have little control. Since then, political turmoil and wars in the Middle East have only exacerbated these concerns. Although many countries are now exploring ways to exploit domestic oil, gas, and coal reserves to offset imported fuel sources, renewable electricity systems are increasingly seen as a way to enhance a nation or region's economic security.

During this same period, public opinion has been broadly supportive of renewable electricity technologies. The most definitive research in this area has occurred in the US, where researchers at the US Department of Energy's National Renewable Energy Laboratory (NREL) analyzed more than 700 public opinion polls carried out between 1973 and 1996. Particularly since the accident at the Three Mile Island nuclear power plant, the NREL has found consistent public support for renewable energy, characterizing it as one of the strongest patterns identified in the entire data set of public opinion surveys on energy and the environment (Farhar, 1996).

In Europe, there has been less systematic analysis of opinion survey results over the same period, but such surveys nonetheless show similar trends. Since the early 1990s, the Eurobarometer studies commissioned by the European Commission have surveyed residents of EU-member countries on various energy-related issues. The most recent report, issued in 2002, found almost universal support for immediate action to address the problem of climate change. The survey also found that 75% of Europeans believe that fossil fuels contribute significantly to climate change; that energy imports create economic security problems, and that switching to renewable energy technologies will ultimately be best for the environment. Nearly 70% of all

Europeans also endorse an expansion of research into renewable energy. The Eurobarometer reports break down the results by country, and these views generally hold constant across the then EU-15 member countries (EORG, 2002).

**Policy Framework Affecting Renewables**

Policies promulgated at the national and international levels have had a considerable impact on renewables development both in the United States and Europe. Policies generally fall into two areas: those focused on overall climate change, and those more narrowly focused on renewables development. By necessity, the former must consider a broader range of issues, such as the climate change impacts of transportation and residential, business, and industrial heating schemes. Most climate change plans nonetheless include some focus on electricity generation and strategies that can reduce the electric power sector's greenhouse gas contributions. Policies specifically focused on renewables development, on the other hand, have emphasized not just the greenhouse gas benefits of such development, but also the payoff in terms of public health, economic development, and security of supply.

As early as 1986, the Council of European Energy Ministers listed the promotion of renewable power sources among its energy objectives (EC, 1997). The first effort to formally establish renewable electricity production targets was made in 1993 by the ALTENER program, an EU environmental research initiative that called for a tripling of electricity production from renewable sources by 2005 (Grubb, 1995).

In 1995, the EU released *An Energy Policy for the European Union*, a white paper considered the foundation of all current energy planning in Europe. The white paper identified three key overarching objectives (EC, 1985):

- Promote competitiveness, both of the European energy industry and of Europe in general
- Improve the security of Europe's energy supply
- Protect the environment

The first objective was the primary driver behind Directive 96/92/EC, which liberalized the electricity marketplace around Europe. One aspect of the directive was specifically designed to accommodate renewable energy: a provision allowing transmission system operators to grant priority grid access to renewable sources as part of a wider public service obligation (Vrolijk, 2002). The second objective culminated in another policy document, the November 2000 Green Paper, *Towards a European Strategy for the Security of Energy Supply.* Among its recommendations, the report called for increasing the percentage of electricity derived from renewable sources from 14% in 1997 to 22% by 2010 (EC, 2000).

The third objective was addressed in the November 1997 *White Paper on Renewable Energy*, best known for setting the ambitious target of doubling the contribution renewable energy makes to the EU's gross energy consumption[4] by 2010, and mandating status reports on progress toward this goal every two years. To ensure that the target is achieved, the plan established targets for different renewable technologies in the belief that each technology must contribute if the overall goal is to be achieved. In the "Campaign for Take-Off" portion of the report (EC, 1997), the EU laid out several goals to be achieved by 2010:

- Installation of 1 million new photovoltaic systems, half in the EU, and half in other countries
- Installation of 10,000 megawatts (MW) of power from large wind farms
- Installation of 10,000 MW of combined heat and power systems powered by biomass
- Integration of renewables in 100 communities, regions, cities, and islands, where the goal is to install enough renewable energy capacity to meet 100% of the area's electric power needs.

[4] Note that this goal focuses on total energy consumption in the EU, including fuel used for transportation and natural gas used for heating purposes. By contrast, the 22% target identified in the Green Paper on Energy Security emphasizes the percentage of the electricity supply obtained from renewable power. Since approximately 40% of all energy sources consumed in Europe are used to generate electricity, a higher rate of renewables penetration must be achieved in the electricity supply sector if Europe is to attain the 12% renewables consumption target identified in the 1997 White Paper on Renewable Energy.

The next major policy step was taken by the Green Electricity Directive (2001/77/EC), which established a legal framework for developing renewable electricity markets across the EU. Under the directive, member states were obliged to establish national targets for the consumption of renewable electricity, and the directive provides reference values for what these targets should be (EC, 2001a). Although the country targets are indicative rather than obligatory, they nonetheless reinforce the idea that each country can capitalize on natural attributes (e.g., sunny weather, strong off-shore breezes, large quantities of farmland that can be dedicated to biomass production, etc.) to help achieve the overall target. The Directive abstained from proposing Community-wide support schemes for renewable energy, leaving it up to individual countries to experiment with approaches they feel are best suited to their own circumstances[5]. However, if by 2005 this hands-off approach does not appear to be working, the Directive obliges the European Commission (EC) to develop a harmonized approach that takes into account the experiences of member states (Hanreich, 2002).

A second relevant EU directive, on the energy performance of buildings, derives from the EC's Action Plan on Energy Efficiency. Most of the directive focuses on ways to cost-effectively enhance energy performance in European buildings. One goal is to promote the convergence of building standards among member states, including those that deal with passive solar design and the integration of renewable electricity technologies into building design.

The final major piece of European policy framework is the EU's Climate Change Programme (ECCP). The ECCP was established in June 2000 to help identify the most environmentally and cost-effective measures to help the EU achieve the 8% reduction in greenhouse gas emissions called for under the Kyoto Protocol (EC, 2001b). ECCP authors analyzed 40 different policy and programmatic measures that might reduce greenhouse gas emissions. These measures then were rated as "at an advanced stage of preparation," "in the pipeline," or something for which "more work is needed." In the area of renewable electricity, the ECCP has merely embraced many of the policies and research agendas described above, reporting on their status in

[5] Currently, these include feed-in tariffs, fiscal incentives, competitive tender schemes, voluntary green pricing, and mandates such as renewables obligations.

annual reports that cover a wide range of issues related to greenhouse gas emission reductions.

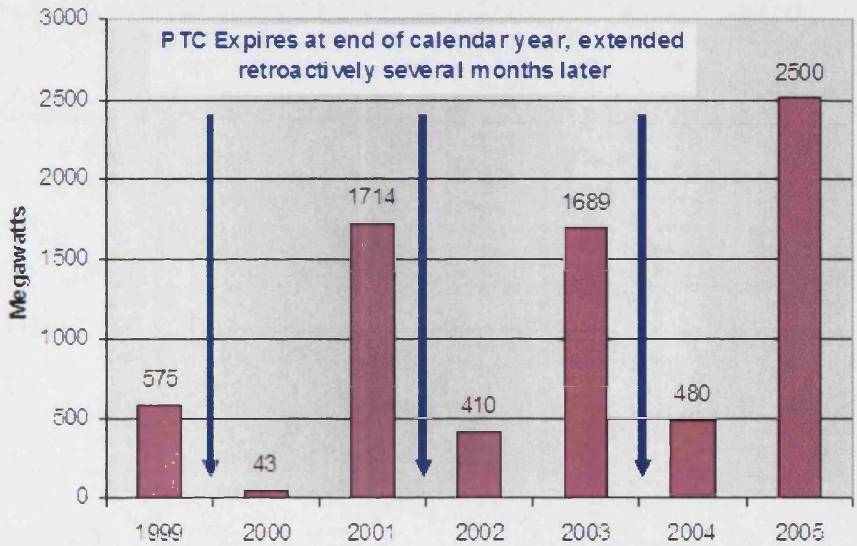
In the United States, renewable electricity first gained prominence in the post-oil embargo era of the mid-1970s. Congress authorized programs to promote renewable power sources, including income tax credits for residential installations of solar and wind systems and business investments in solar, wind, geothermal, and ocean thermal projects. At the same time, California created the world's first large-scale wind farms and awakened the public to the potential of the technology.

The Public Utility Regulatory Policies Act (PURPA), discussed previously in Chapter 1, played a big role in helping renewables gain access to the transmission and distribution grid. In the early 1980s, however, as memories of the embargo dimmed, so did support for these projects. The Reagan administration, with its opposition to government support of technologies that could not garner private funding, ended many of the tax credit programs and slashed federal research funds from roughly $1 billion in 1981 to just over $100 million by 1989 (Rowland, 1997, p 20). Many renewable projects shut down, no longer able to compete with fossil fuel-based electricity.

The next major policy change came in 1992, when President George H. W. Bush signed the Energy Policy Act. EPACT, as it was known, included several important renewables initiatives. First, it established a goal of increasing the percentage of total energy derived from renewable resources by 2005, compared to a baseline period in 1988 (Pace Energy Project, 2001b).

Second, EPACT created two important new financial incentives designed to promote renewables deployment, including a Production Tax Credit (PTC) of 1.5¢/kilowatt-hours (kWh) for electricity produced by wind and closed-loop biomass systems. The second was the Renewable Energy Production Incentive (REPI), which authorized payments of 1.5¢/kWh to public utilities and non-profit electric cooperatives for power generated by biomass, geothermal, and wind and solar power systems. The PTC has expired and then been reauthorized three times, and now applies until the end of 2005[6]. REPI expired in September 2003 and has yet to be reauthorized. Thus far, the record of the two tax credits has been mixed. A 1999 study of the REPI found its impact in promoting electrical generation from renewable sources has been "minor" (EIA, 1999). By contrast, the PTC is considered to play a very important role in improving the economics of renewable power projects (Owens, 2002; Steve, 1999), but it has also been criticized as contributing to a boom-and-bust mentality among wind project developers. Figure 2-1 shows how expiration of the PTC has been followed by a huge slowdown in wind system deployment levels, which then jump once the PTC has been restored (Union of Concerned Scientists, 2004).

**Figure 2-1**
**US Wind Power Capacity Additions (1999-2005)**
Source: (Union of Concerned Scientists, 2004)




The 1998 Comprehensive National Energy Strategy offered but a single renewable energy goal – to double the nation's non-hydroelectric renewable generation capacity to 25,000 MW by 2010. The most recent plan, articulated by President George W. Bush in 2001 Energy Bill and again in his 2005 Energy Bill[7], sets no targets, and efforts to establish a national renewable portfolio standard were defeated in

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[6] The 2004 law extending the PTC also expanded its coverage to other forms of biomass-based power, geothermal power, solar power, small irrigation power, and municipal solid waste. Due to an inflator built into the law, the PTC now stands at 1.8¢/kWh.

[7] The National Energy Policy Act was first proposed in 2001, but early versions were defeated in Congress. In the wake of his re-election victory in 2004, President Bush reintroduced an amended version of his 2001 proposal, winning approval in the House of Representatives in April 2005. At the time of this writing, the legislation has yet to be acted on by the Senate.

committee before it could be voted on by the full Congress (Evans, 2005). The Bush plan goes on to propose the development of new gasoline refineries on closed military bases, federal risk insurance for nuclear power plant developers, and the opening of federal lands for fossil fuel exploration (Blum, 2005).

If there is one area where the US' approach to renewables has been fairly consistent, it is a record of financial support for research and development on different renewable technologies. Despite the cutbacks in the 1980s, over the last 20 years, the US has spent more than $14.2 billion (in constant 2003 dollars) on basic and applied renewables research and development, commercialization of different technologies, technology transfer, and information dissemination (Sissine, 2003).

As in Europe, the US has had a separate, broader-focused climate change policy since the early 1990s. And as in Europe, these policies have been of little consequence in advancing the cause of renewable electricity. In 1992, Congress passed a law requiring the president to prepare a climate-change strategy for the nation, and President Clinton released the first Climate Change Action Plan in 1993. The plan was best known for its goal of returning US greenhouse gas emissions to 1990 levels by the year 2000.

The second Bush administration's attempts at managing climate change policy have principally been focused on moving away from commitments made by President Clinton, who signed the Kyoto Protocol in 1998. Clinton never brought the Protocol before Congress for ratification, however, and in 2001 President Bush announced he would not do so, expressing skepticism that the Protocol would address the root causes of climate change. In July 2003, the US government announced a new 10-year, $130 million research agenda focusing on the contribution of natural causes to climate change (Gugliotta, 2003).

**Impact of Electricity Market Liberalization on Renewable Power**

Since electricity markets were first restructured in the United States and Europe, there has been a dramatic increase in the supply of electricity from renewable sources. Linking this growth to market liberalization is tricky, because there have been many other intervening events and policies that make it difficult to definitively establish a causal link. Some conclusions can be drawn, however, highlighting ways that market restructuring has both helped and hindered the advance of renewable power.

On the helpful side, new requirements opening up transmission and distribution grids to *all* electricity generators have been essential to the advancement of the renewables industry. Such requirements have been a basic element of most market liberalization plans. In the past, failure to gain grid access forced electricity generators to line up users at or near the point of generation, a difficult task that precluded most large-scale renewables development.

Post-liberalization, the question of who will buy the power still exists, but now project developers must simply focus on identifying a few large utility buyers, rather than many small individual users. Part of the growth of the renewables sector also can be attributed to the characteristics of most renewable technologies. Compared to large, fossil-fuel based power plants, renewable power systems typically come on line faster, at a much lower capital cost, and can be scaled up or down in size relatively easily. Such flexibility is highly valued in a more competitive marketplace (International Energy Agency, 2002a).

A more competitive marketplace may also influence the supply portfolio decisions of utilities. In the past, power-sourcing decisions were of little consequence to utility marketing campaigns, as they had a captive audience of customers. Today, however, utility executives can use a renewable power supply as a marketing tool, appealing to niche customers who care about the environmental and public health consequences of how their power is produced (Pollitt, 1999).

Conversely, there are several areas where market liberalization can hurt the renewable power industry. Because there is a heightened emphasis on profitability, in recent years renewables have had difficulty competing with new natural gas-fired power plants, which benefit from the ready availability of cheap gas supplies from Russia and the North Sea (Pollitt, 1999). As electricity begins to be traded across national boundaries, power plants that have benefited from years of subsidies or national infrastructure investment (such as the French nuclear power industry) have other cost advantages that may take years to overcome. Such subsidies may no longer be allowed under new market rules – a fact that could benefit the renewables industry – but, by the same token, policies preferential to renewable power may not be allowed either.

This was the case in Italy, where a national directive mandating favorable prices for renewable energy and other independently generated power for the first eight years of a plant's operation was rescinded (International Energy Agency, 1997). In a related case, in 2001, the European Court of Justice in Luxembourg was asked to examine whether a German law mandating payments to renewable energy generators violated the EU's competitiveness rules. Although the court ruled that policies protecting public health and the environment take precedence over rules levelling the economic playing field, it is worth recalling that under the terms of EU's Green Electricity Directive, the EU retains the right to forbid the use of specific renewables support policies after 2005.

Market liberalization also is having technology-specific impacts. As the companies or agencies responsible for managing the transmission grid have refined their operations, one of the effects has been a heightened emphasis on the accuracy of power demand and supply projections made by local and regional utilities and power generators. However, because wind farms are dependent upon natural systems, over which operators have little or no control, projections of available supply can be difficult to forecast. For instance, in the UK, power output from wind farms can vary up to 40-50% from what was forecast – a high rate compared to the 5% variability typically achieved by the operators of fossil fuel- or nuclear-based power plants (International Energy Agency, 2002a). As failure to provide the projected supply can result in sizable financial penalties, wind farms are at a significant disadvantage compared to less-variable technologies. To succeed, wind farms may need to reduce variability by partnering with other renewable-energy system operators, or with wind farms in other locations.

The growing use of tradable "green" or renewable energy certificates (RECs) is one post-liberalization innovation that undoubtedly will affect the future prospects of renewable electricity. Certificates essentially are efforts to document the generation and use of renewable power, as well as capture the market value of the environmental attributes, or "greenness," of this type of electricity supply. This value is typically equal to the difference in cost between the market price of electricity and the cost of obtaining electricity from renewable sources (Mitchell & Anderson, 2000). Renewable power projects developed in locations with favorable wind, hydro, or solar resources typically will result in less costly certificates, as the cost differential between the market price and the cost of production from these systems tends to be lower (Bird, 2003). Certificate prices also can vary according to their availability – if there is a high demand for green energy, but little supply, the price of the certificates can be bid up, creating an incentive for new firms to enter the renewable electricity market.

Interest in these certificate systems is growing in both Europe and the United States, particularly as countries begin to import or export power to each other. In a typical certificate system, each unit of electricity (usually one megawatt-hour) produced by a renewable electricity plant is given a unique identification code, which is tracked by a central registry. Suppliers seeking to provide renewable power to their customers can purchase this certificate, thereby gaining credit for that designated quantity of electricity. They can redeem this credit immediately, or hold onto it for future use. Once redeemed, the certificate's value is exhausted, and the registry will not allow anyone else to claim credit for that specific unit of renewable power (Ecofys BV, 2002).

Of course, because an electron obtained from a renewable power system is identical to an electron produced by a fossil fuel or nuclear power plant, the certificate is simply a proxy. There is no guarantee that the supplier redeeming a certificate actually sent any electricity from a renewable source to the electrical outlets at the consumer's location. The certificate therefore creates the equivalent of "virtual" green electrons that allow utilities to increase their supply of renewable electricity beyond what they currently produce.

In Europe, national green certificate systems already have been established in several countries, including Sweden, Italy, and the Netherlands, and work has been under way to develop a Europe-wide system since 1998. The logistics are tremendous, as detailed records must be maintained to ensure that energy is produced and "consumed" only a single time (Platts, 2003). In the US, so-called "compliance" certificate trading markets have been formally established only in Texas and in the six states that make up the Northeast Power Pool (i.e., Massachusetts, Maine, New Hampshire, Connecticut, Rhode Island, and Vermont) although other states are moving to establish programs. A California-based NGO is currently working to set up a national certificate system, and utilities in 13 states have thus far established tracking systems that will allow them to utilize this national registry in the near future (Evolution Markets, 2005; Green-e, 2003).

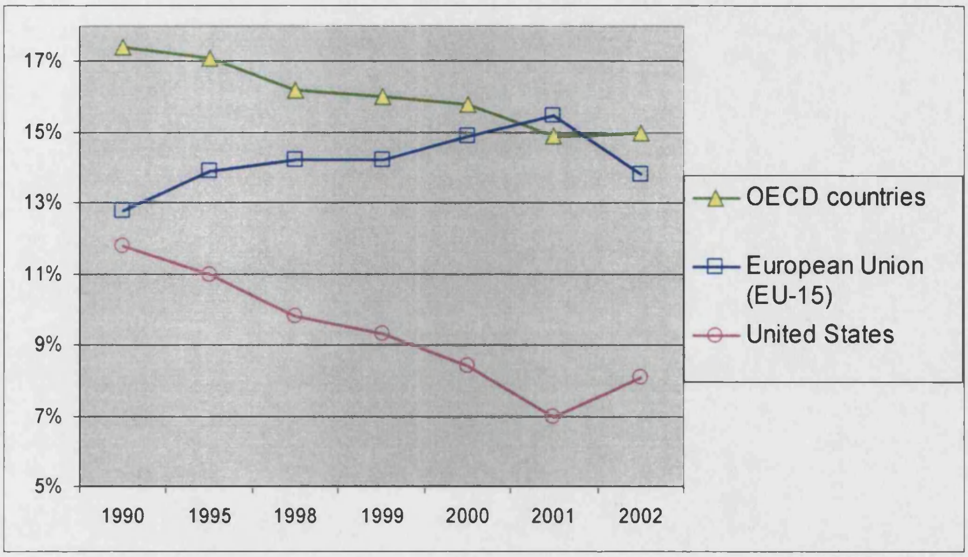
**Current State of Renewable Power Use and Prospects for the Future**

There are many ways to assess the current state of renewables use. The International Energy Agency (IEA) reports on the installed electricity generation capacity in OECD countries around the world.[8] Other IEA data tracks actual electricity generation using renewable sources. Both datasets show growth over the past decade. For instance, among OECD countries, gross electricity production from renewable sources grew at an average annual rate of 1.4% between 1990 and 2002. Contradicting this growth pattern, however, is a simultaneous decrease in the share of electricity derived from renewable sources from 17.4% of total supply in 1990 to 15.0% in 2002 (IEA, 2004b, pp 39-40). [See Figure 2-2]

The IEA attributes this decline to a rising demand for electricity, which is largely being met by fossil-fuel based facilities; and decreased output by hydropower facilities, which suffered from precipitation shortfalls in many major hydropower-producing countries during the latter part of the '90s. From a statistical perspective, the latter factor has an exaggerated impact because conventional hydropower has historically provided the vast majority of the global renewable energy electricity supply (International Energy Agency, 2002b).

[8] IEA data on OECD countries covers Australia, Austria, Belgium, Canada, The Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States.

**Figure 2-2**
**Share of Electricity Production from Renewable Sources**
Source: (IEA, 2004b)

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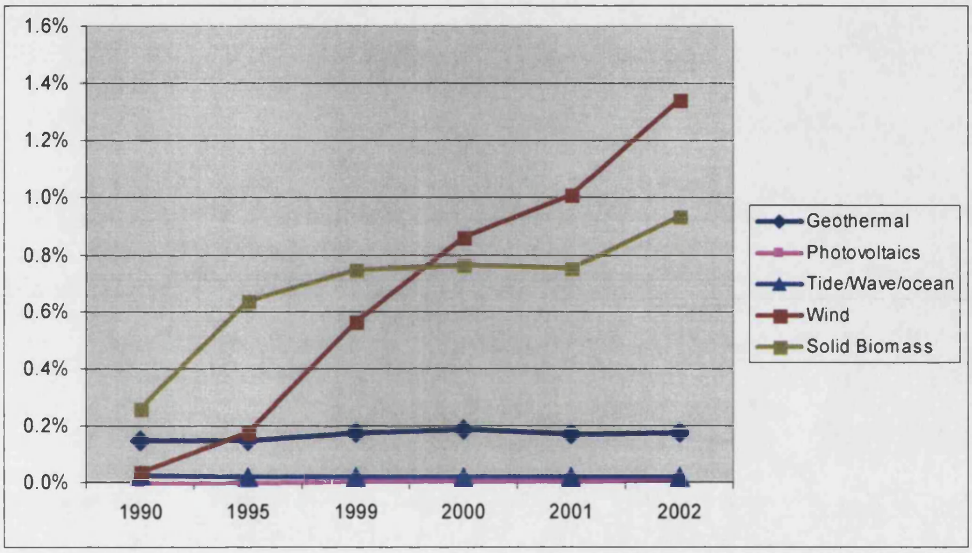
The downward trends are not universal, however. As shown in Figure 2-2, renewables provided an increasingly larger share of Europe's electricity supply during the 1990s, contrasting with a rather steep decline in the US. The increase in Europe stems from a large increase in wind system development, while in the US, rainfall deficiencies in the Northwest resulted in a 1/3 decrease in conventional hydropower generation during the last half of the '90s (EIA, 2002; International Energy Agency, 2002b).

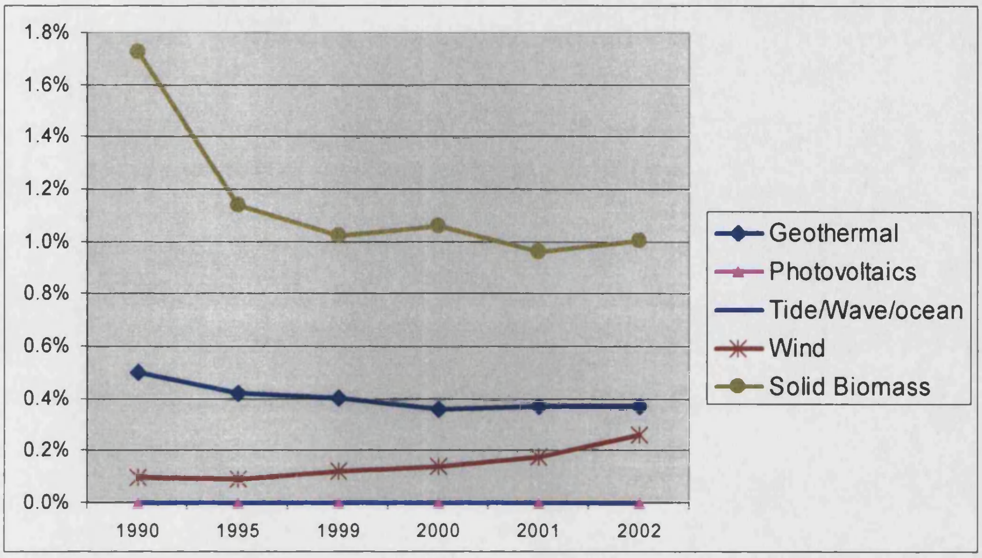
To eliminate the distortion caused by the inclusion of data from conventional hydropower generation plants, Figures 2-3 & 2-4 display generation data related to what some observers term "new" renewables (Grubb, 1995, p xi), which include solar photovoltaic systems, wind power, biomass facilities, and tide/wave/ocean power systems (IEA, 2004b, pp 76-77, 187-188). As these graphs indicate, non-hydro "new" renewable sources contribute only a fraction of the overall electricity supply in both the European Union and the United States, cumulatively totaling less than 2% in each region. The similarity ends there, however, as in Europe trends are clearly on the upswing, with steady increases in almost every source category except tide/wave/ocean power. The wind industry's dramatic increase stands out, as does the steady progress made by biomass systems.

**Figure 2-3**
**Contribution of "New Renewables" to EU Electricity Supply**
Source: (IEA, 2004b)




By contrast, in the United States, levels appear relatively stagnant, with only wind power making any demonstrable upward change. (See Figure 2-4). It is only when one examines the US data in absolute terms that the renewables picture begins to brighten. Because there was a 24% increase in overall electricity generation during the period 1990-2002, it is easy to overlook that wind power's contribution jumped 131% during that period or that biogas combustion increased 55% during between 1999 and 2002 (IEA, 2004b, p 187).

**Figure 2-4**
**Contribution of "New Renewables" to US Electricity Supply**
Source: (IEA, 2004b)




Growth in global electricity demand and renewables use is expected to continue over the next few decades, although projections are that renewables will continue to make only a minor contribution to the overall electricity supply, growing at a rate slower than overall electrical demand (IEA, 2004b). This is not to say that the growth of renewable electricity is slowing – indeed, the IEA projects electricity generated by non-hydro renewable power systems to increase its share of global electricity supply by between 50-125% by 2025. Increasing a small number does little to change the overall supply picture, however, and coal and natural gas are expected to continue to provide the lion's share of the world's electricity supply in 2025. [See Table 2-1.] Even under the US Energy Information Administration's (EIA) more optimistic "High Renewables" scenario, the contribution of renewables remains quite marginal.

**Table 2-1**
**Major Sources of Global Electricity Generation**
**"Reference" vs. "High Renewables" Scenario**
Extrapolated from EIA Annual Energy Outlook 2005 tables A8 and E7

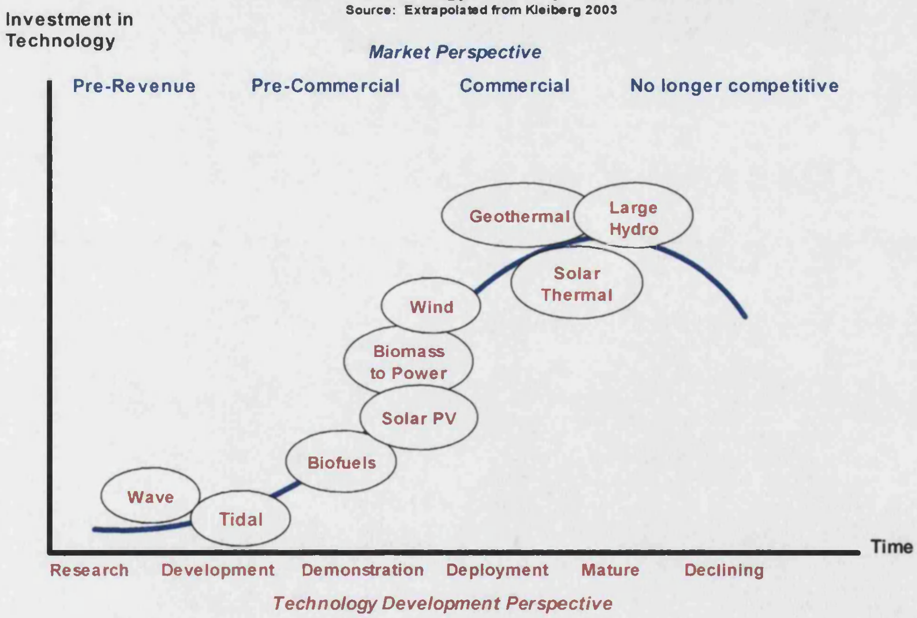
| | 2003 | | 2010 | | 2020 | | 2025 | |
|---|---|---|---|---|---|---|---|---|
| | Reference | High Renewables | Reference | High Renewables | Reference | High Renewables | Reference | High Renewables |
| Coal | 52% | 52% | 50% | 50% | 48% | 48% | 52% | 51% |
| Petroleum | 3% | 3% | 3% | 3% | 3% | 3% | 2% | 2% |
| Natural Gas | 15% | 15% | 19% | 19% | 24% | 24% | 22% | 22% |
| Nuclear | 20% | 20% | 19% | 19% | 16% | 16% | 15% | 15% |
| Conventional Hydro | 7% | 7% | 7% | 7% | 6% | 6% | 6% | 6% |
| Municipal Solid Waste | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% |
| "New" Renewables | 1.63% | 1.63% | 2.29% | 2.39% | 2.51% | 3.15% | 2.75% | 3.68% |

Among individual renewable technologies, wind and biomass power systems are seen by both the IEA and the EIA as having the greatest growth potential, continuing current trends. Wind industry generation is expected to increase by 250% between 2003 and 2025, ultimately delivering 0.74% of worldwide electricity supply. (In the EIA's High Renewables scenario, wind system generation is projected to increase by nearly 350% during this same period.) Biomass also is expected to do well, quadrupling its supply levels to provide roughly 0.80% of global power supply by 2025 (EIA, 2005, p 205). The EIA has been much less sanguine about the prospects for solar power, noting that "solar technologies … are not expected to make significant contributions to US grid-connected electricity supplies through 2025," ultimately delivering just 0.07% of total electricity generation by that date (EIA, 2003a, pp 73, 222). The EIA's 2005 Annual Energy Outlook shows little change in its assessment of the global prospects for solar deployment (EIA, 2005).

Thanks to the 2001 Green Electricity Directive, the prospects for renewable electricity in the European Union are much better (IEA, 2004c), although there remains concern the current pace of progress is too slow to achieve the Directive's goals. Research funded by the European Union and carried out by the Energy Research Centre of the Netherlands in 2003 examined current and anticipated member state and EU policies, applying them to a mathematical model designed to forecast the growth potential of different renewable technologies. Their research concluded the EU would fall short of its 22% by 2010 target, increasing the proportion of electricity derived from renewable sources from 14% to roughly 20.6% (Uyterlinde, 2003). Just one year later, however, the Commission issued a formal communiqué stating the situation on the ground was even worse than anticipated, and that the best that could be hoped for was a 18% renewables generation level. Although Germany, Denmark, Spain, and Finland were expected to achieve their indicative targets, none of the other EU-15 countries were expected to do so. Much of the blame was attributed to slow progress deploying large scale biomass schemes, which had been expected to shoulder much of the renewables power generation load required to meet the various national targets (ENDS, 2004; European Commission, 2004).

One way to explain these conclusions is to analyze the industrial maturity of individual renewable technologies. Shell Renewables has done just that as part of their research into which, if any, technologies the company should pursue as part of a long-term business strategy. In Figure 2-5, the primary renewable energy technologies are plotted on a curve representing the life cycle of a typical manufacturing industry.

**Figure 2-5**
**Renewable Technology Industry Maturation Levels**
Source: Extrapolated from Kleiberg 2003




In this diagram, technological investment levels and time represent the Y and X axes, respectively. At the top of the industrial life-cycle curve sit geothermal and large hydro operations, representing industries that are fully mature and extensively commercialized around the world. Both of these technologies have enjoyed significant capital investment and have long been exploited for electricity generation.

To the left of these and halfway down the curve are wind, biomass, and solar photovoltaic systems. According to the logic of the diagram, these technologies enjoy widespread deployment, but still require considerable investment before they command the level of market share currently achieved by geothermal and large hydro systems. Because they are located higher on the curve, wind and biomass can be expected to achieve widespread commercialization before photovoltaics.

On the far left (i.e., immature) end of the scale are wave and tidal systems, which are slowly moving out of the laboratory and computer modeling stage to deployment on a pilot basis. Considerable investment must yet occur before these technologies begin to generate any demonstrable amount of electricity production.

**The Cost of Renewable Electricity**

One factor that will significantly affect the prospects of renewable electricity is its cost competitiveness compared to electricity generated by fossil fuel or nuclear sources. Historically, large-scale hydropower met this challenge quite well, generating some of the cheapest power available in the marketplace (International Energy Agency, 2002b). Among "new" renewables, however, the story is more complicated. Different renewable technologies have different cost structures, a function of the maturity of the technology, the availability of the natural resource (e.g., wind, sun), and the level of competition in the marketplace. These factors mesh in different ways, meaning there is great variability in the cost of electricity produced by different renewable technologies. As shown in Table 2-2, pricing variability can be quite pronounced, as in the case of solar photovoltaics. (The large spread often is attributed to latitudinal differences in the amount of sunlight available in a region over the course of the year.) The discount rate used in the calculations also has a significant effect on the relative price of different technologies. Because renewable power systems are installed rather quickly, and tend to require less upkeep, their high upfront cost can disproportionately affect their price per kWh compared to technologies which take longer to build and which have significant on-going operations and maintenance costs.[9]

**Table 2-2**
**Cost of Electricity from Different Power Sources**
Source: IEA 2005

| | **Levelized cost of power production (¢ per kWh)** | | |
|---|---|---|---|
| **Power Source** | **5% discount rate** | **10% discount rate** | **n** |
| Coal | 2.5 - 6 | 3.6 - 6 | 27 |
| Natural Gas | 3.7 - 6 | 4.3 - 6.3 | 23 |
| Nuclear | 2.1 - 3.1 | 3 - 5 | 13 |
| Wind | 3.5 - 9.5 | 4.5 - 14 | 19 |
| Small Hydro | 4 - 8 | 6.5 - 10 | 8 |
| Solar PV | 15 - 30 | 20 - 30 | 6 |
| Biomass | 3.7 - 8.5 | 5 - 10 | 2 |
| Geothermal | 2.7 | 4.2 | 1 |

| | |
|---|---|
| **Avg. retail price of electricity in U.S.** | 8.3¢/kWh |
| **Avg. retail price of electricity in U.K.** | 13.4¢/kWh |

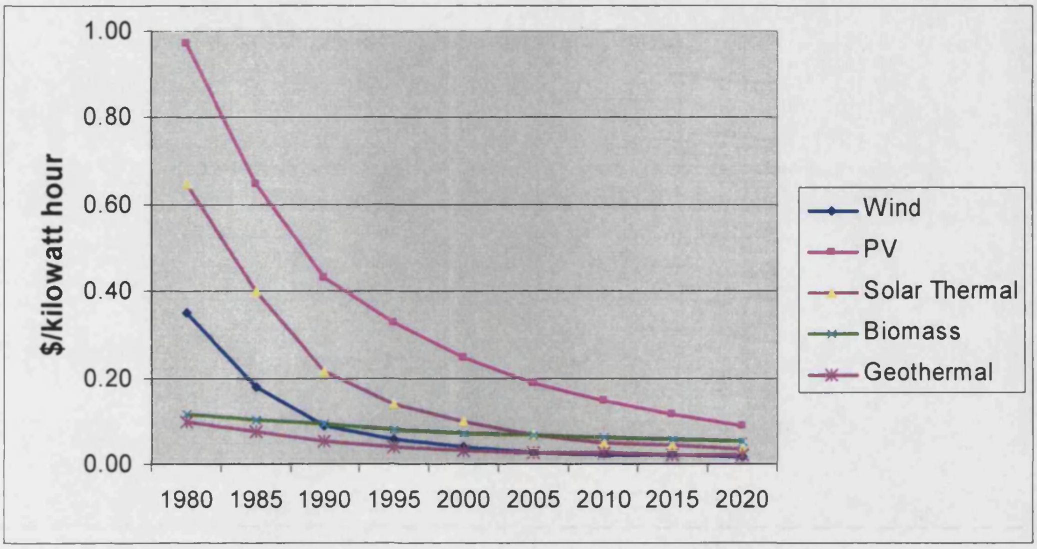
Table 2-2 also shows the typical prices for electric power against which renewables must compete. In the US, the average residential price of electricity is just over 8¢/kWh, while the rate in the UK is over 13¢/kWh. In general, retail residential electricity prices in Europe are much higher than in the US, ranging from 7¢/kWh in Norway to 28.5¢/kWh in Denmark (IEA, 2004a, p 43).

Although renewable electricity today may cost more than electricity from fossil fuel or nuclear sources, it is not expected to stay this way. Prices have dropped significantly over the past two decades, and according to the US National Renewable Energy Laboratory, will keep trending in this direction over the coming decades (NREL, 2003). There are several reasons for the projected price drop: improved manufacturing methods; economies of scale as demand increases; and technological

[9] This is because net-present value calculations will "discount" out-year costs significantly, meaning they do not weigh as heavily in any cost calculation as current-day construction costs. The use of a 10% discount rate makes this comparison even more pronounced, as most costs occurring after 10 years diminish dramatically in value.

gains that increase the conversion rate of wind, sunshine, or wave power into electrical energy.

**Figure 2-6**
**Renewable Power Cost Trends**
Source: (NREL, 2003)




While the first two explanations relate to reductions in the cost of manufacturing, the latter links to the revenue side of the equation – each machine is generating more kilowatt hours of power than it could previously, creating greater economic value. Perhaps the most important conclusion reached by the NREL is their estimate that each of the five technologies displayed in Figure 2-6 will achieve a price point of less than 10 cents per kilowatt hour by 2020, a level below the current cost of power in the UK and within striking distance of the average retail electricity rates in the US

Complicating the entire cost picture are findings by EU-funded researchers that the market prices currently charged for electricity do not accurately reflect the full cost to society of that power. In particular, this research concludes market prices fail to account for several economic externalities: the cost of damage to the natural and built environment from the harvesting of these energy sources and from the energy production process; public health impacts from airborne particulate matter released during the energy production process; occupational disease and accidents at the power plants themselves; and visual impacts in the form of reduced visibility due to smog from power plants (EC, 2001c). The value of the external cost varies widely, by technology. For example, the EU has found that current market prices for electricity produced by coal and oil understate their true economic cost by 5.7 €/kWh . By comparison, the current market price of electricity from renewable technologies *do* internalize most external costs – hydro power prices fail to reflect external costs of just 0.4 €/kWh, and the external costs of solar photovoltaics (PV) total roughly 0.6 €/kWh . Wind power has the lowest external cost of any electricity source, totaling just 0.1 €/kWh (ENDS, 2001). The bottom line of this research is clear -- if these external costs were incorporated into market prices, then most renewable power technologies would quickly find themselves in a highly competitive position (Geller, 2003).

**The Municipal Perspective on Renewable Power**

There are three overarching strategies guiding city-level action on renewables: actions aimed at influencing the local production of renewable electricity; actions aimed at procuring renewable electricity for local use, and actions aimed at using renewable energy as an engine for local economic development. Ravetz (2001) suggests that cities should deploy different options in different areas of the city, mixing and matching them based on local neighborhood conditions or zoning regulations. Ravetz also notes it makes sense to coordinate energy planning on a regional basis, as this will allow cities, suburbs, and rural areas to utilize the fullest range of renewable power policy, technology, and economic development options, as each area can pursue the strategies to which it is optimally suited.

<u>Promoting Local Renewables Deployment</u>

Policies to promote renewable power production can take many forms. One of the most aggressive is the imposition of a “renewables obligation” or “renewables portfolio standard.” Under the terms of these standards, power suppliers in a specified region are forced to procure some minimum percentage of their power from renewable sources. What constitutes a renewable source is typically defined in the authorizing legislation (Berry & Jaccard, 2001; Espey, 2001). Utilities are thus given a menu of process options, allowing them to select the mix of technologies that make the most sense given their location, the cost of energy produced by each technology, etc. Renewables portfolio standards (RPS) have been implemented in many countries around the world, including the US, the UK, Germany, Denmark, Italy, the Netherlands, and Australia, with the renewables target ranging between 2% and 30% (Berry & Jaccard, 2001; Grubb, 1995). In the U.S., twenty states have established RPSs, including New York state (Interstate Renewable Energy Council, 2005).

As noted previously, electric utility regulation is generally a state or national function, and to date most RPS proposals and laws mimic the spatial focus of the regulatory scheme. It is possible, however, for smaller entities to establish RPS programs, as has been done in Austin, the capital of Texas. In 1999, Austin adopted rules requiring that 5% of all local electrical demand must be supplied by renewable sources by the end of 2004. In 2003, the City increased the requirement to 20% by 2020 (ICLEI, 2005). The City of Los Angeles has established an identical target that its municipal utility must achieve by 2017 (Cleanedge, 2004). Neither of these rules requires the power to be produced within the city, and most is expected to come from large wind projects located far outside the city limits.

Building codes and zoning restrictions are regulatory approaches used by cities seeking to actively promote the in-city deployment of renewable power systems. These rules can require or facilitate the use of renewable electricity technologies by individuals or developers proposing new projects or significant modifications to an existing structure. The Dutch Optimum Energy Infrastructure program is one example of a state law giving local governments significant leverage over new building design. Under this program, local authorities can dictate the Energy Performance of the Location (EPL) for a multi-unit development or individual building site. This EPL may consist of a requirement that the building tie into a communal heating network or that the building generate some proportion of its own energy through renewable sources (CADDET, 2001; Fuchs & Arentsen, 2002). In 1997, Germany amended its Federal Building Code so local planners must consider environmental protection in municipal development plans, "including the use of renewable energies" (Gutermuth, 2000, p 210). There is evidence from both countries that local communities now look for both active and passive solar use in designs submitted for planning approval.

In the United States, the cities of Boulder and Aspen, Colorado both incorporate renewable energy requirements into their local building codes. Boulder requires sensitivity to the 'solar envelope' (Knowles, 2003) of a structure so passive solar design and photovoltaic systems can achieve their maximum performance. Aspen, a mountain resort community, requires structures with a high energy load due to excessive size or other amenities (e.g., pools, spas, snow melting systems) to offset part of their grid burden through the installation of on-site renewable power systems. As an alternative, homeowners can pay a one-time mitigation fee to buy their way out of this obligation (ICLEI, 2002b).

Oakland, California's approach focuses on the permitting process rather than design requirements. Implemented during the state energy crisis in 2001, the city promotes renewable power system installations by streamlining the permitting process for new photovoltaic and small wind turbine systems. All reviews by city building department staff must occur within a five-day period, and property owners are given a self-certification checklist to document compliance with local codes. Proposals deemed in compliance with local codes will be approved and have all application fees waived (ICLEI, 2002a). Another move that should facilitate renewables development is a Dutch mandate that municipalities delineate appropriate sites for future wind parks in their structure plans (Beatley, 2000). By essentially 'pre-zoning' these locations for such facilities, delays in permitting development should be reduced.

Financial assistance programs are one non-regulatory approach many cities have adopted to promote local renewables deployment. In Los Angeles, the city-owned utility offers homeowners and businesses a rebate of between $3.50-$4.50/watt on new PV systems. The higher rate applies to systems manufactured in Los Angeles. Demand for the rebates has recently outstripped available funds, and it is unclear when or if more funds will be made available (LADWP, 2005). In Saarbrucken, Germany, the city subsidizes consumers DM1000 ($550) per installed kilowatt beyond the generous subsidies provided by the state. The city-owned utility (*Stadtwerke*) also provides an operating subsidy of 55 pfennigs per kWh produced. Low interest loans (2.9% for 5 years) are available through the Stadtwerke and a city-owned bank to help homeowners finance new photovoltaic system purchases

(Beatley, 2000). The city-owned utility in Austin, Texas offers low interest loans of up to $20,000 for the same purpose (Keith, 2003).

A second non-regulatory approach involves public education. Examples of local agencies disseminating information about renewable power are ubiquitous. In Chicago, the City has funded the Chicago Centre for Green Technology, a showcase building that displays information on the benefits of renewable electricity and how local residents can install such systems themselves. Docents are available to answer questions for visitors, and training sessions are held on a regular basis (Middendorf, 2002). The City of Chicago also publicizes city-funded solar installations on a local website which includes real-time meters that display how much power is being generated by each of the PV systems profiled (Chicago Solar Partnership, 2002). In 1989, the City of Saarbrucken created ARGE Solar, a nonprofit technical assistance and solar promotion company. Jointly funded by the city, the state Ministry of the Environment, and regional energy companies, the company provides technical assistance to solar consumers and promotes its use among local residents (Beatley, 2000).

### Procuring Rather Than Making Green Electricity

Some cities find it logistically and politically easier to sidestep issues related to the local deployment of renewables, choosing instead to buy and resell power from privately managed renewable power plants or encouraging the local utility to do so. Three California cities with municipally-owned utilities, Los Angeles, Palo Alto, and Sacramento directly procure green power from privately-run renewable electricity plants and promote its use among local customers. Customers opting for these different power schemes – Palo Alto Green, SMUD Greenergy$^{sm}$, and LADWP Green Power – all pay a small price premium over what "standard" residential utility customers pay. In Sacramento, electricity is obtained from companies capturing and combusting methane gas from local landfills. In Palo Alto, the power comes from wind turbines around the western U.S. and from large photovoltaic projects in California (CPAU, 2003; LADWP, 2003; SMUD, 2003). Other cities are doing more than simply advocating its use locally – they are making large green power purchases themselves, often to power municipal government operations. The City of Chicago has been very aggressive at building demand for green electricity, working with 47 other Local Authorities around the area to issue a request for roughly 400 MW of electric power services, stipulating that by 2005, 20% of the power must come from green sources. This agreement amounts to one of the largest green power purchase agreements ever made in the United States (ICLEI, 2003).

### Renewables-related Economic Development

Besides the local and global environmental benefits of renewables use, many cities are finding that renewable energy can be an important engine for local economic development. Freiburg, Germany has been one of the most aggressive in pursuing a reputation as a city at the center of the renewable energy universe. The city donated space to house a leading trade group, the International Solar Energy Society, and is home to the Fraunhofer Institute for Solar Energy Systems, a research and development organization. Freiburg is also home to 450 small and medium-sized companies involved in the solar industry, collectively employing 10,000 workers and generating $1.1 billion in annual revenues. Because Freiburg has gained a reputation as one of world's leading 'solar cities,' it also benefits from solar-related tourism visits by government and industry officials from around the world coming to learn more about city's solar strategies (Beatley, 2000).

In the U.S., Chicago is working hard to become the nation's center for green technology and manufacturing (Wilmerding, 2001). The City of Chicago partnered with the Spire Corporation to build a new solar panel factory on a former brownfield site. To jumpstart the operation, the City agreed to purchase $2 million of solar panels from Spire during its first few years of operation; Commonwealth Edison, the local utility, committed to $6 million in solar panel purchases during this same time period (Middendorf, 2002). The City has also partnered in a project sponsored by the Chicago-based subsidiary of a French wind turbine manufacturer to explore the feasibility of a windfarm on the shores of Lake Michigan (Moffett, 2003). This pilot project is the first wind system installed in Chicago, an ironic fact given Chicago's nickname – the windy city.

## Conclusion

Over the last 10-15 years there have been a huge array of policies and programs implemented that were designed to foster the deployment of 'new' renewable energy technologies. Driven by concerns over energy security, climate change, and other emission impacts, these techniques vary widely. Financial incentives, the development of deployment targets, and eliminating impediments restricting interconnections to the electricity transmission and distribution grid are just a few of the strategies being used to help expand renewables use in the US and Europe. These efforts have improved the prospects for this sector, although given the current low level of deployment it will be some time before new renewables make much of a dent in the overall supply picture. Technologies like wind and biomass combustion are expected to provide the bulk of most new renewable supply capacity during the next 5-10 years, by which time other technologies may also have proven their technical or economic viability. The extent to which the technologies currently deemed most viable by the marketplace are suitable for urban deployment is an issue discussed in both case studies.

Efforts to restructure the utility marketplace have also had a very direct influence on the renewables industry, amplifying the need to be cost-competitive with power generated by nuclear or fossil fuel-fired power plants. Because of current cost differentials between renewables and other power generation technologies, research and development programs, price subsidies, tradable 'green' credits and tax credits of various kinds are increasingly important in building demand for and lowering the cost structure of renewable power systems. In both New York City and London, those deploying renewable power systems count heavily on these subsidies, the receipt of which often determines whether a project moves forward.

The urban context for renewables is an interesting one. Cost may indeed be an impediment, but there is nonetheless a long list of cities which are buying green power or promoting the in-city deployment of renewable power systems. In both Europe and the US cities are using zoning rules and permitting systems to mandate or incentivize the installation of renewable power systems in new construction projects. The provision of direct financial support to such installations by local authorities is less common, as cities may be wary of allocating scarce tax dollars for this purpose. Education programs are a lower cost and relatively easy means of promoting voluntary action while other cities are content to ignore in-city deployment issues altogether and simply advocate the purchase of green power from sources outside the city. This can be an effective technique because it allows cities to exploit the cheapest forms of renewable power, whatever those might be in that region. The downside, of course, is that on issues of energy security and localized emission impacts, cities may not realize the same benefits as if those systems were deployed within the city limits.

The bottom line is that there are many ways cities can engage on renewable power policy, and what's key is understanding which strategies are most effective. In the London and New York case studies, I'll build on the general information provided in this chapter to develop a more localized policy context for renewables deployment and use. Part of this story will involve inventorying what each city is currently doing with regards to renewable power in Chapters 6 and 9, and then examining the policy-making and political landscape in Chapters 7 and 10 to see if we can explain the logic behind these decisions.

# CHAPTER 3
# Urban Renewables Policy-making – Alternative Theoretical Approaches

## Introduction

The issue of renewable power use in urban areas is a complex matter, involving a multitude of actors. As noted in the first two chapters, there are government regulators, who may sit at the local, state, and/or national level. There are existing power plant operators, whose facilities may involve thousand megawatt systems; at the other end of the spectrum are local residents and businesses with a few solar panels on their rooftop. Local policy-makers may be highly engaged in this issue, or they may have a very hands-off approach to the matter. Those seeking to install renewable power systems may need to involve architects, installers, planners, government inspectors, or market regulators. Economic development agencies promoting the creation of energy-related jobs must understand private sector needs, and then work with those firms and educational institutions to structure training programs capable of satisfying those needs.

In other words, regardless of how you look at this issue, there are many stakeholders whose involvement is integral to the success of any policy or program. Thus, urban renewables policy-making is a good example of urban "governance" in action. Once considered a synonym for government, governance is now widely recognized as having a distinct meaning, "referring to a new process of governing" (Rhodes, 1996) that involves the "blending and coordinating" of public and private interests (Pierre, 1999, p 374). The shift away from a state-centered and formal process of decision-making is central to the notion of urban governance. Governments may continue to *try* to manage the policy and decision-making process, but boundaries have become "permeable" (Stoker, 1998, p 38) to the point that governments no longer exert sovereign authority (Rhodes, 1997).

In this chapter, I lay out the analytic approach that I believe is best suited to this complex policy environment. My approach has been heavily influenced by Gibbs & Jonas' work positing the application of urban regime theory to local environmental policy-making. URT has previously not been employed for such a purpose, so this thesis stands as its first real test in this regard. However, because URT has been criticized for failing to account for the larger policy and regulatory milieu at work in a city, I move beyond Gibbs and Jonas by also suggesting that regime theory could benefit from some type of modification that captures the influence of this milieu. New institutionalism is a complementary theoretical approach recognized for its skill in this area, and in this chapter I devise a modified regime approach that blends both theories into a single, coherent methodology. By deploying it here, I hope to ascertain a comprehensive explanation of the 'logic' of local energy policy-making in both New York City and London. Because there are other policy realms similarly bound up in state or national government-led regulatory schemas, the blended approach may have applications to situations beyond environmental policy-making. I therefore spend some time in this chapter and in the conclusion of this thesis offering suggestions for researchers interested in applying this model to their own analytic work.

**The Shift to Urban Governance**

There are several reasons behind the shift to urban governance, including:

- the link between globalization and loss of local economic control;
- changing expectations and demands on local government;
- emergent philosophies regarding the role of government; and
- the usurpation of local authority by semi-autonomous public agencies.

Thanks to globalization, cities see state and national governments as less helpful. Trade pacts have loosened constraints on corporate decisions regarding outsourcing, the location of manufacturing facilities, and the establishment of trading partners (Kearns & Paddison, 2000). As a result, cities now engage in "place wars" (Haider, 1992), directly competing against each other to attract and retain businesses. Public and private interests close ranks, as each group finds they "empower themselves by blending their resources, skills, and purposes" (Kearns & Paddison, 2000, p 847). Cities also are directly entering the international arena through cross-border co-operation with supranational organizations such as the European Union (EU), and through networking with other cities (Church & Reid, 1996). Such tactics typically require resources far beyond the capacity of a local bureaucracy.

A second justification for governance focuses on the breakup of the Fordist system of production and consumption, forcing local government into new roles and responsibilities (Stoker, 1998). Under the old Fordist model, local government had a well-defined but narrow set of responsibilities, including the provision of basic infrastructure to support the flow of goods in and out of large industrial plants, and the provision of basic education, health, and housing services for plant employees. But in the post-Fordist era, plant closures, coupled with the rise of the service sector and information-based industries have dramatically changed expectations and demands on local government. Now services are privatized as a means of supporting local firms. In addition, the trend to part-time and contract workers means fewer individuals and families have health benefits or can afford child care. To manage these problems, local governments are increasingly turning to NGOs and the private sector for assistance (Healey, Cars, Madanipour, & de Magalhaes, 2002).

Changing philosophies about government's role in society is a third factor in the emergence of urban governance. Driven largely by the success of conservative political coalitions in the US and Europe, bureaucracy-driven models reliant on government-based service delivery are being abandoned, replaced by an emphasis on entrepreneurial forms of governance (Short & Kim, 1999). Support for change in government's role also has come from the Left, which has been forced to rethink its support of bureaucracy in light of the political success of the Right (Wainwright, 1994). In cases where traditional government functions have been privatized, government has also entered collaborative relationships as a means of ensuring that the public interest is protected (Healey et al., 2002).

A final set of explanations has centered on the "hollowing out" (Healey et al., 2002, p 11) of local authorities, pointing out how power has been usurped by the EU and a range of semi-autonomous public agencies established by state and federal authorities. Frequently these agencies focus on single issues, such as waste management, air quality, or coastal protection, with independent sources of revenue over which local authorities have no control. These new bodies make policy coordination more complicated at the same time they decrease the capacity of local government to provide such coordination (Peters, 1996). Rhodes (1996) also notes the influence of "new public management," where the emphasis on managerial accountability limits the discretion of public servants in policy-making and program administration.

From a pragmatic perspective, the shift to governance has many virtues. For government, the diffusion of responsibility can alleviate some of the risk of failure, as risk now is shared. Also, governance in the form of partnerships can help leverage resources far in excess of what government might be able to provide on its own (Jewson & MacGregor, 1997). From the general public's perspective, governance can provide additional opportunity to influence decision-making, giving citizen groups the chance to influence the world-view of stakeholders with whom they previously had little contact (Elander, 2002). From a private-sector perspective, governance creates "dialogic processes" (Healey et al., 2002, p 13) that can transform what would have been a "win-lose" scenario under a state-driven process into an opportunity more likely to create "win-win" outcomes.

There can be pitfalls, of course. Allowing more groups into the policy-making process does not necessarily mean all voices will gain access, or that certain voices will give up their position of dominance (Jewson & MacGregor, 1997). There also are concerns that issues formerly under the control of the state may be lost to the private sector, with less opportunity for accountability (Bassett, 1996; Jewson & MacGregor, 1997; John & Cole, 2000). Given scarce public resources, this can be a real issue, particularly if the public becomes convinced that private interests are taking precedence over public interests, or that the return on investment achieved by private interests is excessive when compared to public gains. Finally, inviting in private partners to work on an issue doesn't guarantee they'll invest any resources in the project beyond their own time. Like all investors, they must evaluate the risk and potential reward before deciding to invest their own limited funds in a project.

In the past, the traditional choice for analyzing decision-making at the local level would have involved theories of pluralism, corporatism, and urban elites, ultimately focusing on which individuals or groups have the power to govern (Hall & Hubbard, 1996; Stoker, 1998). However, in an era where governance is the central means of local action, these models prove too narrow, unable to address the fact that no single group is likely to dominate (Stoker, 1998). More robust models are therefore required to untangle the complexities of local policy networks and to understand the fragmentation of institutions, the capacities of various stakeholders, and the values that drive them (de Magalhaes, Healey, & Madanipour, 2002; Newman & Thornley, 1997; Pierre, 1999).

Two different analytic models that appear to meet this challenge are new institutionalism (NI) and urban regime theory (URT). Although other analytic frameworks are available – Stoker (1998) cites rational choice theory and literature on policy networks and communities as two other options – new institutionalism and urban regime theory are both commonly identified as theories better suited for dissecting urban governance systems (Harding, 2000; MacLeod & Goodwin, 1999; Newman & Thornley, 1997; Pierre, 1999; Rhodes, 1997). Both examine issues in a specific spatial context. Both excel at dissecting what Healey et al (2002, p 15) refer to as the keys of governance behavior: "dynamics, [or] changes through time"; "relations, [or] the links, gaps and boundaries in social relations which embed governance processes in the wider society," and "capacity, [or] what particular configurations of governance relations can do and what they seem unable to accomplish". Both also pay attention to the values and objectives driving local networks and individual actors, and the organizational arrangements that may shape these values or other patterns of behavior (Pierre, 1999).

**New Institutionalism – An Overview**

Institutions have been a subject of inquiry by philosophers, economists, political scientists, and other academics for hundreds of years. Aristotle and other political philosophers were concerned with the relationship between institutional form and successful governing (Peters, 1999). At the beginning of the 20th century, Durkheim (1982) proclaimed that sociology is nothing less than the science of the genesis and functioning of institutions. Within economics, institutional concepts such as markets, the firm, and market regulation serve as the basis for much neoclassical theory. Given my interest in understanding the role regulation can play in shaping urban energy planning, it is useful to understand the different perspectives on how institutions can influence behavior.

These perspectives have changed over time, as in the past, institutions were seen primarily as official structures, formal rules, and organizations (Lowndes, 2001), and institutionalism tended to be very legalistic, normative, and structuralist (Peters, 1999). Facts and values were taken for granted, with the analytic approach emphasizing "common sense" (Lowndes, 1996, p 181) links between formal structures and policy outcomes. Today, institutions are seen more abstractly as "humanly devised constraints on social action" (Nee & Strang, 1998, p 706). Institutions also are seen now as coming in many different forms, with these constraints defined broadly to include formal and informal rules (Lowndes, 2001); procedures, norms, or conventions (Alt & Shepsle, 1998); religious and cultural beliefs (Weber, 1978); and "supra-individual abstract ideas, devices and guidelines" (Edeling, 1998, p 730). Changing the focus from formal structures to more abstract ideas and values is a logical switch given the change in focus from government to governance. Relying on an analytic approach that focuses solely on formal rules and formal organizations could cause us to miss many of the larger structural factors and values currently driving local policy-making.

The idea that institutions constrain action is critical, as these constraints create regularities in human behavior that reduce uncertainty (Peters, 1999) and help individuals determine "who has the power to do what when" (Alt & Shepsle, 1998, p 735). One can look at electric utility regulation as an institution that similarly embodies social norms, including equity (e.g., ensuring individual customers are not price-gouged and that all customers receive the same reliable service), environmental protection (e.g., ensuring that power plants operate within agreed-upon pollution limits), and public safety (e.g., ensuring that workers installing or repairing electrical systems are not endangered by random power spikes.) Society also agrees to constrain behavior involving the generation and distribution of electricity because this helps achieve other desirable goals, including the ability to buy goods known to operate at a set voltage and to use these goods wherever electricity is delivered in a form that meets these voltage standards.

Along with defining what institutions are, it may be useful to distinguish what they are not. Individuals and organizations are not institutions, as institutions "provide the 'rules of the game,' while organizations – like individuals – are players within that game" (Lowndes, 2001). Idiosyncratic behavior also does not constitute an institution, as patterns of behavior must be stable over time (Jessop, 2001). Referring back to the electricity example, electricity market regulations are the overarching rules that have remained generally consistent over time, and power generators and power users are the players subject to these rules.

### Alternate Forms of New Institutionalism

There are a range of academic disciplines where institutionalism has been revisited in recent years, including history, sociology, economics, political science, and social theory (Goodin, 1996). Because my interest is in understanding the policy-making process, I have chosen to emphasize literature that lends itself to explaining how institutions affect political and policy-making behavior. Several researchers have tried to weave the many theoretical and empirical threads into thematic categories. Below I explore the three primary types of new institutionalism theory, and how each might approach issues related to local renewable power policy-making.

- **Rational choice institutionalism**, or, as DiMaggio (1998) calls it, rational action neoinstitutionalism, is a derivative of the economic theory that posits each of us is assumed to have exogenously formed and stable preferences or tastes, and we act strategically to maximize the attainment of our preferences. Institutions thus are seen as intervening variables that can affect our options and actions, but not determine them (Koelble, 1995). Institutions affect decision-making by providing information and enforcement mechanisms that lead us to prefer certain outcomes (Hall & Hubbard, 1996). Individuals calculate which actions to pursue by using tools such as game theory, evolutionary modeling, and transaction-cost analysis (DiMaggio, 1998).

A rational choice institutionalist would look at the issue of distributed electricity generation[10] in cities as a classic example of a utility trying to 'protect its own.' Because most network grid systems are designed for the one-way flow of electricity *from* the grid into a home or business, the idea that homeowners with solar panels may now feed electricity back *into* the grid can impose costly equipment and logistical burdens for the utility. Distributed generation is still a relatively new concept, and many state and national energy regulators have not yet developed formal policies addressing this issue. If they have promulgated rules, then the utility's behavior is constrained, and it likely will pursue strategies aimed at maximizing the economic return on its new investment. If rules have not been developed, then the utility must calculate how best to optimize its situation. Does it simply ban homeowners from feeding power into the grid, thereby foreclosing the need to make any new investment? Or does the utility hedge its bet by voluntarily making changes in return for higher connection fees than regulators likely would propose on their own? Such are the game theory questions that individuals and organizations face when looked at from a rational choice perspective.

- **Sociological or social construction neoinstitutionalism** subscribes to the same decision-making logic that says utility maximization guides behavior, but differs from rational choice institutionalism by arguing that preferences and tastes are "constructed" by endogenous social forces rather than individual perspectives (DiMaggio, 1998). Behavior therefore results from our efforts to define and express our identity in legitimate and socially appropriate ways (DiMaggio, 1998; Hall & Taylor, 1996). Indeed, our entire concept of what constitutes "acceptable" behavior is based on habituation (Peters, 1999), or the regular feedback we receive from those with whom we interact. It is only when others accord our behavior respect or scorn that we gain social context, guiding us towards acceptable behavior. In the case of urban renewables, one example is corporate efforts to

[10] Distributed generation (DG) involves the production of power on-site or near the point of consumption, rather than relying on power generated elsewhere and delivered to the user via transmission and distribution wires. Electricity can be generated by a variety of sources, including renewable power technologies. DG is more complicated in an urban environment because the network distribution grid found in most cities may require technical upgrades to allow it to accept any power exported by the DG system. This is less of a problem in rural areas where the grid systems are less complex.

procure green power. Researchers have found the most important driver behind these procurement efforts is pressure to be seen as civically responsible by attempting to minimize the firm's impact on the local and global environment (Wiser, Fowlie, & Holt, 2001). Purchasing green power is one way to fulfill societal expectations.

- The concept of path dependency lies at the heart of **historical institutionalism**. From a policy-making perspective, this means choices made early in an institution's life cycle or when a policy is created can have a continuing influence over the policy for years to come (Peters, 1999). Although this seems intuitively logical, and in fact there are historicist tendencies in both rational choice and sociological institutionalism, there are also some difficulties with this approach (Hall & Taylor, 1996). First, historical institutionalism is considered to have "post-dictive" (rather than predictive) powers (Peters, 1999). Knowing what has happened in the past doesn't always help us understand how future behavior will be influenced, absent some other type of decision-making rule, such as utility maximization or adherence to some other set of norms. Second, claims of the influence of historical institutions may be difficult to falsify, failing Popper's test for sound scientific theory (Peters, 1999). By this I mean it is difficult to identify the exact point at which one must discount the influence of history on behavior.

Despite these criticisms, historical institutionalism does have value as a research approach, and one can identify a situation where the institutional influence on urban renewables policy-making behavior is clearly historical in nature. Let's return to our earlier cited example about a societal norm that has developed regarding the electrical supply in urban areas. Although the early history of electrical generation was one of sporadic supply, technology eventually advanced to a point where service quality in the US and Western Europe became quite consistent, available 24 hours per day. Regulations followed insisting on this as a minimum performance standard. However, as interest in renewable power grows, this institutional standard is being used (often by nuclear power advocates) to fight plans to increase society's overall reliance on renewables. The argument is made that because certain renewable technologies are innately or potentially subject to intermittent supply, working only during daylight hours or on windy days, excessive reliance on renewables threatens overall system reliability. Because electricity is the lifeblood of a city, historically derived norms can lead local policy-makers to view intermittency as an unacceptable situation, thus potentially influencing which energy options they are willing to consider.

**Do these Differences Matter?**

There are a variety of institutions I examine in my research on urban renewables policy-making. Some are formal in nature (e.g., energy regulation schemes, mechanisms for public input in local policy-making, mechanisms to educate the public and policy-makers on renewables issues) while others are decidedly informal (e.g., societal norms related to service quality and equity or environmental protection). Both types have relevance for my work, meaning the new institutionalist approach lends an important perspective. Whether I am better served by a narrowly constructed sociological, rational choice or historical approach is less clear. My work examines a long-regulated industry, meaning historical new institutionalism appears tailor-made for this research. Similarly, I just pointed out how historical influences can influence expectations of how the electricity supply system should operate. I have also shown that certain policy behaviors could be explained in rational choice terms. In other words, I could likely conduct research on urban energy policy-making from *any* of these new institutional perspectives, and find examples where such influences appear to provide explanatory value.

Ultimately, however, the real question is whether it is important to follow a specific theoretical model, or whether a more 'generic' new institutionalist approach will suffice. The specific approaches add value by guiding researchers to unique lines of inquiry. For example, rational choice institutionalism focuses attention on what individual actors perceived as their options, how institutional forces colored their calculation of the 'value' of each option, and which option they ultimately saw as maximizing their utility. Historical institutionalism, on the other hand, teaches us to diagram the policy-making process with an eye to how prior decisions may have influenced the range of options available to decision-makers or the choice ultimately selected. One also could argue that a generic analysis forces the analyst to pay attention to too many dimensions of the problem at one time, making it very difficult to uncover the specific factor(s) most responsible for the outcome.

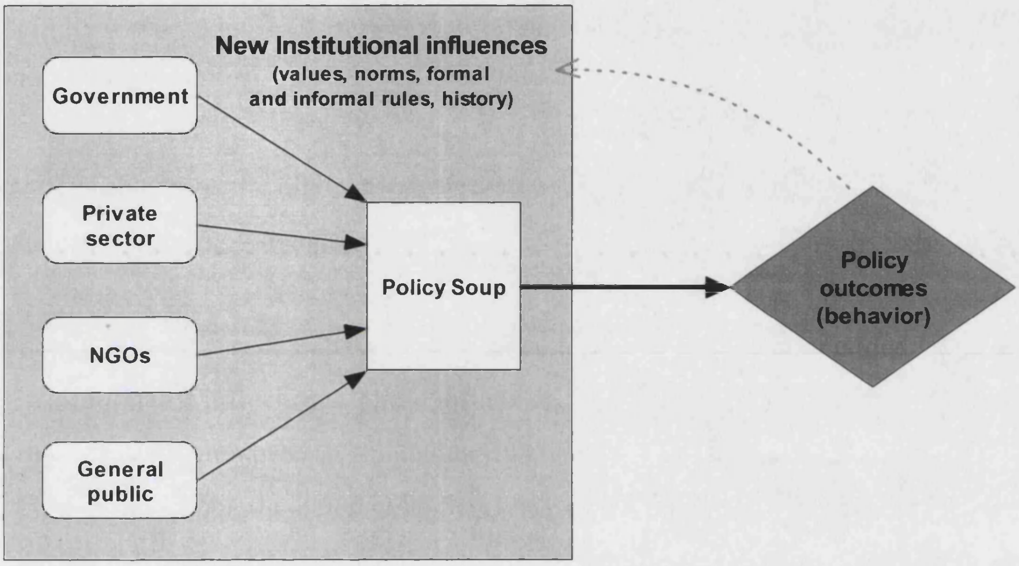
Other commentators label this a straw argument. After reviewing how perspectives on institutionalism have changed in five academic disciplines, Goodin (1996, p 19) concluded "variations on new institutionalist themes are essentially, and importantly, complementary." Neither Pierre (1999) nor Lowndes (2001) mentions the need for analyses specifically geared along rational choice, historical or any other lines, instead simply focusing on the value a new institutionalist approach can bring to the study of urban governance.

Figure 3-1 diagrams the logic of a generic new institutional approach. Implicit in its structure are the following assumptions:

1. Policy outcomes (i.e., behavior) flow directly from a process embedded in new institutionalist influences. These influences subtly or overtly affect all aspects of the policy-making process. Social norms, values, formal and informal rules, and history are among the key factors that serve as new institutional influences.
2. Stakeholders in the policy-making process are embedded in a series of institutions that affect the values and perspectives they bring to an issue, their level of involvement in the policy-making process, and the power they exert over agenda setting and policy implementation.
3. 'Policy soup' (Kingdon, 1995) represents the competing and complementary ideas and agendas put forward by different stakeholders. Some of these ideas taste bad, and are never consumed. Others simmer for long periods before making their way to the policy table, where they are hungrily devoured. Soup is also an apt analogy for policy-making because when different ideas are all bubbling in the same pot, they may soften, change texture, or adopt flavors and aromas introduced by other ingredients (i.e., policy proposals).
4. The policy or policies ultimately selected become part of the institutional landscape affecting the policy-making system. The dashed line implies an indirect and not necessarily equal influence between different outcomes and the larger institutional landscape.

The generic approach does not divorce itself from concepts espoused by specific new institutional approaches, and researchers will by necessity borrow research strands from each. These include tracking policy changes over time (e.g., historical), exploring organizational value structures (e.g., rational choice), and exploring local attitudes about environmental protection (e.g., sociological).

**Figure 3-1**
**Influence of New Institutional Pressures on the Policy-making Process**




### Urban Regime Theory – An Introduction

An alternative analytic approach is provided by urban regime theory, which over the last two decades has gained popularity as a tool for analyzing systems of urban governance. Originally used to explain public- and private-sector relationships in US cities, URT has now shed these geographic limitations and been used by political scientists, geographers, and others to examine urban level decision-making around the world (Mossberger & Stoker, 2001). In doing so, regime theory is considered to have brought new vigor to the study of urban politics (Brown, 1999).

The Oxford English Dictionary defines a regime as "a system or institution having widespread influence or prevalence" (Simpson & Weiner, 1989, p 508), and an urban regime is the coalition of public and private interests that dominate the local policy-making arena. Regime analysis attempts to understand this system: how policy decisions are made at the local level, who makes them, whether these decisions involve formal or informal networks of decision-makers, how the regime was formed, and what is its capacity to act (Brown, 1999; Mossberger & Stoker, 2001). Regime theory also helps explain how certain problems rise to become policy priorities in a city (Stone, 2002). Stone's study of governance in Atlanta is considered a classic early example of urban regime analysis, tracking the influence of Atlanta's business and middle-class black community over the city's political and policy agenda during a 40-year period that spanned several different mayoral administrations (Stone, 1989).

As an analytic concept, URT has many theoretical antecedents. The notion of a regime has its roots in international affairs literature (Krasner, 1983). Brown (1999) considers regime theory an outgrowth of liberal political theory, which emphasizes the tensions between the sovereignty and power of the state and private freedoms and interests. Sites (1997) offers a slight variation on this same theme, viewing regime theory as a bridge between Marxian and state-centered theories because regime theory focuses on how power is shared between the public and private sector.

Several authors bring the focus down to the local level by noting how URT's emphasis on forming coalitions and sharing power echoes, and ultimately advances beyond, the debate of elites vs. pluralists that dominated community power studies of the 1950s and 1960s (Clark, 2001; Dowding, 2001; Hall & Hubbard, 1996; Smith & Beazley, 2000; Stoker & Mossberger, 1994). It does so by focusing not just on *who* has the most power, but *why* this is the case, and what this means in terms of outcomes. Stone (2002) differentiates regime theory from conventional [old] institutional analysis by emphasizing the role of non-governmental actors and the lack of any formal command structure. He goes to the heart of the nature of governance by pointing out that if government alone can set and maintain a particular policy direction, there is no regime, and traditional organizational analysis will suffice. For the same reason, regime theory can be distinguished from classical studies of policy networks, which focus on intra-governmental linkages as a determining factor in policy development. (For example, see Bassett, 1996).

Much of the literature discussing URT explains private-sector involvement in local decision-making as a resource issue – the private sector has access to much greater amounts of capital and technical expertise than the government (Brown, 1999; Clark, 2001; Davies, 2002; Stone, 2002). The private sector's control of these productive resources therefore gives it "privileged influence on the urban power structure" (Davies, 2002, p 3). As Harding (1994, p 361) puts it, "When it comes to urban development projects, votes count, but resources decide." This may explain why most of the early theoretical and empirical literature on urban regime theory focused on the pro-business agenda of many cities, concluding this was a logical outcome of situations where public- and private-sector participants were trying to maximize their own self-interest. (For example, see Elkin, 1987b; Stone, 1989.)

Over the years, URT has broadened considerably from its economic development-centered roots to examine a wide range of issues. Brown's study of AIDS policy in Christchurch, New Zealand, focused on the important role non-governmental organizations played in the development and implementation of local health and education policies targeting sex workers (Brown, 1999). Gladstone and Fainstein's study of the tourism industry in New York City and Los Angeles came to the conclusion that one should not think of a monolithic "business regime" in a city, pointing out different business sectors can have very different interests and differing levels of access to local decision-makers (Gladstone & Fainstein, 2001). Other regime analyses have examined the role of women, gays, and African-Americans in governing coalitions, and the role regimes have played in urban school reform and crackdowns on obscenity (Mossberger & Stoker, 2001).

**Regime Typologies and Characteristics**

There are numerous views, all apparently based on US case studies, on the types of regimes that exist. Although different researchers have given their typologies different descriptive names, they tend to fall into two different thematic categories: how active or aggressive the regime is in promoting new policies, and who benefits from these policies. Most typologies have an activist orientation, which makes sense given that regimes are seen as a form of governance responding to some policy or programmatic shortcoming. There is greater divergence in identifying the intended beneficiaries of regime agendas, ranging from business interests to neighborhoods in need of revitalization to taxpayers decrying high tax rates.

**Table 3-1**
**Urban Regime Typologies**

<table>
<tr><th>Thematic characteristics</th><th>Fainstein & Fainstein (1986)</th><th>Elkin (1987a)</th><th>Stone (1993)</th><th>Dowding (1993)</th><th>Clark (2002)</th></tr>
<tr><td>Activist (pro-growth)</td><td>Directive</td><td>Pluralist</td><td>Development</td><td>Development</td><td>Entrepreneurial</td></tr>
<tr><td rowspan="3">Activist (community focus)</td><td rowspan="3">Concessionary</td><td rowspan="3">Federalist</td><td>Middle-class progressive</td><td>Middle-class progressive</td><td>Progressive</td></tr>
<tr><td rowspan="2">Working class</td><td rowspan="2">Working class</td><td>Activist</td></tr>
<tr><td>Demand side</td></tr>
<tr><td>Activist (fiscal restraint/ government accountability)</td><td>Conserving</td><td>Entrepreneurial</td><td></td><td>Service</td><td>Stewardship</td></tr>
<tr><td>Non-Activist (status quo)</td><td></td><td></td><td>Maintenance</td><td>Maintenance</td><td>Caretaker</td></tr>
</table>

Fainstein & Fainstein (1986) were among the first to posit different regime types. They identified three, each reflecting a different approach and time period. *Directive regimes* occurred in the 1950s and early 1960s, and are typified by urban redevelopment schemes largely sponsored by the state. These were followed by *concessionary* regimes placing greater emphasis on civil rights and class inequities, responding to the social pressures that dominated public debate in the late 1960s and early 1970s. The third model, known as the *conserving* regime, occurred between the mid-1970s and the mid-1980s, placing a renewed emphasis on growth and local fiscal stability. The conserving regime differed from the directive regime, however, in its attempt to address pressing social problems at a greatly reduced level of spending. Fainstein & Fainstein believe their model categorizes governance efforts during this time period in most large US cities with a significant minority population.

Elkin's (1987a) three-tiered model revolves around a political equation involving bureaucrats, local politicians, and business leaders all trying to maximize their own domain. Although he did not see his three regime types – *pluralist*, *federalist*, and *entrepreneurial* – as exhaustive typologies, he did see them as capturing the essence of the change occurring in most US cities. Elkin's regime types are very similar to those proposed by Fainstein & Fainstein (i.e., pluralist = directive, federalist = concessionary, entrepreneurial = conserving), with each occurring in roughly the same period as the Fainstein version. Key differences include Elkin's emphasis on geography – he claimed the first two models dominated in the northeastern and midwest US, while the third was typical of governance taking place in the rapidly expanding southwestern US. Another difference is Elkin's entrepreneurial model places greater emphasis on power sharing between the public and private sectors, involving more active use of partnerships and a bureaucratic style that today might be characterized as 'new public management.'

Both Stone and Dowding have posited descriptive models that stand independent of any specific time frame. Dowding's (2001) five-regime system largely overlaps Stone's (1993) four-model version. Stone identified *maintenance* regimes, which seek to preserve the status quo; *development* regimes, which seek to promote growth and halt economic decline in various parts of the city; *middle-class progressive* regimes, which seek to manage growth and promote a variety of social causes, including environmental and historic preservation, affirmative action, and affordable housing; and *working-class* regimes, which try to expand education, job training, home ownership, and other opportunities for lower-income individuals and families.

To these four, Dowding adds *service* regimes, which stress professionalizing government service delivery in a city through operational improvements or privatization. There are several points worth noting about these new models. First, by jettisoning any temporal link, the typologies are more widely adaptable to non-US locales, where economic and social changes may have occurred within a different time frame. Second, both Dowding and Stone include what is essentially a "non-activist" regime agenda (i.e., maintenance regimes), while Dowding posits a regime focusing largely on issues already under government's control (i.e., service regimes). Neither Elkin nor Fainstein saw these as possibilities, either because they were locked into a specific time-frame reference, or because they were simply trying to see regime analysis as a tool for explaining variations among different pro-growth agendas, rather than as a generic tool for explaining different approaches to governance.

Clark (2001) extended the range of activist regime typologies with a six-regime model. While most of her models describe traits already identified by other commentators, the exception is her *stewardship* regime concept. This refers to a regime that imposes quid pro quo requirements on the recipients of government investment as a means of protecting the public interest. This new typology blends the characteristics of regimes focused on protecting scarce public resources with those interested in supporting pro-growth policies. Clark fails, however, to provide any means of evaluating when a stewardship regime exists. Does a single attempt to wring concessions from a private firm mean an otherwise entrepreneurial or progressive regime should be reclassified, or is a track record required?

Clark's omission begs the larger question of how researchers can identify whether a regime exists. Stone (2002, p 3) provides only partial guidance when declaring, "The test for regime analysis is the proposition that no strong capacity to govern in a direction-setting manner exists outside regime arrangements." Other commentators provide more direction by arguing that outcomes are the key to identifying a regime's existence. For instance, tax breaks, the use of eminent domain powers, and an increase in police presence in certain commercial districts could all be interpreted as evidence of a regime's work (Gladstone & Fainstein, 2001). Clark (Clark, 2001)goes so far as to identify specific characteristics for each of the six regime typologies she proposed. For example, the presence of her *caretaker* regime might be tipped off by substantial local membership in environmental groups, or by the presence of campaigns against corporate welfare. Similarly, Clark argues a minority mayor, fair wage rules, and a focus on rebuilding areas of deprivation are characteristics of cities with progressive regimes.

Dowding's (2001) approach is far less focused on outcomes, emphasizing instead the importance of structural evidence. Dowding describes an eight-point checklist of things to look for: 1) the presence of a distinctive policy agenda; 2) the policy agenda should be relatively long-lived; 3) the regime must consist of a coalition of interests that are not institutional in nature; 4) regime member interests should be cross-sectional or cross-institutional; 5) the agenda must survive changes in political leadership; 6) mobilizing non-governmental resources should be central to the success of the regime; 7) the regime must have strong, visionary leadership; and 8) there should be an emphasis on public-private partnerships that bridge institutions and community interests. According to Dowding, the first four characteristics are of critical importance, while the ability to survive changes in political leadership is perhaps the key defining characteristic of a successful regime.

Stone's definition and Dowding's checklist fit neatly with the explanations given for focusing on city governance rather than city government. Broad participation, involving relationships that extend beyond those called for by statute or regulation, is a notion central to governance, as is the mobilization of resources outside government's control. What are unique about these definitions are the issues not previously raised in the discussion on urban governance: the long-term nature of the governing regime's relationship and its coalescence around a distinctive policy agenda. Examination of these factors is therefore critical when distinguishing the existence of a regime from a simple network analysis (Rydin, 1998).

**Criticism of Regime Theory**

Although urban regime theory has grown in popularity over the last decade, it is not without its critics. Objections generally fall into two categories: the localistic nature of the concept, and its provincial origins.

Complaints about the localistic nature of regime theory stem from its origin as a means of analyzing the politics and relationships that guide policy-making in an urban area. Decisions are seen as the outcome of negotiation between actors and institutions (Brown, 1999). But this overly simplistic view ignores other factors that can affect decision-making in urban areas, including local culture (Ferman, 1996), electoral politics (Lauria, 1994), and state and federal policies. For example, Jonas recounts the dramatic impact cutbacks in federal defense spending had in Southern California. Decisions made in Congress ultimately had huge impacts on local tax revenues, land use decisions, and economic development policies (Jonas, 1997). As regards the issue of urban renewables, the absence of any systematic method for incorporating the effect of regulatory structures is particularly problematic, as these regulations can dramatically limit the energy policy options available to decision-makers. This issue is addressed at length below

Electoral politics is another issue that cannot simply be dismissed – situations arise in the course of urban life to which government must respond or risk ejection from office. Because some powers cannot be devolved to a larger governing coalition, decisions by government may shift the short- and long-term landscape in which regimes operate. Similarly, culture plays a huge role in determining political roles and the local power structure, as Stone (Stone, 1989) so clearly showed in his study of Atlanta politics.

Because regime theory was originally used to explicate local politics and decision-making in the United States, there have been concerns over its applicability in countries where the national government plays the central role in funding local development schemes (Bassett, 1996; Mossberger & Stoker, 2001; Newman & Thornley, 1997; Sites, 1997). This contrasts sharply with circumstances in the US, where funding for local projects is generally dependent on taxes and other forms of financial support from the local business community. Keeping business interests satisfied by collaborating with them in a governing coalition can therefore be very important, and regime analysis follows as a useful tool for analyzing this situation. Franz also notes that, funding issues aside, many European countries have a tradition of strong and effective local public administration. As a result, "the idea that circumstances might force the municipal authorities to lose part of their decision-making power to other urban groups or coalitions with a formally less legitimized status, seems prima facie implausible" (Franz, 2000, p 315).

Attempts at regime analysis in a European context have nonetheless been completed. John and Cole (1998, p 387) report this typically has been accomplished by placing greater importance on the role of public-sector actors in the regime, and by viewing regimes not as a necessary condition for local governance "but as a form of governance that can emerge if given favourable conditions." As examples of the former, they cite Strom's finding of the importance of the state and political parties in driving change in Berlin, and Valler's study of Norwich in the UK, where local government was the key player (Strom, 1996; Valler, 1995). John and Cole's own comparison of Leeds and Lille falls into the second category, as they found that although the politics of both cities shows regime-like qualities, it is not clear if they could be considered fully developed regimes. Franz (2000) came to a similar conclusion in examining cities in the former East Germany, seeing the potential for regime development but finding insufficient evidence to support their existence to date

**Environmental and Energy Regimes – Another Appropriate Broadening of the Paradigm?**

Despite the heavy emphasis on economic concerns in regime agendas, they need not have a hegemonic claim on the attention of regime members. Urban environmental issues can be analyzed using regime analysis, although to date, very little research has been done in this area (Clark, 2001; Gibbs & Jonas, 2000). This is somewhat surprising, given growing recognition of the link between environmental quality and the level of economic activity and development in a city. Stone's regime typology specifically noted that one characteristic of a "middle class progressive" regime is an effort to limit growth due to concerns for the local environment (Stone, 1993). Conversely, one also can imagine a city's environmental amenities being used as an extra-economic factor by pro-growth regimes attempting to attract businesses to an area (Gibbs & Jonas, 2000).

To the extent regime analysis can identify who is behind these decisions, why these groups or businesses are promoting this perspective, and what resources were required to turn this perspective into policy it serves an invaluable research function. However, as noted above, one of the primary criticisms leveled against URT is its localism, ignoring larger structural issues such as the impact of social regulation on local governance decisions (Stone, 2002). This is critically important when dealing with environmental policy matters, because of the heavy reliance on regulation as a policy tool. Local land-use planning decisions are one area where regulations may exceed the political power normally deemed critical to regime analysis. Although the planning process is generally under local control, planning decisions can be circumscribed by state or federal regulations designed to protect greenbelts, endangered species, or water quality. Similarly, local transportation planning decisions may be proscribed to ensure compliance with state or federal air-quality guidelines. Addressing the impact of regulatory schemes must therefore be an important part of any environment-related regime analysis.

There are several observations one can make about the use of regime analysis to study the issue of renewable power issues in cities. First, given the highly regulated nature of the electric utility industry, the impact of such rules on local decision-making must be taken into account, as they may restrict real or perceived options for changes in the electricity delivery and supply system. Second, a regime's perspective on renewable power use may hinge on who is involved in the local regime and their capacity to sway the opinions of other regime members. Utilities are important players in a city's business community, given their key role supporting the operations of other businesses. Understanding the utility's role in any regime, their policy perspective, and capacity to influence local policy-making, is therefore critical. The same holds true for any other energy-related firms or institutions in the area. Burns' analysis of regime influences in Hartford, Connecticut, also points out the need to look beyond purely local-level actors for regime members. He found the Governor of Connecticut was an extremely influential regime member, working hand-in-hand with business interests in the city to promote an active economic development and education reform agenda (Burns, 2002). In the case of energy policy, there may well be non-governmental organizations or actors at the state or federal levels which play an active role in promoting renewable power use in a specific city, and it will be important to identify who they are and what resources they bring to the table.

Finally, a regime's perspective on renewable power use may hinge on its perceived impact on the overall business climate of the area. Opposition likely would be high if renewable power is seen as an obstacle to growth, or as something that will raise the cost of doing business in a city. Such criticisms have been leveled at new proposals to create a renewables portfolio standard in New York State, and to site wind farms offshore of heavily populated Long Island, directly adjacent to New York City (Keating, 2003). Proposals to change local building codes to require the installation of photovoltaic systems may similarly be opposed by a regime because it could increase the cost of real estate development in a city.

Conversely, regimes may be amenable to mandatory schemes if renewable technologies can be shown to hedge against utility price spikes or future price increases, or if the widespread adoption of renewable technologies helps address air quality problems in a region, thereby benefiting the overall business climate. A regime also may have no problem with efforts promoting the voluntary adoption of renewable technologies. These proposals could take the form of government-funded rebates to individuals or businesses installing such systems; or education programs and "model" buildings that showcase the use and benefits of renewable technologies. Such proposals would have negligible impact on the local business climate.

Both sets of scenarios point out the importance of understanding the regime's role in the renewable-energy policy development process. Was the regime actively engaged on this issue, working to tone down or repress energy policy proposals considered anti-business? Or was the influence subtler, reflecting what Bachrach and Baratz (1963) referred to as non-decision making power, where the regime has shaped the policy-making landscape to a sufficient degree that certain proposals are dismissed out of hand, never even making it to the point of discussion among local policy-makers? Finally, is this an issue on which the regime is totally disengaged, leaving it to local government officials to determine the scope and scale of the renewable-energy policy agenda? If so, it may be the case that government agencies and officials working on renewable power policies and programs are isolated from the government agencies and officials engaged in economic development issues. The latter is the group most likely to represent "government" perspectives in any pro-growth regime (Gibbs, Longhurst, & Braithwaite, 1996).

**Commentary**

Renewable energy policy is an area that bridges public- and private-sector interests, and my research focus on urban level decision-making makes URT an obvious analytical framework to consider. Its focus on who is involved in the decision-making process, the nature of relationships among different players, and how they manage to negotiate a mutually acceptable policy agenda means there is much to gain from its use. In particular, regime analysis may enlighten us about why different cities pursue different approaches when promoting renewables use, or why they ignore renewable power altogether.

The analysis, by necessity, will focus on any hegemonic regime's perspective toward local environmental quality matters. Renewable power deployment can be seen as an economic development issue, but more likely it is emblematic of a regime's overall approach toward environmental protection, and the city's role or responsibility in achieving it.

We must also ask, however, whether attention must singularly focus on the actions of the dominant regime in a city, or whether it is possible for a separate and distinct "specialized" regime to drive policy-making on local renewable power deployment or use. This is one of the key questions posed by Gibbs and Jonas that I intend to address in each case study. The current literature is silent on the idea that different regimes can co-exist in a city, either because the previous studies were narrowly focused on a single topic (e.g., economic development) or because this concept is implausible given that regimes are considered hegemonic. If a separate 'sustainability regime' does exist, one would expect to find it either opposing new energy sources (particularly if this regime is dominated by entrenched energy interests) or actively promoting their use.

One also must consider the possibility the regime approach is too robust for this type of research. By this I mean the model may best be suited to exploring very broad policy agendas, rather than the relatively narrow policy matter I have chosen to study. As Stone (2002, p 2) notes, "A regime is not a form of integrated guidance of the full range of policy activity. Instead, concerned actors, from both governmental and nongovernmental sectors, create arrangements (a regime) in order to act on a set of *high-priority* problems" [emphasis added]. Renewable power deployment or use simply may not fit this bill, even in cities where renewable power resources are plentiful or public support is strong. If this is true, then a research framework like new institutionalism may be more useful at explaining the state of renewable power policy and deployment in a city.

**New Institutionalism and Urban Regime Theory – A Blended Approach**

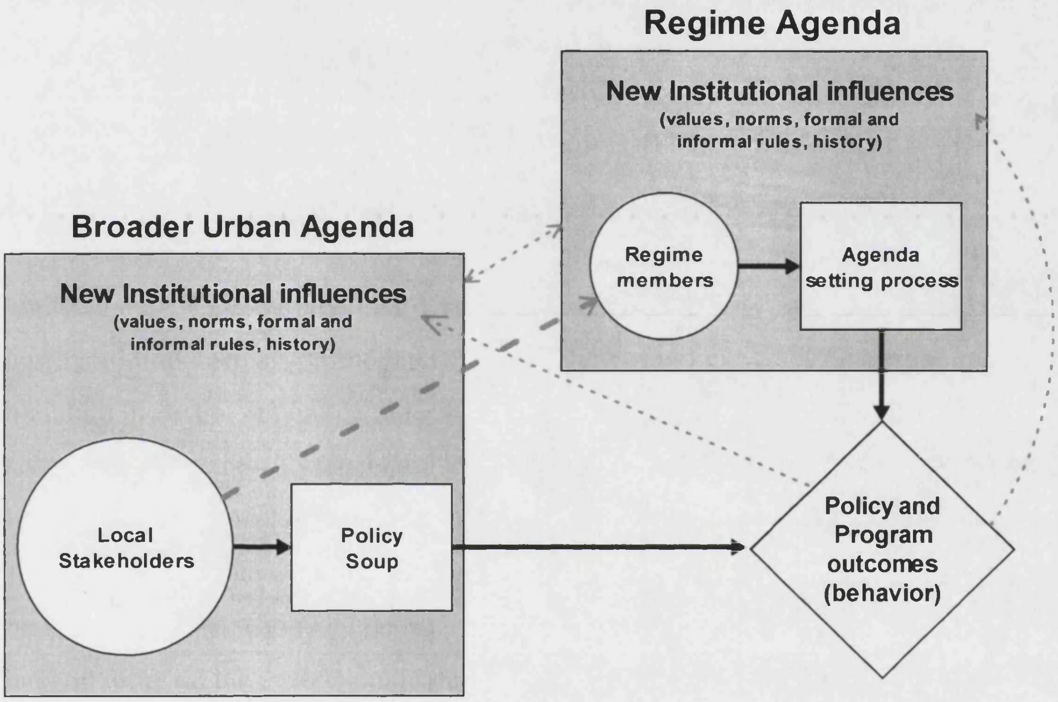
Where does the preceding analysis leave us? Is one approach obviously superior to the other for my purposes? Or is it necessary to craft a third way?

NI and URT both excel at explicating the 'who, what, when and how' of urban governance. Both emphasize that government doesn't act alone, and that informal structures and other influences are equally important. Both approaches stress the importance of history to the equation, either in terms of path dependency (new institutionalism) or in terms of the length of time the governing coalition has dominated local decision-making (regime theory). Both emphasize the role of shared values or interests, and the influence these values and interests have in influencing the behavior of others. When noting that "urban regimes are themselves informally constituted arrangements of rules that shape actor's behavior," (Lowndes, 2001, p 1964) is using the language of new institutionalism to make her point, thus affirming the idea that urban regime theory and new institutionalism share many common traits.

They are not, however, two sides of the same coin, and each has its weaknesses, many of which are addressed by attributes of the other theory. Regime theory is very locally focused, looking for factors that are spatially bounded. To the extent explanatory factors extend beyond the city limits, URT may fail to identify them. New institutionalism does a better job in this way, looking for larger sets of explanations. Ironically, however, new institutionalism's big picture focus can mean that local details get ignored. URT emphasizes "high-priority" agenda setting, while new institutionalism accommodates the full range of policy issues occurring in a city, including those not yet on the radar screen of a ruling regime. Urban regime theory has been criticized for its weakness in comparing cross-boundary situations – 'old' Institutionalism was one of the early analytic mainstays of political scientists making such comparisons, and new institutionalism retains this capacity. Urban regime theory emphasizes who is in the regime, while new institutionalism focuses less on that and more on the societal and structural context that influence regime membership and individual and collective agendas. Finally, as I have mentioned several times, New institutionalism excels at analyzing formal rules like those regulating the electric utility industry, a situation at which urban regime theory is far less adept.

I therefore see value in blending these two approaches to craft a new theory that retains the strengths and eliminates the shortcomings of each individual theory. Under this blended approach, which I dub modified regime theory, urban policy-making emanates from two policy spheres. [See Figure 3-2.] To the right are issues falling within a regime's core agenda, reflecting Stone's contention that regimes only tackle the 'big' issues facing the city. A second, larger, sphere encompasses the broader urban agenda, in which the lion's share of policy-making activity within the city occurs. Issues tackled here represent those not on the regime agenda or about which the regime could not agree. In cities where no regime is present, it is this broad urban agenda policy sphere that provides critical policy leadership to the city. Cross-border analyses are also facilitated by this model, because differences in national government structures, societal values, or market mechanisms are explicitly accommodated by the model, reflected in the institutional backdrop in which policy decisions are debated and made.

**Figure 3-2**
**Modified Regime Framework**




Within the broader urban agenda policy sphere, stakeholders of all types and capacity compete to achieve their agendas. In cities where a regime is present, a smaller subset of local stakeholders participate as members of the hegemonic regime, reflecting some type of privileged status, assets, or knowledge of value to other regime members. The dashed line reflects the fact that regime members constitute a subset of the larger universe linking regime members to local stakeholders operating within a city.

In each sphere, policy-making occurs within a new institutional context, whereby values, norms, formal and informal rules, and history determining which stakeholders are involved, the values they hold, the options they consider, and their capacity to act. It is here that any electricity market regulations or other regulatory mechanisms are accommodated, along with other formal or informal rules that may influence renewables policy-making in a city. Through a feedback loop, policy and program outcomes eventually become part of this institutional fabric, changing or updating societal norms or rules and forming a new historical record. One could conceivably locate the two policy spheres within the same institutional environment, but I have opted to treat them as distinct to signify the separate but inter-related nature of the regime, and the fact that its presence and activity exerts unique influences on the broad urban agenda, and vice versa. (This influence can be seen by the two-way feedback loop situated between the two policy spheres.)

Although many research questions flow quite naturally from this model, in each case study I will attempt to answer two questions which are of primary importance. First, does a hegemonic regime exist within this city, and if so, does it engage on renewable power policy-making matters? If not, is there a policy-specific regime setting the local renewables agenda? Second, what are the key institutional influences that affect the shape of local renewable power policy-making in each city, and how do they manifest themselves in this model? Are they influences that shape policy-making or behavior only in the broad urban agenda, or do they affect regime behavior as well, influencing who is involved or which policy options are considered? In the final chapter of this thesis, I shall also examine the larger question of whether this modified regime theory model was a success, addressing shortfalls in the stand-alone new institutionalism and urban regime theory models, and whether its application in my empirical work produced any revelations worth noting prior to its application to other cities or policy contexts.

**Conclusion**

The new era of urban governance requires new tools for analysis. Urban regime theory has proven itself to be highly adept at explicating the underlying factors and stakeholders driving local decision-making. Gibbs & Jonas suggest URT can be deployed to examine environmental decision-making, something we've not seen to date in the literature. However, left unaddressed in their call to use URT in this way was any counsel on how to account for the larger policy and regulatory milieu tightly bound up with environmental policy-making.

Chapters 1 and 2 made it very clear that such factors must be taken into account in any analysis of urban energy policy-making, as they are so pervasive. These include the fact that cities are home to the bulk of all energy use, yet local authorities are typically not the source of the major decisions shaping the marketplace. Moreover, national and state stakeholders determine how electricity markets are structured and who plays which role in making the market work. State and national stakeholders also provide the overall policy direction for the industry, emphasizing the need to better take account of climate change concerns, energy costs, or the adequacy of the transmission grid. Subject to the rules of the game, market players then develop and implement their own preferred strategy.

Compounding the complexity of this issue is the fact that cities engage in energy policy-making and market activities in many different ways. Understanding the logic of their decisions requires the use of robust models that can help us untangle the influence of different stakeholder involvement *and* larger structural or systems-oriented explanations. My blended theory should prove helpful at analyzing both types of factors. In the case studies that follow, I'll put this new model to the test, first examining whether an energy regime is at work in each city, and if so, how the larger policy and market environment is influencing its behavior. As part of this analysis I'll also interrogate other questions raised by Gibbs & Jonas that offer insights into how and why regimes are formed, and how they operate. By doing so this thesis will expand our understanding of URT's applicability to different policy contexts, and begin to flesh out how to improve its explanatory impact.

# CHAPTER 4
# Methodological Approach

## Overview

Empirical work carried out in support of this thesis involved the development of two comprehensive case studies examining renewable power policy-making in New York City and London. Case study-based research is a common social science research methodology used when "'how' or 'why' questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context" (Yin, 2003, p 1). Regime analyses have long relied on case study analysis, profiling events, institutions, stakeholders, and the broad political and policy-making environment in each city under review.

Case study work has been criticized in the past as lacking the analytical rigor of statistical analysis or other forms of qualitative research (deVaus, 2001), but case studies are nonetheless widely used to broaden our understanding of complex phenomena that are not readily distinguishable from their context (Yin, 2003). In this thesis, the case studies were structured to emphasize areas suggested by my theoretical framework. Because regime analysis emphasizes the role of stakeholders, significant amounts of time were expended looking at who was involved in the crafting of different policies or programs, and what their participation meant in terms of outcomes. New institutionalism forced me to focus on larger sets of issues, such as the nature of local politics in New York City and London; the local policy-making process and the larger state or national regulatory framework; the status and structure of local energy markets; and the values or social norms held by different stakeholders or imbued into various organizations, institutions, or rule-bound processes. Answering the critics of case study research, it is clear that such an analysis would not easily lend itself to statistical techniques that try to isolate the relative influence of one or more of these factors by holding them 'constant' across the two cities.

To obtain this information, the case studies relied heavily on literature reviews and telephone and in-person interviews with local policy elites. Given their long and storied histories and status as two leading world cities, New York and London have both been the subject of much research examining their overall political and policy environment. There has been less work scrutinizing local energy and environmental policy-making, but I did uncover a rich array of newspaper and magazine articles documenting or commenting on these topics. In-person and telephone interviews were conducted with local policy elites and observers of the policy-making process. These sessions gave me an insider's look into the genesis of many key policies, including the nature of any debates that occurred as the policies were first being negotiated. Interviews were tailored to reflect each person's unique knowledge of these issues, and included questions soliciting both personal opinions and factual information.

In this chapter, I explain why I selected these research methods. I identify the categories of interviewees who I sought out in each city, and discuss the general lines of inquiry that were targeted at each group. I also discuss the dominant forms of written documentation that I relied on as part of my literature review, and explain why they were the most relevant. Finally, I discuss my experiences carrying out this work in each city, and offer observations relevant to others conducting similar research.

**Research Plan**

My research plan consisted of several different elements. The most important early decision was the selection of my case study cities. As a long-time observer of and participant in environmental policy-making in New York City, I believed my network of contacts and knowledge of local politics and policy-making processes could expedite the research process, so New York was an obvious choice. Even absent these parochial benefits, the city made for a good candidate for research on this topic because of its standing as a global city (Fainstein, 2001; Sassen, 2001); its reputation as a juggernaut of world finance and 'headquarters for headquarters' (Warf, 2000); and role as the center of a large and diverse regional economy, benefiting mightily from strong tourism, advertising, accounting, legal, media, and entertainment business sectors. To power this economy, New York City consumes vast quantities of power on a daily basis, enduring some of the highest electricity prices in the US. No large new power plant has been constructed in the city in many years, and because of this and constraints on the amount of electricity that can be imported to the city over transmission lines, the city has been at risk of blackouts and brownouts during peak demand periods since 2000 (New York City Energy Policy Task Force, 2004). All of these facts appeared to make the city a good candidate for on-site renewable power deployment, and thus of interest from a research perspective.

London enjoys a similar high profile global status. Population levels are roughly the same as in New York, and it similarly enjoys a post-industrial economy that competes with New York City and leading European cities on financial services, fashion, and knowledge-based services (Greater London Authority, 2000b; Parkinson, 2001; Travers, 2004). At the time I began my research, London Mayor Ken Livingstone had announced plans to develop a comprehensive Energy Strategy for the city, thus affording me the opportunity to query decision-makers in a timely manner about the logic behind their decisions on the plan. Another benefit offered by the timing of the Energy Strategy development process was how it facilitated my identification of key stakeholders, an otherwise time-consuming step.

With this decision settled, I turned my attention to the design of my case studies. DeVaus (2001) suggests researchers keep in mind six key design considerations when developing case studies:

1. *Single vs. multiple cases*: This element refers to the number of units of measure within the analysis. Both are equally valid, but as with statistical analysis, which prefers larger sample sizes, multiple case studies are seen as providing greater insight into an issue or more data points that can support a conclusion aimed at testing or building an explanatory theory.
2. *Descriptive vs. explanatory case studies*: Descriptive case studies primarily focus on communicating information in a non-judgmental or overly analytical way, while explanatory case studies attempt to use the information to answer some question pre-defined by the researcher.
3. *Theory testing vs. theory building case studies*: Explanatory case studies either test or build theories. A theory testing case study uses the information collected to determine which of several competing theories best explain a certain phenomenon. Theory building case studies use the evidence to create a new theory or theories that can explain this phenomenon.

4. *Parallel vs. sequential case studies*: This element focuses on whether the case studies are completed sequentially or in roughly the same time frame.
5. *Retrospective vs. prospective case studies*: A retrospective analysis involves reconstructing the historical record of the case, while a prospective study involves the monitoring of a case from now into the future. Retrospective analyses potentially can suffer if gaps exist in the historical record, whereas prospective analyses may suffer from a failure to fully consider the historical antecedents of the current situation.
6. *Holistic vs. embedded case studies*: Yin (1989) developed the concept of holistic and embedded case studies, identifying a holistic case study as one that dwells on information germane to the entire case, whereas an embedded case study tries to understand the whole situation by analysing the many levels or subunits of analysis that make up the larger case study.

My research design factored in all of these considerations; I will address each in turn. First, although New York City is so complex it could have potentially served as a standalone case study, I believed it was important to contrast the story in New York with the situation in at least one other city. By doing so, it allowed me to use the thesis as both a theory building and theory testing exercise. My primary goal was to understand the logic renewable energy policy-making in each city, meaning I would develop my conclusions based on the findings of two case studies, enhancing its generalizability to other urban contexts. A second city also provided another opportunity to apply my theoretical framework, helping to identify flaws or attributes in its design that may not have been apparent during a single application. The dramatically different political and regulatory contexts of London and New York City make this point particularly compelling.

The lengthy travel time and high cost of traveling between the two cities made it necessary to sequence my research. Field interviews in New York were conducted between October 2003 and January 2004 (and again in May 2005), while London field interviews were generally conducted between April 2004 and August 2004. Although sequencing complicated the writing phase of this thesis because important policy changes occurred in New York City while I was working in London, it also proved beneficial in that my London research benefited from insights gained and mistakes made in New York.

My case study design was by necessity explanatory in nature, given my focus on how and why policy is made on renewables in an urban setting. A descriptive case study would have simply presented facts about the history and current state of energy policy, regulation, and political affairs in New York City and London. This is potentially an interesting story, but one that provides few lessons for other municipalities seeking to expand their own deployment or use levels. Explanatory case studies dig deeper, using raw facts as grist for an analysis from which others can learn. The fact that I was looking to understand how past decision-making has shaped the current energy policy situation in each city made my work partly retrospective in nature. To ensure there were no significant gaps in the historical record, I spent a great deal of time digging for past energy policy documents that might provide some historical or causal link to current day policies. The timing of the London Energy Strategy, however, and the decision by New York Mayor Michael Bloomberg to establish an energy policy task force in 2003 also gave me the opportunity to conduct a prospective analysis, in that my field research occurred shortly after the Energy Strategy was finalized.

Finally, my research design was structured as an embedded analysis, meaning I emphasized spending time with different stakeholders involved in and affected by the energy policy-making process in each city, in an attempt to develop a more complete picture of how decisions are made, who exerts power, and how or whether formal and informal rule structures influence the direction of local policy. I preferred this approach because of renewable power's status as a relatively new and small player in the energy game. Understanding how new stakeholders gain standing with hegemonic energy interests offers insights into the structures dominating the industry, and the values permeating these structures and the entire energy policy-making process.

In crafting my research design, I also needed to keep in mind issues related to how the data will be interpreted and generalized for other locales, meaning dealing with issues of internal validity, external validity, construct reliability, and reliability (Yin, 1989).

Internal validity relates to a researcher's ability to accurately detect a causal relationship between earlier and later events. Lacking statistical measures such as t-tests or $R^2$ values, techniques such as 'pattern matching' have been developed to help researchers ensure the validity of their conclusions. Dowding's 8-point checklist (Dowding, 2001) and Stone (2002) and Clark's (2001) more basic definitions serve as pattern matching templates I can use in my own research. No such framework has been posited in the case of new institutionalism, meaning I must either develop my own framework to justify any claim that institutional influences have driven a city's energy policy-making in a certain direction, or exercise great care when making such assertions.

External validity focuses on the generalizability of the results to other situations. In my work, the issue is whether it will be reasonable to claim that lessons drawn from New York City and London can be generalized to other large urban areas. Given that political and regulatory systems can function very differently in different cities, this may be difficult. Construct validity relates to the breadth and depth of the research design – whether data gaps exist, or whether the research uncovered all factors relevant to the case. This is particularly important when examining institutional influences on the energy policy-making process, as the sources of these influences can be quite diverse. Moreover, some factors may only be known by a limited group of insiders, meaning a careful research design involving a wide range of sources becomes all-important. Finally, reliability refers to the replicability of the findings by another investigator following the same research design and conducting exactly the same research as the initial investigator. In defining reliability, Yin (1989, p 45) draws a parallel between case study research and the work of a bookkeeper. The latter knows they are subject to an audit, where an outsider comes in to validate the original calculations. Although the likelihood that another researcher would replicate this study is slim, the point is the same, leading me to update my research design on a regular basis and keep comprehensive records detailing my research results as they occurred.

## Data Sources

My research drew on four of the six sources of evidence commonly used in case studies (Yin, 1989, p 84): written documents, archival records, interviews, and direct observation. Evidence based on participant-observation and physical artifacts proved irrelevant to my work. Archival records provided valuable historical information about old city energy policies; comments submitted by different stakeholders on regulatory proposals; and minutes from legislative and regulatory hearings. In the New York case study, I also obtained copies of old government contracts through the filing of Freedom of Information Law requests, which give the public access to certain types of government documentation.

The majority of my research, however, involved the review of written documentation and the use of face-to-face, semi-structured interviews with key policy and decision-makers in each target city. Written documentation generally fell into two key areas:

- *Articles/reports documenting local politics and policy-making practices:* The theoretical framework outlined in Chapter 3 detailed the importance of the political dynamics of local policy-making practices in each city. Therefore, it was essential to review academic journal articles, books, news reports, and other documentation discussing the history and process of policy-making in each city, as well as which stakeholders were seen as driving local politics and policy development. There tended to be far less information specifically focused on local energy policy-making, so as a proxy I frequently referenced information about other environmental policy issues in that city.

- *Energy policy studies*: Although the sources differed widely, several key reports were available detailing the status of current energy systems in each city, along with the potential for alternative supply strategies. Authors ranged from local government itself; the local distribution utility and other electricity suppliers; local, state, and national environmental organizations; business and trade groups; and academic researchers. Reports focusing on similar issues at the state or national level were also helpful at explaining the broader policy context in which each locality operates.

**Interview Strategy**

This information was nicely complemented by face-to-face, semi-structured, 'expert' (Flick, 2002, p 89) interviews with key stakeholders who offered their on- and off-the-record perspectives on local energy issues. For the purpose of this thesis, interviewees were treated as 'representative respondents' (Gorden, 1975, p 188) because their answers served as proxies for the larger array of stakeholders around each city. Face-to-face interviews were pursued wherever possible because they facilitated audio-taping and verbatim transcripts that could be reviewed months after the original interview took place.

Semi-structured interviews were used because they allowed me to cover a wide range of pre-planned topics as well as new lines of inquiry arising in the course of an interview. Questions were generally open-ended in nature, allowing the interviewee to respond in whatever manner they wished, or provide nuanced answers to complex questions. Formal questionnaires and structured interviews both suffer from this problem because they are generally pre-designed with specific answers or categories of answers in mind. Such categories may or may not fully capture the range of answers respondents can provide on an issue, particularly because in their role as expert, the respondents may have insights I had not anticipated (Fontana & Frey, 1994). Open-ended questions were also useful when I was unfamiliar with a topic, as the responses provided fodder for follow-on questions. As my familiarity with a topic increased, questions became more structured to elicit more narrowly focused responses. Questions were designed to elicit factual information, interpretations of policies and other formal and informal rules, and personal perspectives on different matters. Examples of questionnaires used to interview two different types of policy experts are attached as Appendix 3.

Most interviews were conducted with individuals who could be categorized as 'elites,' as they held privileged positions in terms of local policy-making or business decision-making (Odendahl & Shaw, 2002). These individuals had many demands on their time, which occasionally forced them to limit the time they could schedule for an interview. Most people were generous with their time, however, and the majority of my interviews lasted between 45-60 minutes. On a few occasions, my interview requests were turned down, generally by people who claimed they did not have the time or had a policy of not conducting interviews with students. These setbacks did not adversely affect my research, as in every case I was able to replace these individuals with others equally knowledgeable about the subject.

Interviews were conducted with a very large number and wide range of stakeholders knowledgeable about energy or political topics in each city to ensure construct validity. Six broad categories of potential interviewees were targeted: government officials; the local advocacy community; the energy industry; the local business community; observers of local politics; and the local building design and construction community. Several of these groups were broken down into subcategories, particularly the government sector, where a wide range of organizational interests were targeted. The type of information targeted from each group included:

Government

- *Energy utility regulators* – With responsibility for oversight of the electric utility industry, this group plays a key role in rate-setting decisions; ensuring renewable power generators have access to the transmission and distribution grid; and managing inquiries into other aspects of electric utility operations. An important line of questioning in these interviews involved how the regulatory system is currently structured.
- *Energy and environmental policy-makers* – These are the politicians and agency officials responsible for molding the local, state, and national energy landscape. Questions focused on the logic of past decisions and expectations for future policy.
- *Land-use planning/Building Department* – Decisions made by these agencies can facilitate or hinder the installation of renewable technologies on private property. Interviews explored staff level knowledge of different technologies, and agency views on mandatory vs. voluntary regulatory approaches.

- *Economic development agencies* – These agencies play a key supportive role in helping to build or sustain a local renewable power industry. Using their industrial bonding powers, they can help businesses obtain less expensive financing for equipment related to renewable power system installations. They can also make direct investments in or provide subsidies to renewable power technology manufacturers wishing to establish a business in the city, and develop training programs designed to develop a workforce trained to work in this industry. Finally, because they are in regular contact with the local business community, they can play a key outreach role in educating businesses and commercial property owners about the benefits of installing renewable power systems in their facilities. Questions focused on all of these issues, and what agency officials see as trends for the future.

Environmentalists/Other policy advocates

- *Organizations focused on state, national, or international energy and environmental policy* – These groups focus on very high-level policy-making, and may or may not pay much attention to what is occurring at the local level. They also may or may not have a specific emphasis on energy issues or specific energy technologies, but will tend to have useful perspectives about the political dynamics of environmental and energy issues at the state and national level. Interviews focused heavily on identifying key stakeholders on energy and environmental topics, along with their perceptions of how policy is made in that city.
- *Community-focused advocacy organizations* – These groups may or may not have an environmental or energy focus, but emphasize local level action. Interviews again emphasized the political and policy dynamics of the city, including which groups exert more or less influence over local policy-making.
- *Energy policy specialists* – These groups or individuals tend to have strong viewpoints on specific energy technologies, both pro and con. Questions focused on market trends, issues related interconnections between renewable power systems and the grid, and their perspective on local energy policy-making efforts.

Energy Industry

- *Renewable energy technology manufacturers* – These firms may or may not be located in the cities targeted by my research, but they nonetheless have a perspective on the viability of the urban market for their systems. Interviews focused on market trends, their familiarity with local energy policy issues, and how they work with policy-makers at all levels to create a more friendly business and policy landscape for their products.
- *Renewable power technology installers* – These individuals or firms all had experience installing systems in New York or London, thereby providing first-hand knowledge of any regulatory or market impediments in these cities. Questions also explored how their business has changed over time, and whether they saw links between business levels and certain policy initiatives.
- *Renewable power technology trade organizations* – These groups are typically very active on policy issues, representing the business interests of system manufacturers and installers before different government agencies. Questions therefore examined their perspective on specific regulatory, economic, and political factors that have influenced renewables markets; their perspective on local, state, and national policies; and who they see as key stakeholders on these issues.
- *Transmission and distribution system operator(s)* – Stakeholders from these groups provided valuable information about the current state of electricity markets; how the marketplace has changed due to liberalization; what it is like to work with the state or federal utility regulators; and how efforts by renewables system operators to enter the marketplace is affecting their operation.
- *Local electric utilities* – As the firm or firms responsible for delivering power into homes and businesses in New York and London, these utilities offered a crucial perspective on interconnection issues; how the marketplace has changed due to liberalization; and the nature of their relationship with state or federal regulators and local policy-makers.

Other Business Community

- *Business organizations* – These state or local organizations are typically focused on improving the local business 'climate,' and were able to provide a useful perspective on how energy issues are perceived by local businesses. Given issues raised in Chapter 2, understanding what role individual business leaders and local business organizations play in driving local policy making was also an important focus of my research with these groups.

Observers/Commentators

- *"Good government" groups* – Protecting the local 'public' interest is the primary focus on these groups, who regularly look for examples of political deals that unduly benefit or burden certain individuals or groups. Questions thus focused on their familiarity with local energy policy matters, and broader questions focused on who holds the greatest sway over the local policy-making process.

Design/Build Community

- *Architects/Engineer/Developers* – These groups exert a great deal of influence over the extent to which new buildings take responsibility for generating a portion of their own power supply. Interviews focused on building codes, the permitting process, the influence of historic preservation rules, the industry's awareness of sustainability matters, and their views on the effectiveness of different mandatory and voluntary policy approaches.
- *Unions/Building Trades groups* – In New York in particular, this group prepared several policy papers over the last few years emphasizing how energy shortages can damage the local economy, thereby harming the economic interests of their members. Questions therefore emphasized whether they endorse specific types of energy technologies over others, their involvement in the policy process, and who they saw as key agenda setters on these issues.

A complete list of those individuals interviewed by telephone and in-person can be found in Appendix 1. Individuals with whom I corresponded via e-mail to satisfy very specific information needs are also listed.

**General Observations of the Research Process/Conclusion**

I undertook this thesis after many years in government and consulting, during which time much of my work focused on policy research on various environmental topics. Thus, the research process was familiar territory for me, although the scale of this work was much greater than work undertaken previously. There were few surprises along the way, and at no time did I find it necessary to dramatically alter my research plan. The case study design proved to be an appropriate methodological choice, allowing for a flexible yet comprehensive review of the factors influencing energy policy-making in each city. Because of my contention that state and national level policies are important considerations, I did spend a significant amount of time pursuing this information. As I explain in Chapter 11, some of the factors I ultimately found to be influencing local policy were expected, while others were more of a surprise, as they lacked any immediate connection to energy policy matters. This was particularly true in London, where budgetary powers retained by Central Government and land use planning powers granted to Local Authorities proved to be key influences on the policies the GLA could ultimately attempt to pursue.

Despite my overall satisfaction with my research design, I nonetheless have several observations related to the research process that are worth noting.

First, familiarity with a topic or city is a two-edged sword. Although I had originally assumed that my large network of environmental policy and government contacts in New York City would expedite my research, there was a downside as well. Knowing many stakeholders from past research projects, I felt compelled to interview more environmental group stakeholders than I otherwise would have because I felt it important to understand their nuanced differences of opinion on this topic. These nuances ultimately proved less enlightening than I had hoped, meaning time spent arranging, interviewing, and preparing transcripts from these conversations could have been used in a more worthwhile manner. It is difficult to know this in advance, however, and because I wanted to err on the side of thoroughness, it may be difficult to prevent this problem from recurring.

Second, audio taping of my interviews created problems on only a handful of occasions, primarily among lower level government officials wary of speaking for the agency in the absence of a designated public affairs officer. In general, I believe most interviewee concerns were allayed by my use of a confidentiality policy allowing them to review in advance any direct or indirect quotes of theirs that I wished to use in my case studies, a strategy suggested by Odendahl and Shaw (2002). In the end, I send out e-mails detailing my intention to reference statements made by approximately twenty interviewees, the majority of whom authorized my use of their quotes. Two interviewees did not respond, despite repeated attempts on my part to obtain their approval. Whether they were too busy or deliberately chose not to respond was not clear. Because I found I was able to make similar points using alternative data sources, the impact on my work was negligible.

On some occasions – and this was especially true in London, where I interviewed nine officials affiliated with the GLA – there appeared to be more hesitancy about speaking 'on the record.' Fortunately, many of these individuals sanctioned the anonymous use of their quotes, and I employed this technique when I felt it was necessary to present this information but was unable to obtain it from another openly documentable source. The vast majority of these quotes are found in Chapters 7 and 10. A copy of the confidentiality statement used in my interviews is attached as Appendix 2.

My third general observation is that it was a challenge to remain a neutral observer during the research process. Given the similarities between New York and London, and an informal interest by many policy-makers to 'outperform' the other city when it came to the deployment and use of renewable power, there was tremendous interest in my research findings. Londoners wished to know what was happening in New York, and vice versa. I was given several opportunities along the way in both cities to report on my findings, which I took, but thus far, I have avoided invitations to prescribe solutions as to what each city might do to improve their current situation.

As a long-time consultant and policy-maker, it was very tempting to engage in this activity, but I am confident there will be ample opportunities for this in the future.

# CHAPTER 5
# New York City case study: Background

## Introduction

New York City is a city in love with electricity. The home of Thomas Edison's first electric utility back in 1882, and the current home of Times Square with its fantastic "spectacle" lighting, New York City owes its reputation as a city that never sleeps to its electricity supply. Although the city has suffered a handful of high profile service disturbances, such as the blackouts of 1968, 1977, and 2003, the local electric system has generally provided a highly reliable, albeit somewhat expensive supply of power to the thousands of businesses and millions of people that make the city their home.

The power supply in New York City is largely generated within the city limits from fossil-fuel based sources. Renewable power schemes are almost non-existent – of the roughly 13,000 MW of electricity required at peak summertime demand periods (Con Edison, 2005a), only approximately 2-3 MW of power comes from in-city renewable sources such as solar power. This number is expected to grow in the next few years, but only marginally. Why is this the case, and what does this say about the state of renewable energy policy-making in New York City?

Over the next three chapters, this case study will examine this question. Going beyond the macro-level picture drawn in Chapters 1 and 2, in this section I explain how technology shaped the development of New York City's grid, and how corruption linked to the granting or selling of franchise rights ultimately led to the development of the New York State Public Service Commission, the country's first state-level electricity market regulator.

The sources of New York City's electrical power and its situation as a load pocket are also reviewed, leading to a discussion of what role renewables can and do play in this supply picture. Of particular interest here is the growing recognition that New York City may soon suffer from a serious electricity supply shortfall. The demand for power has steadily increased in recent years, while the supply infrastructure has stayed relatively constant and may potentially shrink as plants are closed. On the surface, this implies that renewables have the potential to grab market share, something verified by a State-funded consultant's report, which found the city enjoys high levels of solar power resources. Finally, the structure of the city's electricity marketplace is reviewed, including a short discussion of how market liberalization efforts in the mid-1990s changed Con Edison's role in the local marketplace and created new opportunities for other firms, including renewable power system developers.

**The Local Picture: A Brief History of Electricity Generation in New York City**

The opening of Edison's Pearl Street substation in lower Manhattan in 1882 was the beginning of New York City's love affair with electricity. Powered by six of what were then the world's largest electromagnets, the Edison Electric Illuminating Company provided power and incandescent bulbs to illuminate the office of 59 customers in and near the city's financial district (Lurkis, 1982). Local newspapers waxed poetic about the superior quality of electric light over gas light (Moran, 2002), and public interest in the new technology grew dramatically with the 1883 opening of the Brooklyn Bridge, which featured decorative lights (Collins, 1934).

By the 1890's, spectacle lighting in the form of illuminated advertising along Broadway earned the street the nickname "Great White Way," a moniker that survives to this day (Nye, 1990, p 50). During this period, electricity was also credited with changing architecture in the city, powering the elevators that made skyscrapers possible and relieving engineers and architects from the "burden of having to locate and design buildings for maximum exposure to sunlight" (Talbot, 1972, p 59). Even today, spectacle lighting is considered to be a fundamental and beloved attribute of the city. After the collapse of the World Trade Center, a temporary "Tower of Light" was erected to memorialize the victims (Goldberger, 2002). When the 2003 municipal budget crisis forced the City of New York to temporarily turn off the decorative lights on the Brooklyn and other East River Bridges to save money, local businesses stepped forward to pay the lighting bill, arguing that without these lights, the Manhattan skyline had lost some of its magic (Feuer, 2003).

This love affair with electricity creates a massive electrical demand, however. New York City is considered to be the most energy efficient large city in the US, a side benefit of the small quarters in which most New Yorkers live (Resource Insight Inc., 2003). Collectively, however, New Yorkers still consume lots of electricity. In 1960, New York City used 17.3 million megawatt hours of electricity. By 1970, that figure had risen to 28.8 million megawatt hours (Regional Plan Association/Resources for the Future, 1974, p 38). In 2002, Con Edison, the local distribution utility, delivered approximately 53.4 million kilowatt hours of power to users in New York City (Con Edison, 2004).

The entities responsible for delivering this power have changed dramatically over time. In March 1881, fully 18 months before the Pearl Street substation began operation, the New York Board of Alderman granted a franchise to the Edison Electric Illuminating Company to "lay wires, tubes, and conductors for supplying electricity in all the city streets" (Myers, 1974, p 184). This franchise was awarded over the objection of the Mayor, who protested the low rate of compensation the city was to receive for the franchise. Within days, the Board of Alderman overrode another mayoral veto of a second electrical franchise, this time awarded to the Brush Electrical Illuminating Company. These firms held exclusive monopolies in Manhattan for several years, although other franchises were granted in Brooklyn, Queens, the Bronx, and Staten Island, which at this time were still separate cities. When the Greater New York City Charter was approved in 1897, merging the five separate cities into one large city, it included a provision limiting the lifespan of any franchise to no more than twenty-five years. Before the Charter went into effect on January 1, 1898, there was a rush by the Board of Alderman to issue other franchises that would last in perpetuity (Myers, 1974).

The need for multiple franchises was partially explained by the limitations of the technology in use at the time. As Edison imagined it, 28-30 small power houses would be required to serve Manhattan, each designed to provide direct current power to a one square mile service area (Collins, 1934, p 264). Edison's technology was not the only one in the marketplace, however, and at one point, a survey found 296 separate electricity generating and distribution systems servicing New York City in 1900, many of which were operated by a single franchise (Talbot, 1972, p 60). As time went on, pressure built to consolidate these operations. The Consolidated Gas Company of New York, backed by some of the leading financiers and industrialists of the day, moved quickly to roll-up their competition. Using the vast amount of capital at their disposal, Con Gas engineers designed and built ever larger turbines, high tension transmission lines, transformers, and rotary voltage converters that made it possible to transmit alternating current power over distances far in excess of that achieved by Edison's DC-powered system (Talbot, 1972). Such roll-ups did little to enhance competition, however. In 1910, after control over electricity franchises in New York City was taken over by the New York State Public Service Commission, a study found there were 92 different electrical franchises in the five boroughs of New York City. These franchises were controlled by just nine holding companies, none of whom actually competed with each other (Lurkis, 1982, p 26; Read, 1998, p 37).

The PSC took a lead role in attempting to bring order and fairness to the city's electricity markets, but City officials also tried to do their part by advocating for the development of public-owned electric utilities to power municipal operations. Such efforts proved difficult, however. A 1905 proposal to build a municipal plant to provide street lighting and power all public buildings was defeated by the Board of Alderman. In 1908, the City constructed a waste-to-energy plant to power a nearby bridge's lighting system but it was abandoned after five years due to its high operating costs. In 1913, the City built a coal-fired steam plant to provide heat and power for a new Hall of Records, but that also shut down for cost reasons (Nye, 1990). In the mid-1930's, Mayor Fiorello LaGuardia announced he had negotiated a loan deal with President Franklin Roosevelt to finance a municipal power plant, but Consolidated Gas fought and defeated this plan in court, arguing the Mayor was tampering with franchise rights given to the company in the late 1800s and early 1900s (Lurkis, 1982; Talbot, 1972).

**The End of Consolidation and the Beginning of Real Growth**

In 1936, Consolidated Gas formally changed its name to Consolidated Edison (hereafter, Con Edison or Con Ed), reflecting the key role electricity played in the fortunes of the company. Over the next few years, the company set out to consolidate the final pieces of the gas distribution and electricity generation and distribution systems it did not control in New York City (Lurkis, 1982). It was also during this period that Con Edison built the first high voltage transmission line into the city, allowing the utility to bring upstate power into New York during peak summer periods, and allowing power to flow northward during winter months, when upstate areas experienced their peak demand.

Like other utilities around the country, Con Edison made a major push to build consumer demand for electricity in the post-World War II period. Company sales representatives promoted the all-electric home, including electric heating systems. A special operating division was created to encourage the rewiring of commercial buildings and residences to accommodate air conditioning systems, dishwashers, and freezers (Lurkis, 1982). Con Ed also benefited from a rate structure designed to promote greater electricity use, with rates declining as a customer's demand grew. For all of these reasons, demand soared, growing at a rapid 5.8% rate each year between 1948-1968 (Fabricant & Hallman, 1971, p 164). This rapid growth led to problems, however. The adequacy of Con Ed's power supply came into question, as demand growth exceeded Con Edison's ability to site and bring new power plants on line. Population growth in suburban areas near the city also hampered the utility's ability install additional transmission capacity bringing power from outside the area (New York City Department of City Planning, 1974). In the 1960s, for the first time, New York City became known as a 'load pocket,' meaning power generation capacity in the city was insufficient to meet local peak demand, a problem that continues today (New York City Energy Policy Task Force, 2004).

Unlike the early part of the century, when the company was known for its technological prowess, from the late 1950's to the late 1970's, the company became increasingly known for its technological failings. High profile service outages, including an infamous 25-hour blackout in 1977 when widespread looting occurred and thousands of people were trapped in subways and on gridlocked streets, took the sheen off of the utility's long record of reliable service. Con Ed's attempt to site the Ravenswood nuclear power plant right in the middle of Queens earned it a reputation for a political deaf ear. Con Ed's sixteen-year battle to develop a pumped storage facility at Storm King, upriver of New York City on the Hudson River, also earned it a reputation as a company that claimed to care about the environment, but ultimately tried to deploy technologies that would harm it. (For a good description of the Storm King project, see Lurkis, 1982; Talbot, 1972). Despite these shortcomings, by the 1990s Con Edison ran one of the largest and most technically complex urban utilities anywhere in the world.

**Impacts of Market Restructuring on New York City's Electricity Picture**

Before New York State's electricity markets were restructured in the mid-1990s, Con Edison was a vertically integrated company responsible for all aspects of electrical generation, adequacy of supply, and electric power distribution in New York City. The State Public Service Commission's 1997 restructuring agreement changed all that, calling on the utility to sell off at least 50% of its power plants around New York City (New York State Public Service Commission, 1997). By August 1999, Con Ed had done so, auctioning off more than 5,500 MW of power plant capacity to other companies. Con Ed did choose to retain ownership of the large steam generating plants which supply its massive steam distribution system in Manhattan. Today, five entities own or control the majority of the 8,760 MW of power plant capacity in New York City (New York City Energy Policy Task Force, 2004, p 16). Con Ed serves as the distribution conduit for power sold by these plants and imported from outside the city. Con Ed is responsible for all aspects of operation and maintenance of the distribution system, and all residential, commercial and industrial customers in the city must be allowed to hook into and receive power from Con Ed's grid, should they so choose.

Any power these customers receive through Con Ed's system need not be purchased from Con Ed, however. As part of the restructuring agreement retail customers are free to procure power from other Energy Service Companies (ESCOs) authorized by the Public Service Commission to sell power in New York City. Currently, ten ESCOs sell power to residential customers in the city, while commercial customers can select from among 21 different providers (New York State Public Service Commission, 2005b). Access to alternative suppliers has not necessarily led to widespread switching, however. As of February 2005, of the 3.1 million customers in New York City and Westchester County who are served by the Con Ed grid, only 3.6% actually buy power from another service provider. This number is somewhat deceptive because these 3.6% include some of the largest power users in the city, and overall, more than 33% of the power that Con Ed used to sell directly to customers is now sold by other ESCOs but still delivered over Con Ed lines (Con Edison, 2004; New York State Public Service Commission, 2005c). It is no surprise that large power users were among those finding alternative service providers -- even cost savings amounting to no more than a fraction of a cent could equal sizable operating cost reductions for companies that consume tens or hundreds of thousands of kilowatt hours each month.

**New York's Energy Supply – the State and Local Picture**

For the first half of the 20th century, New York State largely relied on coal and oil sources to power electric generation facilities. This supply mix began to change in the 1960s, as nuclear power plants came on line around the state. There were expectations that nuclear plants would soon dominate the state power picture (Fabricant & Hallman, 1971), but geopolitics and the environmental movement of the 1970s lead to a shift to other 'clean' fuel sources, such as natural gas. Today, natural gas power plants provide 25% of New York state's power, and by 2020, natural gas facilities are expected to provide nearly 40% of the state's electricity supply (New York State Energy Planning Board, 1998, p 3-104). This gas is delivered to New York state through a series of pipelines starting at gas fields in the southern US, the Gulf of Mexico, and Western Canada (New York City Energy Policy Task Force, 2004). Several proposals have been made to site new liquid natural gas terminals in Canada, New England, and in the Long Island Sound, any of which could add to the region's security of supply by introducing new gas resources from Africa and Asia. These proposals have proven contentious, however, due to public opposition to where these facilities would be sited, and their development prospects are uncertain (Fagin, 2005; Hall Hayes, 2005; Hebert, 2005).

New York City's story is very similar to the statewide picture. For much of the first half of the 20th century, coal was king, supplying nearly all of the City's power needs. By the 1960s, imported oil was a major fuel source at power stations around the city. The picture changed yet again in the 1970s, as the Arab oil crisis and declining local air quality conditions, exacerbated by the high sulphur content fuels burned at Con Ed power plants, forced the utility to begin looking for 'cleaner' sources of power generation. Nuclear power was one such source, but concerns over its safety and the growing use of natural gas by the power industry in the US led Con Ed to greater reliance on natural gas as a fuel source. During this period, Con Ed installed more than 2,100 MW of gas fired capacity at various facilities around New York City, a trend that continued into the 1980s and 1990s (Resource Insight Inc., 2003, p 38).

**Table 5-1**
**Source of Electricity Supply in New York City**
Source: (New York State Department of Public Service, 2002, 2003, 2004c, 2004d, 2004e; Regional Plan Association/Resources for the Future, 1974)

| | Con Edison | | | | | | KeySpan | Econnergy | US Energy Partners |
|---|---|---|---|---|---|---|---|---|---|
| **Fuel Source** | **1960** | **1970** | **2000** | **2002** | **2003** | **2004** | **2003** | **2003** | **2003** |
| Biomass | -- | -- | < 1% | < 1% | < 1% | < 1% | -- | < 1% | 2% |
| Coal | 56% | 17% | 20% | 16% | 13% | 13% | -- | 32% | 78% |
| Gas | 16% | 21% | 51% | 43% | 40% | 40% | 51% | 23% | 7% |
| Hydro | -- | -- | 6% | 5% | 5% | 4% | -- | 9% | 3% |
| Nuclear | -- | 1% | 12% | 30% | 33% | 33% | -- | 17% | 5% |
| Oil | 29% | 61% | 9% | 4% | 8% | 9% | 49% | 18% | 6% |
| Solar | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Solid Waste | -- | -- | 1% | 1% | 1% | 1% | -- | < 1% | < 1% |
| Wind | -- | -- | < 1% | < 1% | < 1% | < 1% | -- | < 1% | < 1% |

Con Edison's forced divestiture of its power plants has resulted in the company's reliance on a more diverse fuel supply than when they supplied most of their own power needs. Con Ed's use of nuclear power as a fuel source reflects the power purchase agreement negotiated when Con Edison sold off its Indian Point nuclear power plants north of the city in 2000. Under the terms of that agreement, Con Ed agreed to buy the entire 1015 MW output of the plant at an annual average price of 3.9 cents/kWh through the end of 2004, a price below anticipated market rates (Con Edison, 2000).[11] Equally interesting to note is the variation in the fuel sources of the power provided by ESCOs operating in the city, which reflect individual strategies over fuel sources and the long-term and spot market purchase agreements each has negotiated.

In the future, New York City will likely experience a big increase in the amount of natural gas used to power in-city generation facilities, as there are seven power plant

[11] In 2004, Con Edison signed a new agreement with Entergy committing to the purchase of the full 1015 MW capacity through the end of 2006, after which time Con Ed will ramp down its purchases. By 2009, Con Edison will no longer have any long-term agreement to buy power from Indian Point, although Con Edison may still end up buying its power on a spot or short-term basis.

projects totaling over 4,000 MW of power that are proposed, under construction, or in the certification process, that all rely on natural gas. [See Table 5-2 below] Although it is unlikely that all of these proposals will be built, any of these facilities would increase the fuel allocation described above by at least a few percentage points, particularly for Con Edison. There is no guarantee that ESCOs operating in the city would opt to purchase this power, although there would likely be cost advantages to doing so as line efficiency losses and transmission charges from transmitting power long distances would be eliminated.

**Table 5-2**
**New York City Power Plant Projects**
Source: (NYISO, 2005, p 16)

| | *Location/Sponsor* | *Size* | *Fuel source* |
|---|---|---|---|
| **Under construction:** | Ravenswood (Keyspan) | 250 MW | natural gas |
| | East River (Con Ed) | 125 MW | natural gas |
| | SCS Astoria (#1) | 500 MW | natural gas |
| | Poletti (NYPA) | 500 MW | natural gas |
| **Article X certified** | Reliant Astoria (1+2) | 540 MW | natural gas |
| | SCS Astoria (#2) | 500 MW | natural gas |
| **In Article X certification process** | TransGas | 1100 MW | natural gas |

## A Precarious Supply Picture?

In spite of the large amount of in-city generation capacity proposed or under construction, the electricity supply picture in New York City has been portrayed by many as quite precarious. Since early 2001, six major reports have been issued that raise concerns about the adequacy of the city's power supply. Many of the reports reference what is informally known as New York City's "80% rule," or more formally, the Locational Installed Reserve Requirement (NYISO, 2001, p 16). The rule requires that 80% of the projected peak load demand in New York City be met by in-city power plants or power generated elsewhere that is linked directly (and only) to the city's grid. The 80% number is calculated based on statistical estimates of the likelihood that in-city generation capacity and transmission lines coming into the city will simultaneously suffer catastrophic failure. Above-ground transmission lines bringing power from outside of the city are seen as particularly vulnerable to failure from natural phenomena such as lightning strikes. This 80% figure is not cast in stone, however, and should there be no increase in available generation resources in the city, ever-increasing electricity demand will likely force the Requirement to rise to a level closer to 85% (NYISO, 2001, p 17). The New York State Reliability Council is charged with the responsibility of assessing and recommending changes in the reserve requirements, although responsibility for codifying any changes lies with the New York State Public Service Commission.[12]

With overall responsibility for the integrity of the grid in New York State, and because a system failure in New York City can have implications for the rest of the state's grid, the New York Independent System Operator (NYISO) has been very vocal on this issue, issuing *Power Alert* reports in 2001, 2002, and 2003 and *Power Trend* reports in 2004 and 2005. Interestingly, the 80% rule was not the only explanation offered in the *Power Alert* reports of why New York City needed additional power plant capacity. In the NYISO's view, equally important were benefits that additional capacity could bring in terms of lowering prices (potentially by as much as 28% in New York City) and reducing sulphur dioxide and nitrous oxide emissions in the city (NYISO, 2001, p 5). In *Power Alert III*, the NYISO also suggested that in a post 9/11 era, New York City's electric system was a potential terrorist target, and risks would be buffered by additional in-city generation capacity (NYISO, 2003b). Both NYISO *Power Trend* reports noted recent improvements in the current situation, thanks primarily to demand reduction efforts. Nonetheless, NYISO continues to express concerns about the adequacy of the city's power supply after 2009, and will conduct a special Reliability Needs Assessment of this situation by September 2005 (NYISO, 2004, 2005).

Reports issued in 2001 and 2002 by the Energy Committee of the New York Building Congress (NYBC), and a 2004 report issued by the New York City Energy Policy Task Force were all more explicit in noting how much additional power generation capacity was necessary to achieve different goals. The first Building Congress report preceded the release of the ISO report, but it too concluded 2000-3000 MW of additional in-city power capacity was necessary by 2005. As shown in Table 5-3, approximately 30-35% of this amount was believed necessary to satisfy demand growth needs, while 40% was needed to ensure pricing stability. Unlike the NYISO,

[12] One of the most recent PSC documents to formally note the requirement was the market restructuring agreement with Con Ed (Case 96-E-0897) issued in 1997.

the Building Congress report was not as confident that additional capacity would lead to price reductions. Instead, the NYBC believed that a shortage of supply had lead to pricing volatility, which additional capacity would eliminate. Finally, the NYBC noted that nearly 6,900 MW of the in-city supply was produced at plants that exceeded 30 years of age, and that 500-900 MW of capacity would likely be retired in the next five years (New York Building Congress Energy Committee, 2001). The 2002 report offered the same explanations, albeit with slightly different numbers.

**Table 5-3**
**Recent Studies Analyzing NYC Electric System Capacity Needs**

<table>
<tr><th>Report Title</th><th>Issuing organization</th><th>Total Capacity Needed</th><th>Amount needed to reduce costs or eliminate price volatility</th><th>Amount needed to achieve 80% Rule or address increased demand</th><th>Amount needed to replace old/retiring facilities</th></tr>
<tr><td>Power Alert: New York's Energy Crossroads (Mar-01)</td><td>NYISO</td><td>2000-3000 MW by 2005</td><td>800-1200 MW</td><td>700-900 MW</td><td>500-900 MW</td></tr>
<tr><td>Power Alert II: New York's Persisting Energy Crisis (Mar-02)</td><td>NYISO</td><td>2000-3000 MW by 2005</td><td colspan="3">did not specify</td></tr>
<tr><td>Power Alert II: New York's Energy Future (May-03)</td><td>NYISO</td><td>did not specify (provided statewide capacity</td><td colspan="3">did not specify</td></tr>
<tr><td>Power Trends: New York's Success and Unfinished Business (May-04)</td><td>NYISO</td><td>did not specify</td><td colspan="3">280 MW by 2009</td></tr>
<tr><td>Power Trends 2005 (Apr-05)</td><td>NYISO</td><td>did not</td><td colspan="3">did not specify</td></tr>
<tr><td>Electricity Outlook 2001: A Matter of Urgency (Jan-01)</td><td>New York Building Congress</td><td>2000-3000 MW by 2005</td><td>800-1200 MW</td><td>700-900 MW</td><td>500-900 MW</td></tr>
<tr><td>Electricity Outlook 2002: A Call to Action</td><td>New York Building Congress</td><td>2000-3000 MW by 2005</td><td>800-1000 MW</td><td>600-800 MW</td><td>700-1800 MW</td></tr>
<tr><td>City Energy Plan for the City of New York (working draft 2003, not released)</td><td>Resource Insight Inc.</td><td>3000 MW by 2008</td><td colspan="3">did not specify</td></tr>
<tr><td>New York City Energy Policy: An Electricity Resource Roadmap (Jan-04)</td><td>New York City Energy Policy Task Force</td><td>3780 MW by 2008</td><td>1000 MW</td><td>665 MW</td><td>2115 MW</td></tr>
</table>

In early 2004, a Task Force convened by Mayor Michael Bloomberg concluded that "New York City has adequate electricity resources today, but only by a slim margin. A projected increase in electricity demand in the next five years will necessitate new generation and transmission facilities and expanded distributed resources measures. Additional resources will be required to assure market price stability, and old power plants will need to be retired and/or replaced with cleaner, more efficient facilities by 2008" (New York City Energy Policy Task Force, 2004, p 9). The Task Force concluded that 3,780 MW of power were required, of which more than 55% arose from the need to replace anticipated power plant retirements. Other than noting one facility closure which has been planned for some time, however, the Task Force offers no written evidence that this assumption is anything more than a guess.

Similarly, the Task Force cites the need for 1000 MW of power to hedge against price volatility, referencing work of an outside energy consultant and concluding the 1000 MW figure is "prudent for planning purposes" (New York City Energy Policy Task Force, 2004, p 10). However, the original consultant's report offers no clear delineation of what an anonymous 1000 MW of power would bring to the city, as their report was focused on modeling the financial and environmental benefits of very specific actions, such as the construction of a new 1000 MW gas plant in Queens or the development of a new 500 MW transmission line from New Jersey. The consultant's report did conclude the City "should be working toward the addition of at least 1,500 MW of new resources by 2008, beyond the 1,500 MW of resources the authors consider to be committed," and that failure to do so "might well increase power-supply costs to City consumers by $600-$800 million in 2008, or roughly 20-25%" (Resource Insight Inc., 2003, p 1). The final 665 MW of power recommended by the Mayoral Task Force was aimed at addressing likely demand growth, with an eye towards meeting the 80% in-city generation requirement.

In-city generation is supplemented by the transmission system that imports power to New York City. Three sets of lines – one from New Jersey, one from the north, and one from Long Island have been collectively capable of delivering approximately 5,000 MW of power to the city since the 1980s. Efforts to expand this amount have floundered, however, for several reasons. First, transmission links coming from other states must obtain the approval of regulatory authorities in those states as well as New York, and many agencies are hesitant to incur any political heat or environmental impact for systems that don't directly benefit residents of their state (McNamara, 2001). Second, suburbs around the city are very congested, making it difficult to find the room for underground transmission lines. At the same time, overhead transmission lines are disliked for aesthetic reasons, for their perceived health risk (from electro-magnetic radiation emitted from the lines), and for the impact these problems have on local property values (Griscom, 2001). Several developers have proposed new underground and underwater transmission line projects in recent years, but none of these has yet come to fruition.

## A Role for Renewables?

Renewable power systems may be one solution to the city's supply problems. Politicians around the state have looked to renewable power sources to address pressing state electricity needs since early in the 20th century, when efforts began to harness rivers in upstate New York to generate inexpensive hydropower. It wasn't until the 1950's that these dams were actually built, however, one just a few miles downstream from Niagara Falls and another along the St. Lawrence River. Today, these large public hydropower systems contribute more than 4,400 MW of power to the state's 30,200 MW of installed electric generation capacity.

**Table 5-4**
**Contribution of Renewable Energy Sources to New York State Electricity Supply**
Source: (New York State Energy Planning Board, 2002)

| | # of installations statewide | Total generation capacity | % of total |
|---|---|---|---|
| Hydroelectricity | 347 | 4442.7 MW | 97.1% |
| Wood and wood waste combustion | 4 | 38.5 MW | 0.8% |
| Agricultural Residue combustion | 4 | 0.3 MW | 0.0% |
| Landfill Gas | 19 | 46.0 MW | 1.0% |
| Solar photovoltaics | 47 | 1.2 MW | 0.0% |
| Wind | 27 | 48.3 MW | 1.1% |
| | | 4,577.0 MW | 100.0% |

As Table 5-4 makes clear, the contribution of "new" renewable power technologies is currently quite low. This situation is expected to change dramatically in the next 20 years, however. According to a study commissioned by the New York State Energy Research and Development Authority (NYSERDA), the total amount of new installed renewables capacity from just four technologies could skyrocket by 2022. In both cases, these figures refer to the 'technical' potential for growth, or the upper limit of what could be brought on line during each period "without regard to cost, market acceptability, or policy constraints." Estimates of what will actually be achieved are much lower, approaching only 10-50% of the technical potential estimates (New York State Energy Planning Board, 2002, p 3-58). Key limiting factors that could or will inhibit the attainment of the technical potential include land use patterns in or near areas with high resource availability, grid availability in those areas, permitting and financing problems, and technical issues unique to each type of renewable power technology.

**Table 5-5**
**Technical and Economic Potential for New Renewables Deployment in New York State**
Source: (Optimal Energy Inc., American Council for an Energy-Efficient Economy, Vermont Energy Investment Corporation, & Christine T. Donovan Associates, 2003)

| | StatewideTechnical Potential in | | Economic Potential in |
|---|---|---|---|
| | 2012 | 2022 | 2022 |
| Biomass | 3,269 MW | 5,527 MW | 100% |
| Small hydro | 300 MW | 408 MW | 90% |
| Solar photovoltaics | 784 MW | 33,001 MW | 0% |
| Wind power | 890 MW | 17,085 MW | 84% |
| Total | 5,243 MW | 56,021 MW | |

The greatest gains are technically possible in the areas of wind and photovoltaics development, although continued high costs are expected to dramatically dampen the amount of photovoltaics development that actually occurs. [See Table 5-5.] The far right column of that table, *Economic Potential in 2022*, refers to the percentage of this potential power that is expected to be available at costs below that of conventional generation technologies. Biomass, hydropower, and wind power are all expected to be highly cost competitive by 2022. By contrast, power from solar photovoltaic technologies is still expected to exceed the cost of power from fossil-based power sources, despite the expectation that the price of PV systems will decline dramatically by 2022 (Optimal Energy Inc. et al., 2003, p 4-189).

**Renewable Power for the Big Apple?**

New York City's involvement with renewable power dates back to the time of the earliest Dutch settlers of the city, who lined the shoreline of the city with windmills that were used to grind flower and saw timber (Energy Task Force, 1977). The Official Seal of the City of New York, which has been in use for over 200 years, honors that legacy by placing windmills prominently in the center of the seal (Cogne, 2003). That early history was quickly forgotten, however, with the advent of the coal, oil, and natural gas-fired boilers that have provided the bulk of the city's power needs for the last 120+ years. New York City has attempted to procure renewable power from upstate hydro sources on several occasions, most recently in 1986, taking advantage of an opening offered by the expiration of long-term power purchase agreements between the New York Power Authority and other utilities and municipalities around the state. New York City even went so far as to establish its own distribution utility, the New York Public Utility Service, but like past attempts this effort also failed (Barbanel, 1984; Greene, 1988).

Today, New York City draws very little of its power from renewable sources. Table 5-1 shows that Con Ed (by far the dominant electricity supplier in the city) and others buy small amounts of power from renewable sources, but these are all located far outside of the City limits. In-city renewables generation is extremely low, amounting to approximately 2-3 megawatts of power out of the nearly 11,000 MW that New York City requires on peak-demand days. Table 5-6 details the largest renewable power installation in the city, most of which involve the use of photovoltaic panels.

This small number of installations belies the fact that renewables projects have occasionally enjoyed a high profile in New York City. In 1977, for instance, urban homesteaders occupying a vacant tenement in Manhattan installed the country's first modern urban windmill (Energy Task Force, 1977). This two-kilowatt system, which cost $4,000, was momentous because its installation led to the first net-metering system in the US. Con Edison had originally forbidden the owners to connect into their distribution system, fearing power surges from this two-kilowatt system would damage Con Ed's ten million-kilowatt system. After a long back-and-forth debate, the State Public Service Commission finally took up the case, ultimately ruling that Con Ed must allow this windmill and up to 24 others to connect to its grid. Con Ed was also ordered to purchase any excess electricity generated by the windmill at the price Con Ed would otherwise have paid for fuel to generate that electricity (Greenhouse, 1977).

**Table 5-6**
**Large Renewable Power System Installations in New York City**
Source: original research, March 2004

| Name | Developer/Host | Location | Type of System | Size (in kW) | Completion Date |
|---|---|---|---|---|---|
| Maspeth Warehouse | New York Transit Authority | Queens | Solar PV | 16 | 1993 |
| Gun Hill Rd. Bus Depot | New York Power Authority and New York Transit Authority | Bronx | Solar PV | 300 | 1996 |
| Rikers Island Composting Facility | New York Power Authority and New York City Department of Sanitation | Rikers Island | Solar PV | 36 | 1996 |
| Conde Nast Building (4 Times Square) | Durst Organization | Manhattan | Solar PV | 15 | 1997 |
| Greenpoint Manufacturing and Design Center | Greenpoint Manufacturing and Design Center | Brooklyn | Solar PV | 59 | 2002 |
| The Solaire | Battery Park City Authority | Manhattan | Solar PV | 33 | 2003 |
| Museum of Jewish Heritage | Museum of Jewish Heritage | Manhattan | Solar PV | 36 | 2003 |
| NYC DEP Wastewater Treatment Facilities | New York Power Authority and NYC Dept of Environmental Protection | Brooklyn, Staten Island, Bronx | Anaerobic Digestor + Fuel Cell | 1600 | 2004 |
| Whitehall Ferry Terminal | New York City Department of Transportation | Manhattan | Solar PV | 60 | 2005 |
| Stillwell Ave. Terminal Train Shed | New York Transit Authority | Brooklyn | Solar PV | 145 | expected 2005 |
| Roosevelt Ave./74th St. Subway Station and Bus Depot | New York Transit Authority | Queens | Solar PV | 57 | expected 2005 |
| Taino Plaza (affordable housing) | South Bronx Overall Economic Development Corporation | Bronx | Solar PV | 30 | expected 2005 |
| Bronx High School of Science | Board of Education/DDC | Bronx | Solar PV | 35 | expected 2005 |
| NY Hall of Science | NY Hall of Science/DDC | Queens | Solar PV | 15 | expected 2005 |
| Queens Botanical Garden Administration Building | Queens Botanical Garden | Queens | Solar PV | 15 | expected 2006 |
| Brooklyn Children's Museum | Brooklyn Children's Museum | Brooklyn | Solar PV | 40 | expected 2006 |
| Corona Maintenance Shop | New York Transit Authority | Queens | Solar PV | 100 | expected 2006/7 |
| Grand Ave. Bus Depot and Central Maintenance Shop | New York Transit Authority | Queens | Solar PV | 100 | expected 2006/7 |
| East River Underwater Turbines | Verdant Power | East River | Hydro turbines | 5000 to 10000 | expected 2008 |
| Freedom Tower | Silverstein Properties/Port Authority of New York and New Jersey | Manhattan | Wind turbines | unknown | expected 2009 |

1977 was also the year the 917 ft. Citicorp Tower was completed. The Tower, which includes a distinctive chamfered rooftop, was originally designed to face west. Halfway through the process, however, the design was changed to make the roof face south to allow for the installation of solar panels (Council on Tall Buildings and Urban Habitat, 2004). Studies completed at the time found a solar system would not be cost effective, increasing the bank's costs by $3,000 per month (Tucker, 1977), a quite modest amount given the building's original $175 million price tag. In 1983, Citicorp installed photovoltaic panels on 600 square feet of the rooftop, at a cost of $1 million, in a further attempt to gauge the cost effectiveness of urban solar energy systems (Associated Press, 1983; Corporate Design, 1984). These were removed in 1987 and donated to the SUNY Atmospheric Science Research Center (ASRC) in Albany for testing purposes[13] (T. Thompson, e-mail communication, 17 May 2005). More recently, New York has seen the completion of what have been billed as the country's first "green" skyscraper and high-rise apartment buildings. The Conde Naste building in Times Square hosts 15 kW of solar panels and a fuel cell on its roof, while the 27-story Solaire, located on the Hudson River near the old World Trade Center site, features 23 kW of solar panels on its roof and 10 kW of panels integrated into its south-facing façade curtain wall (AltPower Inc., 2004; Astropower Inc., 2002).

In the next five to seven years, New York City could also become home to one of the most high-profile urban renewables projects anywhere in the world. In the middle of the East River, Verdant Power, a merchant renewable power system developer, has successful tested an underwater turbine designed to capitalize on the East River's 4-knot current during peak tidal conditions. Verdant is now planning to anchor several turbines to the floor of the river in 2006 to conduct additional environmental testing, after which they expect to install an underwater field of between 200-300 turbines capable of collectively generating 5-10 MW of power (T. Taylor, pers. comm.).

These projects are moving ahead despite questions about the availability of renewable resources in New York City (Resource Insight Inc., 2003). The State-funded studies examining the technical potential for various renewable technologies around the state were fairly consistent in their finding that New York City lacked significant renewable resources. For instance, in the case of biomass resources, in 2022 New York City was projected to have 83 MW in biomass power potential out of a statewide total of over 5,500 MW. In the case of new run-of-river hydropower potential, New York is anticipated to have just 2 MW of new technical potential by 2022, compared to over 1,000 MW elsewhere around the state. By 2022, the methane

[13] When ASRC moved to a new building several years ago, the panels were donated to the Northeast Sustainable Energy Association which arranged for their installation at the Greenfield Energy Park outside of Albany. Several of the panels were also sold to a non-profit organization headed by David Robinson, son of the late major league baseball player Jackie Robinson, who arranged for their installation in the rural village of Bara, in southwest Tanzania. These panels have thus been in constant use for more than 20 years.

gas recovery potential from the City's old landfills is expected to have nearly disappeared. Windpower potential in the city is also seen as very limited – just over 12 MW of capacity – compared to thousands of megawatts of capacity on and off-shore in other areas of the state (Optimal Energy Inc. et al., 2003, pp 4-34, 4-89, 4-129, 4-268) . Large wind turbines typically require wind speeds averaging above 15 mph to be considered economically viable (New York State Energy Research and Development Authority, undated), while New York City's are much lower (National Climatic Data Center, 1998). The State's projections of future wind potential in New York City assumes development is limited to small wind turbines with lower "cut-in" speeds, or the wind speed required to cause the blades to begin spinning.

The study examining solar power potential had far more optimistic findings. Given the large amount of available rooftop space in New York City, the study found more 4,300 MW of PV potential on commercial and industrial roof space and parking lots in the city. On residential buildings, another 3,800 MW of potential PV capacity was identified. South- and southwest-facing building sidings present another 400 MW of potential (Optimal Energy Inc. et al., 2003, pp 4-191, 4-194, 4-197). In addition to the large amount of space on which to mount photovoltaic cells, solar resources are plentiful. Researchers at SUNY Albany have found New York City enjoys fully 70% of the solar resources of the Arizona desert, an area well-known for its sunny climate. Perhaps more importantly, solar resources are at their peak at the same time as electrical demand in the city, during the hot summer months. Solar photovoltaic systems thus can potentially serve a peak load-shaving function (Perez, undated), reducing the peak demand charges[14] that constitute a big piece of the electric bill of most commercial and industrial users.

New York City residents and businesses interested in buying renewable power rather than generating their own can do so by purchasing green power from a variety of

[14] There are two parts to the average commercial and industrial electric bill: a basic monthly service charge and a demand charge tied to the peak level of energy consumed during the course of the month. (This demand level is assessed a per kWh fee, which is then multiplied by the total number of kWh of electricity consumed that month. In other words, customers are billed as if they continuously used energy at this peak demand rate, regardless of whether this is true or not.) Power generated on-site from a renewable power system generally will displace power purchased from the grid; if on-site power is available at the time the peak demand charge is set for that month, it can significantly cut a business' total monthly electricity charges.

vendors. Con Ed Solutions'[15] *Green Power* plan derives 25% of its power from an upstate wind farm and 75% of the power from two run-of-river hydropower systems near Quebec. Consumers opting for this plan must pay a premium of roughly $0.005 per kilowatt hour (Con Ed Solutions, 2005a). Interest in such programs has been low, however. News reports in July 2003 indicated that there were 300 Manhattan subscribers in Con Ed Solution's *Green Power* program 18 months after the program began (Fairley, 2003); by March 2004 this had increased to just 600 subscribers (Blom 2004), although some of these customers have been rather large. The Ford Foundation, Metropolitan Life Insurance Company, Pace University, and Bank Street College are all among a group of fifteen 'Green Power Pioneers' that collectively purchase millions of kilowatt hours of renewable power from Con Ed Solutions. The Durst Organization, the developer of the first 'green' skyscraper in the United States, has made a similar arrangement to purchase 10.5 million kilowatt hours of renewable power from Con Ed Solutions and Community Energy Inc., which is enough electricity to supply 10% of the total energy demand at seven large office buildings owned by Durst in Manhattan (Community Energy, 2004). Green electricity has also been used to power one-time events in the city – the famous New Year's Eve ball-drop in Times Square and the 2004 Republican National Convention in Madison Square Garden being two of the more noteworthy events (Con Ed Solutions, 2002, 2004).

Like other consumers around the state, New York City (NYC) residents can also buy Renewable Energy Certificates from renewable power system operators selling their output directly to retail customers. Signing up with these firms typically will result in the receipt of two electricity bills – one from the utility that actually provides the electricity service to their home or business, and a second bill from the firm selling the REC. As of May 2005, there were sixteen firms selling RECs on the retail market to New York state businesses, and ten firms selling RECs to New York state residential customers (Green-e.org, 2005). This is a fairly sizable increase from early 2004, when there were ten firms selling RECs to businesses and six firms selling RECs to residential consumers (Green-e.org, 2004).

[15] Con Ed Solutions is an ESCO structured as an unregulated subsidiary of Con Edison of New York. It has no business relationship with Con Edison, the distribution network operator for New York City.

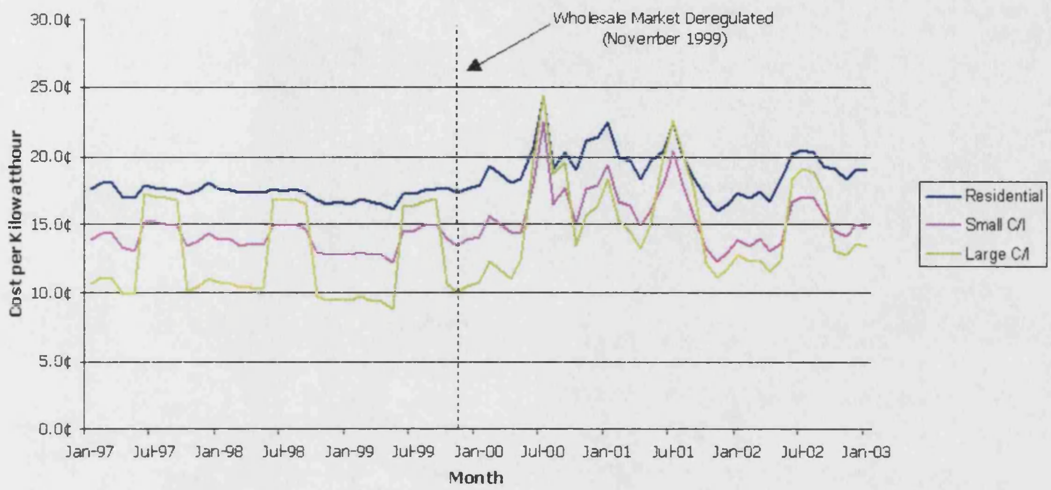
**Electricity Prices**

Electricity prices in New York state are among the highest in the US, with retail customers paying rates 72% higher than the national average (EIA, 2003b). There are several reasons why electricity prices are higher in New York state (New York State Energy Planning Board, 1998, 2002):

- electricity is heavily taxed by both the State and localities;
- the fuel mix used in New York state is driven by air quality and environmental concerns, and this mix is more costly than that used by states who lack New York's strict environmental controls;
- users are still paying for costly long-term power purchase agreements negotiated in the wake of the federal PURPA law, which mandated such agreements with independent power producers; and
- users are still paying off the stranded costs of two large nuclear power plants in the state that are no longer operational.

Prices in New York City are even higher than the statewide average, and since restructuring, have become highly volatile, jumping in some cases by as much as 60-70% over comparable periods in years pre-liberalization. There is also much less seasonal uniformity of pricing. These wild pricing gyrations have resulted in calls for some type of re-regulation from such disparate groups as Democratic members of the New York State Legislature (Tonko, 2002) and then-Mayor Rudolph Giuliani, a Republican, who in 2001 suggested the need for temporary wholesale price controls (Giuliani, 2001b). Since 2003, electricity prices have been more stable, but they have steadily increased, following general market trends.

**Figure 5-1**
**Retail Electricity Prices in New York City 1997-2003**
Source: (Miller, 2003)




Data on the cost of renewable power in New York City was difficult to obtain. There are no permanent wind turbine systems currently in place on which to obtain any base any local price estimates, nor is there any biomass or geothermal power systems. Firms involved in the local installation of solar PV systems report that without taking any NYSERDA subsidies into account, solar power installations in New York City will generate electricity that is 2-6 times as expensive as the current retail cost of grid-based power. (D. Buckner, pers. comm., A. Pereira, pers. comm.). The developer of the East River tidal turbine project anticipates they will be able to generate power at a much lower cost, in the 5-7 cents/kWh range (T. Taylor, pers. comm.), although that estimate can only be validated once their system is in the water and fully operational.

**Conclusion**

This chapter revealed several important things about New York City's energy marketplace that are important to our logic study. First, we know from NYSERDA's analysis that the potential for renewable power system deployment in New York City varies widely by technology, but overall can be considered rather marginal. Because of the large quantity of flat roof space available around the five boroughs solar photovoltaic system development enjoys the greatest potential, theoretically capable of generating thousands of megawatts of power during exactly those periods when electricity demand in the city is at its highest.

Second, the fact that New York City faces a projected supply shortfall should theoretically mean that policy-makers are actively looking to identify new in-city sources of power to fill that gap. The in-city preference derives from the 80% requirement imposed by State regulators, which reflects current limits on the amount of transmission capacity coming into the city. Third, New York City's historically high energy prices should benefit renewables because they hasten the payback period on new system installations. For commercial power users, the payback on renewables systems can be even faster because of their peak load shaving benefits. Finally, renewables are being proposed for use in high profile development projects around the city, implying a greater awareness of their benefits by the real estate development community.

The news is not all good, however. Most important, of course, is that despite the fact many of these underlying conditions have been in place for years, renewables have yet to gain much of a foothold in the city's supply picture, and we are not seeing any rush to deploy these systems. Moreover, the vast majority of the renewable power systems deployed around the city are found at government-owned facilities, meaning households and the private sector have yet to embrace these technologies in any meaningful way. Even when developers talk of incorporating renewables into an iconic project, when push comes to shove they often do not follow through, eliminating the renewables component when the project is redesigned.[16]

Is cost the dominant factor affecting the prospects for renewables? Possibly. NYSERDA's consultants responsible for forecasting renewables potential in New York City certainly believe that project economics will influence future deployment levels. In the case of solar photovoltaics, their optimistic projections of how much power *could* be generated around New York are tempered just a few pages later, when they declare that *none* of these systems would be deployed if you factor cost into the equation (Optimal Energy Inc. et al., 2003). This analysis did not take into account any subsidies or tax breaks currently available for these technologies (a subject

[16] The new Freedom Tower at the old World Trade Center site is a recent example: the original 2004 design incorporated wind turbines into the superstructure at the top of the building that were capable of providing roughly 20% of the building's power demand (Dunlap, 2003). This feature was eliminated when the building was redesigned in 2005, however.

discussed in Chapter 6), but such a conclusion clearly implies a belief that cost is a critical determinant in deployment decisions. The East River tidal turbine project anticipates highly competitive pricing, but as this will be the firm's first permanent deployed project, it is too soon to know how accurate their projections will be.

In the case of green power, or electricity derived from renewable power systems deployed outside of the city, the prospects also do not look very promising. Consumer interest in these programs has been limited thus far, and to the extent consumers object to the current high cost of electricity from their regular service provider, signing up for green power will only make this worse, as most programs are structured as a surcharge on top of a consumer's electricity bill.

In sum, New York City's fundamental market conditions for renewables can generally be considered as somewhat favorable, but there are clear impediments to their deployment and use. In Chapter 6, I will delve into the statewide regulatory and policy environment to examine whether or how they influence the market for renewables in New York City. I will also examine the City's energy policy-making system, exploring what roles the City of New York plays on energy issues and where policy is formulated in local government. This information serves as a lead-in to Chapter 7, when all of this information will be scrutinized from a more theoretical perspective using my modified regime framework.

## CHAPTER 6
## New York City case study – Electricity Regulation and Policy at the State and Local Level

### Introduction

This chapter continues the case study's focus on the larger institutional environment for energy policy-making in New York City. In this section, the emphasis is on formal system structures, and I examine who is involved and how authority is vested in entities at the state government level. As a jumping off point, it retraces steps made earlier in Chapter 1 which focus on market regulation. Recall that New York was one of the first states to wrest control from local authorities and vest it in a state-level body. This chapter thus covers the period when control was first taken away from New York City officials all the way through to the 1990s, when the market was again restructured to promote greater competition. The emphasis of this discussion is on the overall electricity policy landscape, although this chapter also includes a lengthy review of State and local policies that deal specifically with renewable power.

One thing that bears examination is the level of State regulatory oversight and policy specifically focused on New York City. Thus far, my presumption has been that this would be substantial, because New York City is responsible for a large percentage of the state's overall electric demand, imposing particularly heavy burdens on the NYISO transmission infrastructure during the summer months. It is in the State's interest to insure that the electricity system is effectively managed in New York City, because the financial, health, and safety consequences of failing to do so are so dramatic. We saw that in the 20-hour blackout of 2003, when economic losses to businesses and individuals in the city were in the vicinity of $1 billion (Teather, 2003) and riders were stuck below-ground in stranded subway cars and above-ground in elevators for many hours.

Also worth watching is the extent to which the policy-making landscape acknowledges the renewables market conditions described in the previous chapter. Given rising electrical demand, do State and city energy policies place a premium on renewables, or are there other electricity priorities? Chapter 5 left open the question of whether the higher price for renewable power is influencing deployment decisions or local policy. State or local efforts to subsidize deployment would likely indicate strong support for renewables, and the belief that their current high costs do have a deleterious effect on deployment levels.

All of these points are considerations that – using terms from my blended regime model – represent new institutional factors capable of influencing the direction and content of local policy. Information in this chapter thus plays a critical role in setting the stage for Chapter 7, when the theoretical model is formally applied to New York's renewables policy picture.

**New York State's Electricity Regulatory Environment**

In Chapter 1, I detailed how utility regulation in the US changed from a locally-based system to one managed at the state level. This was also the case in New York, where local government officials dominated the utility regulatory scene until 1907, issuing franchises to large numbers of sometimes overlapping, sometimes exclusive geographic areas. Local power was usurped that year when newly-elected Governor Charles Evans Hughes, a reformer, created the New York Public Service Commission (Read, 1998). The Public Service Commission (PSC) was initially charged with insuring "safe and adequate service at just and reasonable rates" (Read, 1998, p 27), and for several decades it focused on utility merger issues and ending abusive pricing schemes by utilities around the state. In 1931, then-Governor and soon-to-be-US President Franklin Roosevelt created the Power Authority of the State of New York (PASNY[17]), with a goal of further driving down utility rates by building large hydropower facilities in upstate New York. It took more than 20 years for these facilities to be built, but they succeeded in bringing low cost power to municipally-owned utilities and several privately-owned utilities, primarily in upstate New York.

The next significant change in the state electricity picture occurred decades later in 1965, when the eight largest utilities in the state banded together to form the New York Power Pool. The Pool was their response to the 1965 blackout which darkened

[17] Now known as the New York Power Authority, or NYPA.

much of the northeastern United States for up to thirteen hours. Early on, the Power Pool was unsophisticated, with members using a telephone to notify one another of their need for additional power. By 1977, however, the amount of electricity flowing between utilities increased dramatically, and the Power Pool had developed fairly sophisticated computer controls that automatically brokered transactions over the statewide grid, reducing costs and enhancing system reliability (McCall, 2001; NYISO, 2003a). The Power Pool operation was independent of PSC control, reporting instead to the Federal Energy Regulatory Commission, the US government agency charged with oversight of electric utility and transmission grid operations around the US

In 1994, the PSC began a multi-year examination of how it could change New York's electric system to achieve greater competition. Ninety stakeholders, representing utility, consumer, and corporate interests around the state, registered with the PSC so they could formally participate in this regulatory proceeding. Early on, the PSC attempted to distill "consensus principles" that would guide future action, and after much give and take, and a dramatic policy reorientation once Republican George Pataki defeated incumbent Democratic Governor Mario Cuomo in 1995, "Vision Order" 96-12 laid out several overarching market restructuring goals (New York State Energy Planning Board, 1998; New York State Public Service Commission, 1996; Norlander, 2002):

- Lower consumer prices
- Increase consumer choice of service providers
- Continue and enhance service reliability
- Continue programs that were in the public interest
- Allay concerns about market power (i.e., re-monopolization of the industry), and
- Continue consumer protections and utility obligations to provide service to customers.

As part of the order, utilities were asked to file voluntary plans showing how they might restructure their operation to comply with the Vision Order.

Prior to assessing the appropriateness of the voluntary plans, the PSC first had to decide between two competing models of deregulation. Under the first, known as wholesale competition, regulated distribution utilities buy power from competing generators, paying wholesale rates set by the market rather than by regulators. Consumers are still locked into their current service provider. The second model, known as retail choice, gives electricity users more flexibility by allowing them to select who supplies their power. Under the retail choice model, the rates consumers pay are largely deregulated, going up or down in response to market forces. Ultimately, the PSC decided on the latter approach, believing consumer sovereignty was maximized by forcing suppliers to compete for customers on a range of different criteria, including supply sources, pricing, and service quality. To aid customers in their selection process, the PSC also required utilities to divulge the fuel mix used to generate their power and emissions information on a twice-yearly basis (New York State Energy Planning Board, 1998). [This data was used in the previous chapter in Table 5-1.]

By late 1997, the PSC had concluded their "voluntary" negotiations with the six major investor-owned utilities operating in the state. As part of these settlements, the utilities retained control of their local transmission and distribution system, but were required to divest their power generation operations.[18] The settlements also established timelines by which the old monopoly utilities (hereafter, distribution utilities) were forced to open up access to their distribution grid to new Energy Service Companies who could buy power from whomever they wished and sell directly to retail customers. Wholesale power could be purchased either on the day-ahead market or via long-term bilateral contracts that would provide more stable pricing over the long run. Customers opting to continue to buy power and billing services from their old distribution utility were free to do so (New York State Energy Planning Board, 1998; Tonko, 2002).

At the same time the PSC was contemplating how to restructure the marketplace, they were also taking steps to ensure that competition and its greater emphasis on profits didn't mean the loss of important programs designed to serve low-income customers,

[18] Recall the previous chapter's discussion of the Con Ed settlement, where they agreed to divest at least 50% of their power plant capacity.

promote energy conservation, and promote long-term environmental protection (McCall, 2001). In 1996 the PSC thus established a non-bypassable system benefits charge (SBC) on the transmission and distribution of electricity in New York State, to be levied for five years. Renamed the NY EnergySmart program in 1998, SBC fees were levied on each kilowatt of power transmitted by a distribution utility and are used to finance energy efficiency programs, energy technology and system research and development; support environmental monitoring and protection; and provide rate-relief to low-income customers (New York State Energy Planning Board, 2002). The SBC charge rate was set at approximately the same level utilities were spending on these programs prior to market restructuring. In 2001 the SBC was reauthorized for another five years, making approximately $150 million available each year for various EnergySmart program activities managed by NYSERDA.

Between 2001-2006, roughly 9% of the SBC money will be allocated to renewable energy-related projects (New York State Energy Research and Development Authority, 2002, p 13). Projects SBC funds have been spent on to date include:

- training photovoltaic system installers
- educating consumers on green power and renewable power technologies
- developing wind maps of the state to aid project developers
- subsidizing the development of wind farms and other renewable power systems through loans and direct grants
- analyzing interconnections between these systems and the state power grid, and
- funding research designed to aid renewable technology firms located or operating in the state.

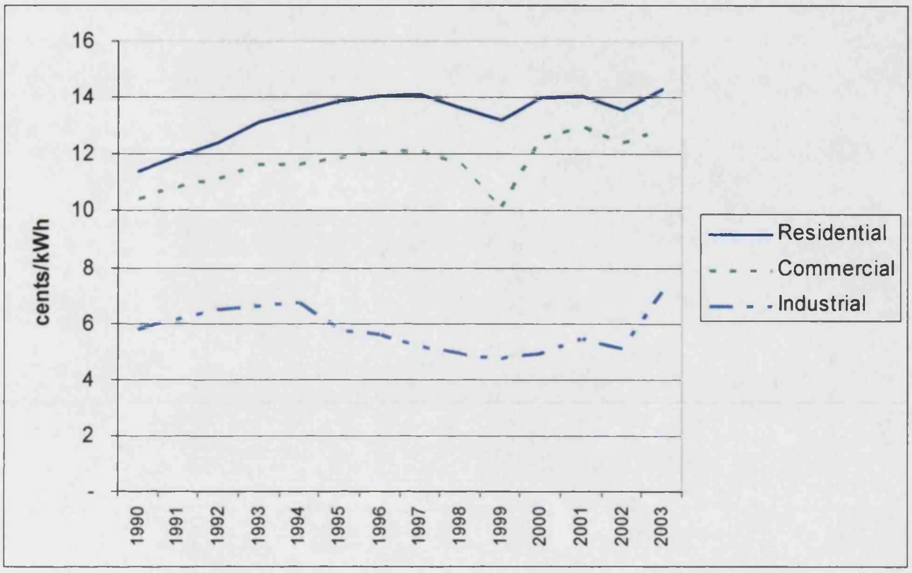
The majority of NYSERDA monies are allocated through a competitive process, with firms and institutions responding to time and budget-limited Program Opportunity Notices (PONs). One PON reissued several times provides rebates to homeowners or businesses which install solar photovoltaic systems on their house or building. Another PON provided up to 50% of the cost of the purchase and installation of small wind systems, while others made funding available for biomass power generation (New York State Energy Research and Development Authority, 2005).

**Restructuring the Transmission and Distribution System**

The State's market reform efforts also brought change to the statewide transmission and distribution system. In the mid-90's, as FERC was dealing with market changes in other states, it also sought to modify the New York Power Pool's member-owned transmission and distribution system so it was more easily accessed by non-member power producers. A series of stakeholder meetings were arranged between Pool members and other interested parties, with a goal of establishing a new non-profit Independent System Operator. In addition to operating the state's high-voltage transmission system, the FERC sought to have the New York Independent System Operator (NYISO) administer a new wholesale electricity market (McCall, 2001; New York State Energy Planning Board, 2002). In this marketplace, the NYISO would gather day-ahead demand estimates from distribution utilities, along with prices and supply estimates from electricity generators. The NYISO would then 'dispatch', or schedule supply commitments from electricity generators for the following day, utilizing a 'locational-based marginal pricing system' to decide which generators will supply a designated amount of power to a specific location on the grid at a certain time the next day (EIA, 2001). Generally, scheduling decisions would be based on who can provide power at the least cost at a certain time of day, but to maintain system reliability, the NYISO would also pay attention to the capacity of each transmission line or substation to ensure the lines did not exceed their peak capacity and melt. Refinements to the scheduling system would also be made one hour ahead of time to reflect unanticipated demand changes or supply availability, and every six seconds the system would be fine-tuned to ensure that supply and demand were evenly balanced (Griscom, 2001).

The FERC approved the ISO framework in 1998, with the proviso that reliability standards under which wholesale electricity generators and the transmission and distribution system would operate must be independently established and monitored by yet another organization, a newly-created New York State Reliability Council (NYSRC). In the past, the Power Pool members and the PSC collaborated on the development of such standards, but FERC opted to give this responsibility to an independent organization managed by a 13-member Executive Committee, with the six major transmission system owners controlling less than 50% of the Board votes (New York State Reliability Council, 2003). Under the new structure, standards developed by the NYSRC applicable to distribution utilities and generators would be formally issued as policy mandates by the State PSC.

**Figure 6-1**
**New York State Electricity Prices (by sector)**
Source: (EIA, 2005)




In the years since market restructuring has been fully in force, the reaction to these changes has been quite mixed. Much of this is due to the fact that many of the most highly-touted reform goals simply have not come to pass. Perhaps because of inertia, and perhaps because big cost savings have not materialized [See Figure 6-1], only 6.9% of retail customers around the state were being served by an electricity provider other than their local utility as of February 2005[19] (Alger, 2001; New York State Public Service Commission, 2005c; Pace Energy Project, 2001a). This is twice the rate achieved in New York City, but not as high as anticipated.

[19] As was the case in New York City, this number is slightly misleading because it largely reflects low numbers of residential users who have "migrated" to another service provider. Non-residential users, who represent a small percentage of the overall customer base, have switched at higher rates. For example, 53% of Large Time-of-Use customers, who typically include savvy commercial or institutional energy users, are currently served by an electricity supplier other than their local utility. They are more likely to switch because their high energy usage gives them considerable negotiating leverage in dealing with electricity suppliers.

Tight electricity supply conditions have been cited as one reason costs have remained high since restructuring began. Although the expectation was that forcing utilities to divest their generation capacity and opening the transmission system to new merchant generators would expand the state's electric supply, to date that has not occurred. Several factors appear to be at the root of this problem. First, project developers have had a difficult time financing new projects over the last few years, the result of timidity on the part of investors scared off by the collapse of the energy firm Enron and other financial scandals that have tarnished the reputation of the industry (Clemence, 2004). One report examining the situation noted that "investors and lenders simply do not appear to trust what most of these [utility] companies tell them about their business and fear the companies have financial exposure because of their possibly illegitimate practices" (Tonko, 2002, p 8). Second, in the past, utilities were given approval to build new plants by regulators, who then established rate structures that guaranteed the utility would earn a profit on that investment. Today, that guarantee is gone, and developers are wary about investing in costly new plants that can take up to four years to build. By the time the plant is finally operational, market conditions may be very different.

One way around this problem is to line up long-term commitments to sell this power to ESCOs and other load-serving entities around the state (Miller, 2003), but here again, utilities are wary of deals that may end up being uneconomical years from now. This was the case with New York State's post-PURPA "6-cent" law from the late 1980s, which required utilities to purchase power from independent power producers for 6¢/kWh. Market prices subsequently plummeted to as low as 2¢/kWh, placing utilities around the state in a precarious financial position (Lentz, 2002b). Third, the regulatory and political environment in New York is not considered friendly to utility project developers. One attorney specializing in power plant permitting has noted that if you're deciding between New York and another state, you'll probably end up spending more money to get permitted in New York because the process is more cumbersome, and the political opposition is well organized (Griscom, 2001).

One issue yet to play itself out is the environmental impact of New York's market restructuring. Originally, it was believed increased competition (and public notification of the fuel sources used by each utility) could lead power generators to switch to cleaner fuels to appeal to customers who care about such issues. Conversely, it is also possible that as competition reduces profit margins, utilities in New York and elsewhere may switch to lower cost fuels that produce higher emission levels (New York State Energy Planning Board, 2002). Of greatest concern is if fuel switching occurs in midwestern states that lack New York's strong air quality restrictions, as prevailing wind patterns would carry these emissions towards New York. To date, there has been little hard evidence that either of these benefits or problems are occurring, although the pursuit of greater system efficiency may be one of the reasons that is encouraging in-state power plant operators to 're-power' older coal and oil plants with new natural gas-fired turbines.

**State Energy Plan**

In 1992, the New York State Legislature passed a law requiring the Governor to develop a State Energy Plan (SEP) every four years. Originally, the plan was used to lay out very specific government actions Governor Mario Cuomo hoped to pursue legislatively or through the regulatory process managed by the State Public Service Commission. Under Governor Pataki, however, the 1998 and 2002 energy plans have instead focused on providing overarching policy direction, serving as a "blueprint to inform energy decision-making" (New York State Energy Planning Board, 2002, p 1-2). The change in orientation was deemed necessary to allow the State plan to remain applicable in light of the rapid changes occurring in the marketplace.

In 1998, the SEP laid out three broad policy objectives: promote competition; ensure fairness, equity, and system reliability; and promote a clean and healthy environment. The last goal was explained to include promoting the development of clean, efficient, and sustainable energy systems (New York State Energy Planning Board, 1998). These goals echoed several of those used by the PSC a few years earlier to guide the market restructuring effort underway at the same time, and the 1998 plan gave an overview about how restructuring was expected to proceed. By 2002, with restructuring well under way, the new SEP articulated a more detailed policy framework that, while reflective of the issues raised and lessons learned during the early years of deregulation, offered little change of direction (New York State Energy Planning Board, 2002, p 1-18).

The 2002 plan has come under severe criticism from environmental and consumer advocates who believe that the SEP's "blueprint" approach is fundamentally incompatible with the State's restructuring strategy. As one environmental group lamented, "the people of New York State, through their government and agencies, ...[have] ceded control over energy markets to corporations that are not answerable to the people" (Hudson River Sloop Clearwater, 2002, p 1). Clearwater goes on to declare the State Energy Plan needs to provide much clearer direction for the electricity market, laying out in definitive terms what outcomes should be pursued. Other advocacy and watchdog groups have clarified this to mean that the SEP should articulate the goal of preventing the clustering of power generation facilities in low-income and predominately minority communities (Masters, 2002), or the need to standardize and simplify the interconnection process to make it easier for renewable power systems to link into local distribution systems (Pace Energy Project, 2001a).

**Article X – New York State's Power Plant Siting Law**

The final major State energy policy of note is Article X of the New York State Public Service law, which deals with the contentious issue of large power plant siting. First passed in 1992, Article X created a single permit approval process, applicable to any proposed facility with a capacity of 80 MW or more. The Article X process consolidated many separate State and local government approvals into a system managed by the State Board on Electricity Generation and the Environment, also known as the Siting Board (New York State Energy Planning Board, 2002). By creating a single approval system, Article X was designed to fast-track the process, and overcome not-in-my-backyard opposition by local opponents of a project as well as local zoning and other restrictions that might prevent the siting of needed facilities (Angotti, 2003; Public Policy Institute of New York State, 2002). That's not to say that local government and public input was not welcomed – Article X included a Public Involvement Process that made funding available to local communities to allow them to hire experts to evaluate siting proposals and provide input into the review process (Pace Energy Project, 2001a). Under Article X, project approval was contingent upon a Siting Board finding that the proposed facility was compatible with public health, safety and the environment; compliant with State and local laws; and is in the public's interest "or is reasonably consistent with the planning objectives and strategies contained in the latest State Energy Plan"(New York State Energy Planning Board, 1998, p 2-51).

Since the Article X law was passed in 1992, eleven different power plant proposals have been certified in New York State, of which six are currently under construction. Another thirteen proposals either withdrew from the process or failed to complete it before the law expired in January 2003 (New York State Public Service Commission, 2003). Efforts to reauthorize Article X have failed on several occasions since early 2003 due to disagreements between the Governor and the New York State Legislature over suggested amendments to the reauthorization measure. Its future prospects are uncertain.

**Key State Renewable Energy Policies**

Although the State Energy Plan architects big picture energy policy in the state, it is not the only vehicle doing so, particularly in the area of renewable power. Several key policies influencing the local renewables landscape have come about as a result of Executive Orders and legislative initiatives. These policies are in addition to renewables project subsidies and research and development efforts supported by NYSERDA using system benefit charge monies:

- *Executive Order 111*: In 2001, Governor George Pataki issued Executive Order 111 requiring all State agencies, departments, and authorities to seek to reduce their power consumption by roughly one-third compared to 1990 levels and purchase 20% of their electricity from renewable sources by 2010 (New York State Energy Planning Board, 2002, p 3-56). The Order specifies which technologies qualify as renewable, including wind, solar thermal, solar photovoltaic, sustainably-managed biomass, tidal, geothermal, methane waste, and fuel cells. In fiscal year 2004, 13,000 megawatt-hours (MWh) of renewable power was purchased by affected State entities (M. Brown, e-mail communication 17 May 2005).

- *Tax Credits*: There have been two different tax credits relevant to renewable power system installations in New York State in recent years. The 1996 Solar Choice Act established a 25% tax credit on systems eligible for NYSERDA's rebate/subsidy program. The maximum tax credit that can be received is $3,750, and it can be carried over for up to five years if the credit is more than the tax due (Fairley, 2003; Romano, 2002). A second tax credit applied to commercial buildings with fuel cells or photovoltaic arrays installed between January 2001 and December 2004. Known as the Green Building tax credit, it was inspired by the efforts of the Durst Organization to build a "green" office tower in Times Square in Manhattan. The Dursts found it difficult to pass along to tenants the up-front costs of many of the environmental features of their new building, and they lobbied the State to create this tax credit to eliminate similar financial barriers for any other developers contemplating such installations (Campbell, 2000). The tax credit, which expired in December 2004, was capped at $3 per watt of the system's capacity, and project developers could apply for the credit for up to five years (New York State Energy Planning Board, 2002, p 3-57). At the time the law sunset, five buildings – three of them in New York City – had qualified for the tax credit (Salama, Schill, & Springer, 2005).

- *Interconnect rules*: The 1996 Solar Choice Act also mandated the development of interconnection standards requiring utilities to allow residential PV systems to hook into the local distribution grid so long as the systems meet safety and power quality standards established by the National Electrical Code and Underwriters Laboratory. Systems meeting such standards are not required to install additional controls, perform, or pay for additional tests, or purchase liability insurance (IREC, 1996). In 1999, the PSC issued standardized interconnection requirements for distributed generation systems (including renewable power systems) less than 300 kW[20] in size connecting to radial distribution systems. These requirements also included a process manufacturers can follow to test their equipment, after which it is automatically approved for use statewide (New York State Energy Planning Board, 2002, p 3-87). In 2002, a law was passed adding interconnect standards for on-farm equipment designed to produce up to 400 kW of power

[20] The rule formally applies to systems less than 300 kVA, or kilo-volt amperes, a different unit of electrical measurement that is roughly comparable to 300 kilowatts of power.

(Office of the Governor, 2002). In November 2004, the PSC raised the limit to cover distributed power systems of up to 2 MW in nameplate capacity. The rules also broadened the scope of the requirement to cover network grids, such as that operated by Con Edison in New York City, arguing that since 1999 much had been learned about how to successfully interconnect systems without jeopardizing the integrity of a network grid. The PSC did, however, grant utilities the right to determine whether special equipment must be attached to the system to protect the grid if site-specific conditions warrant it (New York State Department of Public Service, 2004a). As will be discussed in Chapter 7, this last provision is critically important, as it has resulted in delays and cost increases for renewables projects in New York City.

- *Net-metering law*: The Solar Choice Act of 1996 added New York to the list of states that allow "net-metering" for the owners of residential solar photovoltaic systems. Under net-metering, the amount of electricity a grid-connected PV system feeds into the grid is compared to the amount of electricity that residence draws from the grid. The utility is obligated to pay the residence for any amount of power generated above the level consumed by that residence, valuing the power at the price currently charged to residential users. The 1996 law limited eligibility to residences with PV systems of less than 10 kW in size (DSIRE, 2004b; Office of the Governor, 2002). In 2002, the net-metering law was again amended to cover residential wind systems up to 25 kW and farm-based turbines up to 125 kW. The 2002 law also amended net-metering rules to include farms generating power using anaerobic digesters less than 400 kW in size. Utilities are prohibited from imposing standby rates, back-up fees, and other charges on all net-metered systems. Payments to owners now vary based on system size, with systems under 10 kW earning full retail credit, while larger systems receive credit at the utilities' avoided cost (IREC, 2005). In all cases, New York's net-metering rules limit the total amount of net metering a utility is required to provide.

- *Renewable Portfolio Standard*: In 2003, Governor George Pataki proposed a requirement that within ten years, 25% of the retail electricity sales in the state involve renewable power sources. After a lengthy public review process, the PSC issued final rules establishing such a Renewable Portfolio Standard in September 2004. Because New York state already derives approximately 19% of its power from renewables -- primarily upstate hydro power[21] -- the RPS is expected to result in the development of an additional 3700 MW of additional renewable power capacity around the state (DSIRE, 2004a; New York State Public Service Commission, 2004). Unlike in other states, where the burden to comply with an RPS falls directly on utilities[22], in New York NYSERDA will play the key procurement role, contracting with renewable power producers who will receive financial incentives to sell or deliver their power into the state's wholesale energy market. NYSERDA also has the option to subsidize the installation of on-site renewable power systems that will displace electricity currently supplied by the grid, effectively achieving the same goal of increasing the rate of power supplied by renewable sources. Under the RPS formula established by the PSC, NYSERDA is responsible for increasing renewable power supply rates so they total 24% of statewide electrical demand. The remaining 1% of the 25% RPS requirement is to be achieved using a voluntary green electricity market approach, whereby voluntary consumer demand for renewable power will result in utilities seeking to procure this power of their own volition.

To comply with its procurement obligation, NYSERDA will issue requests for proposals on a regular basis, soliciting large amounts of renewable supply capacity under long term power purchase agreements. In early 2005, the first seven contracts were signed, totaling 820,000 MWh of renewable capacity which must be delivered beginning in 2006. Technologies eligible for the RPS include selected forms of hydro and tidal power[23], biomass-based power[24], large and small

[21] It was noted in Table 5-1 that New York State has 4400 MW of installed hydropower capacity, or 14.5% of the state's installed electric generating capacity. Additional hydropower is procured from Canada, increasing the total proportion of power derived from renewable sources.
[22] The reason for the difference in approach is the huge variation in the amount of renewable energy currently sourced by different utilities around the state. Because upstate utilities already purchase power from upstate hydro dams, many already exceed the RPS' 25% requirement. Downstate utilities do not have such ready access to renewable power sources, however, meaning any excess cost burden may fall unduly on downstate customers. To remedy this problem, the PSC decided to focus instead on the total quantity of power consumed in the state, and structure a formula that evenly credits renewable power use across all utilities and customers.
[23] Qualifying hydropower systems include upgrades that increase the power output at existing hydropower facilities, so long as they result in no new impoundment of water; low impact "run of river" systems rated 30MW or less; and small hydropower facilities rated at 10MW or less.

wind systems, and solar photovoltaics (New York State Department of Public Service, 2004b). With limited exceptions, systems must be new or have come on-line after January 1, 2003.

By 2013, the cumulative cost of procuring renewable power under the RPS is expected to total $179-323 million on a net present value basis. This amount represents costs above and beyond what consumers would otherwise incur if less expensive, conventional power technologies were used to supply this power. In individual consumer terms, cost impacts are forecast to range from -1% to +2%, depending on the sector (i.e., residential commercial, or industrial) and how much renewable power technology costs decline over time (New York State Public Service Commission, 2004).

Funds for NYSERDA's procurement contracts are derived from an RPS fee attached to each kWh of electricity sold by utilities currently subject to system benefits charges. The RPS surcharge, which goes into effect in October 2005, will vary from utility to utility. Power delivered to utilities or consumers by the New York Power Authority is exempt from the RPS fee requirement.

**Role of New York City in Energy Policy-making**

Like most other municipalities, New York City has a limited role when it comes to energy policy matters. A variety of State laws, including the 1907 law creating the New York State Public Service Commission have seen to that, as was just discussed at length. New York City is not totally without leverage, however, as the recent Mayoral Energy Policy Task Force noted. In their report, the Task Force cited three important roles New York City plays when it comes to energy matters (New York City Energy Policy Task Force, 2004):

- *Voice of the people* – In regulatory and legislative proceedings, the City of New York regularly expresses opinions related to its interests on an issue. These

[24] Biomass is generally defined as consisting of energy crops, waste wood, agricultural wastes, animal wastes, and food waste. Biogas includes landfill and sewage gas and gases formed through the anaerobic digestion of food or animal wastes. Because municipal solid waste includes non-biomass-based combustible materials, it was explicitly excluded from the RPS.

opinions may be focused on the impact on city residents and businesses; the City government's own financial, political, or regulatory interests; or that of the larger society. The City has actively fulfilled this role since the earliest days of regulation, appearing before regulatory bodies examining industry corruption, commenting on (and generally railing against) overcharging, and maintaining a formal presence on various advisory committees involved in energy-related matters (New York City Energy Policy Task Force, 2004; Read, 1998). As might be expected, the City's level of activism on energy issues has risen and fallen over time, a function of their prominence and the level of interest civic leaders had in these issues. For instance, Mayor Fiorello LaGuardia's active crusade to develop a municipal power system in the late thirties was influenced both by the high rates charged the city and the opportunity presented by federal efforts to promote hydropower development around the US (Lurkis, 1982). In the late 1960s and early 1970s, when air quality problems in New York City were particularly severe, Mayor John Lindsay was actively involved in pushing Con Ed to reduce emission levels, as was his newly created City Environmental Protection Agency (CEPA). On the other hand, Mayor Abe Beame, who followed Lindsay into office, was much less personally engaged on these issues, and his cutbacks in the CEPA budget affected their ability to play much of an activist role (Axelrod, 1982). More recently, several observers of local energy policy-making have commented that Mayor Rudolph Giuliani paid little heed to energy issues until 2001, when the supply "crisis" noted in Chapter 5 first erupted (R. Anderson, pers. comm.; A. Gupta, pers. comm.; R. Miller, pers. comm.).

- *Statutory Actor* -- The Task Force (2004) also noted that city zoning laws and permitting authority, along with its control of shorelines and streets, allows it to wield significant influence on the siting of major electric projects around the city. This statutory power will be put to the test at a waterfront parcel in Brooklyn, which the city is attempting to convert into a new park as part of a large rezoning of the area (Confessore, 2005; Yassky, 2005). The electric utility developer Trans Gas has been attempting to build a new 1,100 MW gas-fired power plant at that location. If the now-expired Article X power plant facility siting law is reauthorized, the Siting Board has the power to override local zoning restrictions if it deems it necessary (Cook, 2000; Public Policy Institute of New York State, 2002). If Article X is not renewed, standard State environmental permitting rules apply, giving the City far more leverage over the permitting process.

- *Model and moral leader* – By itself, the government of the City of New York uses approximately 10% of all power consumed in the city (New York City Energy Policy Task Force, 2004). As a result, actions by the City to reduce power consumption or develop and use alternative power generation technologies can potentially place the City in a leadership role on these issues, providing a reference point for actions by households and businesses around the city. The recent announcement that the City would procure green power for two City-owned industrial centers in Brooklyn was made specifically with that point in mind (Con Ed Solutions, 2005b).

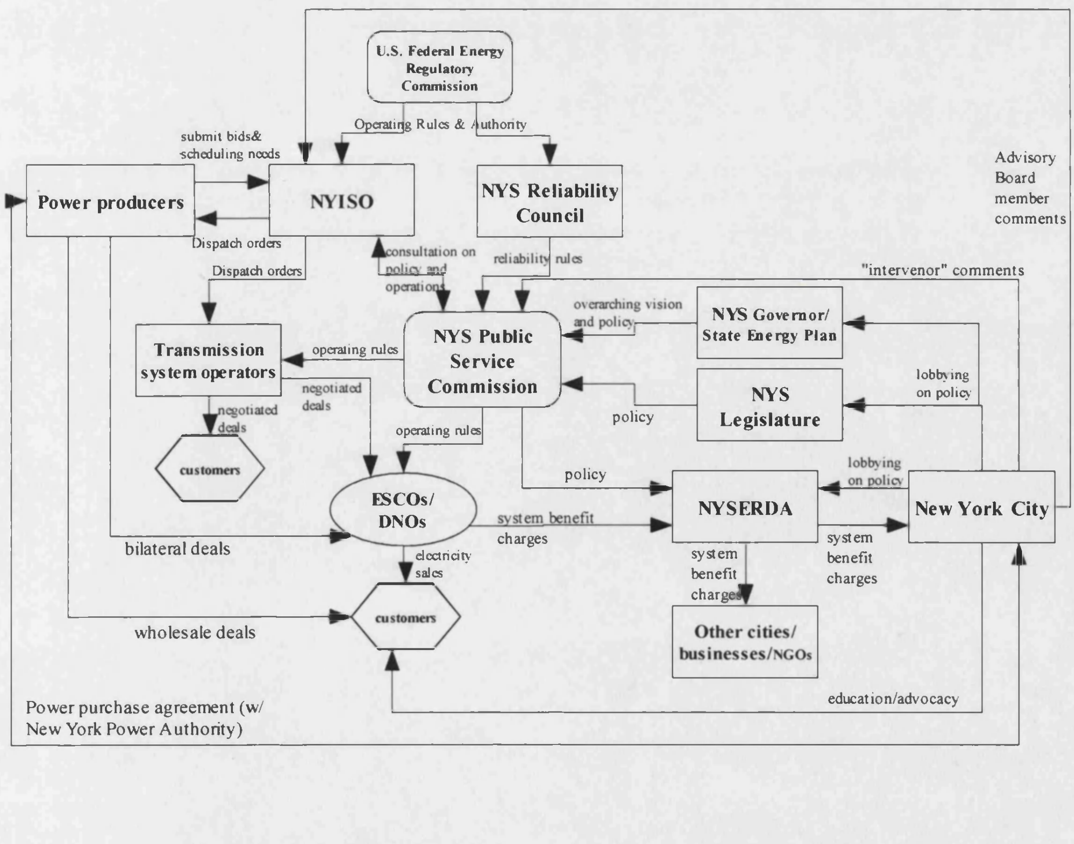
There are two other areas where the City plays in an important role on energy issues. First, the City has a long record of trying to bring rate relief to local electricity users. In the 1930s, 1970s, and 1980s, this took the form of efforts to establish a municipal utility that would either compete head on with Con Ed (with the expectation that competition would force Con Ed to reduce its rates), or simply obtain cheap power from non-Con Ed sources and pass the savings directly on to local customers (Barbanel, 1984; Lurkis, 1982; Purnick, 1982). Most recently, operating through the City's Economic Development Corporation (EDC), the City has helped businesses apply for State and federal incentive programs that cut electricity prices for selected business sectors and neighborhoods in New York City. These programs reduce the cost of doing business in New York City, making firms more competitive and likely to remain in the city.

A final key role the City has played over the years is to conduct independent research on various energy policy issues and using these results to buttress the City's advocacy before the State Legislature or PSC. The subjects of these analyses have varied widely. In 1971, the City's Environmental Protection Administration undertook a study of State procedures for power plant siting, with an eye toward their likely impact on New York City (Fabricant & Hallman, 1971). Three years later, the New

York City Department of City Planning coordinated a Metropolitan Energy Conference to investigate the current energy situation in the City and identify future needs (New York City Department of City Planning, 1974). In 1985, the City hired a consultant to analyze the common practice of electricity redistribution, whereby real estate owners buy power from Con Ed and then re-sell it to their tenants, often at significantly marked up rates (Urban Systems Research and Engineering Inc., 1985). That report was used by State legislators looking into the matter. In 2003, the City hired a consultant to examine alternative locations for a large gas-fired power plant proposed along the East River (Hu, 2003); in 2004, another consultant was hired to advise City officials on the renegotiation of the City's electricity contract with NYPA and Con Ed's application to the PSC to raise electricity prices for local customers (New York City Economic Development Corporation, 2004).

A diagram depicting the overall New York State energy policy-making picture, and New York City's limited role in this process, can be found in Figure 6-2.

**Figure 6-2**
**New York City and New York State Energy Policy-making Process**
Source: Original Research, April 2004



**New York City Energy Policy-making Apparatus**

Responsibility for policy-making and monitoring of energy issues has been vested in a number of different New York City government agencies over the past 120 years. In the earliest days of electricity, the New York City Board of Electrical Control, the Board of Electrical Subway Commissioners, and the Board of Street Lighting all shared responsibility for granting and monitoring different electrical franchises on behalf of the city. In the 1940s, 1950s, and 1960s, the Bureau of Gas and Electricity, part of the City's Department of Water Supply, Gas, and Electricity, was responsible for policy and engineering analyses of the Con Ed system, including assessing what had gone wrong during different service outages (Lurkis, 1982). In 1968, Mayor Lindsay reorganized the government, creating a new Department of Public Works, and moving the Bureau of Gas and Electricity under its control (King, 1968).

Lindsay also created the New York City Environmental Protection Administration, which worked closely with the City's Department of Air Resources to reduce power plant emissions from Con Ed facilities (Axelrod, 1982). Other energy-related responsibilities fell to the Municipal Services Administration, the Interdepartmental Committee on Public Utilities, and the Mayor's Emergency Energy Supply Task Force. To try to rationalize and better coordinate policy under his administration, in early 1974 Mayor Abe Beame created a New York City Energy Office (Council on the Environment of New York City, 1974), but by the late 1980s, it had been merged with city offices responsible for other regulated utilities to form the Department of Telecommunications and Energy. Rudolph Giuliani dismantled this Department early in his first term, shifting responsibility for energy policy issues to a new Energy Department at the city's Economic Development Corporation (EDC), where it has remained ever since.

Although this parentage is somewhat confusing, the current delineation of responsibility for energy-related policy is not. The Energy Department at EDC is responsible for advising the City on energy policy matters, developing long-term energy strategies, and administering the energy portion of local economic development initiatives (Van Wagner, 2002). Responsibility for energy procurement and use by City agencies is handled by the Office of Energy Conservation at the

Department of Citywide Administrative Services. A third government agency, the Bureau of Electric Control at the Department of Buildings has responsibility for ensuring electrical code compliance and sanctioning the installation of new wiring or electrical systems, including new technologies such as renewable power and other distributed energy systems. This division of responsibility has come under criticism in recent years. One report by a leading good government group in the city concluded that the Office of Energy Conservation lacks the clout to effect much change in the government's own energy use, resulting in over-expenditures amounting to millions of dollars each year (Van Wagner, 2002). Similarly, a top official who recently left the EDC's Energy Department is reported to have criticized the placement of energy policy-making responsibility within the EDC, believing the agency's pro-business focus isn't necessarily compatible with the quest for a sound energy policy. The fact that the Energy Department was now a sub-cabinet agency was also seen as hampering its effectiveness, as it lacked the clout enjoyed by the office when it was a free-standing agency (Sargent & Benson, 2003).

Legislation to reconstitute a cabinet-level Energy Office was introduced in the City Council in 2004, one of a series of new proposals dealing with energy matters. These bills represent an energy legislation renaissance for the Council, which has taken a back-seat to Mayoral action on energy issues since at least the mid-1980s[25]. When the Council has acted of late, it has focused on reducing energy use at City-owned facilities or lowering emissions of fleet vehicles over which the City has significant leverage, including government agency vehicles, taxis, and sightseeing buses operating in the city. (For example, see DePalma, 2005). Historically, the energy legacy of the Council is much broader, dealing with the issuance of franchise rights in the late 1800s, and the creation of a municipal utility that was intended to reduce power costs (Hughes, 1983; Purnick, 1982). Individual Council members have been vocal in their opposition to the proposed siting or repermitting of power plants in their legislative districts (for example, see Vallone Jr., 2002; Yassky, 2004), although the Council tends not to take collective action on specific siting proposals. The recent exception was the Council's support of the Mayor's proposal to rezone parts of

[25] According to my review of the New York City Council's on-line database, there have been a total of 49 pieces of legislation dealing with 'energy', 'electricity, and 'emissions' matters proposed since the mid-1980s, of which only a handful have actually been signed into law.

Greenpoint and Williamsburg, where it was obvious that the rezoning plan would effectively kill the prospects for the TransGas facility proposed along the East River (Confessore, 2005).

The most recent policy-making efforts at the City level involved the work of an Energy Policy Task Force established by Mayor Michael Bloomberg in 2003. Under the auspices of the EDC's Energy Department, the sixteen member task force, composed of representatives of key businesses, utilities, environmental groups, community organizations, and statewide energy-related entities, assessed New York City's electricity needs over the next five years and recommended specific policies and programs to meet those needs (Quiniones, 2004b). According to a City official knowledgeable with the origins of the Task Force:

> "We realize a lot of the rules, policies and regulations related to local energy matters are set at the state and federal levels...there are some things that the City can directly influence and take affirmative actions on, but because of that reality, the City decided to form this coalition so we could be the hub in trying to either directly do something about an issue or lead this coalition to go to the appropriate agencies at the state and federal levels and say here are the things that we need to get done"

The Task Force's 57-page report detailed 28 specific recommendations, ranging from legislative and regulatory policies the City will support at the state level; steps the City can take to "lead by example;" and strategies the City can pursue in collaboration with Con Edison and merchant power plant and transmission system developers to ensure the forecasted power supply gap is addressed (New York City Energy Policy Task Force, 2004). To ensure the City makes progress towards achieving these goals, the Task Force agreed to remain empanelled and to issue a scorecard twice yearly discussing the status of their on-going efforts. The first report was released in April 2005, noting specific actions that had been completed, those which had been launched, and those which were still in the planning stages (New York City Energy Policy Task Force, 2005).

**A Renewables Policy for New York City?**

New York City's approach towards renewable power can historically be characterized as passive, talking about the subject but taking no action likely to result in much renewables deployment. The first-known[26] instance of any City policy focus on renewables occurred in 1971, when the new City Environmental Protection Administration's report on energy issues made passing mention of the role renewables could play in ameliorating the air quality impacts of power production in the city. Rather than stating how the City could facilitate their development or deployment, the report instead passed the buck, calling on the State and federal government to invest more in renewables research (Fabricant & Hallman, 1971). In 1974, the Council on the Environment, a citizen advisory committee to the Mayor's office, developed a forward-looking report on energy issues in the city, but they too found no policy-making role for the City in developing alternative energy sources, with the exception of solid waste incineration, which was seen to hold great potential for the city (Council on the Environment of New York City, 1974). Later that same year, the New York City Department of City Planning convened an urban energy conference, attracting experts from around the city and country. Despite a pessimistic talk by one scientist about the limited role renewable power sources could play in the city's future energy picture, a working group convened near the end of the two-day conference concluded "regional policy should emphasize [the] development" of solar and wind power systems in the city (New York City Department of City Planning, 1974, p 116).

The City of New York did little to follow-up on this recommendation, however, a situation that has remained true for the 30 years (and four Mayoral administrations) since that conference. The Giuliani administration's development of High Performance Building Guidelines in 1999 did mention renewables deployment, but even that was limited to a single line out of a 144-page document. At the time these guidelines were developed by a group of city officials, planners, architects, and energy and environmental experts, they represented cutting-edge thinking on how the City could incorporate environmental design features and construction practices into

[26] There had been efforts decades earlier to procure hydropower from upstate projects, but that was done primarily for cost reasons rather than out of a preference for the recognized environmental benefits of renewable power.

future public building renovation and construction projects (New York City Department of Design and Construction, 1999). The guidelines are voluntary, however, and adoption of the ideas contained in the guidelines has been rather low. As of February 2004, 16 capital construction projects funded by the City have incorporated some aspect of the High Performance Building Guidelines, two of which have included building integrated photovoltaic system on the roof and exterior walls (New York City Energy Policy Task Force, 2004, p 51). All projects involving the use of the Guidelines will be closely monitored for a few years to help document any operating cost savings or other benefits that might offset any additional up-front costs.

In 2003, two significant renewables policy-making opportunities occurred, and in both instances, the City of New York maintained its ambivalent stance towards renewables. The first came in the form of the Public Service Commission's regulatory proceeding focusing on how the Governor's Renewable Portfolio Standard should be structured. In its initial comments on the RPS, the City's Energy Department expressed its support for the goals of the RPS, but also raised serious reservations that the RPS would result in higher electricity costs in New York City. To address this problem, the City advised the PSC to consider including "non-traditional forms of renewable energy," such as waste-to-energy facilities and steam air conditioning from modern combined-cycle gas power plants[27] in its definition of what resources should be considered renewable (Delaney, 2003b, pp 5-6). The City also recommended that renewable power generated outside of the state, such as hydroelectric power from Canada, count towards the RPS requirement (Delaney, 2003b, p 6). Six months later the City submitted followup comments that repeated many of the same points (Delaney, 2003a).

A separate set of comments submitted to the PSC by the New York City Council disagreed with the Energy Department's conclusions, arguing that municipal solid waste incineration was too polluting to be considered a clean form of energy production, and thus should not be considered renewable unless the technology is greatly improved. The City Council's comments also expressed reservations about

[27] The City's comments acknowledge that the latter is not strictly a renewable form of energy, but noted that District Heating Systems, such as the large steam heating and cooling system available in Manhattan south of 96th Street, have many environmental benefits and should thus be seriously considered.

the inclusion of large scale hydropower projects in the definition of qualifying technologies because of their recognized adverse environmental impacts and because its exclusion would likely result in a decreased emphasis on newer renewable technologies. The boldest suggestion made by the Council was the PSC should incentivize renewables development in places like New York City because the distributed nature of these electricity systems could help alleviate the City's load-pocket problem (New York City Council, 2003).

The second significant policy-making opportunity came with the formation of the New York City Energy Policy Task Force. Charged with assessing the current state of the City's electricity situation and recommending actions to secure the City's energy future (New York City Energy Policy Task Force, 2004), the Task Force report could have been used to articulate very specific policy and funding initiatives supportive of renewables or explained why renewables were undeserving of any prominent place in the City's near-term energy future. Instead, the report again opted to ignore renewables, stating "the scope of the report does not include such energy-related issues as …sustainable energy, clean air, [or] climate change policy" (New York City Energy Policy Task Force, 2004, p 8). The report does mention solar power on five occasions, as one of many types of clean on-site power generation strategies that can be pursued, but does nothing further to endorse its use.

At a public meeting one month after the Task Force report was released, the Task Force Chair explained there was a conscious decision to not make renewables a significant focus of the Task Force's work, instead shifting responsibility for such issues to a proposed new task force that would explicitly look at 'sustainability' issues (Quiniones, 2004a). That Sustainability Task Force was formally appointed by the Mayor in November 2004, consisting of staff representing eleven different City agencies. The Task Force has a very inward focus, however, emphasizing the 'greening' of internal city government operations. Thus far, Task Force members have been brainstorming different policy and program opportunities that the City could pursue. In the summer of 2005 the Task Force is expected to develop an action plan to guide agency action on sustainability issues over the next few years (R. Kulikowski, pers. comm.).

Several subtle policy shifts that could benefit renewable power occurred in late 2004. As part of its renegotiation of its electricity services contract with the New York Power Authority, old contract provisions interpreted as obligating the City to use NYPA to help plan and install any renewable power projects on City-owned or supported facilities were eliminated. The City can now seek out other installers, some of whom may be less expensive than NYPA. Additionally, although the new NYPA contract continues to allow NYPA to retain full control over decisions on which power sources are used to meet its supply obligation to the City, the City must agree to any "contracts that add long term supply resources to the supply portfolio serving the NYC Governmental Customers" (New York Power Authority, 2005). This provision thus gave the City the opportunity to provide input into the way NYPA structured a recent Request for Proposals seeking 500 MW of power for the City contract. In this RFP, NYPA noted its principal goal was to procure "economical, stable, and predictable" power from sources located in the New York City powershed. The RFP also noted NYPA's openness, however, to "newer, cleaner energy sources of generation and to other solutions, including generation produced by renewable sources, that improve the environment in New York City by displacing older, higher-polluting generation" (New York Power Authority, 2004, p 1). Ultimately, NYPA ended up procuring 20 MW of renewable power supply as a result of this RFP (A. Rosenberg, pers. comm.).

A second, potential policy shift came during the Con Edison rate case before the PSC in 2004. Con Ed's proposal to raise prices for its customers was first submitted to the PSC in April 2004, and it was eventually settled as a result of direct negotiations between Con Ed, the City of New York (in its statutory role as an intervenor), and a multitude of other stakeholders. The negotiation process was overseen by the PSC, following the Commission's standard settlement rules (Couch White LLP, 2004). The give and take of the negotiation process was not documented, and participants were unwilling to fully divulge their negotiation positions with me, but comments submitted to the PSC by the City of New York in reaction to the original Con Edison rate proposal appear to have served as the foundation of the City's negotiation strategy, as did the 2004 Mayoral Energy Policy Task Force report.

Aspects of the settlement agreement include that could potentially benefit renewables deployment and use in the City include (New York City Energy Policy Task Force, 2005):

- A requirement that Con Edison pursue 675 MW of distributed resources in its New York City/Westchester County service territory over the next three years.
- A requirement that Con Ed work with the New York City EDC and others on energy infrastructure master plans for major redevelopment zones of New York City such that distributed resources could be used in lieu of traditional energy infrastructure upgrades, and
- Incentives encouraging Con Edison to promote higher retail migration rates to ESCOs serving the New York City market (including those selling green power).

Because the settlement language does not explicitly call for Con Ed to pursue renewables generation as an end goal in these efforts, it is not clear the extent to which the agreement will actually result in any new renewables system deployment in the city. The door has been opened, however, and it remains to be seen what will actually ensue over the next three years.

**Conclusion**

This chapter focuses on two key topics: the structure of the policy and regulatory system in New York State, and the content of the policies derived by this system. Both are important elements of my logic study, and both link back to market and policy landscape issues first raised in Chapters 1 and 2.

The current energy policy system in New York is clearly State dominated. Between the Public Service Commission and NYSERDA – and with strong input from the Governor – the direction and content of State energy policy is established and implemented. This system structure has been in place for a century, and it still reflects the basic principles outlined in the 1907 law usurping local control of the electric power industry. In that law, the roles of State policy-makers, local officials, and utility managers essentially became codified, with each group allocated clearly defined roles. The State wrote policy, utilities implemented it, and local authorities reacted to these policies and programs when they believed their community would be adversely affected. Of course, local authorities did exert much control over their own electricity use, just as they had a much broader set of powers if they owned and operated their own public utility.

The market restructuring efforts in the mid-1990s changed some important rules regarding competition, but the fundamental system structure remained intact. Markets are still regulated by State officials, and the policy-making powers of local authorities continue to exist within confines dictated by State rules. That is not to say New York City's policy-making powers are inconsequential. The City of New York's governmental operations are responsible for roughly 3% of total statewide energy demand, while peak demand in the city amounts to nearly 40% of peak statewide electricity use (New York City Energy Policy Task Force, 2004; New York State Energy Planning Board, 2002). Efforts by the City to procure green power or reduce electricity usage could have significant statewide consequences. Moreover, particularly on regulatory issues involving Con Edison, the City's voice is an important one, because it is seen as representing the collective interests of three million Con Edison customers.

This chapter also contains several important policy threads continuing themes raised early in this thesis. First, New York State's electricity market restructuring was intended to create opportunities for all types of technologies in the marketplace, including renewables. PURPA first opened this door back in the late 1970s, and New York's mid-1990s restructuring efforts made clear its intent to ensure renewable power schemes retained their access to the state's transmission and distribution grid. Restructuring also had cost containment and cost reduction in mind, however, and to the extent this is a primary goal of policy-makers and energy consumers – a subject covered in Chapter 7 – then renewables may suffer. One thing quite evident is the fact environmental gains expected to occur under restructuring have yet to come to fruition. Consumers are not flocking to ESCOs offering green power programs. There is an overall trend towards cleaner energy supplies (in the form of natural gas), but this follows the national trend described in Chapter 1, and we have not seen a rush by merchant developers to build large renewable power systems around New York State.

Answering a question first posed at the beginning of this chapter, a second theme is that State policy is broadly supportive of renewable power. Between the system benefit charge monies available from NYSERDA for renewables projects, the green power mandates on State agencies, an RPS designed to jumpstart the statewide market for large scale renewable installations, and a series of initiatives (e.g., tax credits, interconnect rules, net metering) designed to facilitate smaller scale installations by homeowners and businesses, State policy has clearly been a friend to the renewables industry. The SBC and RPS programs in particular make renewables more cost competitive with existing power sources, and as will be discussed in the next chapter, they play a big role in determining whether a renewables project actually goes forward. Overall, New York State's efforts in these areas place them at the forefront of State-level programs around the US.

By contrast, New York City is not among the vanguard of cities taking aggressive action on renewables. For thirty years now, local policy makers have acknowledged the benefits of renewable energy, yet done little to advance its use in any meaningful way. Most recently, the Energy Policy Task Force made almost no mention of renewables in their key report projecting a huge electricity supply shortfall in the city. The City of New York's official comments on the RPS said nice things about renewable power, but then effectively undermined their argument by focusing on costs and alternative technologies that few consider to be "new" renewable sources of power. In fact, comparing New York City's actions on renewables with the lengthy list of strategies employed by other municipalities – mandates, tax incentives, expediting permit approval, etc. – one sees the City's nascent green power purchasing program and biogas recovery at local sewage treatment plants as the only real evidence that decision-makers are paying *any* attention to this issue. The distributed generation provisions negotiated by the City as part of the Con Ed rate settlement and the new electric services contract with NYPA may create opportunities for more renewables deployment around the city, but it is too soon to tell how successful they will be in this regard.

Assessing why New York City is not following the pro-renewables path of other cities is the task of Chapter 7, where I try to explicate the logic behind local policy and deployment decisions. Regime governance will be a primary focus of the chapter, identifying the stakeholders most responsible for energy policy-making in New York City and examining what drives their behavior on these issues. I will also weave in new institutional themes from Chapters 5 and 6 when it is clear this information contributes to our understanding of local policy and deployment decisions.

# CHAPTER 7

## New York City case study: Policy and Politics -- A Modified Regime Analysis of Renewables Policy-making in New York City

### Introduction

The previous historical, policy and regulatory system overviews laid the groundwork for this chapter. I build on this by reviewing previous regime analyses of New York City, which essentially conclude there is a business-led coalition that dominates local agenda-setting. I then examine the environmental policy landscape around the city to determine the extent of this regime's involvement with local environmental issues. Recall that Gibbs and Jonas inquire about such issues, so this chapter explores this matter at length. The work of the New York Building Congress Energy Committee is key here as it provides an opportunity for business interests to engage in local energy policy issues at the highest levels.

This chapter also employs my modified regime approach to develop a comprehensive explanation of the logic of local energy policy-making. The key difference between a standard regime analysis and my modified regime approach is the latter's focus on the new institutional influences that can affect the behavior of regime members and other stakeholders in a city. Given Chapter 6's lengthy discussion of the energy policy-making environment in New York State and New York City, there is much to discuss here. The structure of the State's energy policy-making and regulatory system and issues of cost are two important areas of influence, so close attention will be paid to whether and how regime behavior is affected by these factors.

I conclude this chapter with several observations about the prospects for renewable power in New York City. In general, I am skeptical whether we will see a significant expansion of renewables use in either the near or long term. Renewables are not part of the City's energy game plan right now, and State policy appears biased towards renewable power technologies better suited for more remote areas. Market conditions also do not appear conducive to large scale deployment, a situation that will not change until the cost of renewable technologies most likely to be deployed in cities decline significantly.

**New York City – A Political Regime Overview**

Much ink has been spilled over the years examining the question of who 'runs' New York City, a concept central to urban regime theory. Roberts (1985) notes that for much of the middle 20th century, tremendous power was wielded by a relatively narrow group of individuals – the local Roman Catholic Archbishop, Tammany Hall political bosses, trades union officials, the wealthy Republican state governor, and a long-time bureaucrat named Robert Moses who could all change or shape important city policies with a single phone call or nod of their head. The deaths of these people and the city's mid-1970s financial crisis changed things, however. Coalition government was now required, requiring significant cooperation of private sector leaders who were appointed by the State nearly 30 years ago to monitor the City's fiscal health. Today, City leaders must also work with fluctuating coalitions, "inconstant constellations that form on single issues and then fall apart, only to come together in some new configuration when another cause becomes compelling" (Roberts, 1985, p 87). Such an analysis hardly fits within the traditional urban regime model, where a stable, long-lasting coalition exerts influence over the urban agenda for an extended time period. Two studies have looked at the historical record over the last 20+ years, however, and concluded that regimes do exist in New York City.

Gladstone and Fainstein's (2001, p 35) analysis is primarily focused on the city's tourism economy, but they nonetheless found considerable evidence that New York City is run by a pro-growth, corporate-led regime, citing instances where Mayors Koch, Dinkins, and Giuliani have worked closely with real estate developers to create an "engine for growth." The use of tax breaks and eminent domain powers to benefit developers, and the implementation of aggressive policing strategies to ensure public and tourist safety in certain neighborhoods – again benefiting developers with properties in those same neighborhoods – was seen as proof of the power of the corporate-led regime. Sites (1997) primarily focused on analyzing the weaknesses of urban regime theory, but he nonetheless agreed that New York City government looks to the private sector to act, and that past Mayors have fit classic regime typologies: Ed Koch was a pro-growth entrepreneur, David Dinkins ran a progressive, multi-racial community-oriented coalition, and Rudy Giuliani oversaw a caretaker regime stressing budget stability. Sites offers up a great deal of evidence that the pro-growth regime, particularly real estate developers, were given incentives in the form of tax breaks and development opportunities to help the city achieve certain goals. For example, in 1986, Ed Koch outlined plans for a 10-year, 250,000 unit housing rehabilitation plan designed to benefit low and middle income households, a group for whom a significant housing gap was seen to exist. By the time Koch left office just two years later, however, fully "two-thirds of the housing slated for production under the plan was targeted for market-rate and upper-middle-income housing consumers", a market segment that brought developers a much higher profit margin. Even David Dinkins, who came to office vowing to abolish or reform the Industrial and Commercial Incentives Program providing tax abatements to major corporations and developers, was forced to renew it after the business community announced its passage would be viewed as a key bellwether of the Mayor's attitude towards the local real estate market. Other studies focusing on land-use planning practices in New York over the last 25 years have noted similar trends whereby tax breaks, zoning changes, and property condemnation powers have been exercised or proposed for use by the City on behalf of the local real estate community (Bogdanich, 1986; Fainstein, 2001; Fainstein & Young, 1992; Rayman & Robin, 2004; Roberts, 1991).

The real estate community's involvement in any regime makes sense given "real estate is to New York what oil is to Dallas" (Roberts, 1985). Manhattan's real estate market alone was valued at more than $168 billion in 2003 (Real Estate Weekly, 2003), real estate taxes constitute the largest source of city tax revenues (Samuels, 1997), and real estate managers and developers have long been known for their generous donations to local political campaigns (Bogdanich, 1986; Lobbia, 2000). Fainstein and Young (1992, p 31) also see a logic to the real estate community's involvement in that "New York City's government is embedded in a number of structures that restrain its capacity to produce either an efficient or an equitable city…the governing regime can at best hope for improvement rather than transformation." Policies that result in the construction of ever-larger buildings are thus a manifestation of Mayoral efforts to 'improve' the city.

Who else is in New York City's dominant regime? NYC long been considered a strong union town (Hill, 2003) with more than 288,000 municipal union employees alone (Berkey-Gerard, 2004), not to mention tens of thousands of other trade union members around the city. One need only point to the tremendous city upheaval and political fallout that hurt Mayor John Lindsay after several municipal union strikes in the late 1960s (McFadden, 2000) to understand that local unions hold considerable clout (Malanga, 2003). Weikart (2001) says union power can be seen in how the municipal unions structured their new contracts early in Rudolph Giuliani's tenure, when budget deficits threatened the City. By agreeing to a temporary salary freeze, the unions won a no-layoff pledge from the normally tough-talking Mayor. More peripherally, good government groups like the Regional Plan Association, the Municipal Art Society, Citizens Union, and the Citizen's Budget Commission, all of whom have been around for decades, are still seen as having a place at the table and offering key commentary on planning and development issues (Fainstein, 2001). Their voice is not as loud as it once was, when they fought for and won important changes in the city's political and policy-making structure (Citizen's Union, 2004; Municipal Art Society, 2004), but they nonetheless still lend an important voice to the debate. Finally, Malanga (2003) sees non-profit organizations as having an ever-more-important role, given the City has followed post-Fordist trends of relying on non-government entities to provide important public services. Operating locally, these NGOs have built strong political constituencies that can be called on to combat proposed budget cuts.

Two other important players in the city are the civic group Association for a Better New York and the business group Partnership for New York City. In particular, the Partnership is seen as a voice of the business community on major civic issues (Waggoner, 1980). Established in 1980 by David Rockefeller, then-President of Chase Manhattan Bank, the Partnership has played important roles at many times in the city's recent history, lobbying politicians in Washington on behalf of the city (Campbell, 1981; Kolker, 2001); working to develop housing for middle-income New Yorkers (Daniels, 1982); promoting reforms of the city's public school system (Kennedy, 1998); creating summer job programs for city teenagers and a venture capital fund for start-up businesses (Kolker, 2001); and spearheading corporate energy conservation programs at a time when city power supplies were reaching their limits (Archibold & Fried, 2001). The Partnership's influence has risen and fallen over the years, particularly as the city's business community changed, with many Fortune 500 firms moving their headquarters out of New York City, replaced by international firms with "revolving door" executives who have less interest in getting involved in the "provincial" interests of the city (Fainstein, 2001, p 57). Nonetheless, the Partnership is still seen as having the capacity to command an audience with City and State politicians on short notice, an ability they aggressively employed to help the city recover from the impacts of the September 11, 2001 terrorist attack on the World Trade Center (Metropolitan Corporate Counsel, 2002).

**Environmental Politics in New York City**

New York City's environmental movement has a very fragmented leadership structure, with no hegemonic regime broadly focused on the local environment (M. Bystryn, pers. comm.; A. White, pers. comm.; J. Babbie, pers. comm.). There are several well-known national environmental groups based in the city, namely the Natural Resources Defense Council and Environmental Defense, which regularly weigh in on local environmental political issues. They are viewed as having a highly knowledgeable staff, and the groups enjoy good access to local and national political leaders (Johnson, 2000). New York City-based groups with considerable statewide influence include the New York Public Interest Research Group (NYPIRG) and the New York League of Conservation Voters. NYPIRG is an advocacy organization with strong student involvement at college campuses around the state, while the League sees itself as the political arm of the state's environmental movement, helping to identify and elect public officials with a commitment to a strong environmental agenda (M. Bystryn, pers. comm.). Citywide environmental groups include the Straphangers Campaign, a project of NYPIRG; Transportation Alternatives; and the New York City Environmental Justice Alliance (NYCEJA). Straphangers and Transportation Alternatives are issue-oriented groups, while NYCEJA is geographically focused, working on a range of environmental issues seen as disproportionately affecting low income, predominately-minority communities. There are also scores of community groups who focus on environmental quality issues at the neighborhood level.

Given that New York City covers slightly more than 300 square miles of land, it is no surprise that leadership on issues related to the environment should be fragmented. Tripp (pers. comm.) believes there is a broadly construed "sustainability" agenda in the city, but more often environmental politics has a very localist form as groups attempt to address particular development proposals, transport problems, or the siting of specific waste or energy facilities. Johnson (2000) suggests turf battles are one reason environmental leadership is fragmented, as groups working to empower the local citizenry resent what they see as efforts by the larger environmental groups to 'speak for' the community. These community groups want to be directly appointed to panels advising the City, State, or Federal governments, and thanks to the creation of some formal Environmental Justice Advisory Boards, they now have the right to do so. White (pers. comm.) also sees fragmentation as a "classic affliction of advocacy," where groups have acknowledged expertise and contacts in one policy or geographic area but are less well-versed or networked in others. Recycling and waste management issues are one area where there have been noteworthy citywide campaigns over the years (Miller, 2000), but even here potential solutions have run into conflicts between local groups and the national environmental organizations working on the issue (Harris, 2003; Hershkowitz, 2002). A proposed water filtration plant in the Bronx and the development of a new riverfront park on the Hudson River in lower Manhattan are two other projects where conflicts have arisen between the different groups (Johnson & McKinley Jr., 2003; Martin, 1998).

As suggested by Gibbs and Jonas (2000) in Chapter 3, aside from examining whether there is a separate and distinct environmental regime, it is also it worth considering whether the dominant regime in the city is actively engaged on environmental issues. At first blush, this does not appear to be true, with environmental issues seen more as a peripheral issue than something that regularly attracts the attention of the existing pro-growth business-led regime. That is not to say they have been silent, as different regime members often take a prominent role in advocating for various environment related issues. The Partnership for New York City, for example, has been very vocal in its support for new subway lines in Manhattan and in suggesting economic recovery efforts in Lower Manhattan would benefit from the development of a new multi-mode transit hub (Associated Press, 2002; Rutenberg, 1999). The Partnership was also a leader advocating for the passage of brownfields cleanup legislation (Hammond Jr., 2003), and in 2005 began to seriously explore the viability of a congestion charge program for Manhattan modeled after London's successful scheme (Chan, Marshall, & Rutenberg, 2005). The Real Estate Board of New York was one of the primary backers of the Green Building Tax Credit in 1999, seeing big benefits both for its members and the local environment (M. Davenport, pers. comm.). The Municipal Art Society created the Metropolitan Waterfront Alliance to help promote waterfront access and the increased use of ferries for transportation (Kilgannon, 2003).

Regime members have also adopted positions at odds with local environmental groups. Some believe development of a transit hub in Lower Manhattan could divert funding for the 2$^{nd}$ Avenue subway line extension, a proposal long supported by public transport advocates that only recently was included in the Transit Authority's long-term capital budget plan (Lentz, 2002a). Real estate developers and labor unions were big fans of the "Westway" highway project in lower Manhattan that was strenuously opposed by environmental groups. Critics of the project claimed developers were behind Westway because it essentially represented four miles of choice, new developable land along the Hudson River (Baker, 1985). Labor unions in the city have been frequent supporters of projects opposed by environmentalists, arguing projects like Westway, the Bronx water filtration plant, or new power plants represent significant long-term employment opportunities for their workers and other city residents (Associated Press, 2001; Sargent, 2003; Waldman, 1999).

**The New York Building Congress Energy Committee**

In the course of my New York City fieldwork, I briefly explained my basic theoretical framework to most of the experts that I interviewed, and repeatedly was advised that the Energy Committee of the New York Building Congress was worth examining because of its interest in local energy issues. The Energy Committee's parent organization, the Building Congress, was established in 1921 by members of the city's architectural, real estate development, construction, and labor community to help "all branches of the building industry to work out together their common problems" (New York Times, 1921), and it still fulfills that same purpose today (R. Anderson, pers. comm.). The Building Congress is a voluntary membership organization with more than 350 corporate and trade group members.

The Building Congress' interest in energy issues dates back to its earliest days (New York Times, 1927), but the Energy Committee was not created in the mid-1970s, an outgrowth of concern about the potential impacts of the Arab oil embargo on New York City. Jack Rudin, one of the New York City real estate community's 'royals' (Samuels, 1997), was the driving force behind its development. Due to his personal clout and network, the Energy Committee involves the highest level decision-makers, most of whom come personally to the meetings rather than delegating this task to one of their employees (R. Anderson, pers. comm.). The committee is currently co-chaired by John Gilbert, the President of Rudin Management, a large real estate developer and management firm, and William Harkins, an independent consultant who until recently served as Vice President for Policy at Con Edison. Other committee members include individual companies and organizations involved in the local energy industry, key managers from the City's Economic Development Corporation, and groups such as the Real Estate Board of New York, the Association for a Better New York, the Partnership for New York City, and the New York Building Trades Council. Some of these latter names are familiar since they include groups cited earlier as key members of the pro-growth business regime that helps run New York City.

Over the years the Committee has conducted research and staked out advocacy positions on a number of energy issues. In the 1980s and early 1990s, the Committee spoke in favor of the development of waste-to-energy facilities around the city (Coletti, 1992; Newman, 1983, 1984). In 1994, in the wake of years of adverse publicity about the reliability of Con Edison, the Energy Committee undertook a study that concluded New York had the most reliable electrical service of any major urban area in the country (Real Estate Weekly, 1994). In late 2000 and early 2001, at the behest of the Energy Committee, the New York Building Congress Research Institute funded an energy 'dialogue' hosted by researchers from New York University to identify pressing energy-related issues in New York City (A. Zerkin, pers. comm.). Most notable, however, was the Committee's research and advocacy in 2001 and 2002 of potential electricity supply gap problems. These reports, discussed earlier in Chapter 5 and known as the *Electricity Outlook* reports, cemented the Energy Committee's position as "strong, active" leaders on local energy issues (R.

Miller, pers. comm.), significant players who have filled a void that previously existed on energy policy-making in New York City (R. Scanlon, pers. comm.).

The *Electricity Outlook* reports examined the city's electric supply picture and concluded potential shortfalls threaten the reliability of the local electric system. This information was not necessarily new – as noted in Chapter 5, Con Ed had been making public statements about a potential capacity shortfall for at least two prior years (Perez-Pena, 1999; Sherman, 2000) – but the 2001 *Electricity Outlook* report was the first one to gain much traction among local officials. The report was released naming the Building Congress, the Association for a Better New York, the New York Building Construction and Trades Council, the Partnership for New York City, and the Real Estate Board of New York as signatories. On the 2002 report, a sixth name was added, the Natural Resources Defense Council (NRDC), one of the nation's pre-eminent environmental advocacy organizations, also based in New York City. Ashok Gupta, a former official with the New York City Energy Office, and the head of NRDC's Air and Climate Program, was invited to join the Building Congress' Energy Committee in late 2001, and his support of the Committee's second study was seen as a big boost to its credibility (R. Anderson, pers. comm.).

The Energy Committee has unquestionably had a hand shaping the direction of New York City's energy policies in recent years. During his eight-year tenure in office, Mayor Rudolph Giuliani made just one major direction-setting energy policy address (R. Miller, pers. comm.), after receiving a briefing from the Energy Committee on the results of their first *Electricity Outlook* report (R. Anderson, pers. comm.). The points raised in the Mayor's speech clearly echo themes raised in the Energy Committee report (Giuliani, 2001a), and the speech attracted prominent coverage in local newspapers (Lipton, 2001). In July 2003, Mayor Bloomberg convened a roundtable discussion with the Energy Committee at which he announced the creation of an Energy Policy Task Force. Seven of the twelve task force slots were given to Energy Committee members, including the two co-chairs of the Energy Committee. The Task Force report, released in January 2004, repeated the Energy Committee's call for the construction of more power generation and transmission capacity, the reauthorization of Article X, and endorsed the development of distributed resources[28] as a partial solution to the power supply gap (New York City Energy Policy Task Force, 2004).

**Stakeholders Influencing Renewables Policy and Deployment Decisions in New York City – A Modified Regime Analysis**

On its own, the Energy Committee does not constitute a policy regime because it fails many of the conditions researchers have established as minimum criteria. For example, applying Dowding's structural tests (Dowding, 2001), we see that the Energy Committee fails to satisfy the conditions that a regime must cross sectoral or institutional boundaries and bridge institutions and community interests. As an industry-dominated organization, focused on promoting the common interests of the architectural, construction, real estate, and building trades industries in New York, the Building Congress lacks other constituencies the Mayor's office felt compelled to include when establishing its own task force on energy issues. The Energy Committee also fails Clark's (2001) and Gladstone and Fainstein's (2001) test emphasizing the importance of outcomes, as it has proven itself incapable of delivering on its major energy advocacy campaigns, including the renewal of Article X and its endorsement of waste-to-energy facilities.

That's not to say that New York City lacks for a business-led group that could conceivably qualify as a hegemonic energy regime – Mayor Bloomberg's Energy Policy Task Force. With its clearly articulated vision and strong leadership, the Task Force satisfies many of Dowding's regime requirements. [See Table 7-1.] From a regime perspective the Task Force's failings are its young age – it's been meeting just over two years – and the fact that it has yet to survive any change in Mayoral administration.

The policy agenda endorsed by the Task Force has both new and old elements to it. There is a tremendous amount of overlap between the Task Force report and the old *Electricity Outlook* reports. Both sets of documents have a strong economic

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[28] The Mayor's Task Force defined distributed resources as "clean on-site generation and various methods of energy efficiency and demand reduction" (New York City Energy Policy Task Force, 2004).

orientation, arguing a supply gap could bring tremendous harm to the city's fiscal health. Issues like climate change and public health near in-city power plants receive little or no attention in the *Electricity Outlook* reports, and they are similarly downplayed in the Task Force report. Both sets of documents prescribe similar solutions: reauthorizing Article X, building large new central station plant capacity in or linked to the city, and increasing reliance on distributed energy resources. Newer

**Table 7-1**

**Dowding's Regime Tests Applied to the Mayor's Energy Policy Task Force**

| Test # | Description | Energy Policy Task Force Test Result |
|---|---|---|
| 1 | Distinctive policy agenda | Yes |
| 2 | Long-lived policy agenda | **No** |
| 3 | Must consist of coalition of interests that are not institutional in nature | Yes |
| 4 | Member interests should cross sectoral or institutional boundaries | Yes |
| 5 | Agenda must survive changes in political leadership | **No** |
| 6 | Success depends on mobilization of non-governmental resources | Yes |
| 7 | Has strong, visionary leadership | Yes |
| 8 | Emphasizes public-private partnerships that bridge institutional and community interests | Yes |

strategies endorsed by the Task Force emphasize the City leading by example, an unsurprising difference given that one document was written by a Mayoral task force, and the other was prepared by a largely private sector group that may have been hesitant to lecture the City about getting its own house in order.

The Task Force includes representatives of virtually every key electricity policy stakeholder group at the state or local level, thus satisfying Stone's (2002) requirement that there is no capacity to govern in a direction-setting manner outside regime arrangements. The Task Force also passes Clark's (2001) and Gladstone and Fainstein's (2001) outcome-based test, as there is clear evidence the Task Force has shaped both the local energy agenda and the actions taking place on the ground.

Agenda-setting is very easy to prove, as that was the original reason the Mayor convened the group.

Successful outcomes are also in plentiful supply. Because the group acceded to the Mayor's request to continue its work on these issues, in the spring of 2005 the Task Force released a one-year status report, detailing progress on each recommendation. The Task Force does not claim credit for every new initiative, as much work has been undertaken independently by local and State stakeholders involved in the process. There are several instances, however, where the City has taken action, and there appears to be a strong correlation between these initiatives and policies endorsed a year earlier by the Task Force. Some of the most notable progress on renewables has occurred as a result of the new NYPA contract, which enhanced the City's ability to buy green power. Since the contract was signed, the first major supply deal made by NYPA on the City's behalf calls for the purchase of 20 MW of green power capacity, a massive increase over current supply levels (A. Rosenberg, pers. comm.). The NYPA contract also makes it easier for non-NYPA entities to get involved in renewables projects on City-owned property. Both ideas flow from the Task Force's endorsement of a more diverse power supply and the deployment of clean on-site generation at City agencies (New York City Energy Policy Task Force, 2004, pp 26, 54).

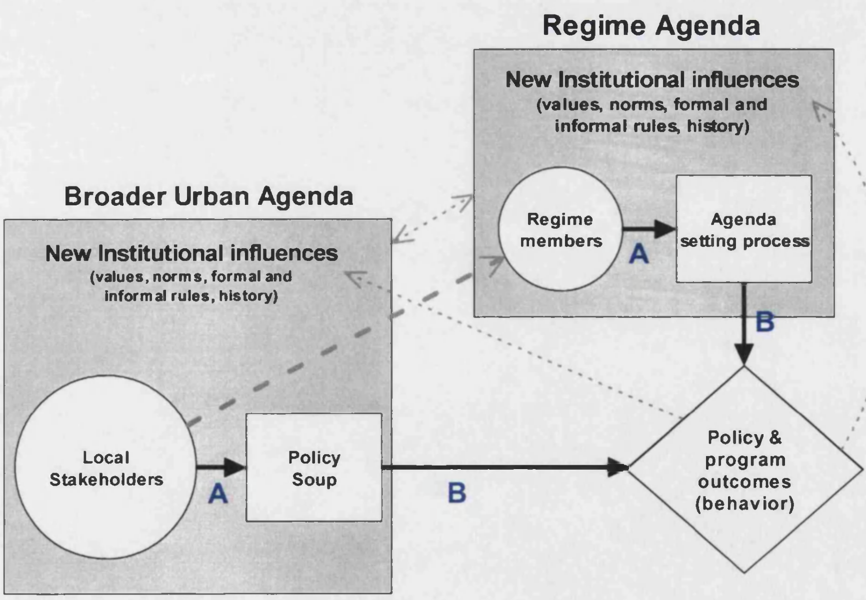
Since the Task Force report came out, the City's Energy Department also successfully inserted many Task Force recommendations regarding distributed resource planning and use into the Con Ed rate settlement that could help increase renewables deployment levels around the city. Of particular note here is the provision requiring Con Edison to pursue 675 MW of distributed resource capacity over the next three years, including 150 MW in load constrained areas of the city (New York State Public Service Commission, 2005a). Con Edison and others stakeholders are currently engaged in an assessment of how this capacity will be achieved – new on-site generation, energy efficiency, peak load management, etc. (New York State Energy Research and Development Authority, working draft). A final plan was expected in late 2005.

**The Logic of Local Action**

The Task Force's many successes still leave open the question of how and why its members agreed to an action plan devoid of any substantive focus on renewable power. Moreover, because the Task Force was formed in mid-2003, there is also the question of why renewables have never seriously registered on the radar screen of local energy policy-makers, dating all the way back to the mid-1970s. Finally, there is the current sparse level of deployment around the city. New Yorkers have known about renewable energy for hundreds of years – so why don't we see more renewables technology deployed around the city?

These are the fundamental questions my modified regime approach was designed to help answer. To set the stage for this analysis, let's turn to Figure 7-1, which is a slightly modified version of Figure 3-2 from Chapter 3.

**Figure 7-1**
**Modified Regime Framework – Observations from New York City**




Distilling ideas presented earlier in the regime section and Chapters 5 and 6, several important things are happening in the grey boxes in this diagram that appear to be causal factors responsible for the absence of renewables from the local energy policy and deployment picture. First, formal rules dating back almost a century have privileged certain stakeholders, namely Con Edison, and disadvantaged others, including the City of New York and those wishing to deploy renewable power schemes around the city. These rules directly influence deployment decisions, as well as the type of policies stakeholders are willing to consider and pursue. Second, values permeate the energy policy process in New York City, with profound effects on deployment and use outcomes. The most critical values influencing local agenda-setting are a least-cost preference, a predilection for voluntary action rather than the imposition of mandates, and a desire for high levels of electric system reliability. I will address each of these below.

Advantage, Con Edison

The notion of privileged status in policy-making is not something people give much thought to because it's often so fundamental, we have a hard time imaging life any other way. In the case of energy policy-making in New York City, Con Edison enjoys a privileged position thanks to the monopolistic nature of the electric power industry. More than a century ago, franchises were granted in specified geographic areas because of the economic and logistical efficiencies a single firm brought to the electricity supply and delivery business. As the industry consolidated, small disparate systems were cobbled together into a large unified network. Over time, technologies changed and demand grew, and the distribution system changed to meet these new circumstances. Occasionally, the old wires and substations failed and needed to be completely replaced; at other times, new systems were layered on top of old systems, creating a grid that is today so technically complex that only the engineers designing and fixing the system fully understand how it works. As the operator of this tangled web of wires and transformers, this detailed knowledge gives Con Edison a highly privileged position, allowing them to make claims that regulators and other stakeholders have difficulty disproving. Using terms from my modified regime methodology, formal rules give Con Edison the capacity to influence which policy options others are able to consider or implement. In Figure 7-1 above, this influence can occur at any of the points labeled 'A' or 'B'.

Take the case of interconnections between renewable technologies and Con Ed's grid. Con Edison has a policy (Con Edison, 2005b, pp 3-4) that expresses openness to distributed power schemes, but can nonetheless prove problematic for those seeking to deploy renewable technologies at their home or business. This policy states:

> **2.0 POLICY ON DISPERSED GENERATION -** It is the policy of the Company to permit operation of on-site generating equipment in parallel with the Company's electric system ... whenever there is no adverse affect on the Company's other customers, equipment, or personnel, while maintaining the quality of service...
>
> Con Edison may identify that a detailed Coordinated Electric System Interconnection Review (CESIR) is required ... to determine the impact of the customer's generation on the Company system and any necessary upgrades or changes to the Company system needed to allow for satisfactory interconnection performance ... The customer is responsible for the cost of any additions and reinforcements to the Company's distribution systems that are required ...
>
> **2.1 PROTECTION RESPONSIBILITY** - ... All protection equipment required to protect and coordinate with the Company's distribution system will be specified by the Company ...

The keys are the yellow highlighted sections. Challenging Con Edison's claims on the equipment necessary to protect the integrity of the local grid can be time-consuming and expensive, harming or killing the project's prospects or anticipated financial benefits (P. Parkhill, pers. comm.). Consultant engineers can be hired to argue or negotiate with Con Edison on the developer's behalf, but even then, there is no guarantee Con Ed will change its mind. System developers can appeal to the PSC for intervention, just as the urban homesteaders did for their East Village wind turbine project back in the late 1970s, but this adds yet more time and expense to the process and there is still no guarantee the PSC will rule in the developer's favor.

As an example, consider the case of the Greenpoint Manufacturing and Design Center (GMDC) in Brooklyn. In late 2002, their installation of a 59 kW rooftop PV system was announced with great fanfare (O'Brien, 2002). The system was not operational for another 18 months, however, the result of a dispute between Con Edison and GMDC over how to handle 'backfeed' from the PV system on weekends when the building was closed[29]. Eventually, and at great expense, GMDC agreed to install a

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[29] On weekdays, the electricity generated by the PV system is completely used up by the electricity-hungry woodworking firms located at GMDC. On weekends, however, these shops are closed, and the power generated by the PV system can potentially exceed the entire electrical load in the building, meaning power can 'leak' back into the grid. Con Edison argued their system was not designed to accept backfeed at that point on their grid, and after much back and forth, it was agreed that the battery system would serve as an acceptable solution.

battery system to absorb this power. The lengthy delay, the cost of the industrial scale batteries, and the cost of the engineers required to redesign, install, and test the new components greatly lengthened the PV system's overall return-on-investment (P. Parkhill, pers. comm.). As a result of this problem, GMDC also cancelled its plans to install a similar size PV system on another building that it owned in the neighborhood.

## New York City: 2nd Class Policy-making Powers?

Contrasting with the privileged position of Con Edison is the regulatorily-weakened state of New York City's policy-making powers. City officials comment as part of any PSC regulatory proceeding dealing with Con Edison or other electricity policy matters of interest to the City, but they do not control the outcome – that authority rests with the PSC. In the case of the Renewable Portfolio Standard, the City's recommendations regarding what should constitute qualifying renewable power sources were ultimately ignored by PSC staff.

Moreover, while Article X was in effect, the State Siting Board had final say over where power plants would be located in New York City, *not* local officials. A host city's zoning preferences are factored into Siting Board decisions (Bahrampour, 2003), but recall that Article X was specifically designed to overcome local opposition to new plants, and the Siting Board had the authority to override local zoning restrictions if necessary. New York City's recent rezoning of Williamsburg was partially done to influence the Siting Board, which was considering an application to build an 1100 MW power plant at a site on the East River. Because Article X expired before the TransGas permit decision was fully resolved, whether the City will ultimately prevail in preventing its construction is far from certain.

City officials are also at a disadvantage when it comes to dispatch rules and the emissions from power plant operations within the city. A prime example here is the 800 MW Poletti power plant in Astoria, Queens. Recall from Chapter 6 that the New York Independent System Operator decides which power sources will feed the statewide grid based solely on day-ahead and hour-ahead price quotes submitted by power generators (New York State Energy Planning Board, 1998); power plant emission levels do not factor into this equation. Because of its low operating cost, for nearly 30 years the NYISO has dispatched power from Poletti to satisfy local demand, despite its acknowledged reputation as one of the dirtiest power plants in the United States (Perez-Pena, 2002). The Poletti plant was one of several in the city that was 'grandfathered,' or allowed to continue operations despite its failure to comply with the 1990 Clean Air Act (Miller, 2003).[30] If the City had more control over emission or dispatch rules, Poletti likely would have been forced out of business years ago. In Figure 7-1, limitations on the City's capacity to act occur at point 'A', as City officials are structurally constrained in their ability to propose or implement utility operating rules beneficial to the city.

How has the City's disadvantaged policy-making powers influenced the direction of its renewables policy agenda? The reticence about renewables displayed by Mayor Bloomberg's Energy Policy Task Force is one example. In Chapter 6 I noted how NYSERDA has lead responsibility for renewables planning in the state, and lots of money to spend on them, thanks to a steady flow of system benefit charge monies. In the future, NYSERDA's renewables funding will grow again, due to the new Renewables Portfolio Standard. Three different Task Force members expressed their belief that because NYSERDA plays such a dominant role on this issue, it was not the Task Force's place to develop a renewables strategy until the PSC concluded its proceeding on the RPS[31], at which point NYSERDA's responsibilities and the City's options would be clearer. In the words of one Task Force member, "Why waste time haggling over this only to find out our suggestions don't fit with how the State is designing their program?" In other words, because of the City's disadvantaged position, the Task Force believed its function was to *react* to leadership or action by others, rather than exerting leadership itself. In modified regime terms, formal rules have constrained the legal standing of the City, affecting its ability to enact certain policies.

[30] The Poletti plant will close in 2008 as the result of an agreement between local environmental groups and its owners, the New York Power Authority, who agreed to replace the facility with a cleaner burning 500 MW combined cycle gas turbine plant that will generate emissions 99% lower than the old plant.
[31] As noted in Chapter 6, the RPS proceeding was concluded in September 2004, eight months after the Mayor's Energy Policy Task Force completed its work.

Values-laden Policy-making

Values have also influenced renewables policy and deployment decisions in New York City in very clear ways. Three are particularly important in this case study: a least-cost preference penalizing more expensive forms of electricity; a preference for voluntary action on renewables deployment rather than the imposition of mandates; and a desire for high levels of electric system reliability which biases policy-makers against technologies that they fear may jeopardize current levels of reliability.

A least-cost preference is a widely accepted cultural norm that has influenced energy decision-making in New York state dating back to the earliest days of electric utilities, when technology and power plant sizing decisions were made with a goal of achieving economies of scale (Hirsh, 1999; Hughes, 1983). Today, we see the concept of cost minimization embodied in dispatch decisions made by the NYISO to feed the statewide transmission grid (New York State Energy Planning Board, 1998). We also saw cost reduction prominently articulated in the 'vision' document used by the Public Service Commission to guide the restructuring of the state's electric industry (New York State Public Service Commission, 1996); in complaints by policy-makers that restructuring has failed to achieve this outcome (McCall, 2001); and in the goals laid out by NYPA in its 2004 request for proposals seeking new power sources for New York City (New York Power Authority, 2004). Finally, least-cost preferences underlie NYSERDA's decision to subsidize renewable power systems around the state, as these subsidies make renewables more cost competitive with other sources of power.

Is cost minimization an important goal for local energy policy-makers? The cost of power was clearly on the minds of City officials commenting on the proposed Renewable Portfolio Standard, as they noted the RPS could have a 'significant rate impact" on in-city consumers as suppliers pass RPS compliance costs on to them (Delaney, 2003b, p 5). More recently, the Mayor's Energy Policy Task Force used the term 'least-cost' or 'cost-effective' nine times when declaring the criteria for strategies the City should adopt over the next five years (New York City Energy Policy Task Force, 2004). In 2005, the City Council considered a proposal requiring the City to buy only green power for City agency operations. In his testimony opposing the bill, the Mayor's chief energy policy advisor noted that such power comes at a cost premium, which should be compared against alternative energy investments, such as energy efficiency technology and demand reduction efforts. Ultimately, he noted that "each dollar invested in energy efficiency upgrades will conserve more fossil fuel and therefore protect the environment more than the same dollar invested in renewable energy sources" (Quiniones, 2005). In Figure 7-1, these concerns manifest themselves at point 'A' as the City is self-censoring the options it is willing to pursue.

Looking beyond the policy arena, there have been many instances where proposed renewable power system installations in the city have been delayed, cancelled, or reduced in scope because the cost exceeded a certain price point. The decision to abandon the installation of solar panels on the Citicorp Tower back in the 1970s was based entirely on a cost comparison with power from the existing electrical grid (Tucker, 1977). The New York City Housing Partnership, a non-profit developer of low and middle-income housing, says the high cost of installing photovoltaic systems, when combined with strict limits on how much the units can be sold for, creates strong disincentives against their use on new Partnership housing construction projects (P. Noonan, pers. comm.). A proposed 72 kW installation on a new housing development in Brooklyn was cancelled once anticipated State subsidies failed to materialize, as the developer believed the cost of the system would not be fully recouped at the time the units were sold (L. Bluestone, pers. comm.)

Return-on-investment considerations have historically been even more problematic for renewables projects on City-owned buildings, due to the below-market price the City paid the New York Power Authority for its electricity. On the one hand low prices were good news for local taxpayers, but it was bad news for renewables advocates because it extended the payback period of City-sponsored renewables projects by as much as several decades (J. Krieble, pers. comm.). When the NYPA contract was renegotiated in 2004, the rate the City paid for electricity increased dramatically (New York Power Authority, 2005), so some of the disincentive against renewables has disappeared. NYPA rates are still below the average market price in the city, however, meaning the disincentive has not disappeared entirely.

A second key value shaping local energy policy-making is a preference for voluntary action on renewables deployment rather than the use of mandates. This policy preference has permeated the City's approach with both the public and private sectors. Since 1999, City agencies have been encouraged to incorporate 'high performance' (or green) design principles into City-owned or financed construction projects. Renewables were one of many issues covered in the design guidelines prepared by the Department of Design and Construction (DDC). The guidelines were not intended to be prescriptive, however, but rather a menu of ideas that consultants and architects advising the City could voluntarily draw from when designing a new building or retrofit project (J. Krieble, pers. comm.)

Between 1999 and early 2005 DDC undertook 25 High Performance Design projects (New York City Department of Design and Construction, 2002, 2005); three of these projects have incorporated renewable power systems of some kind, generally solar PV. In 2005, the City changed course, agreeing to require Leadership in Energy and Environmental Design (LEED) certification[32] on all City-funded construction projects exceeding $2 million in value (Hu, 2005). Like the high performance design guidelines, however, LEED does not require renewables use to achieve certification, meaning the number of projects deploying renewables thanks to this policy may ultimately be negligible.

The City's preference for voluntary renewables deployment and use extends to the residential and business sectors. EDC's 2005 statement announcing the purchase of green power for the City-owned Brooklyn Army Terminal complex was the Bloomberg administration's first public comment on the subject of green power. Because this purchase was touted as an example for others to follow, we can infer the Mayor prefers households and businesses to arrive at similar decisions on their own. A more aggressive policy involving a mandate is unlikely, argued one Task Force member, as deployment mandates "have never – and likely would never – be considered acceptable policy" in New York City. Another Task Force member

[32] LEED is an internationally-recognized set of green design protocols that focus on issues very similar to those covered by DDC's High Performance Design Guidelines. Points are awarded for different green design elements; to achieve certification, some minimum point threshold must be achieved. On-site renewables generation contributes points towards the overall score; high scoring building projects can achieve Silver, Gold, or Platinum status in recognition of their achievement.

echoed this view, suggesting a proposal mandating renewables deployment on new construction projects would be "dead on arrival" at City Hall.

Noonan (pers. comm.) says such views stem from the fact the local real estate community already groans under the weight of construction costs 25% higher than those of neighboring communities. In her view, incentives like the Green Building Tax Credit or zoning bonuses would prove far more effective at inducing the real estate industry to act. It is worth noting, and somewhat ironic, that these views persist despite the success of a renewables mandate on new construction projects in Battery Park City, a waterfront development just blocks from City Hall near the old World Trade Center site. Battery Park City is managed by the Battery Park City Authority, a State agency, which in 2002 developed environmental guidelines that included a requirement that new commercial buildings generate at least 5% of their base load power from building integrated solar panels. At least 30% of the building's power must be derived from renewable sources (Battery Park City Authority, 2002). Similar rules were issued in 2003 for new residential building projects (Battery Park City Authority, 2003). Two buildings have been built thus far using these guidelines, while more are planned.

A third societal value of critical importance in local policy-making regarding renewable power is a desire for high levels of electric system reliability. Over time, the city has developed in ways that make a consistent supply of power a virtual necessity. The city's electric-powered subways run 24 hours per day, as do the elevators carrying tenants to the highest floors of the skyscraper apartment and office buildings that dot the city. Elsewhere around the world, the use of renewable resources has been criticized because electricity is only available when the wind blows or the sun shines. Excess reliance on renewable power has thus been characterized as jeopardizing the overall reliability of the power grid, because power may not be available when it's needed (Massey, 2005). In New York City, the reliability debate has followed a different path, centered on the way interconnections of renewable power systems can reduce system reliability because the grid was not designed with distributed power sources in mind.

In their interconnect guidelines, and in public presentations describing interconnect issues, Con Edison officials and other local experts therefore spend a great deal of time discussing ways to reduce any risks associated with interconnections (Con Edison, 2002; Cronin, 2004; Koenig, 2004). Con Ed's emphasis on reliability is quite understandable – their job is to deliver power wherever and whenever New Yorkers need it. This isn't just a corporate mission statement, however – it's actually one of many Electric Service Standards formally imposed on Con Ed by the PSC (New York State Public Service Commission, 1991). Failure to achieve these standards can result in fines, such as the $1.9 million penalty imposed on Con Edison for a 1999 blackout in upper Manhattan (New York State Public Service Commission, 2002).

Electric system reliability is also of great interest to labor and real estate interests in the city, as their success is rooted in the success of the local economy. When electricity – the life blood of the city – stops flowing, the financial consequences can be huge (Healy, 2003), and businesses may think twice about staying, relocating to, or expanding their operations in New York City. These impacts ripple out, affecting the real estate and building trades sectors. Therefore, when Con Edison professes concern that the use of renewables and other forms of distributed generation can lead to reliability problems locally, those with a vested interest in electric system reliability pay attention[33]. As one Task Force member noted, lacking the technical expertise sufficient to contradict Con Edison's claims, New York's real estate community "tends to acquiesce" to Con Edison's preferred position on technical matters. This is because if Con Edison is forced to accommodate system changes proposed by outsiders, and the changes don't work out as planned, the financial consequences to the real estate community could be disastrous.

The *Electricity Outlook* report's emphasis on the need for additional large, central station power plant capacity in the city can thus be viewed as a form of technology 'lock-in' (Unruh, 2000), where we find it difficult to move beyond current technology because the design of the system itself (i.e., embedded assets like wires, relay switches, and substations) limits opportunities for change. This lock-in results from

[33] We know that reliability has been a long-time concern of the city's leading business interests by virtue of the fact that the Building Congress Energy Committee undertook a study comparing Con Edison's reliability with utilities in other U.S. cities back in 1994 (R. Anderson, pers. comm.)

the shared fears of powerful real estate interests that any attempt to dramatically alter the current system can potentially harm their short and long term economic interests. Thus, they prefer generation capacity that is readily compatible with the existing Con Ed network system design, and work to support policies that promote this type of technology. Because several of these same Building Congress Energy Committee representatives served on the Mayor's Energy Policy Task Force, the Task Force's conclusions may have been similarly influenced.

**Conclusion**

Although the renewables policy scene in New York may not represent the definitive example of an urban regime in action, the robustness and enhanced explanatory power of the modified regime model was validated in its application to this policy environment. There are clear links between who participates in local energy policy-making, and the content of local policy. The Mayor's decision to include Building Congress Energy Committee members on his Task Force was critical in this regard, as there is strong evidence that their participation steered policy towards maintaining the status quo electricity generation and delivery system design. There are also clear links between underlying values or formal rules and policy and behavioral outcomes. These links influenced whether local stakeholders tried to (or believed they could) exert leadership on an issue, or whether they let State policy-makers set the agenda.

It is still too early to know whether the Mayor's Energy Policy Task Force has staying power on energy issues, or if it will survive another four years and be embraced by a new mayor once Michael Bloomberg is term-limited out of office in late 2009. Circumstances can quickly change in local electricity markets, and a decision to build or finance one or two large new power plants in the city could diminish Mayoral or stakeholder interest in the Task Force. Large new supply sources could also undermine interest in the wider electric policy agenda developed by this Task Force. Efforts promoting distributed resources, including costly clean on-site generation, are perhaps most vulnerable to a sudden change in the supply landscape. Task Force and other planning documents already assume these strategies will make less of a contribution to 'solving' the supply gap than large new in-city, central station power plants or new transmission lines bringing power from outside the city. Will the current Task Force consensus to support small distributed resource projects evaporate once larger projects win approval and are under construction? Or are current efforts promoting distributed resources just the beginning, and as these programs deliver results, support for them will grow even greater? Will renewables be part of this distributed resources equation, or will efforts focus on micro-gensets or energy efficiency programs? These are important questions that bear watching as they will only be answered with the passage of time.

In general, I believe the near term prospects for renewables in New York City appear rather dim. Deployment levels around the city are extremely low right now, particularly in comparison to overall electricity demand, and nothing in my research points to much momentum change in the near future. This is noteworthy primarily because there does seem to be significant policy-making activity underway in the city on electricity matters – renewables simply aren't part of the game plan. Cost is a key factor. As the City's Chief Energy Policy Advisor noted in his testimony to the City Council in February 2005, on a dollar-for-dollar basis, the City gets a bigger payback for money spent on energy efficiency or demand reduction programs than it does on renewables. To the extent we do see action on renewables, by either the public, commercial, or residential sectors, it will likely occur only when renewable power projects either become more cost-competitive, or because non-cost arguments (e.g., educational value, climate change benefits, etc.) are given extra weight in the decision-making process. The City does not appear engaged on this question, leaving it to the State to grapple with renewables cost issues.

One State-led solution worth watching will be the effect of the Renewables Portfolio Standard on New York City. Most of the RPS money can be expected to go to large projects constructed in remote areas of the state with good access to either biomass or wind resources. NYSERDA does have the option, however, of spending funds on 'behind the meter' projects, displacing retail demand rather than delivering supply into the wholesale markets. Such funding could boost solar PV and small wind projects in New York City, as they provide both the climate change benefits sought by the RPS as well as some financial relief in load constrained areas. NYSERDA funding for the RPS will be sizable, and the Energy Task Force may wish to begin planning to ensure that the city gets its rightful share of these funds.

Aside from these market implications, is there other information we can gleen from this case study? One thing we can now do is answer the three questions posed by Gibbs and Jonas designed to help us improve our understanding of how regimes work. First, there was the question whether regime behavior in a city can be linked to larger trends emphasizing local action on sustainability and/or climate issues. In New York, this doesn't appear to be the case. The best example of an environmental regime policy agenda – the 2004 Mayor's Energy Policy Task Force report – is not simply devoid of any discussion of these issues, it explicitly renounces any intention to do so. The 2001 and 2002 *Electricity Outlook* reports were similarly silent about larger trends, never once using the terms climate change, global warming, or sustainability. In all three documents the focus on local electricity market conditions was quite clear, as were the solutions required to address the city's anticipated electricity shortfall. To the extent there was any discussion of environmental issues, they were raised in a strictly local context: for example, the 'repowering' of old power plants with newer, cheaper technologies meant "the city will enjoy the concurrent environmental benefits of reduced air emissions" (New York City Energy Policy Task Force, 2004, p 11). The City is developing a sustainability plan for its local government operations, but that process is moving slowly, and it is unclear how comprehensively the plan will address energy matters.

A second question posed by Gibbs & Jonas asked whether pro-growth regimes can simultaneously act as the local environmental/energy regime, or whether a separate coalition must address such issues. Assuming the Mayor's Energy Policy Task Force will continue its work long into the future – and given its record to date this appears to be a safe bet – then we can conclude the pro-growth and energy regimes in New York City *are* one and the same. This is no real surprise given that energy can be a huge cost center for a business or real estate management firm. Businesses also care about high levels of electric service reliability because even short-term losses from a blackout can be costly (Teather, 2003). Finally, even though a landlord or building manager may not be directly responsible for a power outage, they will bear a disproportionate impact if unreliable electric service drives their tenants out of the city. All of these factors support the idea that energy is a fundamental element of a pro-growth policy agenda, deserving of significant attention by the local business community.

Looking beyond energy issues, however, it is not clear whether New York's hegemonic regime exerts comparable influence over other environmental policy agendas. Early in the chapter I described how there was less unanimity among regime members on the broader set of environmental topics, with each group focusing on topics closely aligned with their core competency or sectoral interests. The more an environmental issue crosses sector boundaries and directly links to the core interests of multiple stakeholder groups, the more likely we are to see regime interest and activity.

Whether a coalition actually forms may also hinge on whether the business community sees an issue as purely a governmental function (e.g., sewage treatment). In this case, stakeholder groups may be silent or inactive until there is a problem or crisis that will adversely affect them. The decision to prepare the first *Electricity Outlook* report in 2001 was made for those very reasons. The city's electricity situation was close to crisis, and the Building Congress Energy Committee felt compelled to act to ensure that local and state government were fulfilling their public responsibility in this policy area (R. Anderson, pers. comm.)

A third question posed by Gibbs and Jonas focuses on the underlying conditions that lead individual stakeholders to coalesce around environmental issues, and whether these conditions ultimately shape the character of the coalition. Just a few pages ago, I noted this very point when discussing how – thanks to electricity market restructuring – the Mayor was essentially forced to convene a broad coalition of stakeholders if he had any hope of making progress on energy policy matters. One conclusion we therefore can draw is that regime formation is partly contingent upon a city's capacity to act. Stone (2002) noted this phenomenon several years ago, when he said that if government alone can set and maintain a particular policy direction, then a regime won't exist, as there is no need for collaboration with others. On the other hand, if there are policy or regulatory constraints imposed by the state or federal government that limit a city's decision-making authority, or imbue certain non-governmental stakeholders with specialized knowledge or assets, then regime formation is more likely because these are the groups government must partner with to ultimately deliver its agenda.

Besides creating the fundamental conditions that support regime formation, such constraints also influence how the regime operates. In this case study we saw situations where rules and values formed boundaries on stakeholder behavior: certain technologies were emphasized over others, and local decision-makers felt obliged to defer to state-level agencies rather than exercising independent decision-making authority. To advocates of renewable power use, these constraints can be seen as having a negative influence on the deployment of renewables around New York City. Policies limiting behavior are not necessarily unique to cities with a regime, however, as rules and values can constrain behavior in *any* municipality. What is important is that we recognize this situation can exist, and use tools like my modified regime framework to ascertain exactly how these constraints are changing behavior in a city.

In the next three chapters I turn my attention to London. Following the same format used here, I explore the policy and market context for renewables in Europe's financial capital and largest city. There are many similarities between London and New York, although the policy environment is completely different, with London adopting a much more expansive view and aggressive tone with its recently released energy strategy. Renewables are also much more visible on London's energy policy radar screen, making it an excellent choice on which to apply my modified regime framework a second time. In Chapter 11 I will compare my findings from both cases, distilling general lessons about renewable energy policy-making in urban areas and offering concluding comments about the robustness of my modified regime model.

**CHAPTER 8**
**London case study: the Historical and Market Context**

## Introduction

London offers an interesting contrast to the situation in New York. Both cities have roughly the same population and share 'world city' status. Like New York, London was home to some of the earliest innovators in electric power system design, and the early electric power marketplace in both cities was quite chaotic. Today, the market fundamentals are again similar, with each city served by two regulated monopolies responsible for managing and maintaining the local electrical grid in geographically distinct areas of the city. Multiple firms compete for the right to supply power over these lines. Power demand in both cities is very high, although London's demand peaks during the winter while New York City's peaks during the summer months. Both cities also share a legacy of limited action on renewables in the 1970s, 1980s, and 1990s, and as a total share of the city's energy supply, renewable power plays only a minor role.

This is where the stories begin to diverge, however. Since 2001, London has seen a flurry of activity on energy issues, thanks to Central Government support of background research into the potential for renewables in London and efforts by Mayor Ken Livingstone and the Greater London Authority (GLA) to develop a comprehensive Energy Strategy for the city. As part of this strategy, the Mayor has developed explicit renewables deployment targets he hopes to achieve by 2010 and 2020. Relying largely on funds from Central Government and the private sector, the Mayor has also created public-private partnerships he hopes will lead the city's renewables deployment efforts and undertaken surveys on the public's knowledge of and interest in renewable energy issues. In other words, unlike New York, London has an active interest in renewables issues, and appears poised to achieve real gains in their deployment and use around the city.

This story is explored over the next three chapters, following the same order as the New York case study. This chapter provides background information on the structure of London's electricity marketplace, reviewing changes from its early origins through nationalization, market liberalization, and the current day. For contextual purposes, this chapter also includes information on how much electricity Londoners use, where it comes from, and how much it costs. The research that formed the basis for the Mayor's renewables deployment targets is briefly reviewed, along with separate data I compiled examining the cost structure of different types of renewable technologies. This information all paints a rather bleak portrait of the current renewables market in London, with low deployment levels and high costs. Londoners do have several green power options available – referred to in the UK as green tariff plans – but as in New York, uptake appears low. The progress called for under the Mayor's Energy Strategy therefore requires overcoming the obstacles that have impeded deployment and use to date.

This market data serves as a lead-in to Chapter 9, which examines the energy policy context at both the Central Government and local level. Finally, in Chapter 10, I apply my modified regime framework to these facts to attempt to explain why London has historically not seen a great deal of renewables use. Chapter 10 will also examine why the Mayor has structured his Energy Strategy in certain ways as he looks to increase renewables deployment levels in the future.

**Electricity in London – An Early History**

Home of some of the earliest innovators with electricity and power generation technology, London swiftly took to the use of electric power. Just a decade after electricity was first introduced to the city, London had more than 473,000 incandescent lamps lit by power from central power stations, more than six times the number in Berlin, and seven times the number in Paris, two cities noted for their electricity use (Hughes, 1983). In 1888, construction began at the Deptford electric power station alongside the Thames, featuring what was at the time the world's largest electric generating equipment. Throughout London, scores of utilities operated, managed by both private entities and Local Authorities. Critics found much to complain about, however. The 1882 and 1888 laws authorizing electric utility franchises resulted in a plethora of small utilities that had little in common with each other, relying on different technologies and delivering electricity at different frequencies, voltages, and wildly differing prices. The "retrograde" (Hughes, 1983, p

228) state of London's electricity system alarmed the public, industry experts, and Government officials alike, who believed the system was unbecoming of London's turn-of-the-20th century status as the world's largest and most important city.

Noted electric industry historian Thomas Hughes (1983) argued politics was the root cause of London's problems, rather than technology issues. The power to grant utility franchises was shared between Local Authorities, the London County Council, and the British Parliament. The Institute of Electrical Engineers complained that politicians chose to follow "arbitrary boundaries, mostly of medieval origin" when establishing franchises, limiting the potential for rational decisions regarding the distribution and growth of electrical systems (Hughes, 1983, p 233). Rationality was also hampered by the fact that, although the sector was sizable, most of London's manufacturing firms were small, lacking the big electricity-hungry machines that drove up demand and made utility consolidation necessary in other cities. The various underground transit systems in London were also slow to change over from steam to electric power, another critical factor driving industry growth in other cities.

In 1914, a new effort was made to consolidate utilities across Local Authority boundaries, but this proposal was strenuously fought by local officials fearful of losing control over the 65 electric utilities and 70 power generating stations then in operation around London (Hughes, 1983). After World War 1, concerns over limits the electrical system had placed on the wartime economy led to efforts to integrate electrical networks across the country. These changes came slowly, however. In 1927, the Central Electricity Board was established, with new powers to develop larger power stations and a comprehensive transmission network across the UK. The CEB endorsed a proposal to build 118 large power plants and close hundreds of smaller, less efficient facilities. But when it came time to implement this plan in London, the CEB backed off, arguing that several smaller facilities that had recently been built operated almost as efficiently as the proposed larger facilities, so it didn't make financial sense to shut them down (Hannah, 1979).

What the CEB failed to accomplish in London, however, private utilities began to do on their own. In 1935, six electricity distribution firms merged to form a new company, Central London Electricity, which would draw its power from the new

Battersea power station under construction along the Thames (Hannah, 1979). The County of London Company, another large operator, purchased more than a dozen smaller electric supply undertakings to the south of the city, crossing geographic boundaries and giving it a large presence throughout the southeast of England. When the electric industry was finally nationalized in 1947, mergers such as these had a big influence on how the local regulatory scheme was structured. London was divided among four separate Electricity Boards, following the boundaries of the largest utilities operating in London prior to nationalization. The new Electricity Boards rationalized electricity services throughout their respective service territories, closing down small and inefficient generating stations and building larger and increasingly efficient facilities. By 1966, there were just 34 power stations in Greater London, at 25 locations, which collectively supplied 85% of the city's power needs. Over time, this number dropped dramatically. By 1978, there were just 11 power stations in operation (Greater London Council, 1981, pp 93, 99), and today, just two large power plans operate in the city: a 1000 MW facility at Barking in East London, and a 392 MW facility at Enfield in North London (National Grid, 2004). Both plants are natural gas-fired.

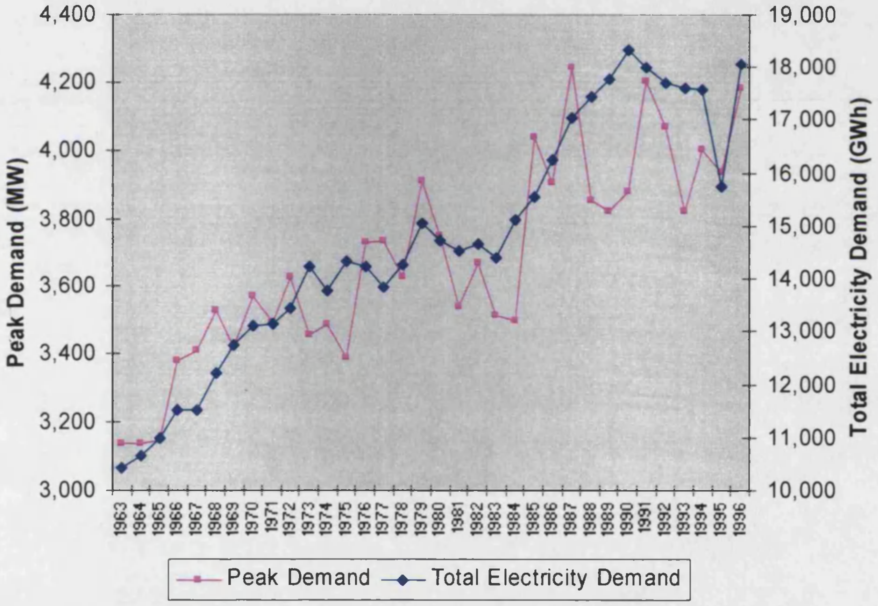
### Electricity Demand in London

With the exception of brief periods during the mid-1970s and mid-1980s when power demand leveled off, electric power use in London has increased annually for most of the past 50 years, as it has nationally. Figure 8-1 charts the total electricity demand (in gigawatt-hours, or GWh) in the central London area formerly served by the London Electricity Board for a thirty-year period ending in 1996[34]. The peak electricity demand recorded each year is also noted; this typically occurs during the winter, reflecting high demand from electric heating systems. London Electricity Company, which took over the London Electricity Board's grid operation post-liberalization, reported demand took one of largest dips in the 1990s, likely a result of large commercial and industrial customers taking advantage of the opportunity provided by market liberalization rules to switch electricity service providers.

[34] More recent data is not available, as this information is no longer reported to or tracked by the Government.

The overall increase in demand occurred despite a dramatic drop in industrial power use in London. During the 1960s and 1970s, the city lost more than 600,000 manufacturing jobs, a result of UK policies designed to shift these jobs from the capital to other parts of the country (Greater London Council, 1981). The decrease was more than offset by growing commercial and institutional power use, however, driven by the 1980 and 1990s boom in the financial services sector and the accompanying growth in large new office developments in the Docklands and the City of London (London Research Centre, 1993). No information was available which offered projections of future demand trends in London.

**Figure 8-1**
**Electricity Demand in Central London 1963-1996**
**(London Electricity Board Service Territory)**
Source: Extrapolated from London Electricity Board/London Electricity Annual Reports

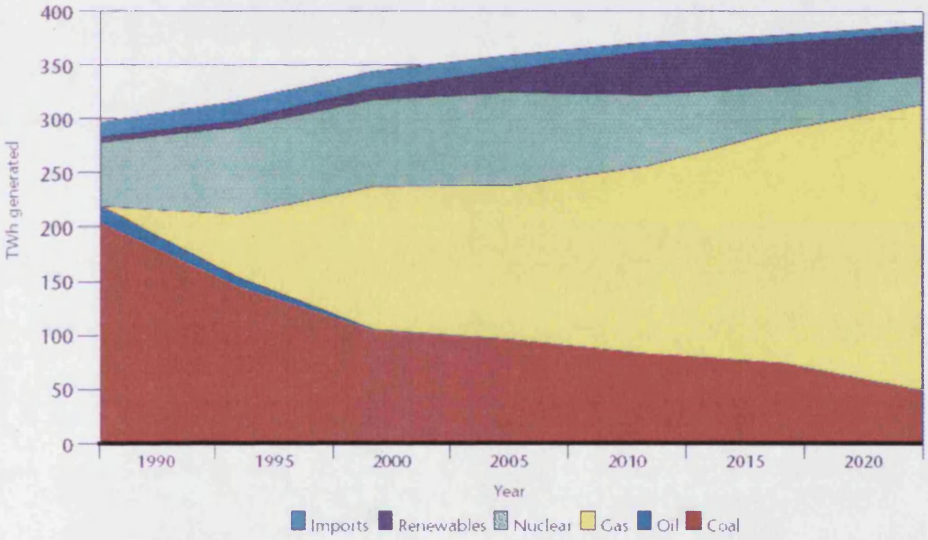



**Power Sources**

Over the last 25 years, there have been big changes in how the UK generates its electricity. As shown in Figure 8-2, today most power comes from natural gas-fired facilities, a trend that is expected to become more pronounced over the next 20 years (DTI, 2003a). The oft-characterized "dash for gas" (Helm, 2003, p 4) has been attributed to a variety of factors (Gorini de Oliveira & Tolmasquim, 2004; Helm, 2003; Winskel, 2002):

- the Government's efforts to force its use to help break the power of the coal unions;
- the comparatively modest cost of new gas power plant construction, along with lower supply and operating costs;
- concern over the environmental impacts of coal use;
- an interest by regional Distribution Network Operators (DNOs) in diversifying supply options; and
- aggressive efforts by new firms to enter the power supply marketplace.

**Figure 8-2**
**UK Power Sector Fuel Mix 1990-2020 (DTI Projections)**
Source: (PIU, 2002, p 58)




Coal has been the primary loser in this supply switch, dropping from a 74% share of power production in 1983 to just 35% in 2000 (Gorini de Oliveira & Tolmasquim, 2004, p 1273). The increase in natural gas use has been so significant, however, that concerns are now raised over whether the UK is *too* reliant on this supply source. Thus far, most of Britain's natural gas supply has come from the North Sea gas fields, but they are now at peak production, and the UK is expected to become a net importer of gas by 2006, raising security of supply concerns. By 2020, more than half of UK gas imports are expected to come from Russia, where supplies are seen as highly vulnerable to disruption. Given that UK gas storage facilities only provide a 14 day supply buffer, electricity supply shortages could be quite severe (House of Lords Science and Technology Committee, 2004).

As power plants have closed around London, the supply gap has been filled by power imported from outside the city. In 1999, imports accounted for roughly 60% of London's electricity supply (Greater London Authority, 2004a, p 12). As a result, London's power supply sources now closely mirror national trends.

London also receives a portion of its electricity supply from a variety of smaller power generation plants around the city that are 'embedded' into the high voltage transmission system. These include a 5 MW diesel generator at BBC studios in London, a 17 MW gas-fired generator at NatWest Bank, and a 31 MW waste-to-energy facility in South London (National Grid, 2004). Many of these facilities, which collectively have a rated power generation capacity of approximately 480 MW, were originally built as back-up power supplies, but increasingly they are used as a primary power source for the host facility. Many also have excess capacity, meaning that in addition to covering the facility's power load, they generate surplus power that can be fed into the grid. National Grid Transco estimates that during peak electricity demand periods, these embedded generators can export up to 141 MW of capacity. London also relies on electricity generated by Combined Heat and Power (CHP) schemes operating around the city. The Greater London Authority (GLA) estimates there are approximately 140 CHP schemes in operation, with a combined electrical generation capacity of 175 MW of power (Greater London Authority, 2004a, p 14).

A small fraction of London's power is currently derived from renewable sources. A study completed by the London Research Centre in 2000 estimated that 2.5% of London's power was derived from renewables. However, that analysis included energy from solid waste and sewage sludge combustion[35] as a renewable resource (London Research Centre, 2000, p 17); if one were to limit the calculation to the narrower definition of "new" renewables (solar, wind, small hydro, tidal, geothermal, landfill, and sewage gas), then only power obtained from a 6 MW landfill gas

[35] There is historical precedence for this approach, as energy studies completed by the Greater London Council in 1978 and 1981 both characterized energy recovery from waste combustion as a renewable resource. (Greater London Council, 1978, 1981)

operation in East London and anaerobic digesters at several Thames Water sewage treatment facilities would qualify. In 2001, the Energy Technology Support Unit (ETSU) undertook a study of the current and potential deployment of renewable technologies around London (ETSU/AEA Technology, 2001a). This study was part of Central Government's efforts to understand how different regions of the UK could contribute to the delivery of national renewable energy targets. ETSU found a very modest "new" renewables sector, made up of a small number of solar PV, small wind and hydro projects scattered around the Greater London area that were providing on-site power to homes and businesses.

**Table 8-1**
**Total Annual Energy Output from Renewable Energy Schemes in London**
Sources: (ETSU/AEA Technology, 2001a; Greater London Council, 1978, 1981; London Research Centre, 2000)

| | 1978 GLC study | | 1981 GLC study | | 2000 LRC study | | 2001 ETSU study | |
|---|---|---|---|---|---|---|---|---|
| | # of systems | Total output | # of systems | Total output | # of systems | Total output | # of systems | Total output |
| **Energy from Waste** | 1 | 150 GWh | 1 | 150 GWh | 17 | 60 MW (installed capacity) | 2 | 256 GWh |
| **Sewage gas** (includes both combustion of gas from anaerobic digester system + sludge incineration) | | | 8 | 155 GWh | 8 | 170 GWh (from estimated 21MW installed capacity) | 7 | 94.9 GWh |
| **Landfill gas** | | | | | 1 | 6 MW (installed capacity) | 1 | 64 GWh |
| **Solar PV** | | | | | ? | 0.2 MW (installed capacity) | 50+ | 0.39 GWh |
| **Small wind turbines** | | | | | | | 5 | 0.0002 GWh |
| **Large wind turbines** | -- | -- | -- | -- | -- | -- | -- | -- |
| **Small hydro** | | | | | | | 1 | 0.044 GWh |

Since the ETSU report was completed, the number of new renewables projects in London has grown. Some of these, like the two large wind turbines installed at the Ford Estate in East London, have attracted considerable attention and now serve as energy icons in London (Brunton, 2004). The Beddington Zero Emission Development (BedZed) in South London is another well-known project that relies on solar photovoltaics and a biomass-based CHP system to provide electricity for the 82-home development. Table 8-2 lists many of the larger projects that have been installed or proposed in the Greater London area since the ETSU study was completed. Collectively, they have given London more than 4.5 MW of installed "new" renewables capacity.

**Table 8-2**
**Recent or Proposed Large Renewable Power Projects in Greater London**
Source: original research, October 2004

| Project Name/Location | Technology | Peak System Capacity | Actual/ Anticipated completion date |
|---|---|---|---|
| Beddington Zero Emission Development (Sutton) | Solar PV<br>Biomass CHP | 109 kWp solar PV<br>135 kWp CHP | 2002<br>2002 |
| Ormiston Wire (Hounslow) | Solar PV<br>Small wind turbine | 10 kWp solar PV<br>2.5 kWp wind turbine | 2003 |
| Center for Engineering and Manufacturing Excellence (Dagenham) | Solar PV | 115 kWp | 2003 |
| Insolvency Services (Bloomsbury) | Solar PV | 25.4 kWp | 2003 |
| Shell Electric Storm (Southwark) | Wind turbine | 130 kWp | 2003 (temporary installation only |
| Trinity Buoy Wharf | Solar PV | 15.4 kWp | 2004 |
| Ecotricity/Ford (Dagenham & Barking) | Wind turbines | 3.6 MWp | 2004 |
| Eastlea Community Center (Newham/Westham/Plaistow) | Solar PV | 12.5 kWp | 2004 |
| Thames Valley University (Ealing) | Small wind turbines | Two 2.5 kWp wind turbines | 2004 |
| Vauxhall Cross Transport Interchange (Lambeth) | Solar PV | 30 kWp | 2005 |
| London Fire and Emergency Planning Authority (Richmond fire station) | Solar PV | 23 kWp | 2005 |
| London Science Museum (Kensington) | Solar PV | 25 kWp | 2005 |
| Spitalfields Bishops Gate (City of London) | Solar PV | 20.9 kWp | 2005 |
| Clapham Park Estate (Lambeth) | Solar PV | 100 kWp | Unknown |
| Vauxhall Tower (St. Georges Wharf) | Building integrated wind turbine | Unknown (total generation = 16-20,000 kWh/year) | Unknown |
| Mile End Park | Solar PV | 100 kWp | Unknown |
| Ladbrook Green/Canalside (Kensington/Chelsea) | Solar PV | 200 kWp | Unknown |

Actual deployment trends have generally matched recent analyst projections of what is economically and technically feasible in London. In the late 1970s, the only renewable technologies seen as having significant prospects in London were solar thermal systems to provide water and space heating in domestic buildings, offices, and schools (Greater London Council, 1978). Over the next fifteen years, many other schemes involving renewable technologies were put forward, but little was actually implemented, so in 1993 the London Research Centre suggested research should be undertaken to rigorously examine the potential for renewable energy in London (London Research Centre, 1993).

Two such studies were completed in 2000 and 2001. The first, by the London Research Centre offered general commentary on different technologies considered most appropriate for London, based on experience gained deploying these systems elsewhere. The electric power technologies considered included solar PV, wind power, geothermal power, energy crops, landfill and sewage gas systems, small hydro systems, and Energy-from-Waste (EfW). The latter was by far the most preferred option of the authors, who argued it was a plentiful resource and a proven and cost-effective technology.

The prospects for other technologies were described in sweeping, less optimistic terms. For instance, "there is no prospect of PV becoming economic…in the UK in the foreseeable future" but it could find a potential fit at prestige offices, displacing other forms of exterior cladding (London Research Centre, 2000, p 18). The report lacked depth, however, offering no comparison of the costs of different cladding materials, providing no data on how much prestige cladding was used in London each year, and making no inquiries into how likely developers and architects would be to use this type of material. In a similar vein, small wind schemes were dismissed as being "visually intrusive," with no significant potential, while large wind schemes were seen as difficult to accommodate in densely populated urban areas (London Research Centre, 2000, pp 31, 33). The report did note the potential for an increase in the number of landfill gas schemes and small hydro projects around London, but saw energy crops as having limited applicability locally, given the lack of land on which such crops could be grown. The report concluded that London could generate 10% of its power from renewables by 2010, although it offered no clear path for how to get there, other than to say more EfW was both necessary and achievable.

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The ETSU study (ETSU/AEA Technology, 2001a, 2001b) was more systematic in its approach, compiling data on how much renewable power generation already occurred in London, and then predicting how this would increase by 2010 under three alternative scenarios. Hard data, such as how much recoverable wood was available from manufacturing and tree trimming operations around London, was used to flesh out alternative power generation scenarios, each of which made differing assumptions about how much of this wood could actually be recovered, and how many wood-fired CHP systems could be supported by this quantity of material. In the end, ETSU projected that by 2010, London would generate 0.88% of its power from new renewable technologies deployed within the Greater London region. This figure increased to slightly more than 2% if Energy from Waste was added to the mix. Solar PV, wind turbines, small wind, biomass, and sewage gas systems were seen as having the greatest potential in London of the various new renewable technologies.

**Local Grid Management and Supply Functions**

Operational control of London's electrical system has changed several times over the last century. Prior to nationalization, utilities holding exclusive franchises had jurisdiction over all electricity supply and distribution grid management issues in a given geographic area. After 1947, the four Regional Electricity Boards covering different portions of the Greater London Area were responsible for managing the generation of power in London, as well as operating the local distribution network. When the market was restructured in the 1990s, the Regional Boards were privatized and the network operation functions converted into regulated monopolies. London Electricity took over the network functions of the London Electricity Board, servicing central London, while SWEB, SEEBOARD, and Southern Energy were responsible for managing the network grid in London's outer ring. Due to recent mergers, a French company, EDF Energy, now owns London Power Networks, the Distribution Network Operator responsible the grid in over 75% of the Greater London area. Scottish and Southern Energy serves as the DNO for southwestern London.

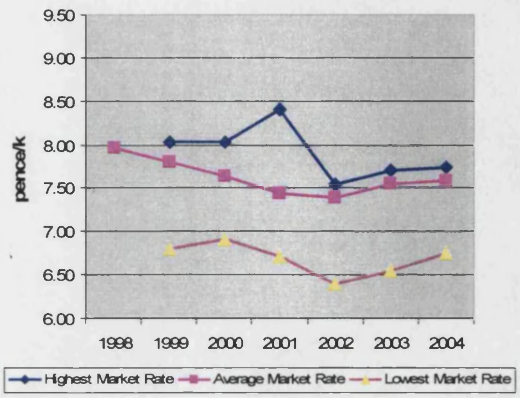
Although the DNOs manage the network grid, customers are free to choose from among many different electricity suppliers, who pay the DNO for the right to deliver power over that grid to their customers. In general, Londoners may select from among seven or eight different firms for their electric power supply; if they are dual-fuel customers, that is, someone requiring electric *and* gas service, their options may be slightly different, as not all electricity suppliers provide gas service. Customers seeking the best pricing for their energy services can utilize websites such as www.energywatch.org.uk, which provide real-time comparisons of the prices charged by different suppliers for different categories of customers in a given postal code.

**Electricity Prices in London**

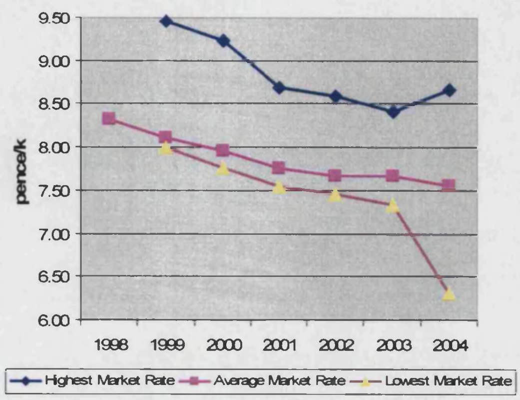
As with the rest of the UK, electricity prices have come down in recent years. Figures 8-3 and 8-4 track the retail price of electricity in London since the markets were fully liberalized in 1998, as reported by the UK Department of Trade and Industry (DTI). Although price decreases have occurred across the board, some customers have enjoyed greater cost savings than others. Pre-payment customers, who traditionally represent lower-income households unable to pass the up-front credit check required by utilities (Greater London Authority, 2004a), have historically paid rates up to 20% higher than those charged other customers, although this gap now appears to be narrowing.

**Figures 8-3 and 8-4**
**Electricity Prices in London by Customer Class**
Source: (DTI, 2004a)

Credit Customers




PrePay Customers




The drop in prices has been welcomed by local policy-makers concerned about the incidence of ‘fuel poverty’ around London. Because many low income households live in poorly insulated homes, and because many cost-containment rules promoted the use of electric heating systems in council housing schemes in the 1970s (Greater London Council, 1978, 1983), high electricity prices eat into the funds that householders have for other necessities. Under London Mayor Ken Livingstone’s definition, which categorizes fuel-poor households as those spending more than 10% of the household’s *disposable* income on all forms of energy, 34% of all London households meet this criterion[36] (Greater London Authority, 2004a, p 27). To help alleviate fuel poverty, many London boroughs participate in Central Government-funded energy conservation projects targeting low-income households.

Householders or businesses interested in deploying renewable power systems on or near their property also will pay a premium for their power. High up-front capital costs are slowly paid back, as power generated on site using “free” natural resources displaces power purchased from the grid. The cost of the system, the amount of power generated, and the cost of the power that the new system displaces all are important elements in determining how quickly the investment will be paid back. Large scale wind turbines, such as those deployed at Ford’s Dagenham site in East London, are believed to have a relatively short payback period, just 4-5 years

[36] The UK government uses a different definition, based on *total* rather than disposable income. Under the UK government definition, 17% of London households are considered fuel-poor

(Dodsen, 2003). At the other end of the spectrum, photovoltaic systems in London are projected to have payback periods of between 40-100 years (Broer & Why, 2004; Inman, 2004; Solstice Energy Ltd., 2004).

**Table 8-3**
**Cost per kilowatt (installed) of Renewable Technologies in London**

| Technology | £/kW installed | Data source |
|---|---|---|
| 1 kW solar PV | £6,600-7,000 (estimate) | (Solstice Energy Ltd., 2004) |
| 2 kW solar PV | £5,950-6,000 (estimate) | (Solstice Energy Ltd., 2004) |
| 10.2 kW solar PV | £4,534 (actual) | (Energy Savings Trust, 2004b; Ormiston Wire Ltd., 2004) |
| "Small" horizontal axis wind turbine (no size given) | £3,000-6,000 (estimate) | (Broer & Why, 2004) |
| 2.5 kW wind turbine | £14,000 (estimate) | (Architects' Journal, 2003) |
| Enercon E66 1.8 MW wind turbine (Hammersmith) | £694 (estimate) | (Dodsen, 2003) |
| Enercon E66 1.8 MW wind turbines (2 @ Dagenham) | £778 | (Brunton, 2004; TLT LLP, 2004) |
| Small hydro | £1,000-3,000 (estimate) | (London Research Centre, 1998) |

These high costs may be dissuading installations (Broer & Why, 2004; Brook Lyndhurst, 2003a; ETSU/AEA Technology, 2001a, 2001b; London Research Centre, 1998). According to a survey conducted in 2003, one in four Londoners is willing to consider installing a PV system on their roof, if cost is not a factor. When cost considerations are taken into account, however, just 4% of respondents report they are very likely to follow through on such installations. Subsidies can therefore play in important role in bringing down costs, a sentiment agreed to overwhelmingly by Londoners, 93% of whom see them as "important" factors in the decision to install renewable schemes (Brook Lyndhurst, 2003a). One PV system installer notes that with subsidies currently available from DTI, the payback period on solar PV systems can be reduced to 15 years (Quinn, 2004), and there has been interest from Londoners in this program. As of 2004, there were 49 London applications for funding under DTI's Stream 1 (Small Scale PV) program, of which 39 received funding[37]. Under

[37] These 39 projects amounted to 10.3% of all projects funded to date.

the Stream 2 (Medium and Large Scale PV) funding scheme, covering projects of 5 kW-100 kW, 31 applications were received for London projects, 19 of which were funded[38] (Energy Savings Trust, 2004c).

Net-metering offers another way to bring down the cost of PV projects. In 2000, the Managing Director of one of London's leading solar installation firms reported earning four pence for each kilowatt-hour of power that he exported back into the grid from a PV system installed on his home in South London (London Research Centre, 2000). Net-metering payments in London are higher today, as shown in Table 8-4. It is interesting to note how different electricity suppliers are approaching the net-metering issue. EDF Energy offers two alternatives, one with an export meter – which tracks how much power the system exports to the grid (and which the customer must pay to install) -- and one without. Because the average 1 kW photovoltaic system in London generates roughly 750 kWh of power each year (ETSU/AEA Technology, 2001b, p 8), it is not clear which approach is more advantageous. This will depend on how power generated by the system matches the load on the building at any given point in time. nPower approaches the equation completely differently, paying customers 5p/kWh for *all power generated* by their PV system, not just power *exported* (Gunning & Davidson, 2004). Although they have been unable to formalize the approach thus far, nPower hopes to eventually lay claim to the Renewable Obligation Certificates (ROCs)[39] earned by the PV systems participating in this program. The 5p/kWh payment is essentially equivalent to the current value of the ROCs earned and power exported by these systems (N. Riley, pers. comm.).

**Table 8-4**
**Electricity Net-metering Schemes Available to London PV System Owners**
Source: original research, November 2004

| Company | Net-metering payment for exported power | Conditions |
|---|---|---|
| EDF | Household receives £10/year per kW installed | No export meter installed |
| EDF Energy | 7.64 pence/kWh | Export meter required |
| Powergen | 6.19 pence/kWh | -- |
| nPower | 5 pence/kWh for all power generated, not just exported | No export meter required. Must be *Juice* (green tariff program) subscriber |

[38] The 31 applications represent 18% of all applications received, while the 19 funded projects represent 21% of all projects funded, indicating London is doing well compared to other regions of the UK.
[39] See page 213 for an explanation of the ROC program.

## Green Tariff Programs in the UK

Consumers seeking to use renewable power without deploying these systems on their homes or businesses can subscribe to a Green Tariff program, offered by many different suppliers. These programs tend to follow two basic formats. The first is known as a 'green fund' or 'eco-funds' tariff (Energy Savings Trust, 2004a; National Energy Foundation, 2004). Under this approach, customers pay a small premium over the price they would ordinarily pay for power, and this premium is then used to subsidize or fully fund new renewable power system deployment. For example, London Electricity customers subscribing to the company's Green Tariff program pay a premium of 0.42 pence for every unit of electricity consumed. This money is deposited in a Green Energy Fund, which pays for small solar PV and rooftop wind systems on schools and non-governmental organizations in the London Electricity service area. London Electricity pays all administrative costs for this program, so all of the funds raised from customers go to support actual deployment projects (London Electricity, 2004). In 2002, London Electricity's and SWEB's combined green energy fund raised £450,000 from subscribers, which was given out to projects costing between £5,000-£50,000 (London Electricity, 2002).

The second type of Green Tariff plan is known as a 'green supply' or 'renewable tariff' fund. Under these plans, customers specify that some or all of the power they purchase must come from renewable sources (Energy Savings Trust, 2004a; National Energy Foundation, 2004). Suppliers may vary the percentage of renewable power they use, helping them target different market niches. Green Energy (UK) PLC, for example, has both the *Green Energy 10* and *Green Energy 100* plans, where the number indicates the percentage of power that is actually derived from renewable sources. Northern Ireland Electric is another firm that offers consumers plans featuring varying levels of renewable power. Plans are priced differently, reflecting the different input prices, and appealing to customers with different budgets or depth of conviction about how 'green' their power must be.

The two Green Tariff approaches have been the subject of much scrutiny by the environmental organization Friends of the Earth (FOE), which recommended that customers select the green supply approach (Glasgow, 2004). At the heart of FOE's advocacy is the belief that a Green Tariff plan must promote 'additionality', or the development of new renewable power sources above and beyond that already being developed to comply with the Renewables Obligation, a statutory requirement described in depth in the next chapter. Some of the suppliers criticized by Friends of the Earth were selling plans featuring only RO power[40], pitching them as if they were the equivalent of supply offerings from firms going far beyond their Renewable Obligation (Friends of the Earth, 2004). By encouraging consumers to support tariff schemes that result in significant new power generation capacity, FOE hopes to supplant power generation from non-renewable or nuclear sources. FOE does include a list on their website offering opinions about which Green Tariff plans consumers should purchase, but this information has become somewhat dated, and FOE does not plan to keep it up-to-date because of the difficulty in verifying the claims made by the different energy companies (Jones, Brignal, & Collinson, 2004).

Uptake of Green Tariff plans is still quite low around the UK. Local Authorities have been some of the largest Green Tariff customers thus far (GreenPrices, 2004), purchasing power for their own operations and for use in social housing and other community facilities under their control. On the residential side, however, fully eight years after the first Green Tariff plans appeared on the market, just 60,000 to 90,000 homes have enrolled, or barely 4% of the total UK market (Dunn, 2004; Energy Savings Trust, 2004a). No comparable data is available for London. Low subscription rates may be attributable to the price premium, but this is by no means clear. On average, subscribers to Green Tariff programs in London pay slightly more for their power, totaling roughly £2-£4 per quarter (Green Electricity Marketplace, 2004). This is well within the willingness-to-pay range of the average Londoner, who in general is willing to spend up to £2.34 extra per month[41] to have a green power supply (Brook Lyndhurst, 2003a, p 23). Another possible explanation is a lack of consumer familiarity with these programs. The same survey investigating

[40] The RO applies to the entire amount of electricity sold by an electricity supplier; it does not require that each and every supply plan offered by a supplier contain some minimum proportion of renewable power. A firm can thus advertise a 100% renewable power plan and be factually correct, because they are indeed selling renewable power. FOE makes the point this is nothing more than a marketing ploy, providing no environmental benefit beyond that already achieved by the RO.
[41] This figure, estimated based on the results of a 2003 survey conducted by the research firm MORI, includes all Londoners, including customers unwilling to pay more for green power.

willingness-to-pay queried Londoners on their familiarity with Green Tariff programs, and the results were not promising. Fully 74% of those surveyed said they had not heard of this option from their current supplier or others; just 1% had heard a "great deal" about these types of programs.

**Conclusion**

This chapter about London's energy marketplace highlights several important considerations we'll need to keep in mind in the next two chapters. First, the underlying market conditions for renewables are slightly less supportive than they were in New York. The UK's "dash for gas" ironically improves the plight of renewables, as it has resulted in a situation where energy security is now a growing concern among government policy-makers. Home-grown renewable power is thus one potential solution to this problem. Electricity demand in London is steadily growing, but because London gets the majority of its power from sources outside of the city, and because electricity transmission capacity coming into London appears plentiful, there is little pressure to deploy new power sources (including renewables) within the city to meet the growing demand for power. Electricity prices have also steadily declined since the markets were first liberalized back in the late 1990s, and there has been little price volatility, two factors that might otherwise push the market towards alternative power sources like renewables.

Second, as in New York, the higher cost of renewably generated power does appear to have adversely influenced the level of deployment around the city. Technologies like wind are increasingly proving themselves competitive with fossil fuel based sources – even in crowded London – but analysts reviewing London's situation are fairly unanimous that high renewables costs have inhibited deployment and likely will continue to do so in the future. It thus bears watching how the Mayor addresses cost issues in his energy strategy. Does he see a role for price subsidies or other incentives to encourage deployment? Net-metering is one cost-related strategy that appears to help in New York, but the program there applies to all installations meeting certain qualifications. In the UK, there are no such rules, and suppliers are free to sponsor net-metering programs or not. Is this a concern of the Mayor's?

There is also the interesting question of why we have not seen local government deploying these systems in large numbers. Particularly after looking at the situation in New York, where most of the installed capacity is on public facilities, it is striking that in London the vast majority of installed renewable power schemes are at private companies. Of course, one key difference is the fact that water systems in the UK are privately owned, and Thames Water is deploying biogas power systems at their sewage treatment facilities just as the DEP does at the City-owned facilities in New York. But what about other local government facilities? Is there some fundamental obstacle to deployment on GLA or Transport for London buildings, or is it simply a matter of cost? This issue will be directly taken up in Chapter 10.

Finally, there is the question of how the Mayor has chosen to exploit the knowledge gained from the ETSU and other studies looking at renewables potential in London. The LRC study was rather optimistic, arguing that up to 10% of the city's power could come from renewables; that study was weak on how the city could deliver on such potential, however. The ETSU study was far more systematic in its approach, discussing supply chain issues and assessing in great detail the opportunities available for each type of new renewable technology. Its conclusions were rather gloomy, however, concluding that new renewables can ultimately only deliver less than 1% of London's energy needs. In Chapters 9 and10, I'll discuss how the ETSU work has been taken up by the Mayor's Energy Strategy, and how ironic it is that a strategy that contains many bold initiatives may ultimately deliver only a fraction of the city's power needs.

# CHAPTER 9
# London case study: State and Local Electricity Regulation And the Renewables Policy-Making Environment

## Overview

Chapters 1 and 2 provided considerable background information on the development of the UK electricity marketplace from its origins in the 1880s to the current day. That history – the early market chaos and slow industry consolidation – set for stage for nationalization of the industry, a regulatory and market structure that lasted for roughly 50 years. Market liberalization changes that went into effect in the 1990s thus had profound impacts on how power was generated, distributed, and purchased by consumers and businesses around the UK. At the same time these dramatic structural changes were occurring, efforts were also underway to move the electricity market in a more environmentally sustainable direction. These changes started modestly, with most policy initiatives having only an ancillary impact on how the market worked. Today, however, environmental considerations are core policy drivers, lying at the very heart of UK energy policy (Wolfe, 2003), and bringing about fundamental changes in electricity market operations. All of these issues are discussed in this chapter.

One thing I point out both here and in Chapter 10 is how certain policies intended to promote green power production have ironically had the opposite effect, inhibiting renewables deployment around the UK and in London. This is similar to what we saw in New York, where the way rules were written or programs were designed advantaged certain players or technologies and disadvantaged others. In the UK, such problems historically arose because of rules associated with the planning system, which while superficially supportive of renewables, didn't give local authorities the guidance they needed to ensure equal application of these policies across the UK. The rules renewable power systems must abide by to earn Renewables Obligation Certificates (ROCs) have also been problematic, as they were designed primarily for large installations that generate lots of power on a monthly basis, not small scale schemes more likely to be deployed in cities. Both topics are taken up in this chapter.

London's 2004 Energy Strategy is also reviewed in detail. This document, which architects the GLA's approach to energy efficiency and renewable power deployment and use over the next 10-20 years, builds on earlier policy documents developed by the Greater London Council (GLC), London Research Centre (LRC), and London Planning Advisory Committee (LPAC). The Mayor was not statutorily required to develop an energy strategy, but did so voluntarily because he saw one as an important and natural complement to the policy documents called for by the Greater London Authority (GLA) Act 1999. The Mayor's Energy Strategy places a big emphasis on renewable power generation, establishing deployment targets and a lengthy list of strategies designed to boost public awareness and deployment levels. Worth noting are the various policy mechanisms the Mayor intends to employ to implement the strategy, as they speak volumes about the powers and resources available to the Mayor, and where policy and regulatory constraints imposed by others influence his capacity to act. These topics are discussed at considerable length in Chapter 10, and ultimately serve as key lessons from this thesis that hold great relevance to energy policy-makers in other cities.

**Slowly Turning Green**

The first significant UK Government policy measures on renewable energy were linked to research and development (R&D) efforts. In 1982, the Government Advisory Council on Research and Development (ACORD) established a methodology to evaluate Government spending on renewable power technologies that had begun several years earlier. ACORD categorized technologies as "strongly placed; economically good; promising; or long shots" (Mitchell, 1996, p 166). Based on their ranking, technologies were either supported with more R&D money or their funding was curtailed. In 1988, the now-defunct Department of Energy issued *Renewable Energy in the UK: The Way Forward.* This document committed the Government to a sustained renewables R&D agenda, and for the first time articulated the Government's view that renewables were a viable source of future power production (Connor, 2003).

The UK moved beyond R&D support with the Electricity Act 1989. Its most well-known provision gave the Secretary of State the ability to require the twelve regional electric companies[42] to secure power generation capacity from non-fossil fuel sources. This Non-Fossil Fuel Obligation, or NFFO, was a "market-pull" support mechanism (Mitchell, 1995, p 1079) designed to both prop up the ailing nuclear power industry (Elliott, 1994) and provide a "guaranteed, premium market" in which the renewable power industry could develop (London Research Centre, 2000, p 8). Under the NFFO, the Non-Fossil Purchasing Agency (NFPA) solicited bids for power generation capacity from a range of different power generation technologies. Contracts were originally offered for terms of eight years; later tranches of funding offered commitments of up to fifteen years. DNOs then purchased electricity from these contracted entities, and were reimbursed by the NFPA for any price premium using funds raised by a small Fossil Fuel Levy imposed on all electricity customers.

Much has been made of the fact that the NFFO was principally a mechanism to support the nuclear power industry (Connor, 2003; Elliott, 1994; Mitchell, 1995). NFFO was much more than that, however. It can reasonably be argued that NFFO helped build the UK's 'new' renewables industry. Before NFFO, the total amount of power obtained from 'new' renewable sources (i.e., wind, tidal/wave, small hydro, solar PV, biomass, landfill gas, geothermal) deployed around the UK totaled roughly 150 MW of installed capacity. By 2000, this had increased to approximately 1,265 MW of capacity, most of which involved large wind and landfill gas projects (DTI, 2004b). NFFO also helped bring down the price of renewable power to a more cost-competitive level. In the first round of bidding (NFFO1), the price premium paid for power from wind farms was £80/MWh, compared to £45/MWh for power from landfill gas. By the fifth round of bidding in 1998 (NFFO5), the price premium had dropped to £30/MWh for wind power and £25/MWh for power from landfill gas (House of Lords Science and Technology Committee, 2004).

Not all NFFO projects succeeded, however, despite the prospect of guaranteed income. Some endured long delays in the planning approval stage, ruining the economics of the project given the time-limited nature of the contract. Other projects were rejected altogether by local planning officers (Mitchell, 1996). In 1993 the Deputy Prime Minister issued new guidance for local planning officers to remedy the

[42] These are known today as Distribution Network Operators, or DNOs.

planning problems. Planning Policy Guidance (PPG) 22 – Renewable Energy offered local authorities basic information about renewables and advice on how to factor Government policy towards renewables into local planning decisions. In particular, PPG 22 focused on Development Plans, which set the framework for all development control decisions in a community (ODPM, 1993). By incorporating renewable energy policies into these Plans, it was hoped that local planning officers would be more inclined to approve these projects.

During roughly this same period the Government was also implementing other initiatives aimed at the larger issue of climate change. In 1994 and again in 2000, the Government laid out comprehensive Climate Change Programs to help the UK achieve greenhouse gas reduction commitments made at the Rio Earth Summit in 1992 and under the Kyoto accords in 1997. These plans included the Government's renewables projects, as well as energy efficiency, demand reduction, and fuel source conversion initiatives. In 2000 the Royal Commission on Environmental Pollution (RCEP) called for even more dramatic reductions than those required under Kyoto, suggesting the UK should cut $CO_2$ emissions by 60% by 2050 (Royal Commission on Environmental Pollution, 2000a, p 28). Other RCEP recommendations focused on how the UK could achieve this goal, including introducing a carbon tax, establishing carbon sinks to sequester $CO_2$, increasing funding on energy research and development, and changing government policies to promote energy efficiency.

The RCEP's carbon tax recommendation was suggested as an alternative to a Climate Change Levy (CCL), which the Chancellor of the Exchequer first proposed in March 1999 and which went into effect in April 2001. Under the CCL, a small tax of 0.43p/kWh is assessed on electricity derived from fossil-fuel based sources that is sold to industrial and commercial users. Domestic consumers are exempt from the Levy. The CCL is also assessed on natural gas, petroleum, coal, and lignite sales, with different rates applying to different fuel sources. To ensure revenue neutrality, mandatory national insurance contributions by businesses were reduced by 0.3%. The RCEP preferred a carbon tax to the CCL because carbon taxes are based on the *carbon* content of a fuel source (rather than the CCL's focus on the *energy* content), thus more accurately targeting contributors to global warming (Royal Commission on Environmental Pollution, 2000b).

**New Policies for a New Millennium**

In February 2000, dissatisfaction with the pace of progress made under the NFFO and its general incompatibility with the free market principles of the UK's electricity market liberalization efforts led the government to scrap NFFO[43] and replace it with another type of procurement requirement known as the Renewables Obligation (House of Lords Science and Technology Committee, 2004). Under the Renewables Obligation (RO), licensed electricity suppliers must procure a specified proportion of their electricity supply from designated renewable sources of energy. Unlike the situation under the NFFO, any extra costs incurred by suppliers are passed directly onto consumers. To ensure prices do not increase too dramatically, the RO imposes a price cap, giving suppliers an incentive to find the cheapest forms of renewable power available in the marketplace. The supply obligation also increases over time, from a March 2003 starting point of 3% of all power supplied to a minimum of 15.4% by March 2016 (PIU, 2002; Vaughan-Adams, 2003). The 15.4% threshold stays in place until 2027, ensuring markets stay robust for an extended period of time.

Compliance is demonstrated through the use of Renewables Obligation Certificates, individually numbered certificates that represent power production at specific, renewably-powered generating facilities during specific time periods (Connor, 2003). Electricity suppliers must deliver the required number of ROCs to Ofgem each year, or pay a "buyout" price as a penalty. The buyout price started at £30/MWh and by 2004-2005 stood at £31.39/MWh, increasing annually at a rate tied to the Retail Price Index (OFGEM, 2004b). Electricity suppliers are free to pick their sources of renewable power, so long as the technology used by the suppliers qualifies for ROCs[44]. Suppliers can purchase ROCs directly from accredited generators or from other ROC holders. Thus far, ROC prices have been the same as the buy-out price, although this may change as the buy-out price continues to rise and the cost of power production declines. Suppliers are encouraged to use ROCs to demonstrate

[43] Under the terms of the Utilities Act 2000, all existing NFFO contracts would be honored until their intended expiration date. No new tenders seeking renewables supply capacity would be issued, however.
[44] As of 2004, ROC-eligible technologies include landfill and sewage gas projects, small hydro systems, on- and off-shore windfarms, systems burning agricultural and forestry residues and energy crops, wave and tidal power plants, and solar PV systems.

compliance rather than simply paying the buyout price by a provision in the law which redistributes buy-out payments to electricity suppliers in proportion to the number of ROCs that they hold (Connor, 2003). Such an approach further decreases the cost of the ROC.

Most observers expect the RO to increase electricity prices throughout the UK. In 2004-2005 alone, achieving the 4.9% RO requirement will cost consumers an extra £500 million, and over the life of the RO, an average of £1 billion/year more than if the RO were not in place (House of Lords Science and Technology Committee, 2004, p 43). Higher costs are attributed both to the current higher cost of renewably-generated electricity, and to the fact that renewable power sources tend to be more intermittent and unreliable, forcing suppliers to pay balancing cost penalties under NETA[45] (DTI, 2003a; Reuters, 2002).

In 2002 and 2003 the Government released two new reports with major implications for UK policy. The Energy Review, carried out by the Performance and Innovation Unit (PIU), looked at trends in energy demand, supply, and costs; problems with the marketplace; and options for the future. The PIU report made several important observations and recommendations (PIU, 2002):

- UK dependence on foreign gas suppliers was growing, but was not yet cause for concern
- The UK should be wary of making large expenditures on carbon emission reductions if other countries are not also doing the same
- Immediate priorities should focus on energy efficiency and expanding the role of renewables, although new investment in nuclear power and clean coal should remain as open options
- The government should target a 20% improvement in energy efficiency by 2010 and a further 20% in the following decade
- The proportion of electricity generated from renewable sources should be increased from the RO's target of 10% by 2010 to 20% by 2020.

[45] Recall from Chapter 1 that NETA was designed to improve the efficiency of electric transmission markets by requiring generators and users to more accurately forecast their supply and demand. Balancing cost penalties are assessed those missing their projections.

Because it was a report *to* Government, rather than a report *by* Government, these recommendations did not have the force of policy. That was the purpose of the 2003 Energy White Paper, which articulated the Government's 10-year policy vision. The White Paper both agreed with and broke with the recommendations of the Energy Review. The White Paper agreed that energy security was an important issue to monitor, and formally adopted the RCEP's 60% $CO_2$ reduction target recommendation. The White Paper disagreed with the PIU's call to set a new, higher target for renewable power, instead calling the 20% figure an "aspiration" to be achieved by 2020 (DTI, 2003a, p 46). To ensure planning approval does not inappropriately inhibit renewables deployment, the White Paper announced that the Office of the Deputy Prime Minister would soon publish an update to PPG22, which ultimately was released in 2004. Finally, the White Paper announced that carbon emissions trading would be a central element of the UK's carbon reduction efforts.

Although the White Paper drew praise from several quarters, it attracted criticism for its mixed messages about the future direction of UK policy. By calling emissions trading the 'central plank' of the UK's emissions reduction efforts (DTI, 2003a, p 29), the Government implied that energy efficiency and nuclear power schemes could supplant renewable power projects as the preferred way to achieve emission reductions. When coupled with the Government's announced intention to formally review the Renewables Obligation in 2005-2006, and the fact that the 20% renewables target was considered merely an "aspiration," industry watchers say investors grew nervous, fearing their stake in renewables projects could be undermined by policy shifts occurring before their investment returns are fully achieved (Gow, 2003; Wolfe, 2004).

**Investments in Energy**

Direct financial support for various aspects of the energy industry has long been a key element of UK policy. When electricity markets were nationalized in the 1940s, this support took the form of requirements that power plant operators buy British coal, both to promote self-sufficiency and to help placate a powerful labor union (Helm, 2003). Almost since the day the nuclear power industry was first created, Government support has been sizable. Originally these investments were for the purpose of building the industry; in the last 30 years, it has been to help the industry stay afloat in an increasingly competitive marketplace.

In the area of renewable power technologies, Government financial support has also been significant. Between 1975 and 1993, more than £232 million was spend on R&D and demonstration projects (Elliott, 1994, p 1067). Much of that money was directed at the fledgling wind and tidal power industries in a "technology push" approach, with the expectation that British firms and investors would build on the Government's early financial support in these technologies. When commercialization did not turn out as planned, the Government pulled its support using the ACORD assessments as its justification (Meek, 2001). Renewables research and development expenditures continued to decline into the 1990s (Runci, 2000), hitting their low point in 1997-1998 when £5.5 million was spent on early-stage renewables R&D programs (House of Lords Science and Technology Committee, 2004, p 29). Because of the NFFO program, however, total expenditures on the renewable power sector actually increased during that same period. In the period between 1990 and 2001, UK government expenditures due to NFFO contracts for renewable power totaled £714 million.

With the shift away from the NFFO in 2000, the Government moved to support the RO by increasing energy R&D budgets and capital grants supporting renewables projects (PIU, 2002). In that year, Prime Minister Tony Blair authorized an additional £100 million for renewables support. In their review of how to allocate that money, the PIU concluded off-shore wind and energy crop projects offered the best near and medium-term prospects. By 2003, Government commitments to renewable technology deployment and research had climbed further, totaling over £500 million, with wind and bioenergy projects each earmarked to receive more than £100 million over a several year period (Mitchell & Connor, 2004). In 2004, the Government announced a new £50 million investment in wave and tidal technology, with the intention of making the UK a global leader in this sector (Bowker, 2004).

**Table 9-1**
**UK Installed Capacity of New Renewable Technologies (in MW)**
Source: (DTI, 2004b)

| | Wind and Wave | Solar PV | Small Scale Hydro | Landfill gas | Sewage Gas | Other (1) | Total installed capacity (MW) |
|---|---|---|---|---|---|---|---|
| 1990 (2) | 10 | - | 48 | 18 | 73 | 0.1 | 149 |
| 1991 (2) | 14 | - | 69 | 32 | 91 | 0.3 | 207 |
| 1992 | 50 | 0.2 | 73 | 57 | 91 | 14 | 286 |
| 1993 | 131 | 0.3 | 77 | 87 | 88 | 52 | 436 |
| 1994 | 153 | 0.3 | 77 | 94 | 87 | 52 | 464 |
| 1995 | 200 | 0.4 | 88 | 105 | 87 | 52 | 534 |
| 1996 | 238 | 0.4 | 175 | 162 | 87 | 52 | 715 |
| 1997 | 322 | 0.5 | 163 | 188 | 87 | 52 | 812 |
| 1998 | 331 | 0.6 | 171 | 245 | 90 | 108 | 946 |
| 1999 | 357 | 1.2 | 177 | 343 | 91 | 108 | 1,078 |
| 2000 | 412 | 2.0 | 184 | 425 | 85 | 157 | 1,265 |
| 2001 | 428 | 2.8 | 189 | 465 | 85 | 157 | 1,326 |
| 2002 | 535 | 4.1 | 194 | 473 | 96 | 177 | 1,479 |
| 2003 | 743 | 6.0 | 203 | 619 | 101 | 184 | 1,855 |

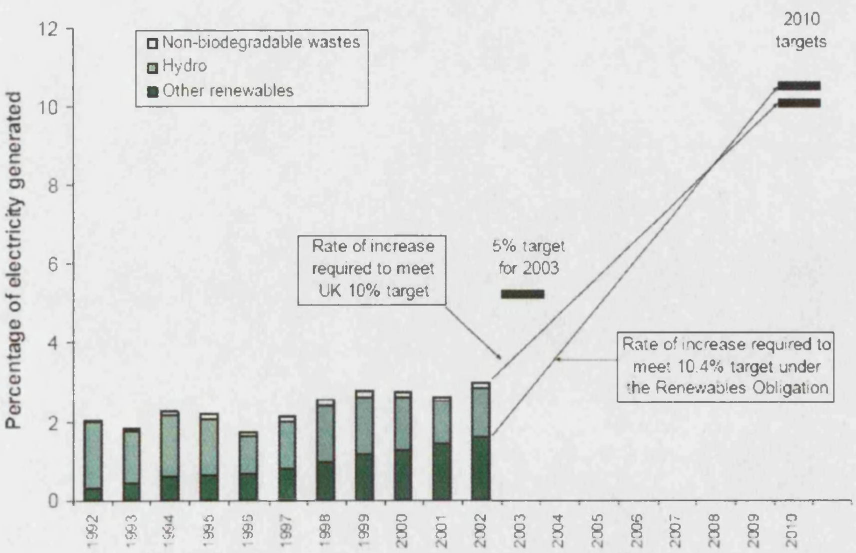
*(1) Includes the use of farm waste digestion, waste tyres, poultry litter, meat and bone, straw combustion and short rotation coppice*
*(2) Estimated*

The payback from the UK's investment in new renewables can be seen in Table 9-1, which demonstrates deployment trends for different technologies. As I had noted earlier, the NFFO deserves credit for gains achieved during the 1990s, when new renewables deployment jumped by 800%. The impact of the RO can also be seen, particularly in 2003, when total deployed capacity jumped by 25% in a single year. In the next few years, these trends are expected to continue, with on- and off-shore wind projects leading the way. Based on the number of projects currently seeking funding, planning approval, or already under construction, the total installed capacity of wind projects is expected to exceed 1,500 MW by the end of 2005 (BWEA, 2004). Wind is a popular technology choice because of the relative maturity of the industry, and because the UK has some of the best wind resources anywhere in the world (DTI, 2004a). Deployment of wave and tidal power systems is expected to occur in the long term, as is growth in solar photovoltaic systems. The Government's optimism in PV technology is tempered, however, by the belief that some type of "3rd Generation" technological breakthrough is necessary before costs decline enough to lead to widespread market acceptance (DTI, 2003b).

**Renewable Power – A Wise Policy Choice?**

Since the Energy White Paper was released in 2003, there has been much debate over the UK's ability to achieve its various renewable power and climate change targets. (For example, see House of Commons Environmental Audit Committee, 2003; and House of Lords Science and Technology Committee, 2004.) Some criticism stems from a fundamental skepticism about the wisdom of placing so much emphasis on renewable power technologies, at the expense of other "climate-friendly" approaches such as promoting energy efficiency or nuclear power. Countryside groups concerned that large swaths of land will be turned into wind farms have been particularly vocal, arguing that nuclear power can achieve the same greenhouse gas reduction goals in a less visually intrusive manner (Vidal, 2004). Other questions have focused on the sheer logistical difficulty of deploying large quantities of renewable power technology in such a short time, given issues related to planning permission, inadequacies of the transmission and distribution grid system, and other regulatory obstacles. This skepticism is not without merit. Figure 9-1 vividly shows the dramatic increase in renewable power generation rates that must be achieved to meet the UK's 2010 targets.

**Figure 9-1**
**UK Progress Against Renewables Targets**
Source: (House of Commons Environmental Audit Committee, 2003, p 11)



The issue of nuclear power's role in the UK energy picture is a complex one. The sector has long been on the ropes financially, forcing the Government to repeatedly bail it out so the badly needed generation capacity would not be jeopardized (Helm, 2003). For some time, however, the expectation has been that the industry would recede into history when the last nuclear power plants closed, approximately 20 years from now. Whether this will actually occur is now a subject of considerable debate. Although the Energy White Paper (DTI, 2003a) explicitly stated the Government had no plans to call for the construction of new nuclear power plants any time soon, it did not shut the door on this option completely, much to the chagrin of advocates who have been fighting the industry for many years (Friends of the Earth, 2003; Greenpeace, 2003). Then-Energy Minister Brian Wilson amplified this point when, in releasing the White Paper, he gave renewable power and energy efficiency efforts just five years to 'prove' themselves, after which time he suggested the UK might need to reexamine its position towards nuclear power (Gow, 2003). Similar points were made by Prime Minister Tony Blair and his chief scientific advisor in September 2004 (Cowell, 2004).

Nuclear power advocates have been emboldened by these statements, and steadfast in their efforts to both criticize the renewables industry and call for nuclear power's inclusion in any low- carbon energy portfolio. Former nuclear industry officials have been linked to studies criticizing wind farms, and there have been rumors that the industry secretly supports community and countryside groups fighting large renewable power projects (Vidal, 2004). Self-interested nuclear power advocates are not alone in making these calls to support the industry. The influential Royal Society sees nuclear power as filling an important near and medium-term role in reducing greenhouse gas emissions. Ian Fells, Chair of the New and Renewable Energy Centre and a well-known figure in the UK renewable power industry, has called for an immediate resumption to the construction of nuclear power stations. Fells argues it is time to end the "wishful thinking" over how much of a contribution renewable power sources can make to the UK's energy supply (Jameson, 2004).

Recent and potential investors in renewable power projects have thus been left confused and nervous over the direction of the UK's energy policy (Wolfe, 2003). No policy changes appear imminent, but given the lead time that is necessary to plan, win approval for, and construct a nuclear power plant, the clock is ticking, and resolution on this issue must come before too much more time passes.

**Overcoming Barriers to Renewables Deployment**

For more than a decade, trade groups, academics, and Government agencies have examined factors known or perceived to have inhibited renewable energy project development decisions around the UK, and designed specific policies to remedy these problems:

- *Planning system barriers* – The planning system was first identified as an obstacle to renewables deployment during the NFFO era, when many NFFO-sponsored wind farm projects had difficulty obtaining planning approval from local authorities (Association of Electricity Producers, 1996; Mitchell, 1996). In 2003, a study sponsored by the Office of the Deputy Prime Minister (ODPM) found planning obstacles were problematic, particularly for wind farms, but they were unlikely to prevent the UK from deriving 10% of its electricity supply from renewable sources by 2010. As supply targets increase beyond that level, however, the report suggested some fundamental changes to the planning system would be necessary (Brook Lyndhurst, 2003b). The first of these changes occurred in 2004, when ODPM replaced PPG22 with a new Policy Planning Statement (PPS) 22—Renewable Energy. PPS22 includes a call for the development of regional renewable energy targets; states that renewable energy should be a 'material consideration' when planning applications are considered by local authorities; and sanctions the use of mandates requiring new construction projects to generate power on-site from renewable power systems (ODPM, 2004a). The 'material consideration' concept is an important development because this makes renewable power a fundamental issue on which planning decisions can be based. Some are already suggesting that PPS22 will dramatically change the way planning officers must view their job, creating a presumption in favor of renewables that will place local planners on the front line of the UK's efforts to facilitate renewables use (House of Lords Science and Technology Committee, 2004).

- *Interconnection costs* – A second key barrier to renewables deployment relates to interconnections between the electrical grid and the renewable power generator. Unlike in New York, however, where technical issues were treated as virtually insurmountable, in London interconnections are treated as a regular part of the business, with the key concern being who pays for any necessary upgrades, and how much these upgrades cost. Traditionally, interconnections that require system upgrades incur costs, known as deep charges, which are borne fully by the supplier connecting into the grid, under the logic that absent this new power source, no changes would be necessary. In 2002, however, Ofgem determined that deep charges could reasonably constitute a barrier-to-entry into the electricity marketplace, thus violating a provision of the Utilities Act 2000 requiring equal grid access for all suppliers (OFGEM, 2001, 2002a). To remedy this problem, Ofgem is conducting a formal Price Control Review, seeking to determine ways to fairly allocate connection charges between electricity consumers (who presumably would benefit from a more vibrant marketplace), DNOs, and electricity suppliers. The results of the Price Control Review were expected in April 2005.

- *NETA closure requirements* – By their very nature, renewable power technologies are subject to the vagaries of the natural forces underlying the technology. Only when the wind blows, the water flows, or the sun shines do these systems generate power. Because NETA prizes certainty, however, renewables projects get penalized when plant operators fail to accurately predict how much supply they will generate during some future time period. Under the old Power Pool system, these predictions had to be submitted 24 hours ahead of time, a huge burden for many renewable technologies. NETA first reduced this gate closure requirement to just 3 hours, and most recently, to just one hour ahead of when the power must actually be delivered, dramatically reducing the risk of financial penalty.

**Energy Policy-making in London**

Prior to 1947, individual London boroughs and the London County Council[46] were actively involved in energy policy matters, issuing franchises to private firms or directly managing electricity supply and distribution utilities themselves. After the industry was nationalized, local government was largely removed from the picture as electricity planning, power generation, and transmission and distribution responsibilities were handed over to the CEGB and the various Regional Boards. This changed in the late 1970s, when as a result of the UK Government's response to the mid-1970s oil crisis, local government began to reengage on this issue out of concern over the high cost they were paying for energy. Since then, various entities have established working groups to look at electricity issues in London, quantified energy use in the Greater London region, and developed locally-oriented action and policy plans they believed were necessary complements to Central Government policies.

The first real stab at a comprehensive energy policy for London was made by the Greater London Council[47] in 1978, when it issued a report examining the impact of UK energy policies on London. Prior to that, the GLC's primary interest in energy matters was limited to coordinating the in-house use of energy by GLC functional bodies and local authorities. This latter work was managed by the GLC Energy Policy Steering Group, which despite its name had little expertise considering "big picture" energy policy matters. The report *Energy Policy and London* (Greater London Council, 1978) attempted to change that. Although hampered by a lack of data on energy use in London, the report recommended a series of wide-ranging steps the GLC and others should take to ensure that London's future energy needs and interests were adequately addressed. These included promoting the broader deployment of combined heat and power and district heating schemes; the development of in-fill land-use policies that would reduce auto use and promote bicycle use around the city; and emphasizing the role that energy conservation should

[46] The London County Council was a precursor to today's Greater London Authority, responsible for regional governance over London boroughs.
[47] The Greater London Council replaced the London County Council in 1965.

play as part of a broad energy strategy. The report also highlighted areas where more research was necessary before policies could be developed.

Following the report's publication the GLC established a new Energy Policy Group, chaired by the GLC's Chief Planner, and began to collaborate with the Central Electricity Generating Board and London Boroughs to collect local energy supply and use data. This work culminated in the 1981 report *Energy Use in London* (Greater London Council, 1981), which presented data on the status of London's current energy supply and future supply options; the use of energy by the domestic, commercial, and industrial sectors in London; transport-related energy use; the geographic distribution of energy use around London; and energy prices. The study included no policy recommendations, as it was intended to serve as the foundation on which future policy could be developed. In 1982 the report was supplemented by a series of working group reports designed to help the GLC, London Boroughs, and the CEGB assess the impacts of current energy use, project future supply and demand, and consider where new supply and energy transmission facilities should be sited around the city (Greater London Council, 1982a, 1982b). In 1983 the GLC Economic Policy Group published *The Energy Economy* (Greater London Council, 1983), repeating many of the concerns raised by the various working groups, and noting that – if properly developed – the London market for energy conservation products and services could approach £20 billion in value over the next decade. The report also renewed the call for strategic energy planning for London, noting that Government policies failed to sufficiently account for local concerns.

Central Government's breakup of the GLC in 1986 brought energy planning efforts in London to a standstill for several years. In 1993 the London Research Centre and the London Planning Advisory Committee renewed the discussion, issuing companion documents updating the 1981 energy data study and offering 66 different policy recommendations targeting London Boroughs and Central Government. The LRC report echoed many themes previously developed in the old GLC studies, such as the need for greater CHP/District Heating scheme use in London, but it was also notable for its new emphasis on environmental issues. For the first time, linkages were made between London's energy use and global climate change, and there was a greater focus than in past documents on the role renewable power schemes could play in

London. The report did not make explicit recommendations as to which energy technologies should be pursued, but instead issued a new call for Government to examine which were most appropriate for London[48], and how the planning system could be used to facilitate their use (London Research Centre, 1993). The LPAC study picked up on the planning theme, analyzing the role that planners could play in influencing energy use and energy supply decisions in London. The study also issued a call for changes in Borough Unitary Development Plans (UDPs) so energy and environmental impacts were more explicitly factored into local planning approval decisions (London Planning Advisory Committee, 1993).

**The GLA Ushers in a New Energy Policy Era**

When the Greater London Authority was established by an act of Parliament in 1999, the authorizing legislation required the new Mayor to develop eight strategic plans for the city, on topics ranging from biodiversity to culture to land use to transportation (HMSO, 1999a). Ken Livingstone, who served as leader of the Greater London Council when it was disbanded by the Thatcher Government in 1986, was elected Mayor of London in May 2000. Upon taking office in July, he vowed to voluntarily develop a ninth strategic plan, focusing on energy use in London (Greater London Authority, 2000b). In developing his energy plan, the Mayor laid out three overarching objectives (Greater London Authority, 2004a, pp 39-40):

1. Reduce London's contribution to global climate change
2. Help eradicate fuel poverty
3. Contribute to London's economy by delivering sustainable energy and improving London's housing and building stock

It took nearly four years to develop and refine the Energy Strategy. The task of authoring the first draft was completed by an in-house Energy Team, managed by one of the Mayor's principal environmental policy advisors, and staffed by civil servants and political appointees, several of whom had a background on local energy issues. Two of the GLA staff members contributing to the Strategy were Matthew Chell and

[48] The ETSU study *Development of a Renewable Energy Assessment and Targets for London* was Government's response to this plea.

David Hutchinson, the principal authors of the 1993 *London Energy Study*. Joanna Dawes, the Mayor's Principal Energy Advisor, was a co-author of the 2000 LRC report *Renewable Energy in London*[49], along with David Hutchinson. Outside support and feedback came from a 13-member Energy Strategy Advisory Group, consisting of academics, Local Authority representatives, developers, and energy and public health experts.

Public input into the content of the first draft was invited via a daylong consultation event held in November 2000. 500 invitations were sent out to representatives of the energy industry, Central Government and Local Authority officials, businesses, trade groups, and housing associations, academics, and special interest groups. More than 120 people attended the event, which focused on clarifying the overall purpose of the Energy Strategy and obtaining suggestions on specific actions that should be included (Greater London Authority, 2002). The Energy Team took these comments and over the course of the next year developed a 204-page draft that was presented to the London Assembly and GLA functional bodies in March 2002 for their consultation and review. The Draft Strategy covered many topics:

- An overview of UK energy policy
- Energy use and supply in London
- Links between land use in London and energy consumption
- Transport-related energy use
- New policy and programmatic proposals the Mayor wished to implement or promote
- Techniques the Mayor would use to implement the Strategy

In January 2003, the GLA released a second draft of the report intended to serve as a public consultation document. The second version was considerably longer than the first (Assembly) draft, growing to 373 pages in length. Whereas the Assembly draft

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[49] This report was one of five reports issued by the LRC between 1998 and 2000 related to renewable energy: *Exploiting Renewable Energy in London: An overview of renewable energy technologies (1998)*; *Auditing local renewable energy resources: A guide for local authorities (1999)*; *Model planning policies on renewable energy for London's unitary development plans (1999)*; *Incorporating passive solar design into the design process: Briefing notes on non-domestic buildings (1999)*; and *Incorporating passive solar design into the design process: Briefing notes on housing 1999).*

had 34 policy statements and 83 proposals, the Public Consultation draft had 41 policy statements and 134 proposals. Most of the increase was attributable to a jump in the number of transport-related proposals and the structure and process to be followed by the new London Energy Partnership. To solicit public input on this new draft, the GLA took several steps between February and April 2003. The report was posted on the GLA website, along with a summary document and leaflet. Copies of these documents were mailed and e-mailed to thousands of stakeholders around the city, representing different racial, ethnic, religious, industry, and environmental organizations. Questionnaires were posted on-line and distributed via e-mail; written copies of the questionnaire were distributed at libraries and shopping malls around the city. In total, the GLA reported receiving more than 330 statements and questionnaire responses about the draft Energy Strategy from different individuals and groups.

In February 2004 the GLA released the final draft of its Energy Strategy, entitled *Green Light to Clean Power.* The final draft was much shorter, 260 pages in length, with 33 distinct policy statements and 70 programmatic proposals.

**Breaking New Ground or More of the Same?**

*Green Light to Clean Power* is remarkably reminiscent of the overall direction and recommendations put forth by the London Research Centre and the London Planning Advisory Committee in 1993. The 2004 strategy adopts a more aggressive stance than the 1993 policy proposals by announcing energy management and supply standards that must be met by GLA functional bodies and large new development projects in London. The 2004 strategy also has a 'greener' tint to it that the 1993 reports, benefiting from recent research on the potential for renewable energy in London. This research gave the Mayor the ammunition he needed to establish targets for renewable power and other forms of 'clean energy' systems, including combined heat and power projects. *Green Light to Clean Power* also benefited from the statutory requirement that the GLA develop other strategic plans that have energy components to them, including the spatial development strategy (the London Plan), the air quality strategy, the biodiversity strategy, the waste strategy, and an economic development strategy for London. These reports were produced during roughly the same period, providing the Mayor with ample opportunity to employ cross-cutting strategies.

Policies endorsed in both the GLC's 1993 and the GLA's 2004 energy documents include:

- The expanded use of CHP/district heating in built-up areas of London
- Energy recovery from the waste stream
- Address fuel poverty in London by expanding energy efficiency and energy conservation programs
- Adopt land-use policies that result in increased public transport and bicycle use and pedestrian access to shops and businesses
- Promote energy-related business development in London
- Convert Transport for London's vehicle fleet to cleaner power sources
- Use the planning system to promote change by incorporating policies in UDPs that lead developers to consider the environmental impacts of their projects
- Use the planning system to help educate the public and developers
- Train planners at Local Authorities so they are more aware of energy issues and the energy implications of their decisions
- Establish a public-private partnership to guide action on energy issues in London
- Expand the use of hydrogen as a clean-burning fuel source in London
- Promote power production using sewage gas as a fuel

Energy-related concepts endorsed in other GLA strategic plans that were mentioned in 1993 include an endorsement of Crossrail, a major new rail transport project in London, and a proposal that Central Government examine the potential impact of a congestion charging scheme on traffic levels in London.

*Green Light to Clean Power* does break new ground in several areas, primarily as an outgrowth of how the Mayor proposes to implement his plan. To begin, the Mayor proposes to use all available Mayoral powers to help implement the Energy Strategy. One power stems from the fact that by statute, certain types of development projects must obtain Mayoral approval, in addition to approval from the Local Authority with planning jurisdiction over the project.[50] In his Energy Strategy, the Mayor explicitly states projects seeking his approval must abide by certain design and energy standards, such as generating at least 10% of the site's power and heat needs on site from renewable power sources (Greater London Authority, 2004a, p 107).

The Mayor also intends to lead by example. In Proposal #43, the Mayor calls on the GLA to explore the feasibility of installing a fuel cell at City Hall to provide both heat and power, and encourages the functional bodies to do the same at their own facilities (Greater London Authority, 2004a, p 176). Because there are currently no large-scale fuel cells operating in London, these installations could serve as highly visible examples other building owners, managers, and developers could visit and then replicate at their own site.

A third technique proposed by the Mayor is to use his statutory powers and highly visible pulpit to draw attention to energy issues in London and lobby for policy changes and funding from Central Government. One example is the Mayor's development of renewable energy targets for London. Although the GLA does not have the funds to meet these targets on its own, the Mayor can nonetheless draw the public's attention to the fact that London is actively promoting the in-city deployment of renewable power technologies; that funding is available from Central Government to subsidize the cost of these installations; and report on how well London is achieving its targets. Similarly, the Mayor has issued a call for the construction of one "zero-carbon" development in each London borough to show the public, Local Authority planners, and real estate developers that building homes and businesses that do not contribute to global warming is not science fiction, but rather an achievable goal. The 'Bed-Zed' development in Sutton is one of the few developments of this type anywhere in the world (Bill Dunster Architects, 2004; Dyckhoff, 2004), and the Mayor is anxious to show that it need not be an anomaly.

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[50] The Town and Country Planning (Mayor of London) Order 2000 states that the Mayor of London has significant powers in relation to individual planning applications of "strategic" importance to London. These include large scale developments (which are defined based on the number of square feet in the development and its location in London), developments in close proximity to the River Thames, major infrastructure projects, and developments that may otherwise affect strategic policies in London. Boroughs receiving planning applications meeting these criteria must notify the Mayor, who has the option of deciding whether to comment on and support these applications, or, if he deems it necessary, direct the London Borough to refuse planning permission. The Mayor cannot direct Boroughs to approve applications otherwise opposed by the Borough. Source: (GOL, 2004b)

The final two implementation strategies proposed by the Mayor, establishing energy-related public private partnerships and promoting energy-related business development, also echo techniques called for in the 1993 *London Energy Study*.

**A Renewables Strategy for London?**

The 2004 Energy Strategy is the first attempt to lay out a coherent plan to promote the use and deployment of renewable power across London. Back in 1978, *Energy Policy and London* briefly mentioned the need to provide guidance on solar thermal installations, and expressed concern that solar access rights may need protection (Greater London Council, 1978). In 1993, the London Research Centre called on Government to examine the contribution renewables could play in London, and suggested London would benefit from a high profile solar PV installation that could serve as a model for local developers (London Research Centre, 1993). The five-report series developed by the LRC between 1998 and 2000 laid out how certain renewable technologies could contribute to London's energy supply, and explained which changes would help facilitate their deployment, but these reports did not constitute formal policy.

In the 2004 Energy Strategy, the leap from concept to policy was finally made. Six of its 33 policies specifically reference renewable energy or some type of renewable power generation technology, as do 21 of the 70 proposals found in the document. These cover a wide range of suggestions and mandates directed at Government, Local Authorities, private developers, and the GLA and its functional bodies. (A complete list of Energy Strategy policies and proposals related to some aspect of renewable power can be found in Appendix 4.) Three elements of the plan are of the greatest significance:

- ***Targets***: Proposal #6 calls for London to generate 665 GWh of electric power[51] (and 280 GWh of heat) from renewable power schemes by 2010. To achieve this,

[51] To put this in context, Figure 2 on page 7 of the Mayor's Energy Strategy indicates that Londoners use approximately 30,000 GWh of electricity per year.

the Mayor established the following deployment targets (Greater London Authority, 2004a, p 71):

- 7,000 (or 15 MW peak capacity) domestic solar PV installations
- 250 (or 12 MW peak capacity) commercial and public building solar PV installations
- 500 small wind generators on public or private sector buildings
- 25,000 domestic solar water heating schemes
- 2,000 solar water heating schemes associated with swimming pools
- "More" anaerobic digestions plants with energy recovery and biomass-fueled CHP plants.

By 2020, the Mayor believes London should triple these figures.

The targets proposed by the Mayor in the 2004 Energy Strategy are similar to those suggested by ETSU in their 2001 assessment of the viability of renewable power in London. The number of domestic PV systems has been reduced to 7,000, down from 10,000 in the ETSU report, but the number of larger commercial system installations has been increased from 100 to 250 making up the difference. Importantly, the Mayor's total renewable energy production target of 665 GWh remains the same as ETSU's. The Energy Strategy makes no specific projections of how many total megawatt-hours or gigawatt-hours of electricity would be achieved annually by each type of power technology, but given the similarity of the numbers, we can presume it follows the ETSU estimates. This means a substantial amount of power must come from waste incineration, pyrolysis, gasification, and anaerobic digestion facilities, as was called for in the Mayor's Municipal Waste Strategy (Greater London Authority, 2003d).

In establishing the targets, GLA staff said they faced a balancing act. In their public consultations, the reaction they heard was that these were extremely challenging targets, and the difficulty was compounded by the fact the Mayor doesn't have the power to implement them. According to one key staff member,

> "Where does that leave us? Do we set targets that are easily implemented by others? Or do we set targets that are extremely challenging to try, which we couldn't be held to? On balance, the comments that we were getting was that we have to provide leadership, we have to go for challenging targets, and we have to do as much as possible to meet them. So that that was the direction we went in."

The irony of this statement, of course, is the fact that although 7000+ installations is a very bold gesture when compared to the few dozen installations currently in London, ETSU estimates these targets will still only result in a supply capacity of less than 1% of London's total electricity demand.

- ***Use of the Planning System***: The Mayor calls for active use of the planning system to promote renewable power in London. Two different proposals are particularly relevant. Proposal #12 requests London Boroughs to establish their own renewable energy targets and incorporate them in the Borough's Unitary Development Plan. The Mayor also hopes that Boroughs will then "use their planning powers, land and property control, and awareness-raising activities to meet them" (Greater London Authority, 2004a, p 106). Proposal #13 is more aggressive, announcing that the Mayor expects the approximately 250 planning applications referable to him for approval to generate at least 10% of the site's energy needs (both heat and power) from renewable sources generated at the site, where feasible (Greater London Authority, 2004a. p 107).

- ***Energy Hierarchy***: The Mayor established an energy hierarchy intended to guide the GLA and its functional bodies as they implement energy initiatives at their own facilities and in regeneration projects involving the London Development Authority (LDA). It is also intended to serve as guidance for private developers, building managers, and the general public. The hierarchy is structured as follows (Greater London Authority, 2004a, p 41):

**Table 9-2**
**Mayor's Energy Hierarchy**

| | | |
|---|---|---|
| 1 | Be Lean – use less energy | • Reduce consumption through behaviour change<br>• Improve insulation<br>• Incorporate passive heating and cooling<br>• Install energy efficiency lighting and appliances |
| 2 | Be Green – use renewable energy | • On site – install renewable energy technologies, such as solar water heating, photovoltaics, biomass, wind turbines<br>• Off-site – import renewable energy generated elsewhere |
| 3 | Be Clean – supply energy efficiently | • Use combined heat and power, and community heating<br>• Cut transmission losses through local generation |

The hierarchy is useful both for educational purposes – it is an intuitively easy-to-grasp concept – as well as for the direction it offers to those responsible for designing or permitting new and existing government facilities, or regeneration projects sponsored by the LDA.

**Implementation Efforts**

Even before the London Energy Strategy was finalized in early 2004, the GLA began to implement many different aspects of the plan. The London Hydrogen Partnership was established in April 2002, with a very broad mandate to help create a hydrogen economy in London and throughout the UK (London Hydrogen Partnership, 2004). Projects to be promoted by the Partnership include both stationary and transport-related applications.

In 2003, the GLA, the Association for London Governments, and the Government Office for London received funding to create London Renewables, a public-private partnership designed to promote the uptake of renewables in London. From early 2003 through the summer of 2004, London Renewables engaged in a variety of tasks to establish a foundation on which the renewables portion of the Energy Strategy could be constructed. Several important reports and guidance have been produced thus far. The first, *Attitudes to Renewable Energy in London: Public and Stakeholder*

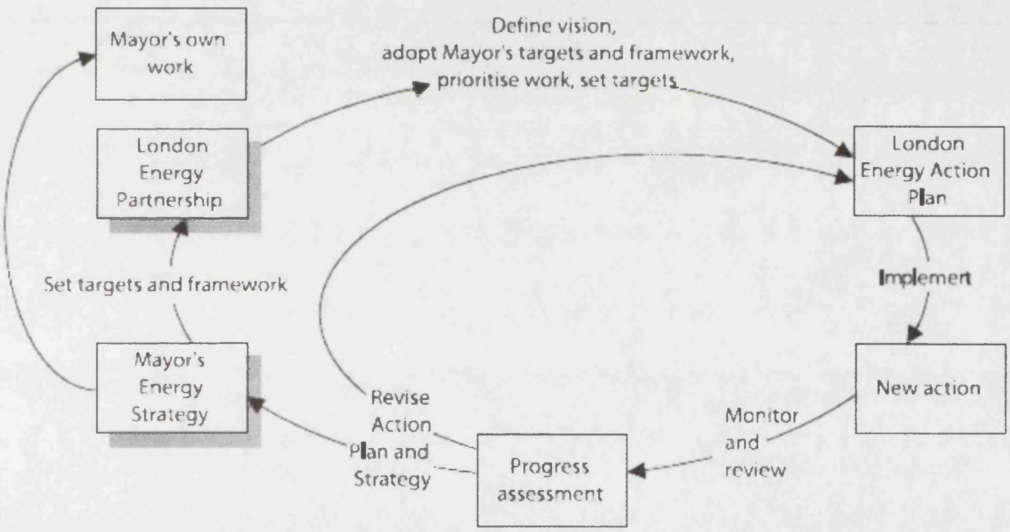
*Opinion and the Scope of Progress* (Brook Lyndhurst, 2003a), was the first survey research to focus on what Londoners, developers, and other stakeholders have to say about renewable energy in London. The research examined the participant's familiarity with and support for renewable energy, their views on what deployment targets should be set in London, and what they see as the major issues related to renewables deployment in London. The report found Londoners overwhelmingly support the use of renewables in London, but have a limited willingness-to-pay to purchase green power or deploy them directly on their homes and businesses.

The majority of London Renewables' time and energy has been spent developing guidance for a variety of audiences, including Borough Councilors and planners, architects, developers, and housing associations. Each document is highly tailored, reflecting information that will be of greatest use to the reader. Councilors are given basic background information about which renewable power technologies are appropriate for London, the local and UK policy context, and finally, lists of questions to ask planners and energy managers at their Borough. These questions focus on the content of the local UDP, whether planners are aware of energy issues, and energy management practices at Council-owned buildings (London Renewables/London Energy Partnership, 2004b). The guidance for developers offers case studies of clean energy projects already underway in London, hoping to show that such projects can prove effective locally (London Renewables/London Energy Partnership, 2004c). A sixth guidance document, *Integrating Renewable Energy into New Developments: Toolkit for Planners, Developers and Consultants*, provides detailed information about different renewable technologies; issues to consider when considering planning applications that incorporate one or more of these technologies; and how to assess or challenge a developer's claim that these technologies are technologically or economically infeasible (London Renewables/London Energy Partnership, 2004a).

DTI funding for London Renewables ran out in August 2004, and this group has since been subsumed into the London Energy Partnership (LEP), an even larger public-private partnership the Mayor has characterized as central to the success of the Energy Strategy (Greater London Authority, 2004d). The LEP was established in January 2004, and spent much of the first six months developing a business plan so it can be self-sustaining financially, establishing sub-task working groups, and prioritizing tasks among the dozens of proposals made in the Energy Strategy (Greater London Authority, 2004c).

Although the LEP has a steering group designed to represent a cross-section of government agencies, academics, industry, and trade organizations, the Strategy also created the London Energy Forum to invite broader public participation in the work of the LEP and on citywide energy issues. Membership in the Forum is open to all Londoners, businesses, and other stakeholders who wish to contribute or simply monitor what is happening locally on energy policy issues. Figure 9-2 describes how the Forum is intended to function.

**Figure 9-2**
**Links Between the Strategic Framework of the Mayor's Energy Strategy and the London Energy Partnership's Work**
Source: (Greater London Authority, 2004a, p 224)




What is not yet clear is where the new London Climate Change Agency fits into this picture. The Climate Change Agency was first proposed by Nicky Gavron in her short-lived run for Mayor in the 2004 elections[52], and then taken up by Ken

[52] Nicky Gavron served as Deputy Mayor to Ken Livingstone between 2000-2003. Because Livingstone left the Labour party in 1999 to run as an independent, it was not clear who would run as the Labour Party candidate in the 2004 Mayoral election. Nicky Gavron assumed this mantle in 2003, and stepped down as Deputy Mayor. In 2004, Livingstone was welcomed back into the Labour Party, and Gavron stood down as the official Labour Party candidate, in deference to the sitting Mayor. Gavron was re-elected to her London Assembly seat in 2004 and reappointed Deputy Mayor shortly thereafter.

Livingstone as part of his 2004 re-election campaign manifesto. According to Gavron, the agency will focus on a subset of Energy Strategy projects, including managing the energy efficiency of old and new buildings, focusing on bigger projects such as commercial clusters and public sector housing, and working with the LDA. The GLA has also suggested that a key aim of the Agency is to work with the private sector to establish an enhanced energy infrastructure in London (Greater London Authority, 2004f; London Energy Partnership, 2004b).

The London Development Agency has undertaken several projects aimed at supporting the Energy Strategy. In January 2004 the LDA released *Green Alchemy: Turning Green to Gold*, a report examining the economic development potential of the waste recycling and sustainable energy sectors. The energy section concludes that deploying the technologies called for in the Strategy could result in 5,000-7,000 new jobs and a market worth £3.35 billion by 2010 (London Development Agency, 2003. p 2). This is markedly less than the £20 billion market valuation made by the GLC Economic Policy Consulting group back in 1983 (Greater London Council, 1983), but sizable nonetheless. The LDA has also been actively engaged in examining the energy infrastructure of East London and the Thames Gateway, ascertaining what type of infrastructure is necessary to support the level of development proposed in the London Plan.

**Conclusion**

Modified regime analysis looks to the policy backdrop in a city or nation for factors that have influenced local policy decisions. London is rich in this regard as there are an incredible number of different research paths we can look to for insight. At the Central Government level, there have been efforts to link climate change concerns and the direction and content of national energy policy since the early 1990s. The renewables sector generally has done well as a result, thanks to the subsidies offered under the NFFO and more recently, under the Renewables Obligation and various small-scale installation incentive programs. Research and development funds are on the upswing again, with the UK trying to position itself as a global leader on certain renewable technology issues. In Chapter 10, I'll describe how Central Government's funding preferences have exerted a clear influence on actions taken by the GLA.

By itself, London also has a rich energy policy history, but one needn't look too hard to see there was historically more talk than action. This is logical – don't forget that until the 1990s, the industry was nationalized, and Central Government was essentially responsible for all aspects of planning delivery. There was really no need for a municipality to engage on this issue, except when they had concerns about the quality or type of service delivered by the state-run utilities.

Times have changed, however. Mayor Ken Livingstone and the GLA appear fully engaged on energy issues, and this time city policy-makers are trying to walk the talk. Thus, much of the new Energy Strategy is taken up with specific steps the Mayor plans to take to effect change within the GLA itself, at Local Authorities, in homes and businesses, and in new development projects. The Energy Strategy is ambitious in its scope, covering a wide range of topics, and inviting accountability by establishing vehicles for public and stakeholder involvement and concrete targets that can be monitored to assess progress. Some of the most interesting facets of the energy strategy are its goals, which are vastly different from the narrowly crafted policy goals in New York City. Reducing London's contribution to global climate change is explicitly mentioned, while the other two reasons focus on household levels concerns (rather than New York's macro-level economy focus) and the fact that energy is seen not just as a means to an end (i.e., the lifeblood that supports the vast real estate and construction sectors), but rather as the foundation of an independent services and technology sector with strong growth potential of its own.

There are two other key themes we can distill from this chapter that will be an important part of my modified regime analysis. Both are reminiscent of issues highlighted in the New York case study. First, we again see that the cost of energy is important to policy-makers. We know from Chapter 1 that Margaret Thatcher justified the restructuring of electricity markets out of a belief that the private sector could provide electric service at a lower cost than government. In this chapter we saw that the NFFO was designed in a way that would ultimately drive down the cost of renewable power. Cost considerations are also fundamental to NETA's operation, which is predicated on reducing inefficiencies in the power supply and transmission system. They also explain why the RO includes a buyout clause, ensuring that the pursuit of renewable energy doesn't drive overall electricity prices through the roof. In other words, in all of these examples, least-cost pricing was an implicit or explicit priority of Central Government policy-makers. This explains the need for Central Government's R&D and subsidy programs. To the extent they want the renewables sector to compete, they believe steps must be taken to make them more cost competitive in the short run. Interestingly, the London Energy Strategy is largely silent on this subject, apparently willing to defer to the deeper pockets of Central Government. This last subject is taken up in Chapter 10.

The other key theme of this chapter reflects the influence of Government-level policies and decision-making on local authority and market behavior. One of the clearest examples of this occurs when we consider the wealth of local energy policy documents prepared during the 1990s but the dearth of any programs to implement these policies around London. In Chapter 10, I'll also discuss how the decision to dissolve regional government meant there was an energy leadership gap during this period, with no citywide entity capable of moving any energy agenda forward. Renewables system developers have also been affected by the way Central Government-led programs have been structured: ROC rules disadvantaged smaller renewable power systems with minimum monthly power generation requirements, while for a time NETA rules increased the likelihood wind system operators would face stiff penalties for inaccurate supply projections. Companies seeking to deploy new systems also suffered from the vagaries of well-intentioned but ill-defined planning rules allowing considerable agency on the part of local planning officers. Planning applications in one community were handled completely differently than applications in another, and delays and rejections of project applications ultimately contributed to the demise of the entire NFFO program.

Given this broad set of circumstances, it is now time to turn our attention to examine how these facts contribute to the logic of policy and program decisions in London. The larger political environment will also be woven into the analysis to develop a comprehensive portrait of the factors shaping the London Energy Strategy and the deployment and use decisions of other stakeholders around London.

# CHAPTER 10
# London Case study: Policy and Politics – A Modified Regime Analysis of Renewables Decision-making in London

## Introduction

In the last chapter, I described *what* London proposes to achieve in terms of renewables; in this chapter, I focus more on *how* the Mayor proposes to implement his strategy, and *why* he has structured his plan in a certain way. My modified regime framework provides the analytical approach undergirding this chapter, providing key insights into which rule- or value-based influences are most relevant, and which stakeholders enjoy positions of privilege when it comes to local energy matters.

The previous chapter noted there is considerable evidence that new institutional factors have shaped the direction of London's strategy towards energy and climate issues. Many formal rules that exert the greatest influence emanate from Central Government, and as will be made clear in this chapter, this is to be expected because Central Government is an inescapable part of policy-making life in London. This situation was first alluded to back in Chapter 3, when criticisms were levied at urban regime theory for its failure to adequately account for the strong role central government plays in the life of many European cities. On the ground in London we see Central Government influence manifest itself time and again. Funding preferences by DTI and DEFRA shape which issues the GLA takes on, while Parliamentary rules establish limits on the powers available to the Mayor in the areas of budget and planning.

Because of the tremendous amount of policy activity occurring at City Hall, however, it is not always apparent that such limitations exist, or that they have much influence. Unlike in New York City, where the fact that most renewable energy planning occurs at the State level appeared to limit the willingness to undertake renewables planning at the local level, in London the Mayor and his team have seamlessly woven these circumstances into their policy approach, identifying where they can exert strong independent leadership, and where they must call on Central Government to intercede or act. By parsing the past five years of policy work by the GLA, however, Central

Government's web of influence becomes quite clear, affecting the direction, tone, and level of assertiveness found in Mayoral strategies. Other new institutional factors, such as value preferences related to least-cost, also carry considerable influence over policy and program decisions made by the GLA and other stakeholders.

As with the New York case study, I begin this chapter with a standard regime analysis of London, exploring the extent to which a small cadre of decision-makers holds sway over the local policy agenda. I then move on to the energy and environmental policy landscape in London, discussing evidence that shows stakeholder involvement is critical in explaining local renewables policy. Finally, I weave in new institutionalist threads to bolster my assessment of which factors best explain local decision-making, resulting in a quite robust explanation of the logic behind renewables policy-making and deployment levels in London.

## PART 1: Who Runs London?

### The Power(s) of Central Government

Regime analysis focuses on who is engaged in local policy-making, reasoning that who is involved ultimately influences the direction and shape of policy and implementation efforts. As originally conceived, urban regime theory argued the local business community enjoys a privileged status in setting (or shifting) the local government's policy agenda, because it has many essential resources (e.g., money, knowledge) that local government lacks. In the UK and many other countries, however, national-level government plays a similar role, meaning to carry out a proper regime analysis one must first appreciate how local context can change the nature of the regime.

In the UK, Central Government power manifests itself in many different ways:

- *Land owner*: Central Government own large swaths of land in many communities, giving it leverage in deciding whether (or what type of) development or regeneration may occur in that community.

- *Source of funds*: The vast majority of a UK Local Authority's budget comes from funds allocated to it by Central Government. In the UK, local borrowing is also tightly controlled by Central Government (Harding, 1994).
- *Deliberate attempts at promoting private sector partnerships*: In the UK, "new urban governance" policies by Central Government have either required local authorities to contract out for a good or service or partner with a private firm to be eligible for regeneration project funding, national lottery monies, City Challenge funds, etc. (Newman & Thornley, 1997; Rydin, 1998).

Central Government has even more fundamental powers that over the last 150 years have proven particularly important in London: the power to establish, or abolish, regional government and borough-level government; and the power to assign each body very specialized responsibilities. These powers have been exercised several times since 1855, a result of struggles between Central Government and local officials over who should control the destiny of the UK's capital city (Travers, 2004). The most recent change occurred in 1999 when Parliament reconstituted regional government in London for the first time since 1986. Composed of a publicly-elected Mayor and Assembly, the Greater London Authority is the latest in a long line of attempts to provide essential public services, strategic vision, and civic leadership to the 600+ square mile area known as Greater London. This area now extends far beyond the borders of the original 'City of London', the one-square mile area where the city was first born.

Prior to the formation of the GLA, the last form of regional government was the Greater London Council, which governed from 1965-1986. Almost from the start, the GLC's efforts were criticized, as "it did the things it was supposed to do badly or not at all, and tried to do too many things it should never have tried to do" (Pimlott & Rao, 2002, p 39). After 1983, when Margaret Thatcher became Prime Minister, the battles between the GLC and Central Government became pitched, with then-GLC Leader Ken Livingstone using "the wealth of County Hall and its location beside Westminster Bridge as a political platform to challenge and tease the Government" (Hebbert, 1998, p 115). Thatcher vowed to abolish the GLC, a goal she achieved in 1986.

Following the GLC's demise, governmental powers and responsibilities in Greater London were split among Central Government, the thirty-three boroughs, and a web of quangos and joint arrangements that developed over time among and between different levels of government. London governance during the 14-year period following 1986 has been characterized – mostly negatively – as an "uncoordinated mess" and a period when the capital suffered from the lack of any formal vision for the future of the city (Pimlott & Rao, 2002; Rydin, Thornley, Scanlon, & West, 2004, p 55). There were several attempts to bring order to this situation. The thirty-three London boroughs banded together to form the Association of London Governments (ALG) and the London Planning Advisory Committee (LPAC), giving the boroughs a stronger, more coordinated voice on issues of common concern. In 1994, Central Government established the Government Office for London (GOL) to streamline interactions between the boroughs and various Central Government ministries; it was led by a Government-appointed Minister for London.

However, these efforts did little to stave off calls for some new form of regional governance, a stance that was a key platform position of the Labour party in the 1997 elections. When Labour took power, they set to work crafting Green Papers and White Papers on the subject, putting the issue to a public vote, and finally passing the GLA Act in 1999 (Pimlott & Rao, 2002). Compared to governance structures in other parts of Britain, the GLA broke new ground. The new London mayor is both the formulator and executor of most policy decisions, while the Assembly was given weak "junior partner" powers related to the budget and an ability to scrutinize mayoral appointments and policy decisions (Loveland, 1999, p 93). On its own or through four different 'functional bodies,' the GLA's remit includes managing public transport in London, major roads, taxi and minicab regulation, traffic regulation, police/fire/emergency management issues, economic development, and strategic planning. The second tier of government in London – the thirty-three Local Authorities that were first established around 1899 – are responsible for schools, social housing, local transport and roads, refuse and recycling services, street cleaning and lighting, local economic development, and local planning decisions (Fuchs & Travers, 2000). The budget controlled by the GLA is quite large, but as previously noted its budgetary powers are quite weak. Most GLA funds come from grants by

Central Government, and ultimate control over both the GLA and borough budgets rests with Central Government, which can intervene to ensure that spending is not excessive (Loveland, 1999).

**A Role for Others in London's Agenda-setting?**

The three levels of government in London (i.e., central, regional, and local) do not have exclusive claim to local political and policy agenda-setting powers, however. As in New York, London's business community also holds considerable sway, filling in many of the gaps created by the uneven (and occasionally absent) regional governmental structure. Ironically, the abolition of the GLC in 1986 is given much credit for this situation. The business community, concerned that London was falling behind other cities in its economic competitiveness, banded together both to highlight the need for some new form of London-wide governance and to directly promote inward investment (Newman & Thornley, 1997). London First, the most notable of the private sector initiatives, was created in 1992, the outgrowth of a collaboration between leading private sector interests, the voluntary sector, and the London boroughs (Pimlott & Rao, 2002). It operated as a wholly private entity, focusing on strengthening the skill base of London's workforce, campaigning for transport system improvements and expansion, and positioning east London as the primary area where growth should occur.

The run-up to the formation of the GLA in the late 1990s offers more evidence of the business community's influence. First, in 1998, several leading businesses approached Central Government offering assistance in laying the groundwork for a new London Development Authority, which was to be the GLA's new economic development arm. Government quickly agreed, and the London Development Partnership (LDP) was formed, lead by representatives of London First, the London Chamber of Commerce and Industry, the Corporation of London, and the London region of the Confederation of British Industries, a manufacturing trade group. The LDP developed a draft economic development strategy in January 2000, greatly influencing the economic development strategy delivered by the LDA later that same year (Thornley, Rydin, Scanlon, & West, 2002). Many of the LDP board members have since gone on to serve on the Board of the LDA.

Second, the management consulting firm KPMG was actively involved in the debates over how to structure the GLA. KPMG staff were seconded to the GLA early on to help smooth the transition, including one person who was responsible for appraising the "business-friendliness" of the various mayoral strategies (Pimlott & Rao, 2002; Travers, 2004; West, Scanlon, Thornley, & Rydin, 2002, p 18). Their work culminated with the publication of the KPMG-drafted report *The Mayor and Relations with the Business Community*. Issued by the Mayor just one month after the election, the report describes the Mayor's intention to follow a 'consultancy model" whereby "outside expertise will be drawn as early as possible into the formation of policy, and execution will, in the maximum number of cases, also be carried out by bodies outside of the Mayor's Office/GLA – with the Mayor's Office/GLA playing primarily a co-ordinating and monitoring role" (Greater London Authority, 2000a, p 1).

This statement echoed many themes raised by the London Business Board[53] in their 1999 report *Business Manifesto for the Mayor and Greater London Authority*. One of the manifesto's recommendations was the need to "closely liaise and consult with business – appointing business representatives to work with the mayor and contribute to all GLA policies at an early stage" (London Business Board, 1999, p 4). Seven months later, the Mayor's statement said roughly the same thing. Following the election, the Mayor set up bi-monthly meetings with the London Business Board, coordinated by the Mayor's principal economic advisor John Ross. Business interaction with City Hall was far more frequent than that, however, with one business group claiming they were in contact with John Ross on a "weekly, if not daily" basis (Thornley et al., 2002, p 7).

Political parties have also had long-standing influence over the governance of London. This was of course seen in the Tories' decision to abolish the Labour-dominated GLC, and more recently in Labour's efforts to reconstitute regional government yet limit the extent of its powers. Party allegiance does not appear to have played a major role in the operation of the London Assembly, which thus far has

[53] The Business Board was made up of three of the groups in the London Development Partnership – CBI London, the London Chamber of Commerce and Industry, and London First.

been characterized as a relatively harmonious body (Travers, 2004). At the borough level, political battles between parties are still de rigueur. (For example, see Myerson, 2004). After the 2000 elections, the Labour party controlled seventeen of London's thirty-two borough councils[54], while the Conservative and Liberal Democrat parties controlled four and three borough councils respectively. Eight borough councils are split (House of Commons, 2000, p 10). These political debates can intrude on policy discussions in many different realms, including revisions to local Unitary Development Plans and other policies the GLA may need to rely on to foster change at the borough level. According to one local political observer, the Mayor's policy agenda could suffer if Local Authorities defy his call for cooperation. "For instance, take Westminster Council – which is Tory – they've been a steady thorn in [the Mayor's] side, and wouldn't think twice about telling him to sod off."

**Environmental and Energy Politics in London**

An energy regime analysis must account for local environmental politics, which in London involves many sources, ranging from national and local 'green' groups, businesses and business groups, political parties, and all levels of governmental organizations. Given the large size and range of geography covered by Greater London, the issues taken up by these groups is quite diverse, ranging from groups opposed to trains carrying nuclear waste through London to groups focused on preserving gardens and open spaces.

Like New York, London is home to two of the world's most well-known environmental groups, Friends of the Earth and Greenpeace. Greenpeace is highly selective about the issues it takes up, with most having a national or international focus rather than a local orientation. Greenpeace is quite active on UK energy issues, promoting renewables deployment and enrollment in Green Tariff plans. Friends of the Earth engages on a much wider range of issues, although it too has been active on climate change matters. FOE is also unique in its setup, with a central office staffed by full-time professionals, supplemented by an extended network of volunteers who

[54] In the City of London, Greater London's 33rd borough, all candidates agree to serve as independents with no political party affiliation.

operate through affiliate chapters around the UK. The affiliates rely on information and strategy from the professional staff, and then develop their own advocacy campaigns targeting their Local Authority, members of Parliament, or Central Government. In London, FOE has fifteen chapters, and a central staff liaison dedicated to providing support and eliciting feedback from these groups. Two other national green groups with a London presence are the Royal Society for the Protection of Birds (RSPB) and the Campaign to Protect Rural England (CPRE). Both groups have been very active on issues related to the on-shore deployment of wind turbines (CPRE, 2004; RSPB, 2004).

Three important organizations with a citywide focus include London21, the London Wildlife Trusts, and the London Sustainability Exchange (LSx). Both LSx and London21 act as a clearinghouse for information on local environmental issues. Because both groups adhere to a broad definition of "sustainability," their remit also covers issues related to social exclusion and economic development. LSx has had a particularly high profile in recent years through its participation in many different GLA-led commissions and advisory bodies. LSx is policy neutral, and their role is largely one of ensuring that information is widely disseminated to groups that play an advocacy role.

There was an attempt made by several green groups to develop an environmental agenda in the run-up to the GLA election in 2000. In this election manifesto, *Making London Work: Gaining Economic and Social Advantage from a Better Environment*, the Sustainable GLA Coalition[55] explored how "an environmental approach to economic development" could bring jobs and wealth creation opportunities to London (Sustainable GLA Coalition, 2001, p 3). The report examined urban regeneration, transport, energy, waste, eco-technologies, and biodiversity, advocating specific policies and programs the Coalition believed could improve the quality of life in London, create jobs, lower the cost of doing business, and address social exclusion. Another election manifesto, *Creating a Sustainable London* was developed by the Sustainable London Trust, a group instrumental in establishing the London21 network. *Creating a Sustainable London* addressed issues of London governance,

[55] The Coalition included Forum for the Future, London Cycling Campaign, London Wildlife Trusts, CPRE London, RSPB, and Friends of the Earth.

how the GLA should operate, which sustainable development issues were most critical in London, and how sustainability principles could be incorporated into GLA policies (Sustainable London Trust, 1997).

Political parties and business groups have also been vocal on environmental topics in London. Nearly 40% of the local Green Party's 2000 GLA election manifesto dealt with environmental topics (Green Party, 2000), with transport issues earning the lion's share of the attention. The Greens even claim credit for portions of Ken Livingstone's 2000 election manifesto, although others attribute its 'greenish tint' to the involvement of Friends of the Earth (Thornley et al., 2002). During the first year of Livingstone's administration, Green party mayoral candidate Darren Johnson served as the Mayor's Environmental Advisor, and was appointed Chair of the Mayor's Policy Commission on the Environment.[56]

Among business groups, London First has the strongest record of action on local environmental policy matters, publishing reports on the mayor's congestion charge plan (London First, 2002b); publishing local environmental quality data (London First, 2003) and a 'footprint' study examining London's global environmental impact (London Remade/London First, 2003); providing feedback on all of the Mayor's strategies (for example, see London First, 2002a, undated); and partnering with London Renewables to launch the release of new guidance documents for developers, consultants, Local Authority planners, and Councilors (London First, 2004). The London Chamber of Commerce and Industry, the other leading business group in the city, is far less engaged on local environmental issues. They have been a vocal opponent of the Mayor's congestion charging plan, claiming it hurts local business (London Chamber of Commerce and Industry, 2004), but other environmental issues do not appear to be a priority focus of the group.

Within the energy arena, there are several groups of note in London. At the Local Authority level, there are three organizations supporting the work of Borough employees working on energy issues (London Assembly Environment Committee, 2002b, p 25):

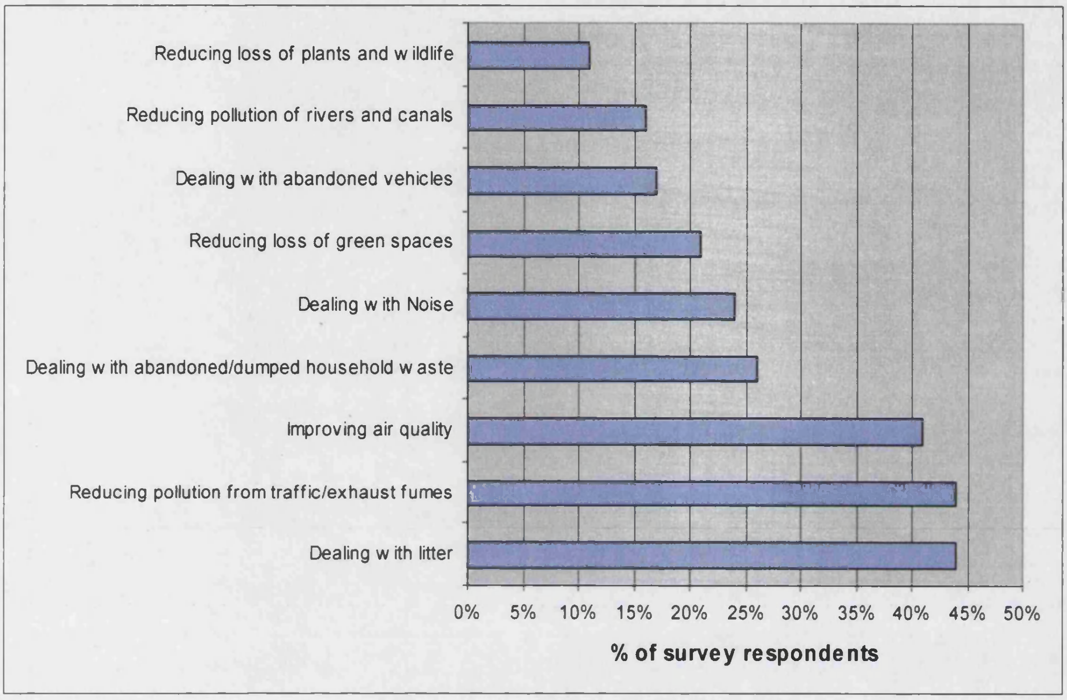
[56] Johnson left this position after one year, and currently serves in the London Assembly, where he holds the position of Chair of the Environment Committee.

- London HECA Forum – a network of borough government employees involved in implementation of the Home Energy Conservation Act (HECA)
- London Borough Energy Manager's Group – a network of borough government employees and others responsible for energy management within public buildings
- London Utilities Consortium – a network of borough-level purchasing managers who have consolidated their energy service contracts to obtain better pricing.

There are also a handful of NGOs that specialize in providing assistance on energy matters to Local Authorities, businesses, and the general public. Many of these groups were active participants in the development of the Energy Strategy, either early in the development phase or later in the public consultation process. These groups include Creative Environmental Networks (CEN), the Greater London Energy Efficiency Network (GLEEN), Sustainable Energy Action, and Energy Solutions. All four groups regularly work with Local Authorities around London, advising them on energy matters, providing hands-on technical assistance to borough residents or Council housing developments, or assisting with the development of supplemental planning guidance for use by borough planning staff.

If we move away from *who* engages in local environmental policy debates to *what* are the key issues, transport-related matters – including congestion, transport-related air quality, and the perceived poor state of London's public transport system -- are far and away the most significant environmental issues in the minds of the public, the business community, and local policy-makers. This was true before the GLA was established (Pimlott & Rao, 2002), in candidate manifestos during the 2000 election (Green Party, 2000; Travers, 2004), and it has been borne out in opinion surveys of the public and business community since then (Greater London Authority, 2003b; London First/London Remade, 2003). Among other types of environmental issues, air quality, litter and waste disposal, and water pollution are seen as the most pressing problems facing London. (See Figure 10-1.) None of the categories respondents could check off in the GLA survey readily lend themselves to climate change or renewable power concerns, so it is hard to know where these issues rank as a priority for Londoners. The Managing Director of one local energy group suggested that in general, “Energy is not a very high profile public issue here in the UK…you’ll find a lot more interest in waste or street graffiti than there ever will be in energy.”

**Figure 10-1**
**Most Important Environmental Issues Facing London**
Source: (Greater London Authority, 2003b)




### The Politics and Process of Renewable Energy Agenda-Setting in London

Transport issues were very much on the mind of Mayor Ken Livingstone once he was elected, and have been a major focus of his administration, particularly among his closest advisors. The decision to emphasize transport matters was deliberate, a calculation by the mayor that his 2004 re-election prospects would be enhanced by tackling those issues most “salient to the electorate and where the results of mayoral action could be directly demonstrated” (Rydin et al., 2004, p 66). Other environmental issues fell into a second tier of less urgent “Big Tent” agenda items, and were handled by others in the GLA Policy and Partnership directorate. Many of these GLA staff members had worked on related issues in the past (West et al., 2002), and their ideas may have influenced the content and direction of the environmental strategies the Mayor was statutorily required to prepare (Rydin et al., 2004).

Because the mayor was not required to develop an Energy Strategy, understanding its genesis is important. Parentage is shared – or claimed – by many. Several energy advocates around London interviewed for this thesis report lobbying for the development of an Energy Strategy both before and after the GLA elections, arguing that because many of the statutory strategies had an energy component, it made sense to consolidate all of the policies in one place. Top mayoral advisors attribute the idea to a longstanding interest in the issue by Ken Livingstone, something evidenced by the Mayor's installation of a solar thermal system on his own house in Cricklewood (Sawer & Bar-Hillel, 2004). Deputy Mayor Nicky Gavron, characterized by one local energy expert as the "green arm of Ken", was also credited by many in City Hall for her early and ardent advocacy of an Energy Strategy.

Once the development of an Energy Strategy was agreed to by the Mayor, it then became a matter of determining what it should say. In the previous chapter, I discussed the overlap between the old LPAC and LRC energy policies and reports and *Green Light to Clean Power*. I raised the question whether these historical documents, or the GLA's reliance on staff who had worked on the old studies, somehow influenced the new Strategy. GLA Energy Team members insist this was not the case, claiming they began the process with no preconceived notions about what it should include. Instead, they explained the Team went out and solicited input from a range of stakeholders around London, looked at current and anticipated policies flowing down from the EU and Central Government, and examined the role Local Authorities would play in implementing any strategy. Finally, the team looked at the GLA Act to review the powers at the Mayor's disposal. According to one advisor, these factors all "shaped the direction of policy and how the Mayor proposed to deliver them."

The task of drafting the document fell to the GLA's small Energy Team, led by Joanna Dawes, a former LRC staff member. Several internal drafts were developed before the Assembly draft was publicly released in March 2002. As part of the drafting process, the Team would meet with Dr. David Hutchinson, Environmental Policy Manager within the Policy and Partnerships Directorate; John Duffy, the Director of Environmental Policy at the GLA; and Darren Johnson, the Mayor's then-Environmental Advisor, on an as-needed basis to review each draft. Unlike the internal battles that were reportedly fought over the content and direction of the London Plan (Rydin et al., 2004), GLA staff reported there were no major internal differences over the content and direction of the Energy Strategy. Half-day and day-long meetings were scheduled to review the entire report, and provide feedback to the Energy Team on the preferred wording of policies and proposals to be incorporated into the draft. GLA legal staff was also regularly consulted on the extent and limits of mayoral powers, to help guide the Team on the final wording of the various proposals.

**Table 10-1**
**Key Events – London Energy Strategy 2001-2005**
Source: Original research June 2005

| | |
|---|---|
| 2001 | GLA Energy Team solicits ideas on what should go into Mayor's Energy Strategy and prepares first draft |
| Feb 2002 | ETSU study *Development of a Renewable Energy Assessment and Targets for London* is released |
| Mar 2002 | First (Assembly/Functional Bodies) draft of Mayor's Energy Strategy released |
| Apr - Jul 2002 | London Assembly scrutiny of first draft Mayor's Energy Strategy |
| Jan 2003 | Second (Public consultation) draft of Mayor's Energy Strategy released |
| Feb - Apr 2003 | Formal public consultation on Mayor's Energy Strategy occurs |
| Feb - May 2003 | London Assembly scrutiny of second draft of Mayor's Energy Strategy |
| Mar 2003 | London Renewables launched |
| Dec 2003 | London Renewables report *Attitudes to Renewable Energy in London* is released |
| Jan 2004 | London Energy Partnership launched |
| Jan 2004 | LDA's *Thames Gateway Energy Infrastructure study* released |
| Feb 2004 | *Green Light to Clean Powe* r released |
| Sep 2004 | London Renewables/London Energy Partnership report *Skills and Jobs from Renewable Energy* is released |
| Sep 2004 | London Renewables/London Energy Partnership *Toolkit for Planners, Developers and Consultants* released |
| Jun 2005 | London Climate Change Agency formally launched |

The first (Assembly and Functional Bodies) draft of the Strategy was released in March 2002. In July 2002, the London Assembly Environment Committee released a report summarizing three formal scrutiny hearings and a series of scrutiny workshops involving various energy stakeholders from around London. Generally, reaction to the draft Strategy was quite favorable, although there were many suggestions offered as to how it could be improved (London Assembly Environment Committee, 2002b). Much of the Assembly scrutiny hearings were taken up with discussions about the lack of any clear renewable power targets in the Strategy. In his appearance before the Committee, the Mayor explained targets were an issue on which he was seeking feedback from the business community (London Assembly Environment Committee, 2002a), a task he assigned to the London Sustainable Development Commission.

When the second (Consultation) draft of the Energy Strategy was published in January 2003, targets were in place, along with a requirement that planning applications referable to the Mayor generate 10% of the building's heat and power needs on-site from renewable sources (Greater London Authority, 2003c, pp 86, 120). In establishing the renewable power targets, the Mayor essentially accepted the deployment targets laid out in the 2002 ETSU study, despite the fact that he had expressed disappointment with these targets when the ETSU study was first released (ETSU/AEA Technology, 2001a). The Mayor's criticism was based on his disappointment at the fact these deployment levels would satisfy less than 1% of London's overall power needs. The 10% on-site generation requirement was an outgrowth of UK Planning Minister Keith Hill's ruling in October 2003 upholding the right of Merton Council to impose such a mandate on large new development projects in the borough. In the first (Assembly) draft of the Energy Strategy, the requirement had been more nebulous, requiring only that new developments generate a "proportion of the site's energy needs (electricity and heat) from renewables" [57] (Greater London Authority, 2002, p 92). Another significant change between the first and second drafts was the addition of dozens of new policies and proposals dealing with issues the Mayor wished the London Energy Partnership to take up. At their scrutiny hearings in 2002, Assembly members had expressed concern about the lack of clarity on the structure and priorities of the partnership, and changes in the second (Consultation) draft may have been intended to address those concerns.

The majority of the comments received during the formal public consultation process on the second (Consultation) Draft were again favorable (Greater London Authority, 2003a). One City Hall observer said that "... of all of the Mayor's strategies, this is the most agreed upon. There wasn't any major barrier or idea that was seriously challenged – something that was definitely NOT true for some of the other [GLA] strategies, particularly the waste and transport plans." Not all the comments submitted in the public consultation process were ringing endorsements, however. The comments of the London Fire and Emergency Planning Authority (LFEPA), a GLA functional body, highlighted difficulties the LFEPA would face in trying to procure green power and deploy renewables on LFEPA buildings, policies called for

[57] As previously noted, the term 'proportion' was also used in the version of this proposal appearing in *The London Plan*.

in the Strategy (Lightbown, 2003). London First (undated) offered highly skeptical comments, endorsing the draft Strategy in principle while simultaneously questioning the wisdom of many proposals. In particular, the group:

- Called the renewable energy targets "unrealistically high within some of the time scales suggested", thus jeopardizing the strategy in its entirety.
- Criticized the proposal to develop Supplemental Planning Guidance that might place London at an economic disadvantage to other areas of the UK, thus discouraging development in the capital.
- Noted that the 10% on-site generation requirement may not be viable in all cases in the short term for both logistical and reliability reasons. As an alternative, London First suggested establishing a "realistic" target date for its deployment, although nothing was offered as to when such a date might be.

The consultation process itself was criticized by other observers, including one who argued it was handled in a far more ad hoc fashion than the GLA will publicly acknowledge:

> "I was appalled at how it was done. Anyone who wanted to could call up the GLA and say we want Nicky Gavron or someone else to come talk to us...the GLA would comply, and then convince itself that it was engaging in a very broad consultation, when in reality, the GLA was only hearing from those groups that took the initiative to call City Hall."

In their review of the second (Consultation) draft, the Assembly Environment Committee focused almost exclusively on the Mayor's proposals for the London Energy Partnership. Although the Committee had been hungry for Partnership details in the prior year's scrutiny, this time around they said the Mayor had gone too far, prescribing a work plan and operating structure that threatened the independence of the Partnership (London Assembly Environment Committee, 2003).

The final version of the Energy Strategy, known as *Clean Light to Green Power*, was finally released in April 2004. With the entire document shrinking in size from 373 pages to 260 pages, there were substantial changes made between the consultation and final drafts of the Strategy, although most were cosmetic in nature rather than fundamental changes in direction. Twenty three of the proposals included in the consultation draft that didn't make the cut in the final version dealt with the London Energy Partnership.

**Implementation – Another Opportunity for Influence?**

Beyond considering agenda-setting, we also need to examine implementation issues. There are two obvious areas in which to do this – the work of the Mayor's energy-related public-private partnerships (London Renewables and the London Energy Partnership) and the GLA's handling of planning applications requiring Mayoral approval.

London Renewables got underway in early 2003. The GLA invited eleven organizations to join in its work:

- Government agencies (ALG, GOL, and the LDA)
- Business/Trade groups (London First, Renewable Power Association, London Environment Coordinators Forum)
- Energy firms (Solar Century, EDF Energy)
- Academia (Imperial College), and
- NGOs (LSx, Creative Environmental Networks)

The group engaged in discussions about which tasks it should take up, but much of the remit was determined by the UK Department of Trade and Industry, which provided match funding for the group. GLA staff report the DTI strongly encouraged London Renewables to examine planning-related issues in London, and this was clearly a recurring theme in the group's work. London Renewables' first report spent a great deal of time examining the status of the planning system in London, and recommending how to make it more renewables-friendly (Brook Lyndhurst, 2003a). In 2004, in conjunction with the London Energy Partnership, London Renewables published several more documents providing specific planning and policy guidance on renewables for Local Authority planners, real estate and renewable power scheme developers, architects, Borough Councilors, estate agents, and housing associations (London Renewables/London Energy Partnership, 2004a, 2004b, 2004c).

The London Energy Partnership's first year proceeded more slowly, with much of its early work focused on developed a business plan for the organization, and more recently, an Energy Action Plan laying out the Partnership's agenda through 2009. The steering group responsible for setting this agenda has a larger and more diverse set of members than London Renewables, although there is overlap between the two. The most significant difference is the inclusion of representatives from the finance and construction sectors, and the appointment of a Chair from outside the GLA. (By contrast, London Renewables was entirely managed by GLA staff.) Representatives from several groups involved in the Strategy development process have expressed concern about the makeup of the Partnership, and the fact that they've been relegated to 'observer' status rather than a full voting member. Said one, "...we're worried we might be sidelined, particularly because it's [groups like ours] that have the biggest chance of implementing something. We're worried we had good input all the way through, but now when it comes to delivery, we're put on the sidelines..."

Two program areas are priorities for the Partnership over the next year. The Energy Efficiency Task Group was the first one established by the Partnership, with a goal of providing focus, publicity, and additional funding for existing energy efficiency initiatives around London (London Energy Partnership, 2004a). Energy Action areas are to be the other early focus of the Partnership. Although the definition is still under development, Energy Action Areas are intended to be a specific location, neighborhood, or large development site where some type of high profile energy-related project will occur. The project may emphasize a single technology or the marriage of multiple energy technologies into a single project. The Partnership's Energy Action Area Task Group is currently working to define its first set of projects.

One will likely be in the East London/Thames Gateway area, which is a key focus of the London Development Agency. In January 2004 the LDA released the results of a study examining the current and anticipated energy infrastructure requirements of the region. Because the area will potentially experience the construction of up to 93,000 new housing units during the next 12 years, the analysis focused on both the capacity of the current energy infrastructure, and what might be necessary under different development scenarios (Sinclair Knight Mertz, 2004). Several large projects intended for the area, such as the 5,000+ home Stratford City development in the Borough of Newham, have already received planning permission from the Mayor. Over the year-long period during which planning permission was negotiated, there was considerable back-and-forth between the GLA and the project developers that resulted in significant changes in the energy systems planned for the site.

Under the terms of the final agreement, the Stratford City developer will "use reasonable endeavours to achieve a minimum of 2% of the energy requirements of the development ... from locally resourced renewable energy either on or off-site." Should more funds become available from government sources, the developer agreed to increase this percentage rate. The developer also agreed to establish a renewable fund of up to £3 million to be used to deliver renewable energy generation within the development or in the local vicinity. 70% of the development's power will be derived from combined heat and power installations, and one of the buildings will be designed as an "exemplar building" delivering at least 10% of its power from on-site renewable sources (Greater London Authority, 2004g).

The Stratford City project is just one of many development projects in which the Energy Strategy played an important role in shaping the outcome of the project. This was not always the case, particularly soon after the Strategy was finalized in February 2004. GLA staff report their attention to energy issues in planning applications was spotty early on, as they lacked the staff to follow through on these matters. This changed in early summer, when the GLA Planning Unit hired an experienced planner to focus solely on an applicant's compliance with Energy Strategy policies. He liaises with the project applicant to discuss energy considerations, and develops a response noting strengths or deficiencies in the applicant's approach. (For example, see page 23 of the Planning Report on the Kings Cross development scheme at http://www.london.gov.uk/mayor/planning_decisions/strategic_dev/2004/oct2704/kings_cross_report.pdf.) As appropriate, he consults with GLA Energy Team members to discuss individual projects and ascertain the appropriateness of applicant claims regarding the feasibility of renewable energy schemes at the project site. Ultimately, however, it is up to the Mayor to decide how aggressively to press Energy Strategy requirements on any individual application. According to GLA staff, these decisions are made in regularly scheduled meetings between the Mayor and his planning staff where all planning applications referable to the GLA are reviewed.

**A Regime for London?**

Given this evidence, can we conclude that urban regimes have existed, or currently do exist in London? Several studies assert they are present in some London boroughs, but the results are contradictory, and regimes are clearly not a citywide borough phenomenon. Saunders' (1979) analysis of the London borough of Croydon was the first to identify a regime-type entity anywhere in London. Twenty years later, Dowding et al (1999) found this characterization was still accurate. Dowding also found regimes in the boroughs of Wandsworth and Islington, although they differed from the Croydon version in that both were local service delivery-focused rather than growth-oriented. The staying power of the Wandsworth and Islington regimes was deemed questionable, as they appear to be heavily reliant on the Labour party retaining control of Central Government and/or the local borough council. Regimes were not found in Westminster, Lambeth, or Tower Hamlets, despite the distinctive political agenda in each borough, as each of the dominant coalitions had difficulty delivering on their agenda. Buck et al (2002) contradicted these earlier studies, arguing that with the possible exception of Wandsworth, there is little evidence that regimes exist in London. In Buck's analysis, several boroughs display one or more of Dowding's key regime characteristics, but none satisfy all eight test criteria. Long (2000a) tried to characterize a tourism partnership in Islington as a regime, but his analysis lacks rigor and the partnership he scrutinized would fail most regime tests.

The absence of any regional governmental structure in the post GLC-era made it difficult to conduct a regional regime analysis during that period (Thornley et al., 2002). Some have claimed London First displays the characteristics of a business-centered regime, given its distinctive and long-lasting policy agenda. However, London First was historically fostered and supported not by local political elites, but rather Central Government, making it a variation on the traditional urban regime model (Newman & Thornley, 1997). The City of London Corporation and the London Docklands Development Corporation are other business-led groups identified as having regime-like characteristics that focused on regional policy aims during the

1986-2000 period (Thornley et al., 2002). Rydin et al (2004) conclude that with the creation of the GLA, and clear evidence that business groups have gained the ear of Mayor Ken Livingstone, London may soon be home to an identifiable region-wide regime. Conclusive evidence will hinge on whether the regime can mobilize resources and the participation of both London Boroughs and Central Government to fulfill its agenda and gain a position of stability.

A very similar statement could be made about the existence of an energy regime in London, although I believe some telling results are already known. There clearly has been a spate of energy-related activity since 2001, catalyzed by the GLA, and involving a broad coalition of stakeholders. The key players involved in this work are known:

- **Central Government** is a crucial player. Its policies set the ground rules for the national electricity marketplace, while locally it has been very supportive of the GLA's Energy Strategy development process. Because success in London is important to the attainment of national renewables deployment targets and other climate change goals, we can expect to see continued, active participation by Central Government.

- The **private sector** is an equally important coalition partner. The energy marketplace is now structured so the involvement of suppliers and DNOs is critical when discussing or designing new supply or delivery schemes. The GLA actively sought the participation of real estate developers and other business interests to insure Mayoral policies would not alienate these groups or otherwise harm their business interests. Both groups responded willingly, providing information vital to the crafting of the first draft strategy, and then providing feedback as subsequent versions were produced. Through their participation in the London Energy Partnership, and through the key role real estate developers will play in constructing new energy-efficient or energy-generating buildings, the business community can be expected to maintain some type of on-going interaction with GLA staff.

- **Non-profit energy agencies** and **green groups** made valuable contributions to the strategy development process, and will continue to play an important role in the delivery of the Strategy. Groups like Energy Solutions, Creative Environmental Networks, and the Greater London Energy Efficiency Network have tremendous hands-on experience working with the public on energy issues, giving them knowledge highly valued by the GLA and Local Authority policy-makers and planners seeking to devise effective rules and programs. Advocacy groups will be much less involved in implementation efforts, although they are in a position to mobilize public support for or against the GLA should implementation falter.

- Travers (2004) believes **Local Authorities** represent the most powerful tier of governance of London, and such a claim holds some truth in the energy realm as well. Thanks to Central Government policies, Local Authorities have an independent power base over which the GLA has little leverage. The GLA's Energy Strategy is thus heavily reliant on the willingness of Local Authorities to buy green power or establish planning policies supportive of renewables. The planning policies are particularly crucial, as the Mayor passes judgment on fewer than 1% of all planning applications filed in London; Local Authorities are responsible for approving or denying the rest. To the extent they promulgate policies encouraging or requiring renewable power on more of these projects, the increase in deployment levels could be significant.

Less clear is the role of the London Assembly. Many commentators have noted the impotence of this body (Loveland, 1999; Pimlott & Rao, 2002; Travers, 2004), and this was true early on as GLA staff reported the Assembly had no role in the formation of the first draft of the Energy Strategy. Their scrutiny hearings did make a contribution in shaping subsequent versions, but the Mayor and GLA staff were under no statutory obligation to take any of the Assembly's advice. Ultimately, it is unlikely that the London Assembly will play a key role in any London energy regime other than as an observer and commentator.

**Table 10-2**
**Tests for Presence of an Energy Regime in London**

| Commentator | Key criteria | Commentary |
|---|---|---|
| Stone, 2002 | "no strong capacity to govern in a direction setting manner...outside regime arrangements | **YES** – this group represents all the important stakeholders in setting local energy policy |
| Clark, 2001; Gladstone & Fainstein, 2001 | Outcomes are key determinants of regime presence | **YES** – this group has shaped both the agenda and how implementation is occurring |
| Dowding, 2001 | Distinctive policy agenda | **YES** – the Mayor's Energy Strategy consolidates all other energy policies germane to London into a single, comprehensive, direction-setting document |
| | Long-lived policy agenda | **UNCLEAR** – many aspects of the current local energy agenda date back to old GLC/LRC/LPAC policies, but implementation is relatively recent. Must be monitored further. |
| | Coalition of interests that are not institutional in nature | **YES** -- because three levels of government are involved in the regime, there are formal structures relating one level of government to another. However, until the London Energy Partnership was created, there was no statutorily formed energy committees or bodies driving work on this issue. |
| | Member interests should cross sectoral or institutional boundaries | **YES** -- membership reflects a wide range of government, private sector, and NGO interests. |
| | Agenda must survive changes in political leadership | **UNCLEAR** – Many ideas in the GLA's Energy Strategy reflect policies first promoted in the pre-GLA period. Implementation has only occurred under the GLA, however, meaning until we observe trends in a post-Livingstone era, we cannot be certain. |
| | Success depends on mobilization of non-government resources | **YES** -- Although Central Government was key in providing funds for the early work of London Renewables and the London Energy Partnership, private funds will ultimately be critical to city-wide implementation of different renewable energy schemes. |
| | Has strong, visionary leadership | **YES** – They Mayor's energy agenda is one of the most wide-ranging and far-reaching energy plans in all of the UK. |
| | Emphasizes public-private partnerships that bridge institutional and community interests | **YES** – the London Energy Partnership easily fits this description, but the broader energy coalition in London includes a wide range of players drawn city-wide. |

On just about every level, this GLA-led coalition 'tests' well as a regime, as shown in Table 10-2. The only areas where problems arise are the two timing-related questions. The ideas that form the heart of the Energy Strategy are not necessarily new ones – many date back to policy documents prepared more than a decade ago by the LRC and LPAC. It is only recently, however, that real progress implementing these and several newer ideas has occurred. Will this momentum last? If the Labour party lost power, or if Ken Livingstone was no longer Mayor, would work on London's Energy Strategy continue unabated, or dramatically change direction? Until more time has passed, we cannot answer this question with any great certainty. As a result, if we accept Dowding's strict constructionist approach, then we must characterize what is occurring in London as an early stage energy regime. If we use the less time-sensitive definitions suggested by Stone, Clark, and Gladstone & Fainstein, the answer appears far more conclusive.

**Part 2: The Modified Regime model – Improving our Understanding of the Logic of Local Action**

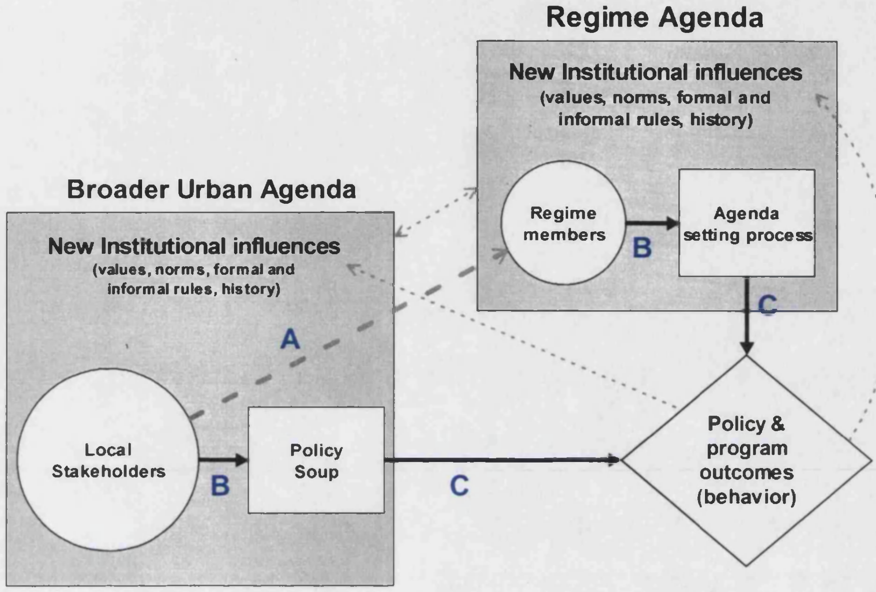
This lengthy discussion of stakeholder influence on local policy-making provides important insights into specific policy decisions by the Mayor, but it is by no means the only set of factors we must consider. In particular, knowing that Central Government is involved is rather meaningless, because their intervention takes the form of specific funding sources, policies, or rules. The Modified Regime model (Figure 10-2) is thus useful in helping to clarify the three broad categories where influence occurs:

- influences affecting regime membership
- influences affecting agenda setting, and
- influences affecting policy and program outcomes.

Two groups in particular amplify the first point about how institutional influences beget privileged status, a situation represented by Point A in the schematic: Local Authorities who gained strength as a result of planning powers granted them by various acts of Parliament, and the London Assembly, whose powers were severely circumscribed by the Greater London Authority Act 1999. Had the Assembly been given strong legislative powers, they might now be seen as a group that belongs in the local energy regime. Because of restrictions on their powers, however, their ability to gain a seat at the regime table is greatly diminished.

Factors that influence agenda-setting exert their power at either Point B or C on the diagram. Whether the influences occur before or after the agenda-setting or negotiation process depends on whether the institutional influence is known or acknowledged in advance. In such situations, stakeholders may self-censor their advocacy agenda, knowing certain policy options simply will not survive the negotiations with others involved in the process. At other times, formal rules only become known during the agenda-setting process, at which point they influence which options are considered or selected (i.e., Point C).

**Figure 10-2**
**Modified Regime Framework – Observations from London**




There are at least five examples where formal Central Government rules have significantly influenced the development of local renewable energy policy and deployment decisions being made in the field; each is described below. The influence of another important factor, the value-based societal preference for least-cost energy, is also discussed as it too forms the basis of rules limiting either the options considered or selected by decision-makers:

<u>Formalized Regional Government Leadership Gap</u>

The GLC's 1978 energy study made a very brief mention of renewable energy, but the topic didn't really emerge as a major policy issue regionally until the late-1990s, when the London Research Centre published a series of reports examining all facets of renewable power deployment in London. [See footnote 49 for a complete list of these publications.] However, even those documents did not represent "official" policy in London; in the absence of the GLC or other overarching local government structure in London, only policies emanating from Central Government and from Local Authorities carried any statutory weight. The closest London came to having a strategic energy policy at this time was the one page-long section on energy in Regional Planning Guidance (RPG) 3, issued by the Government Office for London in 1996.

That document offered little in the way of any grand vision, however. In one paragraph it summarized the current sources of London's energy and explained how CHP and energy from waste could contribute to sustainable development in London. The second paragraph suggested renewable power sources also held potential for London, and explain how guidance was already available in several different Policy Planning Guidance documents, including PPG22—Renewable Energy. The section concluded by making several recommendations (GOL, 1996):

- In their UDPs, boroughs should identify opportunities for power generation from renewable sources
- Potential sites within the borough should be identified, or an explanation given why no suitable sites are available
- The criteria by which renewable power projects would be evaluated in the planning process should be articulated, and
- Boroughs should develop Supplemental Planning Guidance that addresses energy use in buildings.

Five years later, as part of their analysis of the potential for renewable energy in London, ETSU reviewed the 33 borough UDPs to ascertain their comprehensiveness and how supportive they were of renewable power. UDPs were judged against nine separate quality indicators, assessing whether they reference official Government guidance like PPG22; whether they expressly support renewables use; and whether the guidance is broadly applicable to many renewable technologies, or just a few. ETSU concluded that while a majority of UDPs did a "good" or "satisfactory" job, none could be considered "excellent" and fully one-third rated poorly (ETSU/AEA Technology, 2001b, p 45).

The inadequacy of these UDPs not only reflects the inadequacies of RPG3 and PPG22, but also the fact that, because of the abolition of the GLC, London lacked a body focused on formulating and implementing a strategic vision for the city (Pimlott & Rao, 2002). There were, of course, institutions created to try and fill that gap, such as the London Planning Advisory Committee, but as their name says, this was simply advisory in nature. Only the Government Office for London had powers of much consequence, but because renewable power was not yet a high priority of Government, GOL appears to have accorded it a low level of importance when examining borough UDPs.

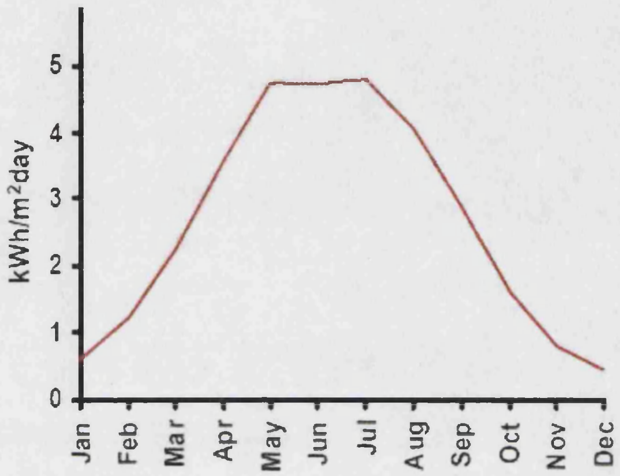
In terms of our modified regime framework, the lack of regional leadership manifests itself most directly at Point C, in that a pro-renewables agenda had been established but there was no one available to push the agenda towards fruition.

### ROC eligibility and the buy-out price under the Renewables Obligation

Although the large wind turbines at the Ford Estate in East London show large-scale renewables can find a home in London, earn ROCs, and generate electricity at a competitive price, the majority of the installations anticipated under the Mayor's renewable energy targets are small-scale solar PV systems will do neither. Until this happens, developers will have limited incentive to install them. A contributing factor is the fact that until recently, ROC eligibility was conditional upon the system exceeding a 0.5 MWh/month minimum power output threshold (OFGEM, 2004a). For most solar PV systems, this will only happen during the summer months.

The problem is made clear in Figure 10-3, which tracks the power production of a typical solar panel in London over the course of the year. During the winter months, the power output drops precipitously, meaning the system would have to be quite large to meet the minimum output threshold required to earn ROCs. The situation has improved now that new rules issued in 2004 allow systems to consolidate their output over a one year period of time, rather than one month. It will still take longer to accumulate ROCs during the winter months, but small systems are no longer precluded from ROCs funding as they were under the old rules. This factor again manifests itself at Point C in the diagram because of the way the rules are influencing deployment decisions.

**Figure 10-3**
**Typical Solar Panel Output in London**
Source: (DTI, 2003b)




Limits on GLA Financial Powers

The Greater London Authority is structured unlike any other Local Authority in Britain (Fuchs & Travers, 2000). Under terms laid out in the Greater London Authority Act 1999, the Mayor has both representative and executive functions, establishing the budget and making policy over economic development, environment, public safety, transport, culture, and public health issues. Compared to the 'strong mayor' system of local government commonly found in the US, however, the London Mayor's powers are quite weak, largely limited to the powers of "patronage, persuasion, and publicity" (Travers, 2004, p 68). The GLA's fiscal powers are particularly constrained, having only the capacity to raise funds through a precept charged to Local Authorities, through miscellaneous service charges, and through direct grants from the government. The GLA does not have the powers to directly levy income, property, or sales taxes on London residents or businesses (Loveland, 1999). Even the size of the precept charges can be constrained, if Government sees them as excessive (HMSO, 1999a). Travers (2004) attributes this situation to the work of Whitehall bureaucrats who, while crafting the GLA Act, deliberately tried to limit the amount of power shifting from Central Government to the GLA.

The bottom line is the GLA has little of its own funding available to spend on renewable energy issues. The Mayor could propose to allocate funds to renewables projects directly out of the general GLA budget, but such funds would displace funding for other GLA activities and services and be subject to Assembly scrutiny, where its value would be compared to other worthy expenditures. This is likely the reason the London Energy Strategy makes no firm commitment of GLA funds to any renewable energy systems or projects, and why we don't currently see large installations on GLA or functional body properties. In a few instances, the Mayor does impose different renewable energy requirements on the GLA functional bodies[58], but more often than not his proposals use exhortatory language (e.g., 'The Mayor encourages the GLA functional bodies…', 'The Mayor requests…', etc.) rather than outright mandates. In Figure 10-2, this influence manifests itself at Point B.

The new Climate Change Agency may present the Mayor with one way around this funding problem, through its capacity to provide direct energy services delivery. The most well-known UK model for this approach was championed by new Climate Change Agency Development Manager Allan Jones, who created such a business while he was with Woking Borough Council. The Council-owned energy services company known as Thamesway provides electricity, heating/chilling, energy efficiency and energy conservation services to its customers. On projects targeting energy use at Woking Council-owned buildings, the budget savings from reduced energy use were reinvested in new projects, creating an on-going capital finance fund. The first such investment, which cost the Council £250,000 in 1991, has been parlayed into £2.7 million of investments in new energy systems around Woking, and the annual energy cost savings to Woking Council total approximately £885,000/year (Thamesway Energy Ltd, 2004). The financial benefit of a comparable GLA-affiliated ESCO in London could be much greater, given the large number of buildings owned by the GLA, the various functional bodies, and the 33 Local Authorities around London.

[58] For example, see Proposal 38 on page 171 of the Energy Strategy, which calls on Transport for London and the LDA to power all their buildings from renewable electricity by the end of 2005.

Limits on mayoral authority over borough decision-making

Central Government rules also restrict Mayoral powers over borough decision-making. These limits have shaped the format of several Energy Strategy proposals, particularly where the Mayor announces that on planning applications referable to his office, he will hold applicants to strict design and technology standards. Several of these are listed below in Table 10-3, including the 10% on-site rule, which was previously referenced.

**Table 10-3**
**Expectations on Projects Referable to the Mayor for Planning Permission**
Source: (Greater London Authority, 2003c)

| Proposal # | London Energy Strategy Proposal | Reference to Local Authority responsibility? |
|---|---|---|
| 10 (p 103) | "Wherever lighting is proposed in developments referable to the Mayor, this should be energy efficient, minimizing light lost to sky." | "Boroughs should expect the same." |
| 13 (p 107) | "To contribute to meeting London's targets for the generation of renewable energy, the Mayor will expect applications referable to him to generate at least ten percent of the site's energy needs (power and heat) from renewable energy on the site where feasible." | "Boroughs should develop appropriate planning policies to reflect this strategic policy." |
| 15 (p 110) | "The Mayor requires planning applications referable to him to incorporate passive solar design, natural ventilation, borehole cooling and vegetation on buildings where feasible." | "Boroughs should expect the same." |
| 17 (p 113) | "The Mayor requires all planning applications referable to him to incorporate solar water heating and photovoltaics, where feasible. Developments not initially incorporating solar technologies should, where practicable, be of suitable design to support them later. Applications considering prestige cladding should incorporate photovoltaics where feasible. Applications including new street appliances (eg., bus shelters, bus stops, parking ticket machines and road signs) should incorporate solar power where feasible." | "Boroughs should apply the same policies." |
| 18 (p 127) | "The Mayor requires planning applications referable to him to include combined heat and power and community heating where feasible. Applications for electricity generating plant referable to the Mayor should use the heat, where feasible, even if that means distributing it to other buildings nearby." | "Boroughs should expect the same." |

The Mayor's ability to impose these requirements on planning applications stems from powers granted him under the Town and Country Planning (Mayor of London) Order 2000 which specifies the type of development projects referable to the Mayor. In 2003, approximately 250 planning applications, or 0.3% of the 84,600 planning decisions made by London Boroughs that year, ended up in front of the Mayor, roughly in line with what was originally expected (Greater London Authority, 2004h; ODPM, 2004b; Pimlott & Rao, 2002).

On the one hand, because these projects are the largest development schemes in London, imposing on-site power generation and other green design standards can result in a sizable impact on local energy use, amounting to hundreds of thousands of kilowatt hours of power generation each year. On the other hand, if the Mayor had the ability to impose similar requirements on *all* planning applications in London, the impact would be exponentially greater. As the last column in Table 10-3 implies, however, this is not the case. The Mayor cannot order the 33 boroughs of London to do things (Travers, 2004) like follow the GLA's rules on planning applications – all he can do is ask. Hence, in the various strategy documents prepared by the GLA, there is a considerable emphasis on partnerships with Local Authorities, and frequent use of exhortatory language: 'Boroughs should...' or 'Boroughs are encouraged...', etc. These restrictions on mayoral powers show up at Point B in the modified regime diagram, influencing the way the Mayor has framed his renewables policy agenda.

The Mayor can shape borough-level planning behavior regarding renewables through the content of the Spatial Development Strategy (SDS) for London, more commonly known as the London Plan. The SDS provides "a common spatial framework" for all of the Mayor's strategies, as well as for land use policies in each of the 33 boroughs (GOL, 2000, p 6). At the borough-level, the equivalent of the SDS is known as the Unitary Development Plan, or UDP. Under the GLA Act, borough UDPs must be in "general conformity" with the London Plan, and boroughs must submit a copy to the Mayor prior to its adoption so he can offer an opinion on whether it satisfies this requirement (HMSO, 1999a, p 215).

Of the various strategic planning documents mentioned in the GLA Act 1999[59], the SDS is the only one that has this general conformity power. Therefore, to the extent the Mayor wishes boroughs to implement key ideas of his other eight strategies, he must weave these ideas into the SDS. In many cases, the linkages between the various strategies and the SDS are readily transparent, such as when the SDS tries to improve air quality and reduce energy use by encouraging new developments near

[59] The eight strategies listed in the GLA Act cover Spatial Development, Transport, Economic Development, Culture, Biodiversity, Ambient Noise, Municipal Waste Management, and Air Quality. The GLA was also obliged to "contribute towards the achievement of sustainable development in the UK," and the Mayor has explained his pursuit of sustainable development was a central factor in his decision to voluntarily develop a ninth strategy examining energy supply, demand, and the impact of its use on London and the global environment (Greater London Authority, 2003c; HMSO, 1999a)

public transport hubs. Renewable energy use is tied into the SDS through several renewables-friendly policy statements and paragraphs, which for the most part closely track recommendations made in the Energy Strategy.[60]

Whether these policies will ultimately be reflected in borough UDPs is not clear. A significant obstacle is the fact the concept of general conformity carries little clout, thanks to a 2004 ruling by the Office of the Deputy Prime Minister clarifying the definition of this term. Put simply, ODPM believes general conformity does not equal absolute conformity. Thus, a borough's failure to take up all of the SDS' renewables requirements in its UDP is of consequence only if this omission causes "significant harm to the implementation of the SDS" (GOL, 2004a). Whether ignoring a requirement about on-site renewable power generation rises to the level of significant harm is an open question that only the ODPM Planning Inspectorate can answer. The Mayor can weigh in on this subject, but his opinion is just that, an opinion that carries no statutory weight.

Circumstances surrounding this issue have changed somewhat, thanks to passage of the Planning and Compulsory Purchase Act in 2004, which eliminates UDPs and replaces them with Local Development Frameworks, or LDFs. LDFs are slimmed-down documents with clearer policy direction that will be easier to keep current. The Planning Act, which went into effect in September 2004, gives boroughs three years to develop a new LDF. Boroughs that are in the process of updating their UDP will be allowed to complete that process, after which the three-year clock starts ticking. In other words, it may be some time before all 33 boroughs have new LDFs in place. The LDFs will operate under the same general conformity requirement as the old UDP, but the key here is the timing. Some Boroughs may be early adopters[61], but

[60] One rather noticeable exception is a change in the proposal that buildings generate power on-site from renewable sources. In the Mayor's Energy Strategy, Proposal 13 states that 10% of the building's power should come from on-site renewable power generation; in the London Plan, the policy has been changed so that a "proportion" of the site's electricity or heat needs comes from renewables (Greater London Authority, 2004a, 2004e).

[61] For example, as of November 2004, ten London boroughs (Barking & Dagenham, Bromley, Croydon, Ealing, Lambeth, Lewisham, Southwark, Tower Hamlets, Waltham Forest, and Westminster) have moved to modify their UDPs or develop Supplemental Planning Guidance to require planning applications involving buildings larger than 1000m$^2$ to generate 10% of their anticipated energy demand on-site from renewable sources. Three other boroughs (Corporation of London, Greenwich, and Havering) are considering such a move. This policy was originally adopted by Merton Council in 2003.

many will not, meaning we won't see a significant change in borough-level policies until after 2007.

Changing Definitions of 'Renewable' Power

Although it is difficult to definitively state that local policy-maker interest in energy-from-waste has diverted London from making progress on non-waste-related renewable power system deployment, there is no question that rules promulgated by Central Government related to EfW have influenced London's renewable energy policy-making behavior over the years. The story begins in 1978 when the GLC energy study first concluded "the recovery of energy-from-waste must be regarded as a significant aspect of energy policy for London," a much stronger endorsement than it gave to energy from what we would now consider 'new' renewable resources (Greater London Council, 1978, p 81). In 1992, the South East London Combined Heat and Power Plant (SELCHP) was constructed, built largely because of the receipt of a NFFO contract for its power. (Recall from Chapter 9 that NFFO was designed to promote renewable power and nuclear technologies, meaning at that time Central Government recognized EfW as a qualifying technology.) The following year, the LRC and LPAC energy policy studies both supported the development of additional energy-from-waste plants in London.

Ironically, both of these documents (and the 1978 GLC study) differentiated energy-from-waste from renewable energy, as each topic was covered in different sections of the report. In 1998, however, a new LRC report examining renewable energy technologies for London re-categorized waste-to-energy as a renewable technology, calling waste a "resource that cannot be ignored if 10 percent of UK electricity is to be generated from renewables by 2010 at acceptable cost" (London Research Centre, 1998). The LRC offered an even stronger endorsement of energy-from-waste schemes in 2000, arguing that "if London is to contribute its share towards meeting national targets for renewable electricity production … and for reduction in $CO_2$ emissions … London's political leaders will have to give a strong push to the exploitation of MSW and other waste resources through the capital's waste management strategy and planning policies" (London Research Centre, 2000, p 17). These reports both mentioned more nuanced waste processing techniques such as anaerobic digestion in passing, but did not differentiate among them when assessing the overall potential of energy-from-waste systems.

When the NFFO was replaced by the Renewables Obligation, Central Government policy towards energy-from-waste changed, as did the GLA's approach towards these technologies. Today, the GLA discourages the deployment of mass-burn incinerator facilities in London, preferring these nuanced systems targeting specific elements of the waste stream (e.g., anaerobic digestion of food waste) that are eligible for Renewables Obligation Certificates. The GLA could have continued to endorse mass-burn technology, but recognized such projects will have difficulty obtaining financing because the marketplace now prefers RO-eligible projects that can deliver this second revenue stream. In modified regime terms, RO eligibility has changed both how local policy-makers define their policy options and the value that they place on them.

### The influence of values: Least-cost preferences in London's renewable energy policy-making and deployment decisions

In Chapter 8, I noted the high cost of electricity from renewable power sources compared to grid-based power from fossil and nuclear-based power sources. Survey results discussing the average Londoner's limited willingness-to-pay for renewables were also presented. These facts are of interest because of the societal value emphasizing the importance of least-cost pricing, a value shared not just by Londoners, but by consumers and policy-makers across the UK. As in New York, government policy-makers have codified this value into a multitude of policies. While the electric industry was nationalized, a least-cost pricing policy governed the power dispatch rules used by the Central Electricity Generating Board (Gorini de Oliveira & Tolmasquim, 2004). Years later, one of the primary arguments made in favor of electricity market liberalization was the expectation that electricity prices would fall thanks to market competition (Helm, 2003). In the 1990s, the Non-Fossil Fuel Obligation was created to address the price gap between fossil- and non-fossil fuel based power. The NFFO covered any price differential so utilities would be indifferent as to the power source. Even so, the NFFO had an explicit goal of reducing the cost of renewable power over time, and one of its successes was the fact that succeeding procurement rounds kept contracting for renewable power at lower and lower prices (House of Lords Science and Technology Committee, 2004;

Mitchell, 1995). Most recently, the Renewables Obligation was implemented with a price cap to ensure that the price premium borne by consumers is not excessive.

Local Authorities, who have been free to shop around for new electricity service providers since 1994 (ETSU/ESD Ltd, 1999), may have been influenced by least-cost preference rules that date back to 1972. As early Green Tariff plans typically involved some type of cost premium (Department of Trade and Industry, 1999), subscribing to these plans would have violated the 'value for money' procurement rules used by most Local Authorities to comply with the Local Government Act 1972 (ODPM, undated). The Local Government Act 1999 offered more wiggle room with its introduction of the concept of Best Value. This made it a duty for Local Authorities to "secure continuous improvement in the way in which its functions are exercised, having regard to a combination of economy, efficiency and effectiveness" (HMSO, 1999b). In other words, Local Authorities were given the latitude to define the services they procure or provide in much broader terms. Croydon Council has done just that with their Environmental Procurement Policy, passed in 2002. In the preamble to the policy, the Council notes:

> "Ensuring 'value for money' involves much more than 'lowest upfront cost'. It involves considering 'whole-life' financial costs (e.g., with respect to energy savings, durability, reduced maintenance, and waste reduction), and reducing environmental (and other) risks. The concept that environmental benefits are worth paying for, provided the financial cost is not excessive, is also implicit" (Croydon Council, 2002).

In the case of energy procurement, Best Value provisions allow Local Authorities to explicitly state a preference for purchasing renewable power, and then judge once the bids are received whether the offerings also satisfy a preference for cost-effectiveness. Southwark's energy procurement policy, passed in October 2001, calls for the Council to seek green electricity supplies and accept the bid "providing it costs no more than 5% higher than the best standard electricity supply offer" (London Borough of Southwark, 2004). Half of the Borough's large electricity contracts now purchase green power thanks to this provision. Lewisham currently powers 100% of the Council's operations through green power, purchasing more than 54 GWh of green electricity each year, making it one of the largest green power users in all of the UK. Other London boroughs purchasing large quantities of green power each year include the Corporation of London, Greenwich Council, and London Borough of Redbridge (GreenPrices, 2004).

On a citywide level, it is somewhat surprising how little the Mayor's Energy Strategy talks about the higher cost of renewable power. Although the Strategy acknowledges this is a problem, the Mayor offers no real solution to this issue beyond encouraging functional bodies, Local Authorities, and private developers to seek financial support from programs operated by Central Government and the EU. In other words, the Mayor is essentially saying I want you to deploy more renewable power, but how you pay for it is your responsibility. The Strategy makes no pronouncement about the availability of funding from the GLA for renewables projects, but does accept that "in the future...the Mayor and Partners may wish to become involved in procuring and coordinating funds from a range of sources for energy projects" (Greater London Authority, 2004a, p 183). The Strategy is also silent about the issue of net-metering. As discussed in Chapter 8, net-metering is available to renewable power system owners on a very limited basis, on terms unique to each energy supplier. There is no national net-metering policy, and it is somewhat surprising that the Mayor makes no mention of advocating for a more uniform policy as a means of providing additional financial support for small-scale renewables projects in London.

**Conclusion**

This is an interesting time to focus on energy policy-making in the UK. Within Central Government, concerns over climate change receive attention at the highest levels, and this attention has been translated into policies delivering real impacts on the ground. Renewable power schemes have done well as a result, thanks to the subsidies offered under the NFFO and more recently, under the Renewables Obligation. Research and development expenditures are on the upswing again, with the UK trying to position itself as a global leader on certain renewable technologies.

A similar story is occurring in London. Although not required by statute, Mayor Ken Livingstone and his team have developed a comprehensive strategy they believe will make London an urban showcase on energy issues. The research carried out in support of the strategy and the work underway for the last four years to help design and deliver the plan, follow a thoughtful but logical path. The lone exception appears to be their strategy for dealing with the higher cost of renewables, which to date has essentially told developers 'You're on your own'.

The modified regime framework was again helpful at revealing the logic behind London's approach. Regime theory was helpful at elucidating the influence the business sector had on the terms of the on-site renewables mandate, allowing developers wiggle room to ensure the requirement did not become financially onerous. Focusing on the key staff people involved in the development of the strategy helped us draw links to policy documents they had worked years earlier that possibly influenced the range of issues targeted by the new strategy. Finally, there is the issue of Central Government's influence on the direction of London's renewables policies. It is not enough to merely state that Central Government is a key regime member, because its presence is manifested by specific policies and programs. Thus, our logic study benefited from a review of where the Mayor has statutory powers, and where his hands are tied by Central Government policies. The decision to emphasize the tactics of persuasion and education when dealing with Local Authorities is readily understandable, for instance, when we account for the fact that Central Government policies give boroughs more direct planning control powers than the Mayor. By developing guidance documents targeting Borough Councilors and local planners, the Mayor makes it easier for Local Authorities to deliver on renewables. The energy policy agenda also becomes more understandable if we can link it to forces at the Central Government level that deliberately or unconsciously steer London's policies in a certain direction. DTI's influence over the work of London Renewables was one such situation, as was the GLA's decision to emphasize ROC-eligible combustion technologies in the city's waste and energy plans. Similarly, there is no need for the GLA to worry about the cost of renewable power so long as EU and Government subsidies are currently available.

The modified regime model also helps us clarify the logic of which stakeholders are included or excluded from key policy-making circles, because it emphasizes the new institutional foundations of each group's unique privilege. The London Assembly loses out because of statutory restrictions limiting its ability to deliver any specific policy agenda. Local Authorities have a seat at the table because within the planning realm, they are responsible for the vast majority of planning applications filed each year. Central Government is at the table because it decides when the GLA lives, and when it dies; how much money the GLA has to work with; and frequently, how this money must be spent. Non-profit energy agencies are at the table because they receive funding from Central Government to implement energy efficiency programs, and this knowledge has value when designing regional energy policies.

Looking at the London case study from a practical rather than theoretical perspective, I believe the situation in London should give supporters of renewable power reason for cautious optimism. Central Government has been very supportive of London's efforts, and the Mayor and his team have crafted policies that leverage the full range of his statutory and persuasive powers. The Mayor's personal interest is also noteworthy, and he remains engaged, participating in the final decision on whether individual planning applications referable to the Mayor should be approved. As part of these discussions, a review of each project's energy plan is included, which means the Mayor's familiarity with the on-going progress of the Energy Strategy will remain very high. That said, even with the Mayor's close attention to this matter it bears watching how rapidly deployment levels ramp up in London. In sheer numbers, the Mayor's deployment targets are ambitious, totaling 7000+ individual installations. To achieve such progress by 2010 will require the installation of thousands of systems per year. The Mayor has direct planning control over just 250-300 projects per year, however, so whether this many systems will be deployed is not clear.[62]

Because of this, the level of cooperation provided by Local Authorities is critical. Several Boroughs have already proven themselves to be leaders on renewables, purchasing green power for their own operations, developing guidance for local developers, or imposing their own mandates for on-site renewables deployment in new development projects. Merton was the leader on this third policy, and as of September 2004, fifteen other London Boroughs have begun or completed work on related policies (Hewitt, 2005). It is not clear how many of London's thirty-three boroughs will ultimately follow suit, what policies they will pursue, or what timeframe they will follow. Political differences between Borough Councils and the

[62] The fact that the Mayor passes judgment on larger projects may help because one large housing development project can involve the deployment of dozens or even hundreds of individual systems.

GLA may come into play. There is also the question of where energy ranks among all of the other policy priorities the Mayor has asked each Local Authority to implement as part of his other strategic plans. Some Boroughs have significantly more resources available than others, but none will likely have enough to do all of the things the Mayor is asking of them.

Second, there is the issue of the new London Climate Change Agency (LCCA). Charged with replicating the nearby village of Woking's Energy Services Company model on a grand scale, the LCCA has the potential to completely change the face of London's energy marketplace. By marrying alternative power generation technologies, energy efficiency, and energy conservation schemes together into a single business model, ESCOs are a cost-effective way to reduce the environmental impacts of local electricity production and use. Woking began by establishing a system that served Council-owned or operated facilities, and then slowly expanded it to serve nearby residential and commercial buildings, recycling any cost savings into new technology investments. In London, each Local Authority could conceivably implement a similar model, but the logistics of working with thirty-three sets of decision-makers means progress will not come swiftly. The LCCA can also collaborate with the London Development Authority and private developers on large new development schemes around the city, working towards the day when disparate schemes begin linking together all around the city. Because the opportunities are so immense, London is fortunate to have one of the pioneers of the Woking system involved with the LCCA, but only time will tell how quickly this model can succeed, or whether new obstacles arise that are unique to London's complex energy landscape.

Finally, although it may take years for the issue to play itself out, London's success on renewables may partly hinge on the role nuclear power plays in the UK's energy future, as it will profoundly affect the markets for renewables around the UK, including any large deployment scheme in London. Because of the long lead time required to build a nuclear power plant, renewables project developers may find it difficult to forecast where electricity prices will be in the future, and as a result, what the long term financial prospects are for their own installations. A nuclear-centric policy may jeopardize R&D funding for renewables, and market support programs like the Renewables Obligation, both of which influence the rate at which large and small deployment schemes occur.

These conclusions about London's energy prospects are just some of the insights we can gain from this case study. This research also helps shine a light on some of the mechanics of how regimes operate, answering the questions posed by Gibbs and Jonas. The answers are often reminiscent of New York, although there is one important difference.

Take the issue of links between regime behavior and larger trends emphasizing the localization of environmental policy activity. Whereas New York was very focused on short term, parochial concerns, it's very clear that London has responded to these calls since the early 1990s, when Local Agenda 21 and other urban-focused initiatives first gained prominence in European policy circles. I noted this in the previous chapter, when I differentiated the energy policies first crafted in London in the late 1970s and 1980s with the documents prepared by the LRC and LPAC in the 1990s. In the later documents, environmental concerns enjoyed greater prominence, and linkages between London's emissions and global climate change were expressly drawn. This trend has grown even more pronounced under the GLA, with the Mayor explicitly stating that his strategies are intended to improve London's sustainability and minimize it's contribution to climate change. The GLA has received considerable support from Central Government to support this work, because of the recognition that the UK's attainment of its climate change and renewable energy obligations under the Kyoto accords and various EU directives is highly contingent on success in London.

Where does London stand with regards to Gibbs & Jonas' second question, about the correlation between hegemonic regime interests in the city and those stakeholders most active on energy and environmental topics? As in New York, there is significant overlap, with business regime interests again seeing energy costs as an important consideration worthy of their attention. London First thus worked to attenuate the on-site power generation requirements of the Mayor's plans so the financial burden on new development schemes would not be too onerous. London First also partnered with London Renewables on the release of guidance documents for the real estate community, clarifying what the renewables requirements call for, and how developers and real estate managers can reduce their long-term operating costs by designing projects with energy conservation in mind. To the extent London has a regime, it involves than just business interests, however, and it is clear there is broad support and interest among other stakeholders for London's energy planning efforts. Central Government's financial and policy support for the Mayor's various environmental strategies has been critical. Grants have supported baseline research important to the development of these plans, and now government funds are being directed at its implementation. Local Authorities were vocal contributors during the policy development process, but whether they will play a supportive role during the implementation stage is not clear. Several boroughs have begun to embrace the ideas put forth in the various mayoral strategies, while others have been less active.

Finally, we have Gibbs & Jonas' third question, inquiring about the underlying conditions that lead local stakeholders to mobilize around local environmental issues. As in New York, the situation in London is explained by the larger institutional environment. The history of London over the past 20 years is very telling in that regard, for it was during the period 1986-2000, when London lacked any regional government, that the energy policy documents prepared by the LRC and LPAC were prepared. These reports were underwritten by the EU, but in the absence of any coordinated leadership by a regional form of government, very little progress was made on local energy matters. Fast forward to today: a new governance structure is in place, and strong regional leadership on energy issues is provided by the GLA, although ironically, the energy strategy developed by the Mayor looks remarkably similar to the old LRC plan. Given constraints on his powers, however, the Mayor still needs the support of others to deliver results. This time, willing partners are available who share the Mayor's general policy preferences, but are not afraid to leverage the strength of their own bargaining position to serve their own self-interest, influencing the direction or details of the city's energy policy.

In other words, comparing the differences between the two time periods, we can see that the underlying conditions supporting regime formation around environmental issues involve an institutional framework that thrusts one group or individual into a position of leadership acknowledged by others, yet does not provide them with the full resources to deliver on a plan. As a result, others participating in the process do so from a position of greater strength, and for success to be achieved, their preferences on this issue must be accommodated.

## CHAPTER 11
## The Interplay of Policy and Politics in Urban Renewable Energy Policy-Making: Conclusion and Lessons from the Empirical Research

This thesis examining renewable energy policy-making and deployment in two world cities certainly fulfilled my desire for an interesting and rich analysis. New York and London were both central to the early story of electric power generation, exhibiting market behavior that gave rise to the regulatory systems that have dominated the sector in each country for the better part of the 20th century. Both cities have voracious appetites for electricity, and in the coming years, demand is expected to grow. As New York and London begin to plan for their energy futures, however, we see them following different policy paths. Neither route is expected to result in more than a small amount of renewable power being generated over the next 10-15 years, although London will likely end up with far more installed capacity than New York.

Indeed, New York City's future electricity path looks very much like its current one, almost totally dependent on large central station power sources. The primary goals of New York's new plan are cost containment and energy reliability. Renewable power sources barely register on the current supply meter, and this is unlikely to change any time soon because the City's new energy plan is almost totally silent on the subject. By contrast, London is adopting a more proactive perspective, looking to change the way local residents view and use energy. Leaner, greener, and leader are good terms to characterize the new London Energy Strategy, with the Mayor focused on reducing power consumption, using cleaner power, and establishing London as a global leader on urban energy issues. New renewables enjoy greater prominence in London's strategy, with the Mayor aiming to generate just under 3% of the city's electricity supply from in-city based renewable power schemes by 2020.[63]

My idea of blending new institutionalism and urban regime theories as the best way to capture the 'logic' of local policy-making also proved appropriate, as in both case

[63] Recall that although full attainment of the Mayor's renewable energy targets would produce approximately 2.2% of London's power needs by 2010, the majority of this power would be derived from energy-from-waste schemes. ETSU calculated that only 0.88% would be derived from 'new' renewables. The 3% figure here reflects the Mayor's goal of tripling the 2010 targets by 2020, and could theoretically amount to hundreds of megawatts of installed renewables capacity, a massive amount compared to where London is today.

studies regime theory's traditional explanatory powers were enhanced by accounting for the policy and regulatory constraints influencing policy and system deployment decisions at the local level. In New York and London, there are clear rule-based drivers shaping the local energy agenda. Deployment decisions by project developers have been both impeded and encouraged by national, state, and local governmental policies, while officials in both cities have made agenda-setting decisions based on their often-constrained capacity to act. A new institutionalist approach proved very valuable in explicating these circumstances. The influence of key stakeholders has also been clear, affecting the energy policy direction each city intends to follow over the next 5-10 years. The makeup of the energy coalition differs slightly in each city, and with time, there may be compelling evidence that each group constitutes an energy 'regime,' as defined by criteria established by Stone, Clark, Dowding, and other urban regime theorists. For the time being, however, we can only state each coalition displays clear regime tendencies, strongly influencing the direction and content of each city's electricity and renewables policies.

In this chapter, I briefly expand on these findings, and discuss how my blended model – which I shall now term a "constrained" regime model – offers a clear window on the policy-making practices in each city. In constructing the model, I offer guidelines other researchers can use should they wish to apply it to their own empirical work. I conclude this chapter by addressing several issues raised by Gibbs and Jonas (2000), the first researchers to broach in a comprehensive way the idea that urban regime theory can be applied to local environmental policy-making and governance. I also highlight several areas where I believe further research is needed, both as it relates to my suggested theoretical approach, and to the larger issue of renewable energy policy-making in urban areas.

**New York City: Staying the Fossil Fuel Course**

The New York case study juxtaposes two very different dynamics – it is a city whose market conditions appear renewables-friendly, yet current deployment levels are extremely low.

The fundamental marketplace conditions supportive of renewables are rather clear:

- New York City has some of the highest grid-based electricity prices in the U.S., meaning those installing renewable power systems will fully recoup their investment faster than those installing comparable systems in other cities with similar wind/sun/tidal characteristics.
- Demand for power in New York City is steadily increasing, while the available supply of power has remained relatively flat for many years, and may soon decline as power plants around the city close due to advanced age. At the same time, New York City is a notoriously difficult place to site new fossil-fuel fired power plants, meaning it is unlikely we will see any significant replacement supply capacity in the near future.
- New York City is a load pocket, and under state rules, the vast majority of the city's power must be derived from in-city power plants.
- Although it's not the windiest or sunniest area in the state, New York City is blessed with sufficient natural resources to support a fairly robust renewables sector. Because of the large amount of flat roof and south-facing building facades available around the city, the theoretical amount of PV system potential is extremely high, amounting to nearly half of all power consumed in the city during peak demand periods.
- The State of New York has been quite supportive of renewable power, ensuring that renewables system operators have open access to transmission and distribution grids around the state; providing subsidies to varying types and sizes of renewables installation projects; and driving up demand for renewable power schemes through the establishment of a statewide renewables portfolio standard.

Despite these facts, the city is currently home to less than 3 MW of deployed renewable power schemes, and policy-makers in New York City have been slow to embrace renewable power as a potential supply source that can reduce the anticipated supply gap. Indeed, the most important energy policy document issued by the City in recent years is largely devoid of any discussion of how renewables can contribute to the city's overall supply picture. Instead, the 2004 Mayor's Energy Policy Task Force report emphasized staying the course, pushing for more new large fossil-fuel fired central station power plants.

The logic behind this policy approach stems from a confluence of factors. To begin, more than half of the Mayor's Task Force involved representatives from many of New York City's hegemonic regime interests – real estate developers, managers, and builders. Several years before the Task Force was established this group, operating under the auspices of the New York Building Congress Energy Committee, released two reports drawing many of the same conclusions subsequently reached by the Mayor's Task Force: that an electricity supply shortfall was imminent, and that large new generation or transmission capacity was necessary to stave off this problem. That Building Congress Energy Committee members advocated for the Task Force to adopt similar conclusions is hardly surprising. Their preference for this policy approach, rather than a focus on renewable power sources, can also be linked to some of the new institutional explanations driving local energy policy-making:

- *Reliability concerns* – because unreliable electric service can harm the long term economic interests of Building Congress members, the group has historically been concerned about this issue, and they listen closely to Con Edison's claims regarding system changes that could threaten the grid's integrity. Con Ed enjoys considerable repute on this topic by virtue of their privileged position as the operator of the local grid, and their detailed and proprietary knowledge of the system makes it difficult for outsiders to challenge their claims. For several years now, Con Edison has raised questions about the risks that the interconnection of renewable power schemes present to the local grid, and occasionally they have imposed technical requirements on renewables installations that some claim harm the economic viability of these projects. Developers can counter with their own analysis and/or appeal to the State regulator, the Public Service Commission, but this can dramatically add to the overall cost of an installation. In the case of long-term policy, it appears that Con Edison's reliability concerns have become Building Congress Energy Committee concerns, ultimately influencing the type of policies the Mayor's Task Force members were willing to support.

- Policy-making powers – the same regulatory schema privileging Con Edison has left the City of New York in a policy-disadvantaged position. One of the most vivid examples of this occurred when several Task Force members reported they deferred policy action on renewables because the State Public Service Commission had yet to complete its work laying out the operating parameters for the Renewable Portfolio Standard. Rather than take action, Task Force members reportedly felt it was more prudent to wait until the RPS proceeding had concluded before making any attempt to develop a local renewables policy.

- *Cost* – the current high cost of renewably generated power is another key obstacle to its use in New York City, violating least-cost preferences held dear by New York City consumers and policy-makers alike. Over time, these preferences have made their way into official City policy and deployment decisions. We saw an example of this in the City's official comments decrying the RPS' potential to increase local power rates; in comments made by the City's chief energy advisor arguing that renewables currently aren't a cost effective investment; and in decisions by developers to abandon renewables installation projects when subsidy applications to the state are rejected. The high cost of renewables was also cited by researchers as the principle reason why very little of the theoretical potential for solar PV in New York will ultimately be realized.

These circumstances conspire to make the future prospects for renewables in New York City appear rather bleak. Deployment levels are low now, and given the lack of policy focus by the City, nothing seems to point toward any significant change in the near or medium term.

**London: A Greener Energy Vision**

London provides an interesting contrast to New York City because although we see market conditions that are slightly less favorable for renewables, the policy environment is far more supportive, particularly at the local level. London also has a very low amount of deployed renewables capacity, leading to the obvious question of how we explain these contradictions.

Like New York, London is experiencing a growing demand for electrical power, but because the electricity transmission infrastructure into London is more extensive than New York's, there is no pressure to develop new power supply capacity within the Greater London region itself. The cost of renewably generated power is approximately the same as in New York, but with slightly lower electricity costs (and because there is far less sun in London in the winter months), the payback period for renewable power projects can be quite lengthy. Subsidy programs maintained by the EU and the UK government thus play a big role in incentivizing installations in London, and are emblematic of the strong policy support that both levels of government provide to renewable power. The Greater London Authority is also extremely interested in renewable power use, seeing it as one of the key strategies that can reduce London's contribution to global climate change. As part of his Energy Strategy, the Mayor imposed renewables deployment mandates on development schemes requiring his approval, and he established what he saw as ambitious citywide targets for renewables deployment so the public can gauge the level of progress occurring over time. The renewables sector is also one area where the Mayor sees strong job growth potential, linked to the fabrication, installation, and maintenance of these systems. The Mayor also hopes London's financial markets can exploit local renewables sector opportunities, developing financial instruments that support green power deployment, or underwriting business and household investments in these systems.

Several factors are at play which helps us understand the logic behind London's deployment and policy situation. Some have links to regime behavior elements, while others are more institutional in nature:

- *Strategic planning opportunity* – we cannot escape the fact that although the Mayor's decision to develop an Energy Strategy was voluntary, he was leveraging the fact energy considerations cut across many of the eight strategic plans he was required to develop by the GLA Act 1999. Voluntarily developing this ninth strategy allowed him to consolidate these ideas in a single document that greatly strengthens the GLA's grasp of and control over these issues. Developing an energy strategy also allowed him to hone in on the best opportunities to take action, which he then wove into the London Plan, the only strategic plan with statutory powers, and the one which all Local Authorities must conform to when drafting their own local development frameworks.

- *Least-cost pricing* – the language employed in the Energy Strategy speaks volumes about limits placed on the GLA by various Parliamentary laws. These limits, including those constraining the GLA's ability to influence local planning decisions or development frameworks, are made visible through the Mayor's extensive use of language beseeching others to act. In areas where the Mayor has more direct authority, such as over the GLA's functional bodies or on planning applications referable to the Mayor, much stronger language is employed, *requiring* action rather than simply encouraging it. In the GLA Act 1999, Parliament also constrained the Mayor's budgetary powers. We saw evidence of the impact of this in the work of London Renewables, much of whose agenda was dictated by the funding preferences of Central Government.

Least-cost pricing preferences are the final important factor explaining past deployment and use decisions. Government purchasing rules required Local Authorities around the UK to purchase least-cost energy sources, effectively eliminating any opportunity to procure green power given its slightly higher cost. Since purchasing rules were changed to allow Local Authorities to seek out 'Best Value' purchases, and giving them flexibility in how they define 'value', boroughs are queuing up for green tariff programs. Some Local Authorities in London are going so far as to procure 100% green power for their local government operations. At the GLA level, the London Climate Change Agency is the vehicle the Mayor will likely use to address the higher cost of renewable power. By attempting to access Government subsidies; by creating investment opportunities for private sector partners; and by recycling cost savings achieved by other LCCA projects, the Mayor will be following the successful model established by Woking's ESCO Thamesway, the model on which the entire LCCA is based. Woking has been extraordinarily successful at leveraging all of these funding sources, and despite its higher cost, the village is now is home to approximately 10% of *all* of the solar PV deployed around the entire UK.

In sum, the future prospects for renewables in London look pretty good when compared to New York. The Mayor and Central Government have clearly created a platform on which renewables can thrive, although to the extent cost continues to be a barrier, deployment levels may remain low. There also remains the fact that current deployment is so low, and electricity demand so high, that it will take some time, and thousands upon thousands of individual installations, before renewable power becomes a prominent part of London's electricity supply picture.

**A Preview of Things to Come?**

London and New York City represent interesting case studies on their own, but there are larger lessons to distill from these analyses that can apply to other cities as well. In doing so, however, we are reflecting on a question raised in the Introduction to this thesis. I had pointed out that renewables bring the energy discussion back to a very local context, harkening back to when the first electric utilities were essentially neighborhood operations, and cities regulated utilities operating within their geographic jurisdiction. Given that most urban-scale renewable power schemes will also be capable of satisfying the energy needs of only a relatively small service territory, are policy-makers re-crafting their policy approach and re-orienting their regulatory systems to accommodate this new/old operating paradigm?

The answer is fairly clear. We're not seeing any shift whatsoever at the state or national levels in terms of regulatory approaches. Both New York State and the UK government have done much to advance the renewables industry, but they are still clearly wedded to the regulatory model crafted long ago. Even during the 1990s, when the opportunity arose to rework the system to adapt to new power generation methods, policy-makers simply treated them as new technologies plugging into the same old wiring scheme, meaning regulatory fundamentals didn't change. Looked at purely from a practical perspective, this makes sense. Which state or national-level regulatory responsibilities should be devolved to cities? Power plan emission limits? The ability to determine how much utilities charge customers? Interconnection rules or other technical standards for grid operations? The granting of franchises? Having been out of the regulatory business for so long, few cities would be immediately adept at the oversight of such issues. Many local politicians may also prefer to maintain an arms-length relationship with such responsibilities, as it shields them from blame if anything goes wrong.

Aside from the lack of change in the overarching regulatory framework, we see a mixed set of results in how state and national policy-makers are approaching city-level action. In the UK, Central Government has been quite forthcoming with funds and assistance to the GLA as part of the energy strategy-development process, recognizing that success at the national level on climate change agreements or renewables deployment targets to some extent hinges on what happens in London. By contrast, we do not see the State of New York offering – or New York City seeking – significant State-level assistance in the local energy planning process.

London's approach to this entire energy/renewables planning business can therefore be seen as a textbook example of a city making the most of the circumstances in which it finds itself. Because the Mayor's Energy Strategy is based on a comprehensive assessment of the GLA's capacity to act, it is difficult to think of a policy stratagem that the GLA does not rely on in some form or another to implement its energy policy. The GLA does not employ every strategy on behalf of renewable power, but it clearly uses a wide range of techniques intended to advance the cause of renewables around the city. For the most part, these strategies maximize the GLA's powers, reflecting the various policy-making constraints imposed on the city by Central Government.

Other cities can learn from London's policy approach, but as New York City clearly shows us, having the *capacity* to act is one thing, but having the *desire* to act is another. Indeed, New York City could easily employ London's basic approach towards renewables, setting renewables targets or mandates, developing renewables guidance documents for local developers and planning staff, or establishing partnerships with local businesses to foster the development of a local renewables industry. For their own reasons, however, New York City's policy-makers have chosen an entirely different energy policy path that downplays renewable power use.

Cost may well be the reason, and the question again becomes one of what cities can do about it. In Chapter 2 I noted how some cities – generally those with their own municipal utility – were offering their own installation subsidies on top of or in lieu of those offered by state or national government sources. To the extent a city can afford such a strategy, this can indeed be an effective mechanism of facilitating deployment. As New York City's chief energy policy advisor noted, however, comparable energy benefits can be achieved for less money by pursuing energy efficiency or demand reduction. This means local officials choosing to implement a renewables subsidy plan of their own could take political heat for overspending scarce tax dollars. Cities can also attempt to work with state or national officials to develop funding sources dedicated to in-city renewables deployment, arguing that deploying such resources where the power is needed most can bring greater overall benefit (in terms of localized health benefits, decreased transmission losses, etc.) than expenditures on renewable power schemes located outside of the city.

London's new Climate Change Agency provides another interesting cost-reduction model cities may wish to examine further. The original Thamesway operation on which the LCCA is based began with a grant from Woking Council to invest in energy-efficient technologies (A. Jones, pers. comm.). When the borough's energy costs declined, these cost savings were then recycled – again and again – in additional energy efficient equipment and renewable power generation schemes. Over time, the Council's initial several hundred thousand pounds investment has paid off many times over. The ESCO model also allows local authorities to spread the investment risk among other partners, and in some cases, capitalize on state or federal tax credits for which local government-funded projects are normally ineligible.

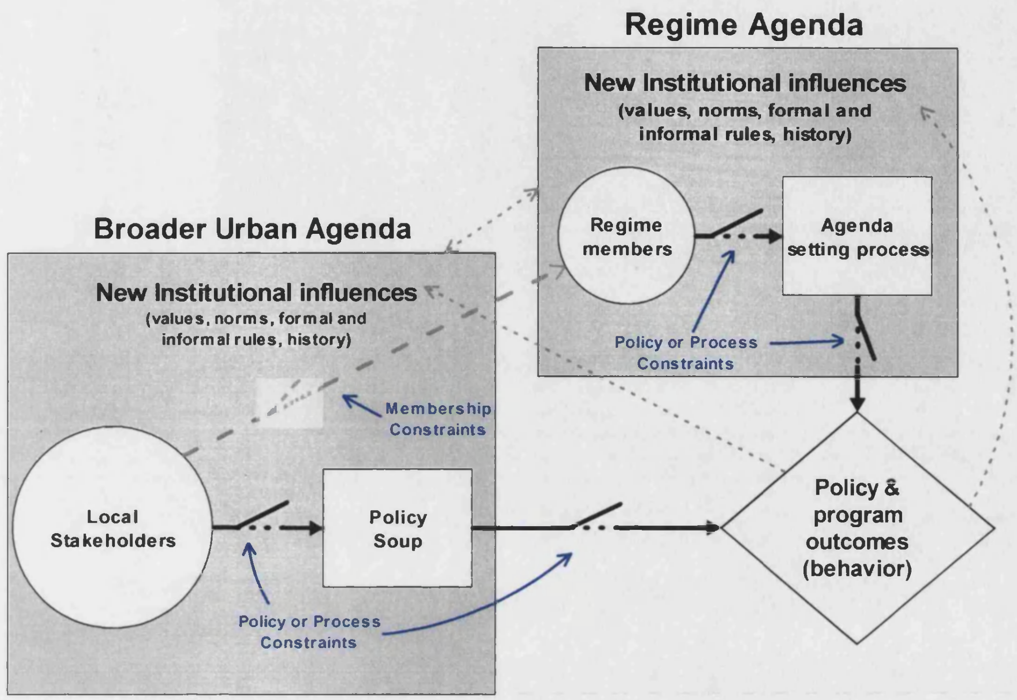
Worth commenting on but ultimately not clarified by my research is the question of whether London's comprehensive approach is truly necessary, or whether a city's efforts are better spent identifying or developing the cheapest green energy program available, relying primarily on power sources located outside of the city. There are very few things on which cities are fully self-reliant – cities import the vast amount of the food consumed in the city, and many cities export waste to disposal facilities located outside of the city. Is it reasonable to expect that cities should be more self-reliant when it comes to energy generation, particularly when an approach like

London's imposes additional cost and logistical burdens on developers and city agencies responsible for monitoring compliance? New York is one city where more in-city generation from renewable sources actually does make sense, because of its situation as a load pocket and because current in-city electricity generation imposes emission burdens on neighboring communities with high asthma rates. London is another matter entirely, as it can very easily benefit from the large amount of wind power schemes being deployed in Scotland or out in the North Sea. London Mayor Ken Livingstone has decided he prefers local deployment because it can jumpstart the creation of a new renewables-related business sector, but other cities may ultimately decide London's complex and comprehensive approach is too difficult to carry out given their available staff, knowledge, or financial resources.

**The "Constrained" Regime Model**

Turning back to more abstract lessons, we must also revisit the theoretical model employed in this thesis. Regime theory is premised on the idea local agenda-setting is dominated by a coalition of stakeholders who dominate the local agenda-setting process. Both of my case studies showed this to be the case, with the energy policy of London and New York clearly linked to the actions of a small group of stakeholders acting in concert. What is missing from standard regime analysis, however, is a formalized way of reflecting the influence of any structural forces that can shape implementation decisions or the agenda-setting process itself. As was made clear above, these forces can be extremely powerful, and they must be accommodated within the analytic model. The case studies showed these forces tend to exert the greatest influences at three different points in the agenda-setting process: influencing who's in the regime, the agenda they pursue, and the implementation decisions that are made in the field. Figure 11-1 is a modified version of the schematic introduced earlier in the thesis. In it, I now show that new institutionalism's rules, informal rules, and values most commonly manifest themselves as some type of constraint on regime participation and behavior. My modified regime framework should thus more accurately be characterized as a "constrained" regime model, a term I shall use henceforth. In using this terminology, I acknowledge that although constraints are often interpreted as having a negative connotation, I am using a less normative definition which simply implies a capacity to direct action in a specific manner.

Figure 11-1
Constrained Regime Model




In this section, I'll focus on why this is an appropriate reframing of the model I first introduced in Chapter 3, after which I'll focus on how others might employ my new model in their own research. Much of what I'm presenting below synthesizes points made earlier in Chapters 7 and 10.

- ***Constraint #1 – Who's in the Regime***: One question of interest to researchers is why certain stakeholders are part of the regime while others are excluded. Politics may be one reason – a Mayor may anoint participants for no obvious reasons, with no explanation necessary. Structural explanations are more readily understandable, however, as certain stakeholders bring assets to the table considered desirable by others. The explanatory value of the regime model is improved if it can somehow account for these structural factors. For example, recall the earlier discussion of how the regulatory schema 'privileges' Con Edison, by virtue of the fact that as the builder and operator of the local electric distribution grid, they must be involved in decisions affecting the current or future operation of that grid. In this example, formal documents – franchises issued by both the State Public Service Commission and the City of New York – convey the regime privilege. In London, we see the same phenomenon. The GLA Act placed strict limits on what the London Assembly can and cannot do. As a result, the Assembly has little to offer other stakeholders interested in setting or implementing policy, and any possibility the Assembly might be part of a regime is greatly diminished. Conversely, Local Authorities enjoy tremendous privilege, thanks to various laws passed by Parliament granting Boroughs significant planning powers. As the Mayor hopes to employ planning controls as one means of promoting renewables deployment, he must seek the cooperation of Local Authorities, and by doing so he acknowledges their seat at the regime table.

- ***Constraint #2 – Agenda-setting impacts***: Stakeholders entering an agenda-setting or policy-making process generally do so bearing fundamental principles that guide their behavior or with prescriptive actions or policies they wish to pursue. Often, their approach has been influenced by external rules, values, or events and their behavior will reflect these influences. In New York, several participants suggested the Task Force's hands-off approach towards renewables was partly a reaction to the formal Renewable Portfolio Standard proceeding underway at the State Public Service Commission. There are logical reasons for waiting to see how the PSC would rule, but from a more theoretical perspective, this strategy is also an indicator of New York City's disadvantaged status under the State's official regulatory schema.

  In London, the GLA's approach towards energy-from-waste reflects the influence of Central Government's rules on which technologies qualify for Renewables Obligation Certificates. During the 1990s, Central Government treated mass-burn plants as a subsidy-eligible renewable power technology, and regional groups like the London Research Centre followed suit in endorsing this type of renewable energy. Under the Renewables Obligation, however, Central Government changed the rules so only certain types of combustion technologies qualify. The GLA's waste and energy policies, both of which were prepared after the RO guidelines were published reflect these new priorities. Another example of this agenda-setting influence is the work of London Renewables, whose research work was largely dictated by the availability of monies focused on planning issues.

In examining the role new institutional influences have on stakeholder agenda setting or the agenda-setting process, we must consider whether the influences were overt – as they apparently were in the case of the GLA's energy-from-waste policy – or whether the influences were more subtle, representing what Bachrach and Baratz (1963) characterized as non-decision-making power. This means certain influences are so pervasive stakeholders self-censor their policies and programs, believing themselves incapable of challenging or changing these underlying influences. One potential example is the extent to which Con Edison's concerns about interconnections threatening grid reliability resonated with other stakeholders. Repeated often enough, these concerns may have subtly shifted stakeholder perceptions to such an extent that they became less willing to contemplate a renewables strategy as a serious policy option.

- ***Constraint #3 – Implementation impacts***: New institutional influences constrain outcomes by affecting either how stakeholders value certain outcomes, or by limiting the range of implementation options open to these stakeholders. Values are a particularly important influence. Take least-cost preference, a societal value that pervades much individual and public sector decision-making. In New York City, the Mayor's Chief Energy Advisor has been very dogmatic about least-cost issues, speaking out against a proposal calling for 100% green power purchases, arguing the City can ill-afford the added expense at this time. Least-cost values thus narrow the policy options the City is willing to consider. In the UK, the London Borough of Southwark has tried to strike a balance, purchasing green power so long as the price does not exceed a 5% premium over the best market rate available for non-renewable power. In other words, Southwark is honoring the spirit of least-cost, while still seeking to achieve some renewables use.

A desire for high levels of electric system reliability is another societal value that can have serious implications for renewables projects. Homeowners and businesses interested in deploying renewable power systems in New York City may find Con Ed wants to impose additional network protection equipment requirements on their project, forcing them to pay more or abandon the project altogether. The GMDC project is one case where decisions made by Con Ed in the name of system reliability after the project had begun resulted in lengthy installation delays and significant additional costs.

In elucidating these constraints, I caution the reader to remember that for more than two decades, researchers have satisfactorily applied the standard regime model to explain the logic of policy-making behavior in different cities around the world. My conclusions here in no way invalidate the findings of these researchers. What I am trying to do, however, is show that there are a myriad of ways institutional influences can affect regime behavior and implementation outcomes, particularly in the area of environmental policy-making. Reflecting these constraints in the regime model is an important change enhancing this analytic technique's overall explanatory powers, thus representing an important new contribution to the literature on urban policy-making.

**Characteristics of a Constrained Regime**

In Chapter 3, Stone's claim that regimes only tackle high priority issues led me to posit the need for two spheres in which all direction-setting policies in a city were considered and ultimately acted upon. In the schematic model that I first introduced in that chapter, a hegemonic regime operates within one sphere, tackling the "big" issues facing the city, while within a second sphere lesser issues are addressed that do not – or will not – make their way onto the hegemonic regime's radar screen. My research in New York and London leads me to believe this is still an accurate portrait of reality, although some minor tweaking of that schematic model is now in order. What's new is, as has just been discussed at length, the idea that institutional influences explicitly constrain various aspects of a regime's makeup and behavior. In Figure 11-1 on page 290 these influences are now manifested as gateways through which stakeholders and ideas must pass. New institutional influences dictate when the gate is open or closed. Different closure rules may apply for different stakeholders, reflecting the varied nature of the new institutional environment.

Although Central Government's role as a key member of London's energy regime is more easily explained under this approach than it is in a traditional regime model, the constrained model should not be construed as *requiring* the involvement of state or federal government agencies or officials within the regime. (Some might believe this to be the case because these entities generally create the formal and informal rules that open or close the gate.) The real determinant of federal or state government's role in any regime is whether their behavior *actively* and *continuously* endeavors to influence local policy behavior. For example, in London, Central Government plays a much more substantial and vibrant role in local decision-making than the State of New York does in New York City. Funding has been provided by DTI specifically for the purpose of steering London's energy policy-making efforts in a certain direction. The decision by Planning Minister Keith Hill to allow Merton Council to require power generation on-site from renewable sources meant the GLA could follow suit in its citywide Energy Strategy. In New York, on the other hand, while State officials have developed funding programs that local policy-makers can exploit, state-level stakeholders are much less focused on monitoring or steering decision-making in the city so it follows a pre-determined policy path. Thus, we would not consider State government to be an active part of an energy regime in New York City.

Constrained regimes are unlikely to be a phenomenon unique to the area of energy or environmental policy-making, where command-and-control approaches – the source of many important constraints – are commonplace. Education, public health, public housing, transportation, and immigration are other policy spheres that rely on statewide or federal mandates or standards to ensure some uniform level of performance, behavior, or activity across localities. For example, because there are more than 350,000 refugees and asylum seekers living in London (Greater London Authority, 2001), the Mayor has noted that national immigration and asylum policies are something about which he must pay careful attention (Greater London Authority, 2004b). One can easily imagine the Mayor working with a business-led regime on strategies designed to house this large group or put them to work to help grow London's economy. Such discussions may be constrained, however, by broader national goals promoting the dispersal of refugees to other parts of the UK, or rules designed to discourage refugees who might impose a "burden" on British society from settling in London in the first place (Home Office, 2005).

Researchers seeking to apply the constrained regime model to their own empirical work will generally do so because they have identified other policy-making situations that share common structural characteristics. In particular, the regime must operate in an environment where state or federal government policies specifically seek to foster certain types of local-level behavior or policy outcomes. The mere existence of a restrictive mandate on local government is not enough, as depending on how the requirements are written, local government may have tremendous latitude in selecting a policy path to achieve that mandate. In the case of a constrained regime, however, certain paths are definitively foreclosed or available options are clearly specified. Least-cost purchasing requirements, imposed on UK local authorities back in 1972 to promote fiscal responsibility, are one example of a constraint limiting a Local Authority's options.

Policies imposing these constraints may be city-specific, as was the case with the GLA Act, which overtly minimized the powers of the Mayor and the Greater London Authority. Alternatively, they may be broadly applicable to all local authorities in the state or country, as in the case of New York's utility regulation law designed to eliminate all local-level oversight of electric utility activity. The constraints may also have been designed to be policy-area specific – the case of electric utility regulation is again the obvious example here – or they may have impacts transcending many different policy areas, as in the case of limits placed on a mayor's ability to impose taxes.

Clark (2001) has posited that outcome-based characteristics, such as campaigns against corporate welfare and high environmental group membership, may indicate the presence of a certain type of urban regime. I believe that outcome-based characteristics may similarly tip off a researcher to the presence of a constrained regime, although with less certainty than structural evidence. Outcome-based characteristics can include mayoral statements acknowledging the lack of any substantive role in a particular policy area, or mayoral or city-led campaigns to actively lobby the state or federal government to take action on behalf of the city.

**Responding to Gibbs & Jonas**

In examining where my analysis fits within the larger set of literature on urban regime theory, it is worth revisiting issues highlighted by Gibbs & Jonas (2000) in their path-breaking article examining the role regime analysis can play in explaining local environmental policy-making. Although they pose a range of interesting questions in their article, my empirical analysis and theoretical conclusions are most applicable to three specific questions (Gibbs & Jonas, 2000, pp 301, 306):

1. To what extent has the process of policy localization activated processes of regime formation around environmental policy?
2. Can policy regimes for the environment exist and operate separately from entrepreneurial or pro-development regimes?
3. Under what conditions do local interests mobilize around local environmental policy and how does this process shape the character of a governing coalition or partnership?

I will address each question in turn.

The first asks whether regime-type policy activity in each city is an outgrowth of larger trends such as Local Agenda 21 or national or EU policy mandates, whereby municipalities are required or encouraged to tackle issues such as climate change. In London, there is clear evidence this is true. The Mayor's Energy Strategy explicitly states London has a responsibility to reduce its local environmental impacts and overall contribution to global climate change (Greater London Authority, 2004a). Moreover, the Mayor's Energy Strategy is predicated largely on what the GLA can do to effect change, thus serving as a model for other cities. A role is seen for Central Government, with the Mayor repeatedly mentioning steps the Government can take to augment or facilitate efforts by the GLA, but *Green Light for Clean Power* is principally a document where Mayor Ken Livingstone accepts responsibility for identifying where changes should occur, and how they should be achieved. Part of the strategy emphasizes coalition-building to deliver the plan.

In New York, the situation is very different. The Mayoral Task Force Report (New York City Energy Policy Task Force, 2004) explicitly states that it will *not* take up larger issues such as sustainability or climate change. It does not create any new partnerships to tackle larger issues. Instead, the report focuses on localized concerns – the risk that the city will run short of power – and sets out a strategy designed solely to address that problem. Certain solutions, such as renewable power systems or energy conservation programs are thus touted not for their climate change benefits, but rather because they move the city closer to specific power targets. Even when explicit environmental benefits are acknowledged – such as reducing emissions from local power plants by "repowering" them with natural gas as a fuel source – they are defined in local rather than global terms: particulates rather than carbon dioxide reductions. In sum, environmental regimes *can* be linked to trends towards policy localization, but this will not always be the case.

As regards to Gibbs and Jonas' second question – whether environmental regimes can operate independently from pro-growth regimes in the city – the answer is a bit muddled because of the lack of clarity over whether energy regimes exist in each city. There is clear movement in that direction, and any lingering doubts should be resolved with time. To answer Gibbs & Jonas, however, we do know hegemonic regime interests play a key role in each city's dominant energy coalition. In other words, a separate and distinct policy regime does *not* exist, likely because energy policy matters are inextricably linked to the interests of the hegemonic regime. Energy may not sit at the top of their agenda, but it is an issue on which they take an active interest to ensure that energy does not become too costly or unreliable, damaging their parochial development interests or the overall economic prospects of the city. In New York, this means real estate developers and construction interests downplay or ignore renewable energy, possibly out of a concern that its use will be detrimental to the broader business community's interests. In London, groups like London First similarly softened the Mayor's proposals so they accommodate renewables without jeopardizing the financial viability of new real estate development projects.

Whether hegemonic regimes will focus on a wider range of environmental agendas is debatable. Air quality concerns, traffic congestion concerns, and the adequacy and quality of the local water supply could be other fundamental considerations influencing business location or investment decisions, and thus be of interest to a pro-growth regime. On the other hand, open space is likely to be seen as a nicety that increases a city's attractiveness relative to another location, but it may not be a key issue around which regime interests will mobilize.

The third question inquires as to the conditions under which local interests mobilize around local environmental policy and how this shapes the governing coalition. My analysis in both London and New York lead me to believe there is nothing inherently unique about energy and environmental issues that predisposes a regime to form or be active on such issues. In New York, hegemonic regime interests have latched onto local energy policy as an important issue because they see an electricity shortfall as a condition threatening to their short and long-term financial interests. To the extent there are any 'green' aspects to New York City's Energy Task Force plan, it is because regime interests do not see them as conflicting with their primary goals of long term economic growth in the city. Sustainability or climate change concerns were not, however, fundamental issues driving regime involvement or interest. The situation is basically the same in London. The Mayor's Energy Strategy is much, much greener, than New York's plan, but it was primarily the Mayor leading on these issues, rather than other regime members. Its many green provisions have been embraced by the larger group of stakeholders, however, thanks to a willingness on the part of the Mayor to ensure that the strategy's provisions did not seriously harm the interests of key regime stakeholders. To the extent specific policy provisions ever were in conflict, these problems appear to have been smoothed over during the draft strategy development process.

One open question worth considering is whether local regimes would have been similarly consulted or involved if the Mayor of London or New York had a markedly different capacity to act. This question arises because of the very different situation in cities like Los Angeles, Seattle, and Austin, where a municipally-owned electric utility operates some or all of the local electric grid and supply system. Municipal ownership vests local officials with more direct control over supply choices, interconnection rules, and renewables subsidy levels, meaning there may be less need for coalition formation to deliver on a pro-renewables strategy. Because my research focused on two cities that are both reliant on privately-owned utilities for the bulk of the city's power needs, this is one area that could benefit from further research, as it may shed insights on the broad applicability of my model to other urban settings with different energy contexts.

**Looking to the Future**

There are several other issues arising out my research that would also benefit from follow-on work. My research focused on energy policy-making in two of the most highly developed cities in the western world, so environmental policy literature would also benefit from comparable research examining urban energy regime activities in a developing nation context. Moving beyond alternative urban contexts, another area ripe for research is my contention that a constrained regime holds applicability to policy areas such as education and public health, where state policies and programs can be similarly restrictive or directive. To date, I am not aware of any regime analyses investigating education policy-making at the local level, although one researcher has examined a local regime's involvement in public health policy-making in Christchurch, New Zealand (Brown, 1999). That analysis glossed over the issue of how central government policies constrained the behavior of or options considered by local policy-makers, and it could be worthwhile to revisit this situation using my alternative research paradigm.

From a strict policy-making, rather than theoretical perspective, my research has also raised several compelling issues worthy of further study. First, my fundamental research question was interpreted by several policy-makers that I interviewed as presuming there is an inherent advantage to the deployment of renewable power schemes within the city limits. There are several reasons why this could be true, all of which have been previously cited: distributed power located near the point of use can increase energy security at that location; in-city renewables deployment can eliminate the majority of the power losses that occur during the transmission of electricity over long distances; in-city deployment can provide local air quality benefits, etc. There is also the question of fairness, as under the current system, rural and suburban communities must bear the cost of New York and London's energy profligacy by hosting power plants that impose adverse emission or visual impacts on the area. An interesting analysis, therefore, would consist of a comprehensive assessment of the true economic impact of on-site renewable power generation in New York City, examining whether reductions in local air quality emissions produce comparable reductions in health care expenditures or other cost savings sufficient to justify the higher cost of renewable power. The analysis must by necessity make assumptions about how much new in-city generation capacity (of any type) will actually be built over the next several years, and the role that local distributed power sources can play in providing peak use period energy cost savings.[64] A comparable analysis in London would presumably provide very different results, because London does not suffer from the limits on transmission capacity that currently plague New York.

Finally, perhaps the greatest contribution to the current literature on energy policy-making in urban areas will come through monitoring the implementation of the Energy Strategy in London, tracking how well it accomplishes its many goals and where the greatest obstacles lay. The sheer breadth of the plan and its ambitious goals contrast starkly with the Mayor's capacity to act, both financially, and in terms of the powers he can deploy to deliver on this agenda. Because London is such a high profile city, however, the success or failure of this plan will be watched closely by other cities. Understanding what London did right, and where it fell short, could be tremendously important if more cities agree it is time to join London in taking up arms to combat global climate change.

[64] The assumption here is that absent significant new capacity deployment in New York City, peak period pricing will increase dramatically, as local users will be willing to endure higher rates than users in other parts of the state to ensure that demand is fully satisfied. According to the NYISO, the location-based marginal price for electricity in the New York City marketplace during peak afternoon demand periods can be two to twenty times as expensive as power prices in upstate and western New York. (For a real-time display of location-based marginal power pricing in New York, see: http://www.nyiso.com/oasis/oasis_zonemaps.htm) The strategic use of renewably-generated power could, during peak demand periods, result in sizable cost savings far exceeding the cost of a renewable power system's installation.

## REFERENCES


Alexander, G. (1996). The Context of Renewable Energy Technologies. In G. Boyle (Ed.), *Renewable Energy: Power for a Sustainable Future* (pp. 1-40). New York: Oxford University Press.

Alger, D. (2001). *Lighting the Way*. GothamGazette.com. Retrieved 26 June, 2003, from the World Wide Web: www.gothamgazette.com/commentary/70.alger.shtml

Alt, J. E., & Shepsle, K. A. (1998). Rules, restrictions, constraints: structure and process in the new institutional economics. *Journal of Institutional and Theoretical Economics, 154*, 735-743.

AltPower Inc. (2004). *Recent Projects: Solaire (20 River Terrace)*. Retrieved 23 February, 2004, from the World Wide Web: http://www.altpower.com/rece_rive.htm

Angotti, T. (2003). *The Lesson of the Blackout is NOT More Power Plants* [web site]. GothamGazette.com. Retrieved 7 September, 2003, from the World Wide Web: www.gothamgazette.com/article/landuse/20030826/12/505

APPA. (2002). *Straight Answers to False Charges About Public Power*. Washington, D.C.: American Public Power Association.

APPA. (2003). *American Public Power Association Fact Sheet*. American Public Power Association. Retrieved 10 July, 2003, from the World Wide Web: http://www.appanet.org/About/appa/APPAFactSheet.pdf

APPA. (2005). *Electric Power Statistics* [website]. American Public Power Association. Retrieved 3 May, 2005, from the World Wide Web: www.appanet.org/files/PDFs/2005-stats.pdf

Archibold, R. C., & Fried, J. P. (2001, 28 June). The Heat is On, and Businesses Strive to Keep the Power On, Too. *New York Times*, pp. B5.

Architects' Journal. (2003, 20 November). RIBA scraps turbine plans after failing to find sponsors.

Associated Press. (1983, 23 September). Solar Study Starts on Citicorp's Roof. *New York Times*, pp. B5.

Associated Press. (2001, 4 June). Power plant opponents say Queens is already overburdened with generators. *Associated Press Newswires*.

Associated Press. (2002, 19 September). Civic, Business Groups call for transit hub in lower Manhattan. *Associated Press State and Local Wire*.

Association of Electricity Producers. (1996). *Obstacles to the Growth of a Renewable Energy Industry in the UK*.

Astropower Inc. (2002, 1 June). *AstroPower's Building-Integrated Photovoltaics to Power Nation's First Environmentally Sustainable Residential High-Rise Building*. Retrieved 26 March 2003, from the World Wide Web: www.prnewswire.com

Axelrod, R. (1982). *Conflict Between Energy and Urban Environment: Consolidated Edison Versus the City of New York.* Washington D.C.: University Press of America.

Bachrach, P., & Baratz, M. (1963). Decisions and Nondecisions: An Analytical Framework. *The American Political Science Review, 57*(3), 632-642.

Bahrampour, T. (2003, 19 June 2003). City seeking to rezone Brooklyn waterfront. *New York Times,* pp. B1.

Baker, R. (1985, 9 October). Big One Gets Away. *New York Times,* pp. A23.

Barbanel, J. (1984, 8 October). City, Through a Tiny Agency, is Fighting to Get Low-Cost Niagara Power. *New York Times,* pp. B1.

Bassett, K. (1996). Partnerships, business elites, and urban politics: new forms of governance in an English city? *Urban Studies, 33*(3), 539-555.

Battery Park City Authority. (2002). *Hugh L. Carey Battery Park City Authority Commercial/Institutional Environmental Guidelines*. New York City.

Battery Park City Authority. (2003). *Hugh L. Carey Battery Park City Authority Residential Environmental Guidelines (Version 4)*. New York City.

BBC. (2005, 16 February). *Kyoto Protocol comes into force* [website]. Retrieved 12 June, 2005, from the World Wide Web: http://news.bbc.co.uk/1/hi/sci/tech/4267245.stm

Beatley, T. (2000). *Green Urbanism: Learning from European Cities*. Washington DC: Island Press.

Benson, M. (2002, 4 November). Light Switch: As Woes Mount for Utilities, Cities Try to Take Charge. *Wall Street Journal,* pp. A1.

Berkey-Gerard, M. (2004). *The City Budget and Labor Unions* [web site]. GothamGazette.com. Retrieved 9 March, 2004, from the World Wide Web: www.gothamgazette.com/print/872

Berry, T., & Jaccard, M. (2001). The renewable portfolio standard: design considerations and an implementation survey. *Energy Policy, 29*, 263-277.

Bill Dunster Architects. (2004). *BedZed* [website]. Retrieved 9 August, 2004, from the World Wide Web: http://www.zedfactory.com/bedzed/bedzed.html?main=/bedzed/bedzedtext.html

Bird, L. A. (2003). *Understanding the Environmental Impacts of Electricity: Product Labeling and Certification* (NREL/TP-620-33475). Golden, Colorado: U.S. Department of Energy, National Renewable Energy Laboratory.

Blum, J., VandeHei, J. (2005, 28 April). Bush Unveils Energy Proposals. *Washington Post,* pp. A5.

Bogdanich, W. (1986, 2 May). Tainted City -- Undue Influence? -- In New York, Power of Real Estate Firms Comes Under Scrutiny. *Wall Street Journal,* pp. 1.

Bowker, J. (2004, 3 August). Marine energy sector powers up with GBP 50M funding boost. *The Scotsman,* pp. 23.

Boyle, G. (Ed.). (2004). *Renewable Energy: Power for a Sustainable Future* (Second ed.). Oxford: Oxford University Press.

Broer, S., & Why, I. (2004). *Feasibility Study of Sustainable Energy Solutions for the Neighborhood of Sutton Central*: Rudloe Centre for Climate Change Solutions, Energy for Sustainable Development, London Borough of Sutton.

Brook Lyndhurst. (2003a). *Attitudes to Renewable Energy in London: Public and Stakeholder Opinion and the Scope for Progress.* London: London Renewables.

Brook Lyndhurst. (2003b). *New Horizons: Planning for Renewable Energy Final Report.*

Brown, M. (1999). Reconceptualizing Public and Private in Urban Regime Theory: Governance in AIDS Politics. *International Journal of Urban and Regional Research, 23*(1), 70-87.

Brunton, M. (2004, 17 May). Power Struggle. *Time Europe, 163.*

Buck, N., Gordon, I., Hall, P., Harloe, M., & Kleinman, M. (2002). *Working Capital: Life and Labour in Contemporary London.* London: Routledge.

Burns, P. (2002). The intergovernmental regime and public policy in Hartford, Connecticut. *Journal of Urban Affairs, 24*(1), 55-73.

BWEA. (2004, 24 February). *UK Wind: The Build Begins* [press release]. British Wind Energy Association. Retrieved 1 October, 2004, from the World Wide Web: www.bwea.com/media/news/oneyearon.html

CADDET. (2001). *Sustainable Energy infrastructure within reach: the Dutch approach.*: International Energy Agency, Center for Analysis and Dissemination of Demonstrated Energy Technologies.

Campbell, C. (1981, 5 June). Business Team Goes Prospecting in Washington on Behalf of City. *New York Times,* pp. B3.

Campbell, R. (2000). *In the News: Times Square Goes Green* [web page]. GothamGazette.com. Retrieved 11 September, 2003, from the World Wide Web: www.gothamgazette.com/environment/jun.00.shtml

Capello, R., Nijkamp, P., & Pepping, G. (1999). *Sustainable Cities and Energy Policies*. Berlin: Springer-Verlag.

Cassedy, E. S. (2000). *Prospects for Sustainable Energy: A Critical Assesment*. Cambridge: Cambridge University Press.

Chan, S., Marshall, C., & Rutenberg, J. (2005, 11 November). Driving around Manhattan, You Pay, Under One Traffic Idea. *New York Times,* pp. B1.

Chesshire, J. (1996). UK Electricity Supply under Public Ownership. In J. Surrey (Ed.), *The British Electricity Experiment: Privatization -- The Record, The Issues, The Lessons*. London: Earthscan.

Chicago Solar Partnership. (2002). *PV Installations* [website]. Chicago Solar Partnership. Retrieved 11 December, 2002, from the World Wide Web: www.chicagosolarpartnership.com/pv/index.htm

Church, A., & Reid, P. (1996). Urban power, international networks and competition: the example of cross-border competition. *Urban Studies, 33*, 1297-1319.

Citizen's Union. (2004). *History of the Citizens Union of the City of New York 1897-1997* [Web site]. Retrieved 3 March, 2004, from the World Wide Web: www.citizensunion.org/culegacy/cuhistory1897-1997.shtml

Clark, J. (2001). Six urban regime types: The effects of state laws and citizen participation on the development of alternative regimes. *Public Administration Quarterly, 25*(1), 3-48.

Cleanedge. (2004, 20 September). *LADWP Receives over 40 Proposals for Renewable Energy Projects* [webpage]. Retrieved 21 June, 2005, from the World Wide Web: http://www.cleanedge.com/story.php?nID=3209

Clemence, S. (2004, 3 March). Death of financing shorts out power plan. *Albany Times Union,* pp. E1.

Cogne, D. (2003). *The Seal of New York City* [web site]. Heraldic America. Retrieved 9 January, 2003, from the World Wide Web: http://pages.infinit.net/cerame/heraldicamerica/etudes/newyork.htm

Coletti, L. (1992, 11 June). New York Times Letter to the Editor: "Try a Mix". *New York Times*.

Collins, F. L. (1934). *Consolidated Gas Company of New York; A History Published by the Company in the Fiftieth Year of Its Existence as a Corporation and the One Hundred and Tenth Year of Continuous Service to the People of the City of New York*. New York City: Consolidated Edison Company of New York, Inc.

Community Energy. (2004). *The Durst Organization Makes State's Largest Commercial Purchase of Wind Power* [Press Release]. Retrieved 24 February, 2004, from the World Wide Web: http://www.communityenergy.biz/cei_pr_durst.html

Con Ed Solutions. (2002). *Con Edison Solutions to Donate 83,000 watts of wind power on New Year's Eve -- Enough to light the Times Square Ball* [Press release]. Con Edison. Retrieved 25 June, 2003, from the World Wide Web: www.newwindenergy.com/regional/northeast/press_release/conedison_press.html

Con Ed Solutions. (2004, 4 August). *Host Committee will rely on Renewable "Green Power"* [press release]. Retrieved 14 May, 2005, from the World Wide Web: www.conedsolutions.com/news_events/pressreleaseaug42004.htm

Con Ed Solutions. (2005a). *Green Power for Residential and Small Business Customers* [Website]. Retrieved 16 May, 2005, from the World Wide Web: www.conedsolutions.com/residential/greenpowermain.htm

Con Ed Solutions. (2005b, 9 February). *New York City makes largest purchase of 'green power' in New York City Government history* [press release]. Retrieved 15 May, 2005, from the World Wide Web: www.conedsolutions.com/news_events/pressreleasFeb92005.htm

Con Edison. (2000). *Con Edison Announces Agreement to Sell Indian Point Nuclear Units to Entergy* [Press Release]. Con Edison. Retrieved 7 Febuary, 2004, from the World Wide Web: www.coned.com/about/news/pr20001109c.asp?from-rc

Con Edison. (2002). *Specification EO-2115, Revision 5: Handbook of General Requirements for Electrical Service to Dispersed Generation Customers*. New York City: Consolidated Edison Company of New York, Inc.

Con Edison. (2004). *Con Edison Facts for the periods ended December 31, 2003 and 2002.*

Con Edison. (2005a, 4 September 2005). *Con Edison reports record power use over one of the hottest summers ever* [press release]. Retrieved 29 November, 2005, from the World Wide Web: http://www.coned.com/newsroom/news/pr20050904.asp?from=hc

Con Edison. (2005b). *Specification EO-2115 (Revision 7): Handbook of General Requirements for Electrical Service to Dispersed Generation Customers*. New York City.

Confessore, N. (2005, 12 May). Council approves makeover of the Brooklyn Waterfront. *New York Times,* pp. B3.

Connor, P. M. (2003). UK renewable energy policy: a review. *Renewable and Sustainable Energy Reviews, 7*, 65-82.

Cook, K. (2000, 8 March). Shock Corridor: How a Long-Dormant Law Could Spark a Hudson Valley Power Plan Boom. *The Village Voice.*

Corporate Design. (1984, May/June). Citicorp's Solar Experiment. *Corporate Design, 3,* 103.

Couch White LLP. (2004). *Case 04-E-0572 (Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Electric Service) -- Statement in Support of the City of New York.*

Council on Tall Buildings and Urban Habitat. (2004). *Building of the Month: Citicorp Tower.* Retrieved 23 February, 2004, from the World Wide Web: http://www.lehigh.edu/~inctbuh/bom_citi.html

Council on the Environment of New York City. (1974). *Citizen's Policy Guide to Environmental Priorities for New York City (Part I: Energy and the New York City Environment).* New York City: Council on the Environment of New York City.

Cowell, A. (2004, 9 October). Britain Feeling Pressed for Power. *New York Times,* pp. C1.

CPAU. (2003). *PaloAltoGreen* [Fact sheet]. City of Palo Alto Utilities. Retrieved 28 August, 2003, from the World Wide Web: www.cpau.com/programs/green

CPRE. (2004). *Policy Position Statement: Onshore Wind Turbines*: Campaign to Protect Rural England.

Cronin, B. (2004). *Distributed Generation in NYC (presentation to NY Association of Energy Engineers).* New York: CSA Engineering Services.

Croydon Council. (2002). *Croydon's Environmental Procurement Policy.*

Daniels, L. A. (1982, 15 January). New City Group to Build Middle-Income Housing. *New York Times,* pp. B1.

Davies, J. (2002). Urban Regime Theory: A normative-empirical critique. *Journal of Urban Affairs, 24*(1), 1-17.

de Magalhaes, C., Healey, P., & Madanipour, A. (2002). Assessing Institutional Capacity for City Centre Regeneration: Newcastle's Grainger Town. In P. H. Goran Cars, Ali Madanipour and Claudio de Magalhaes (Ed.), *Urban Governance, Institutional Capacity, and Social Milieux.* Aldershot: Ashgate.

Delaney, M. J. (2003a). *Comments of the City of New York: Case 03-E-0188 Proceeding on a Motion of the Commission Regarding a Retail Renewable Portfolio Standard -- Submitted to State of New York Public Service Commission.* New York City: Economic Development Corporation.

Delaney, M. J. (2003b). *Initial Comments of the City of New York [Case 03-E-0188 -- Proceeding on Motion of the Commission Regarding a Retail Renewable*

*Portfolio Standard] -- Submitted to State of New York Public Service Commission.* New York City: Economic Development Corporation.

deOliveira, R. G., & Tolmasquim, M. T. (2004). Regulatory performance analysis case study: Britain's electricity industry. *Energy Policy, 32*(11), 1261-1276.

DePalma, A. (2005, 23 April). In new laws, big step in journey to cleaner city fleet. *New York Times,* pp. B1.

Department of Trade and Industry. (1999). *Guidelines for establishing a local authority market for green power.*

deVaus, D. A. (2001). *Research Design in Social Research.* London: Sage Publications.

DiMaggio, P. (1998). The new institutionalism: avenues of collaboration. *Journal of Institutional and Theoretical Economics, 154,* 696-705.

Dodsen, S. (2003, 20 November). Wind farms go urban: Coming soon to a wasteland near you... *The Guardian,* pp. 9.

Dowding, K. (2001). Explaining Urban Regimes. *International Journal of Urban and Regional Research, 25*(1), 7-19.

Dowding, K., Dunleavy, P., King, D., Margetts, H., & Rydin, Y. (1999). Regime Politics in London Local Government. *Urban Affairs Review, 34*(4), 515-545.

DSIRE. (2004a, 15 October). *New York Incentives for Renewable Energy -- Renewable Portfolio Standard* [website]. Retrieved 10 May, 2005, from the World Wide Web: http://www.dsireusa.org/library/includes/incentive2.cfm?Incentive_Code=NY03R&state=NY&CurrentPageID=1

DSIRE. (2004b). *New York State Public Service Law. Article 4: Provisions Relating to Gas and Electric Corporations; Regulation of Price of Gas and Electricity* [Web page]. Database of State Incentives for Renewable Energy. Retrieved 19 February, 2004, from the World Wide Web: www.dsireusa.org/library/docs/incentives/NY05R.htm

DTI. (2003a). *Our energy future -- creating a low carbon economy.* London: Department of Trade and Industry.

DTI. (2003b). *Renewables Innovation Review*: Department of Trade and Industry.

DTI. (2004a). *Digest of UK Energy Statistics 2004.* London: Department of Trade and Industry.

DTI. (2004b). *Digest of UK Energy Statistics 2004 (unpublished data)*: Department of Trade and Industry.

Dunlap, D. W. (2003, 20 December). 1,776-Foot Design is Unveiled for World Trade Center Tower. *New York Times,* pp. A1.

Dunn, S. (2004, 15 February). Static Consumers Slow Drive to Green Power. *Independent on Sunday,* pp. 10.

Durkhein, E. (1982). *The rules of sociological method.* London: Macmillan.

Dyckhoff, T. (2004, 18 May). Zed and the art of home making. *The Times of London.*

EC. (1985). *White Paper COM(95)682: An Energy Policy for the European Union.* Brussels: European Union.

EC. (1997). *White Paper for a Community Strategy and Action Plan COM(97)599: Renewable Sources of Energy* (COM(97)599). Brussels: European Commission.

EC. (2000). *Green Paper COM(2000)769: Towards a European Strategy for the Security of Energy Supply.* Brussels: European Commission Directorae-General for Energy and Transport.

EC. (2001a). *Directive 2001/77/EC of the European Parliament and of the Council of 27 September 2001 on the promotion of electricity produced from renewable energy sources in the internal electricity market.*

EC. (2001b). *European Climate Change Programme: Long Report.* Brussels: European Commission.

EC. (2001c). *ExternE-- Externalities of Energy: An Overview.* European Commission. Retrieved 14 August, 2003, from the World Wide Web: http://externe.jrc.es/overview.html

Ecofys BV. (2002). *Green Energy Outlook in Europe: Strategic Prospects to 2010.* London: Reuters Business Insight.

Edeling, T. (1998). Economic and sociological institutionalism in organization theory: two sides of the same coin? *Journal of Institutional and Theoretical Economics, 154,* 728-734.

Edison Electric Institute. (2003, April). *Status of Electricity Competition in the States* [webpage]. Retrieved 23 June, 2005, from the World Wide Web: http://www.eei.org/industry_issues/electricity_policy/state_and_local_policies/state_restructuring_and_regulatory_policy/Competition_states_map.pdf

EIA. (1999). *Federal Financial Interventions and Subsidies in Energy Markets 1999: Primary Energy* (SR/OIAF/99-03). Washington, D.C.: US Department of Energy, Energy Information Administration.

EIA. (2001). *Electricity Restructuring Fact Sheets: New York City's Summer 2001 Electricity Situation* [webpage]. U.S. Department of Energy, Energy Information Administration. Retrieved 25 June, 2003, from the World Wide Web: www.eia.doe.gov/cneaf/electricity/page/fact_sheet/newyork.html

EIA. (2002). *Renewable Energy Annual 2001.* Washington, D.C.: US Department of Energy, Energy information Administration.

EIA. (2003a). *Annual Energy Outlook 2003*. Washington D.C.: U.S. Department of Energy, Energy Information Administration.

EIA. (2003b). *Electric Power Annual 2003 -- Spreadsheets (1990 - 2003 Average Price by State by Provider (EIA-861))* [Spreadsheet]. Retrieved 10 May, 2005, from the World Wide Web: http://www.eia.doe.gov/cneaf/electricity/epa/average_price_state.xls

EIA. (2005). *Annual Energy Outlook 2005* [pdf file]. U.S. Department of Energy Energy Information Agency. Retrieved 21 May, 2005, from the World Wide Web: http://www.eia.doe.gov/oiaf/aeo/excel/figure67_data.xls

Elander, I. (2002). Partnerships and urban governance. *International Social Science Journal, 172*, 191-204.

Electricity Association. (2002). *Introduction to the UK Electricity Market*. Electricity Association. Retrieved 7 June, 2003, from the World Wide Web: www.electricity.org.uk/media/documents/pdf/Intro_UK_Elec_Market.pdf

Electricity Council. (1977). *Electricity Supply in the United Kingdom: Organisation and Development, 31 December 1977*. London.

Elkin, S. (1987a). *City and Regime in the American Republic*. Chicago: University of Chicago Press.

Elkin, S. (1987b). State and Market in City Politics: Or, the "Real" Dallas. In H. Sanders (Ed.), *The Politics of Urban Development (Studies in Government and Public Policy)* (pp. 25-51). Lawrence, Kansas: University Press of Kansas.

Elliott, D. A. (1994). UK renewable energy strategy: The need for longer-term support. *Energy Policy, 22*(12), 1067-1074.

ENDS. (2001, 23 July). *EU highlights real costs of power generation*. ENDS Environmental Data Services. Retrieved 14 August, 2003, from the World Wide Web: http://www.environmentdaily.com/articles/index.cfm?action=article&ref=10366&searchtext=externalities&searchtype=All

ENDS. (2004, 26 May). *New EU renewables target "will be set in 2007"*. ENDS Environment Daily. Retrieved 27 May, 2005, from the World Wide Web: www.environmentdaily.com/articles/index.cfm?action=article&ref=16471

Energy Savings Trust. (2004a). *Green Tariffs* [website]. Retrieved 8 June, 2004, from the World Wide Web: www.saveenergy.co.uk/renewables/energyuse/green.cfm

Energy Savings Trust. (2004b). *PV Grant Programme -- Ormiston Wire*: Department of Trade and Industry.

Energy Savings Trust. (2004c). *Solar Grants: Number of Applications to Date* [website]. Department of Trade and Industry. Retrieved 10 August, 2004, from the World Wide Web: www.est.org.uk/solar/resources/applications.cfm

Energy Task Force. (1977). *Windmill Power for City People: A Documentation of the First Urban Wind Energy System.* New York City: Energy Task Force.

EORG. (2002). *Energy: Issues, Options and Technologies, Science and Society.* Brussels: European Opinion Research Group, European Commission.

Espey, S. (2001). Renewables portfolio standard: a means for trade with electricity from renewable energy sources? *Energy Policy, 29*, 557-566.

ETSU/AEA Technology. (2001a). *Development of a Renewable Energy Assessment and Targets for London: Final Report to Government Office for London and the GLA (Volume 1 -- Main Report).*

ETSU/AEA Technology. (2001b). *Development of a Renewable Energy Assessment and Targets for London: Final Report to Government Office London & the GLA -- Volume 2 -- Annexes.*

ETSU/ESD Ltd. (1999). *Establishing a Local Authority Market for Green Power* (ETSU/K/BC/00187/REP).

European Commission. (2004). *COM(2004)366 Final: Communication of the European Commission of 26/05/2004 on the share of renewable energy in the EU* [website]. ManagEnergy. Retrieved 27 May, 2005, from the World Wide Web: www.managenergy.net/products/R608.htm

Evans, B. (2005, 12 April). *House Panel Defeats Slew of Democratic Changes to Sweeping Energy Bill.* CQ.com. Retrieved 5 May, 2005, from the World Wide Web: www.cq.com

Evolution Markets. (2005). *State and Regional Compliance Markets* [Website]. Retrieved 5 May, 2005, from the World Wide Web: www.evomarkets.com/rec/index.php?xpl1=3

Fabricant, N., & Hallman, R. M. (1971). *Toward a Rational Power Policy: Energy, Politics, and Pollution.* New York City: George Braziller.

Fagin, D. (2005, 3 April). LI energy answer comes with risks. *Newsday*, pp. A14.

Fainstein, N., & Fainstein, S. (1986). Regime Strategies, Communal Resistance, and Economic Forces. In M. P. Smith (Ed.), *Restructuring the City: The Political Economy of Urban Redevelopment.* New York: Longman.

Fainstein, S. (2001). *The City Builders: Property Development in New York and London 1980-2000* (2nd Edition, Revised ed.). Lawrence, Kansas: University Press of Kansas.

Fainstein, S., & Young, K. (1992). Politics and state policy in economic restructuring. In M. Harloe (Ed.), *Divided Cities: New York and London in the Contemporary World* (pp. 203-235). Cambridge, Massachusetts: Blackwell Publishers.

Fairley, J. (2003, 18 July). The Sun Also Lowers; Utility Costs, that is, in 'zero energy' homes that use solar panels to help cut bills. *Newsday,* pp. C8.

Farhar, B. C. (1996). *Energy and the Environment: The Public View.* College Park, Maryland: Renewable Energy Policy Project.

Ferman, B. (1996). *Challenging the growth machine: neighborhood politics in Chicago and Pittsburgh.* Lawrence, Kansas: University Press of Kansas.

Feuer, A. (2003, 1 November). "Necklace Lights" to Return. *New York Times,* pp. B2.

Flick, U. (2002). *An Introduction to Qualitative Research.* London: Sage Publications.

Fontana, A., & Frey, J. H. (1994). Interviewing: The art of science. In Y. S. Lincoln (Ed.), *Handbook of Qualitative Research.* Thousand Oaks, California: Sage Publications.

Franz, P. (2000). Suburbanization and the clash of urban regimes: development problems of East German cities in a free market environment. *European Urban and Regional Studies, 7*(2), 135-146.

Friends of the Earth. (2003, 24 February). *Goodbye Nuclear, Hello Wind* [press release]. Retrieved 5 October, 2004, from the World Wide Web: www.foe.co.uk/resource/press_releases/goodbye_nuclear_hello_wind.html

Friends of the Earth. (2004). *Friends of the Earth Guide to Green Electricity Tariffs 2004: Background Document.*

Fuchs, D., & Arentsen, M. (2002). Green electricity in the market place: the policy challenge. *Energy Policy, 30,* 525-538.

Fuchs, E., & Travers, T. (2000). Governance in London and New York. In Corporation of London (Ed.), *London-New York Study: Final Report (Section 3).* London.

Geller, H. (2003). *Energy Revolution: Policies for a Sustainable Future.* Washington D.C.: Island Press.

Gibbs, D., & Jonas, A. (2000). Governance and regulation in local environmental policy: the utility of a regime approach. *Geoforum, 31,* 299-313.

Gibbs, D., Longhurst, J., & Braithwaite, C. (1996). Moving towards sustainable development? Integrating economic development and the environment in local authorities. *Journal of Environmental Planning and Management, 39*(3), 317-332.

Giuliani, R. (2001a). *Addressing the Need for Long-term Reliable Energy in New York City* [Speech]. City of New York (Archives of Rudolph W. Giuliani). Retrieved 21 February, 2004, from the World Wide Web: www.ci.nyc.ny.us/html/rwg/html/2001a/energy.html

Giuliani, R. (2001b, May 2001). Keeping the Lights On in NYCHA and New York City. *New York City Housing Authority Journal, 31.*

Gladstone, D., & Fainstein, S. (2001). Tourism in US Global Cities: A Comparison of New York and Los Angeles. *Journal of Urban Affairs, 23*(1), 23-40.

Glasgow, F. (2004, 3 July). How Can You Be Sure Your Energy Supplier is Green? In the Complex Area of Green Energy, Not All Suppliers are Equally Green. *The Independent (London),* pp. p 7.

GOL. (1996). *RPG3: Strategic Guidance for London Planning Authorities.* London: Government Office for London.

GOL. (2000). *Strategic Planning in London: Greater London Authority Act 1999; The Secretary of State for the Environment, Transport, and the Regions' guidance on the arrangements for strategic planning in London. (GOL Circular 1/2000).* London: Government Office for London.

GOL. (2004a). *General Conformity: Principles and Procedures. Consultation Draft Guidance Note, March 2004. Government Ofice for London Response on behalf of the First Secretary of State.* London: Government Office for London.

GOL. (2004b). *Roles in Planning and Development Control -- the London Boroughs, the Mayor of London and the Secretary of State* [website]. Retrieved 5 June, 2004, from the World Wide Web: http://www.go-london.gov.uk/planning/land_use_planning/rolesindevcontrol.asp

Goldberger, P. (2002, 15 April). Lights Out. *The New Yorker,* 34.

Goodin, R. E. (1996). Institutions and their design. In R. E. Goodin (Ed.), *The Theory of Institutional Design* (pp. 1-53). Cambridge: Cambridge University Press.

Gorden, R. (1975). *Interviewing: Strategy, techniques, and tactics.* Homewood, Illinois: Dorsey Press.

Gordon, B. (1981). *One Hundred Years of Electricity Supply 1881-1981.* East Sussex: South Eastern Electricity Board.

Gorini de Oliveira, R., & Tolmasquim, M. T. (2004). Regulatory performance analysis case study: Britain's electricity industry. *Energy Policy, 32,* 1261-1276.

Gow, D. (2003, 25 February). Five years for green power to prove its worth. *The Guardian (London),* pp. 13.

Greater London Authority. (2000a). *The Mayor and relations with the business community: Statement.*

Greater London Authority. (2000b). *The State of London* [webpage]. Retrieved 8 November, 2004, from the World Wide Web: www.london.gov.uk/mayor/state/solenvironment.jsp

Greater London Authority. (2001). *Refugees and asylum seekers in London: A GLA perspective (Draft Report for Consultation).*

Greater London Authority. (2002). *The Mayor's Draft Energy Strategy: Assembly and Functional Bodies Consultation Draft.*

Greater London Authority. (2003a). *Consultation on Green Light to Clean Power, the draft Energy Strategy* [web page]. Retrieved 9 November, 2004, from the World Wide Web: www.london.gov.uk/mayor/strategies/energy/docs/energyconsultation.pdf

Greater London Authority. (2003b). *Four years of Annual London Surveys -- Londoner's views of life in the Capital (Final Report).*

Greater London Authority. (2003c). *Green light to clean power: The Mayor's Draft Energy Strategy.*

Greater London Authority. (2003d). *Rethinking Rubbish in London: The Mayor's Municipal Waste Management Strategy.*

Greater London Authority. (2004a). *Green light to clean power: The Mayor's Energy Strategy.*

Greater London Authority. (2004b). *Home Office Consultation -- Integration Matters: A National Strategy for Refugee Integration (Response by the Mayor of London).*

Greater London Authority. (2004c). *London Energy Partnership -- First Steering Group Meeting (Handouts).*

Greater London Authority. (2004d). *London Energy Partnership: Transforming London into a world-class city for sustainable energy* [website]. Retrieved 18 August, 2004, from the World Wide Web: www.london.gov.uk/mayor/environment/energy/partnership-steering-group/about.jsp

Greater London Authority. (2004e). *The London Plan: Spatial Development Strategy for Greater London.*

Greater London Authority. (2004f). *London taking on climate change challenge* [press release]. Retrieved 13 November, 2004, from the World Wide Web: www.london.gov.uk/view_press_release.jsp?releaseid=3865

Greater London Authority. (2004g). *Planning Report PDU/0296/03 (Stratford City).*

Greater London Authority. (2004h, 10 November 2004). *Strategic Development Proposals by Date Reviewed* [website]. Retrieved 30 November, 2004, from the World Wide Web: http://www.london.gov.uk/mayor/planning_decisions/date_index.jsp

Greater London Council. (1978). *Energy Policy and London.*

Greater London Council. (1981). *Energy Use in London (Statistical Series: No. 10).*

Greater London Council. (1982a). *Electricity Supply in London: Part 1--A Review (Reviews and studies series: No. 13).*

Greater London Council. (1982b). *Electricity Supply in London: Part 2--Working Group Reports (Reviews and studies series: No. 14).*

Greater London Council. (1983). *The Energy Economy -- Building Employment by Investing in the Rational Use of Electricity (Strategy Document No. 5)*: GLC Energy Policy Group.

Green Electricity Marketplace. (2004). *Decide which tariff is best for you* [website]. Retrieved 8 June, 2004, from the World Wide Web: www.greenelectricity.org/regions/london.html

Green Party. (2000). *GLA Elections 2000: Green Party Manifesto* [website]. Retrieved 29 December, 2004, from the World Wide Web: http://mirror.greenparty.org.uk/gla/manifesto/manifesto_p.htm

Green-e. (2003). *Green-e: renewable electricity certification system.* Retrieved 4 August, 2003, from the World Wide Web: www.green-e.org/what_is/program_sum/program_summary.html

Greene, D. (1988, 28 February). A Setback on Electric Rates. *New York Times,* pp. 6.

Green-e.org. (2004). *New York Choices* [web page]. Green-e.org. Retrieved 19 February, 2004, from the World Wide Web: www.green-e.org/your_e_choices/ny_businessprod.html

Green-e.org. (2005). *New York Choices* [website]. Retrieved 11 May, 2005, from the World Wide Web: www.green-e.org/your_e_choices/ny_businessprod.html

Greenhouse, L. (1977, 6 May). State Tells Con Ed to Buy 2 Kilowatts -- From a Windmill. *New York Times,* pp. 1.

Greenpeace. (2003, 11 March). *Greenpeace welcomes the end of the road for nuclear power* [press release]. Retrieved 5 October, 2004, from the World Wide Web: www.greenpeace.org.uk

GreenPrices. (2004). *Large Users* [website]. Retrieved 15 October, 2004, from the World Wide Web: http://www.greenprices.com/uk/usertop.asp

Griscom, A. (2001, 18 June). Power Struggle. *New York Magazine.*

Grubb, M. (1995). *Renewable Energy Strategies for Europe -- Foundations and Context* (Vol. 1). London: Earthscan.

Grubb, M., & Vigotti, R. (1997). *Renewable Energy Strategies for Europe: Volume II -- Electricity Systems and Primary Electricity Sources.* London: Earthscan Publications.

Grubb, M., Vrolijk, C., & Brack, D. (1999). *The Kyoto Protocol: A Guide and Assessment*. London: RIAA/Earthscan.

Gugliotta, G. (2003, 24 July). Taking on Global Climate Change -- Planned Study is Decried as Stalling. *Washington Post,* pp. A6.

Gunning, R., & Davidson, S. (2004). *National Survey Report of PV Power Applications in the United Kingdom 2003*: International Energy Agency.

Gutermuth, P. (2000). Regulatory and institutional measures by the state to enhance the deployment of renewable energies: German experiences. *Solar Energy, 69*(3), 205-213.

Haider, D. (1992). Place wars: new realities of the 1990s. *Economic Development Quarterly, 6*, 127-134.

Hall Hayes, K. (2005, 14 April). Possible disasters at LNG site spelled out. *The Providence Journal,* pp. E4.

Hall, P., & Taylor, R. (1996). Political Science and the Three New Institutionalism. *Political Studies, 44*, 936-957.

Hall, T., & Hubbard, P. (1996). The entrepreneurial city: new urban politics, new urban geographies? *Progress in Human Geography, 20*(2), 153-174.

Hammond Jr., W. (2003, 4 September). Hazardous Waste Cleanup Bill Faces Opposition. *New York Sun,* pp. 3.

Hannah, L. (1979). *Electricity before Nationalisation: A Study of the Development of the Electricity Supply Industry in Britain to 1948*. London: Macmillan Press.

Hanreich, G. (2002). *Renewable Energy in European Union Policies*. European Commission, Directorate General for Energy and Transport. Retrieved 22 July 2003, 2003, from the World Wide Web: http://europa.eu.int/comm/energy/res/sectors/doc/photovoltaic/hanreich_paper_for_munich1_amended_version.pdf

Harding, A. (1994). Urban Regimes and Growth Machines: Toward a Cross-National Research Agenda. *Urban Affairs Quarterly, 29*(3), 356-382.

Harding, A. (2000). Regime Formation in Manchester and Edinburgh. In G. Stoker (Ed.), *The New Politics of British Local Government* (pp. 54-71). London: MacMillan.

Harris, L. (2003). *Tilting at Mills: Green Dreams, Dirty Dealings, and the Corporate Squeeze*. New York City: Houghton Mifflin.

Healey, P., Cars, G., Madanipour, A., & de Magalhaes, C. (2002). Transforming Governance, Institutionalist Analysis and Institutional Capacity. In C. de Magalhaes (Ed.), *Urban Governance, Institutional Capacity, and Social Milieux*. Aldershot: Ashgate.

Healy, P. (2003, 25 August). New York State Promised $5 Million in Aid. *New York Times,* pp. A12.

Hebbert, M. (1998). *London: More by Fortune than Design.* New York: John Wiley.

Hebert, H. J. (2005, 19 January). Potential of catastrophic fire from terrorist attack worries LNG opponents. *Associated Press.*

Helm, D. (2003). *Energy, the State, and the Market: British Energy Policy since 1979.* Oxford: Oxford University Press.

Hershkowitz, A. (2002). *Bronx Ecology: Blueprint for a New Environmentalism.* Washington D.C.: Island Press.

Hewitt, A. (2005). *Eco-housing & Sustainable Energy: The Power of Local Government; The Power of Planning; Mobilising to address climate change (presentation to Royal Institute of British Architecture).* London: London Borough of Merton.

Hill, M. (2003, 1 March). Looking Hard for Union Label in New York: Union Strength Weakens. *Associated Press State and Local Wire.*

Hirsh, R. F. (1999). *Power Loss: The Origins of Deregulation and Restructuring in the American Electric Utility System.* Cambridge, Massachusetts: MIT Press.

HMSO. (1999a). *Greater London Authority Act 1999 (Chapter 29).* London: Her Majesty's Stationery Office.

HMSO. (1999b). *Local Government Act 1999.* London: Her Majesty's Stationery Office.

Home Office. (2005, 7 February). *Controlling our borders: making migration work for Britain. Charles Clarke sets out five year Strategy for Immigration and Asylum* [Press release]. Retrieved 19 February, 2005, from the World Wide Web: http://www.ind.homeoffice.gov.uk/ind/en/home/news/press_releases/controlling_our_borders.html

House of Commons. (2000). *The local elections and elections for a London Mayor and Assembly: 4 May 2000 (Research Paper 00/53)*: House of Commons Library, Social and General Statistics Section.

House of Commons Environmental Audit Committee. (2003). *Energy White Paper -- Empowering Change?* (HC618).

House of Lords Science and Technology Committee. (2004). *Renewable Energy: Practicalities* (HL Paper 126-I).

Hu, W. (2003, 4 October). Mayor Wants to Move Site of Power Plant. *New York Times,* pp. B3.

Hu, W. (2005, 16 September). New York: Mayor Approves Construction Rules. *New York Times*, pp. B5.

Hudson River Sloop Clearwater. (2002). *Public Comment on Draft New York State Energy Plan and Draft Environmental Impact Statement*. Poughkeepsie, New York: Hudson River Sloop Clearwater.

Hughes, T. P. (1983). *Networks of Power: Electrification in Western Society, 1880-1930*. Baltimore, Maryland: Johns Hopkins University Press.

Hyman, L. S. (1985). *America's Electric Utilities: Past, Present, and Future* (Second ed.). Arlington, Virginia: Public Utilities Reports Inc.

ICLEI. (2002a). *Permits and Ordinances for Wind Development*. Retrieved 1 December, 2002, from the World Wide Web: http://www.greenpowergovs.org/wind/Oakland%20wind%20permit.html

ICLEI. (2002b). *Strategies to Promote Solar*. Retrieved 1 December, 2002, from the World Wide Web: www.greenpowergovs.org/Solar2strategies.html

ICLEI. (2003). *Municipal Aggregation for Green Purchase* [website]. International Council of Local Environmental Initiatives. Retrieved 28 August, 2003, from the World Wide Web: www.greenpowergovs.org/wind/Chicago%20Aggregation.html

ICLEI. (2005). *Case Study: Austin, Texas -- Local Government Renewables Portfolio Standard* [website]. Retrieved 21 June, 2005, from the World Wide Web: http://www.greenpowergovs.org/wind/Austin%20case%20study.html

IEA. (2004a). *Key World Energy Statistics 2004*. Paris: International Energy Agency -- OECD.

IEA. (2004b). *Renewables Information 2004 (with 2003 data)*: International Energy Agency/OECD.

IEA. (2004c). *World Energy Outlook 2004*: International Energy Agency/OECD.

Inman, P. (2004, 19 June). Now sun power is really hot: Solar panels are growing in popularity as home owners take up cash incentives to go green. *The Guardian*, pp. 6.

International Energy Agency. (1997). *Renewable Energy Policy in IEA Countries Volume 2: Country Reports*. Paris: OECD/IEA.

International Energy Agency. (2002a). *Distributed Generation in Liberalised Electricity Markets*. Paris: OECD/International Energy Agency.

International Energy Agency. (2002b). *IEA Statistics -- Renewables Information 2002*. Paris: OECD/International Energy Agency.

Interstate Renewable Energy Council. (2005, May). *Renewable Portfolio Standards Map* [webpage]. North Carolina State Solar Center. Retrieved 21 June, 2005,

from the World Wide Web:
http://www.dsireusa.org/documents/SummaryMaps/RPS_Map.ppt#1

IREC. (1996). *New York Enacts Net Metering Legislation for Residential PV Consumers* [Website]. Interstate Renewable Energy Council. Retrieved 19 February, 2004, from the World Wide Web: www.irecusa.org/articles/static/1/binaries/rru-1996-08.htm

IREC. (2005). *Connecting to the Grid*. Retrieved 10 May, 2005, from the World Wide Web: http://irecusa.org/articles/static/1/1097177394_987096450.html

Jacobson, C. D. (2000). *Ties that Bind: Economic and Political Dilemmas of Urban Utility Networks 1800-1990*. Pittsburgh, Pennsylvania: University of Pittsburgh Press.

Jameson, A. (2004, 14 September). Britain must go nuclear, energy chief tells ministers. *The Times*, pp. 1.

Jessop, B. (2001). Institutional re(turns) and the strategic-relational approach. *Environment and Planning A, 33*, 1213-1235.

Jewson, N., & MacGregor, S. (1997). Transforming cities: Social exclusion and the reinvention of partnership. In S. MacGregor (Ed.), *Transforming Citis: Contested Governance and New Spatial Divisions*. London: Routledge.

John, P., & Cole, A. (1998). Urban regimes and local governance in Britain and France: policy adaptation and coordination in Leeds and Lille. *Urban Affairs Review, 33*(3), 382-404.

John, P., & Cole, A. (2000). Policy networks and local political leadership in Britain and France. In G. Stoker (Ed.), *The New Politics of British Local Governance*. Houndsmills: Macmillan.

Johnson, K. (2000). Green With Envy: National environmental groups want to clean up New York. Can neighborhoods hold on to a say in their own future? *City Limits, 25*, 16.

Johnson, K., & McKinley Jr., J. C. (2003, 24 July). Officials Face Tough Part of Water Deal. *New York Times*, pp. B1.

Jonas, A. (1997). Regulating Suburban Politics: "Suburban -Defense Transition," Institutional Capacities and Territorial Reorganization in Southern California. In M. Lauria (Ed.), *Reconstructing Urban Regime Theory: Regulating Urban Politics in a Global Economy*. (pp. 206-229). Thousand Oaks, California: Sage.

Jones, R., Brignal, M., & Collinson, P. (2004, 20 November). Will being green put you into the red? *The Guardian*, pp. 2.

Jurewitz, J. L. (2002). California's Electricity Debacle: A Guided Tour. *Electricity Journal*(May 2002), 10-29.

Kearns, A., & Paddison, R. (2000). New Challenges for Urban Governance. *Urban Studies, 35*(5-6), 845-850.

Keating, R. (2003, 14 January). Pull Plug on Pataki's Plans for Electricity and Emissions. *Newsday.*

Keith, J. (2003). *Austin Energy pushes solar panels with a loan incentive* [Transcript]. News 8 Austin. Retrieved 4 August, 2003, from the World Wide Web: http://www.news8austin.com/content/headlines/?ArID=79413&SecID=2

Kennedy, R. (1998, 27 January). Private Group Offers Bonus Pay as a Spur to City's Public Schools. *New York Times,* pp. A1.

Kilgannon, C. (2003, 18 August). Going Near the Water; Renovation Efforts Reclaim the City's Forbidden Shoreline. *New York Times,* pp. B1.

King, S. (1968, 11 September). Mayor Signs Laws Creating 2 Agencies for City. *New York Times,* pp. 52.

Kingdon, J. (1995). *Agendas, Alternatives, and Public Policies* (2nd ed.). New York: Addison-Wesley Educational Publishers Inc.

Knowles, R. (2003). The solar envelope: its meaning for energy and buildings. *Energy and Buildings, 35,* 15-25.

Koelble, T. (1995). The New Institutionalism in Political Science and Sociology. *Comparative Politics, 27*(2), 231-243.

Koenig, M. (2004). *Distributed Generation in NYC (presentation to NY Association of Energy Engineers).* New York City: Con Edison of New York Company.

Kolker, R. (2001, 26 November). The Power of Partnership. *New York Magazine.*

Krasner, S. (Ed.). (1983). *International Regimes.* Ithaca: Cornell University Press.

Krewitt, W., Heck, T., Trukenmuller, A., & Friedrich, R. (1999). Environmental damage costs from fossil electricity generation in Germany and Europe. *Energy Policy, 27,* 173-183.

LADWP. (2003). *What is Green Power* [website]. Los Angeles Department of Water and Power. Retrieved 28 August, 2003, from the World Wide Web: www.ladwp.com/ladwp/cms/ladwp001924.jsp

LADWP. (2005). *Residential Programs -- Solar Incentives* [webpage]. Los Angeles Department of Water & Power. Retrieved 21 June, 2005, from the World Wide Web: http://www.ladwp.com/ladwp/cms/ladwp000787.jsp

Lauria, M. (1994). The transformation of local politics: manufacturing plant closures and governing coalition fragmentation. *Political Geography, 13,* 515-539.

Lentz, P. (2002a, 15 July). Business Groups Split on WTC Plan; Amount of Commercial Space, Transportation Priorities at Issue. *Crain's New York Business*, 1.

Lentz, P. (2002b, 4 November). State seeks to help energy firms. *Crains New York Business*, 3.

Lightbown, J. (2003). *Consultation on the Mayor's Draft Energy Strategy -- Green Light to Clean Power -- Comments submitted to Mayor Ken Livingstone*: London Fire and Emergency Planning Authority.

Lipton, E. (2001, 28 March). Giuliani calls for tightening controls on electricity rates. *New York Times*, pp. B3.

Living on Earth. (2005, 3 June). *Following the Toxic Trail* [Transcript]. Retrieved 21 June, 2005, from the World Wide Web: http://www.loe.org/shows/segments.htm?programID=05-P13-00022&segmentID=7

Lobbia, J. A. (2000, 26 January). Campaign Cash. *The Village Voice*.

London Assembly Environment Committee. (2002a). *Minutes: Environment Committee 13 June 2002 Appendix A*.

London Assembly Environment Committee. (2002b). *Scrutiny of the Mayor's Draft Energy Strategy*.

London Assembly Environment Committee. (2003). *Power in Partnership: Response to the Public Consultation Draft of the Mayor's Energy Strategy*.

London Borough of Southwark. (2004). *Delegation of award of energy supply contracts (meeting notes)*.

London Business Board. (1999). *The Business Manifesto for the Mayor and Greater London Authority*.

London Chamber of Commerce and Industry. (2004). *The Retail Survey: One Year On -- the Impact of the Congestion Charge on the Retail Sector*.

London Development Agency. (2003). *Green Alchemy Turning Green to Gold: Powering London's Future -- as study of the sustainable energy sector*.

London Electricity. (2002). *Let's be clear: LE Group Review 2002*.

London Electricity. (2004). *London Energy Green Tariff* [website]. Retrieved 6 August, 2004, from the World Wide Web: http://www.london-electricity.co.uk/showPage.do?name=homeenergy.switchBrand.green.til

London Energy Partnership. (2004a). *First Steering Group Meeting 19 March 2004*. London: Greater London Authority.

London Energy Partnership. (2004b). *Third Steering Group Meeting (27 July 2004).* London: Greater London Authority.

London First. (2002a). *The Draft London Plan: Response from London First.*

London First. (2002b). *Getting the best from London's roads.*

London First. (2003). *A Triple Bottom Line for London: An Index of London's Sustainability.*

London First. (2004). *Sustainable Development Initiatives* [website]. Retrieved 29 December, 2004, from the World Wide Web: www.london-first.co.uk/improving_london/initiatives.asp?L2=85

London First. (undated). *The Mayor's Draft Energy Strategy: The London First Response.*

London First/London Remade. (2003). *London's Ecological Footprint -- Business Survey (Final Report).*

London Hydrogen Partnership. (2004). *About the Partnership* [website]. Retrieved 9 November, 2004, from the World Wide Web: http://www.lhp.org.uk/article_flat.fcm?articleid=170&subsite=1676

London Planning Advisory Committee. (1993). *Strategic Planning Implications of Energy Supply and Use in London.*

London Remade/London First. (2003). *Towards a Sustainable London: Reducing the Capital's Ecological Footprint (Phase 1 Report).*

London Renewables/London Energy Partnership. (2004a). *Integrating Renewable Energy into New Developments: Toolkit for Planners, Developers and Consultants.*

London Renewables/London Energy Partnership. (2004b). *Renewable Energy in London: The Role of Councillors.*

London Renewables/London Energy Partnership. (2004c). *Renewable Energy in London: The Role of Developers.*

London Research Centre. (1993). *London Energy Study: Energy Use and the Environment.*

London Research Centre. (1998). *Exploiting Renewable Energy in London: An overview of renewable energy technologies.* London: London Research Centre & David Bartholomew Associates.

London Research Centre. (2000). *Renewable energy in London: An overview of current projects and future prospects.* London: London Research Centre & David Bartholomew Associates.

Loveland, I. (1999). The Government of London. *The Political Quarterly, 70*(1), 91-100.

Lowndes, V. (1996). Varieties of new institutionalism: a critical appraisal. *Public Administration, 74*, 181-197.

Lowndes, V. (2001). Rescuing Aunt Sally: Taking Institutional Theory Seriously in Urban Politics. *Urban Studies, 38*(11), 1953-1971.

Lurkis, A. (1982). *The Power Brink*. New York City: The Icare Press.

Lyman, E. S. (2004). *Chernobyl on the Hudson? The Health and Economic Impacts of a Terrorist Attack at the Indian Point Nuclear Plant*: Union of Concerned Scientists.

MacLeod, G., & Goodwin, M. (1999). Reconstructing and urban and regional political economy: on the state, politics, scale and explanation. *Political Geography, 18*, 697-730.

Malanga, S. (2003, Autumn). Who Runs New York? *City Journal, 13*.

Martin, D. (1998, 9 March). Hudson Park Plan Turns Friends Into Foes. *New York Times*, pp. B6.

Massey, J. (2005, November). No barrier to large volumes of wind. *Windpower Monthly, 21*, 31.

Masters, D. (2002). NYS Energy Plan Comments from Deborah Masters for State Energy Plan Hearings -- Comments submitted to NYS Energy Planning Board.

McCall, H. C. (2001). *Electric Deregulation in New York State: The Need for a Comprehensive Plan*. Albany, New York: New York State Comptroller.

McFadden, R. D. (2000, 21 December). John V. Lindsay, Mayor and Maverick, Dies at 79. *New York Times*, pp. A1.

McNamara, K. (2001). What Happened? Grid Locked: US Transmission Lines were built for a whole different era. *Wall Street Journal*, pp. R10.

Meek, J. (2001, 16 July). Power Games. *The Guardian (London)*, pp. 2.

Metropolitan Corporate Counsel. (2002, June). Stand Tall With New York Organizations; The Business Community Partnering for New York's Future. *The Metropolitan Corporate Counsel*, 63.

Middendorf, B. (2002). *Green Technology Center to Open* [news article]. Conscious Choice. Retrieved 11 December, 2002, from the World Wide Web: www.consciouschoice.com/issues/cc1504/greentechnologyctr1504.html

Miller, B. (2000). *Fat of the Land*. New York City: Four Walls Eight Windows.

Miller, R. (2003). *Power Margins: NYC's Summer Electricity Supply and Demand -- Speech before the New York Academy of Science.*

Mitchell, C. (1995). The renewables NFFO. *Energy Policy, 23*(12), 1077-1091.

Mitchell, C. (1996). Renewable Generation -- Success Story? In J. Surrey (Ed.), *The British Electricity Experiment* (pp. 164-184). London: Earthscan.

Mitchell, C., & Anderson, T. (2000). *The Implications of Tradable Green Certificates for the UK* (ETSU Project Number: TGC (K/BD/00218)): SPRU.

Mitchell, C., & Connor, P. (2004). Renewable energy policy in the UK 1990-2003. *Energy Policy, 32*(17), 1935-1947.

Moffett, N. (2003, 11 June). Can Windy City live up to its reputation? *Chicago Sun-Times,* pp. 15.

Moore, A., Woerner, J. (2000). *Integrating Municipal Utilities into a Competitive Electricity Market* (Policy Study No. 270). Los Angeles: Reason Public Policy Institute.

Moran, R. (2002). *Executioner's Current: Thomas Edison, George Westinghouse, and the Invention of the Electric Chair.* New York City: Alfred A. Knopf.

Mossberger, K., & Stoker, G. (2001). The evolution of urban regime theory: the challenge of conceptualization. *Urban Affairs Review, 36*(6), 810-835.

Municipal Art Society. (2004). *What's New at the MAS* [web site]. Municipal Art Society. Retrieved 3 March, 2004, from the World Wide Web: www.mas.org/home.cfm

Myers, G. (1974). *History of Public Franchises in New York City.* New York City: Arno Press.

Myerson, J. (2004, 28 April). Sometimes, the trouble with local politics is the politics. *The Guardian,* pp. 11.

Nagourney, E. (2003, 12 August). Why the Great Smog of London was Anything but Great. *New York Times,* pp. F2.

National Climatic Data Center. (1998). *Climatic Wind Data for the United States.* National Oceanic and Atmospheric Administration. Retrieved, from the World Wide Web: http://www.ncdc.noaa.gov/oa/documentlibrary/wind/wind1996.pdf

National Energy Foundation. (2004). *Green Electricity* [website]. Retrieved 9 June, 2004, from the World Wide Web: www.greenenergy.org.uk/green_electricity.htm

National Grid. (2004). *Types and Location of Embedded Generation (Table 4.1 Embedded Generation Connected to Distribution Networks)* [website]. Retrieved 11 December, 2004, from the World Wide Web:

http://www.nationalgrid.com/uk/library/documents/sys_04/default.asp?action=mnch4_8.htm&Node=SYS&Snode=4_8&Exp=Y#Types_And_Location_Of_Embedded_Generation

Navarro, P., & Shames, M. (2003). Aftershocks -- and essential lessons -- from the California electricity debacle. *Electricity Journal*(May), 24-30.

Nee, V., & Strang, D. (1998). The emergence and diffusion of institutional forms. *Journal of Institutional and Theoretical Economics, 154*, 706-715.

New York Building Congress Energy Committee. (2001). *A Matter of Urgency: New York City's Electric Supply Needs.*

New York City Council. (2003). *Comments of the Council of the City of New York: Case 03-E-0188 (Proceeding on Motion of the Commission Regarding a Retail Renewable Portfolio Standard -- Comments submitted to New York Public Service Commission.*

New York City Department of City Planning. (1974). *New York City Metropolitan Energy Conference.*

New York City Department of Design and Construction. (1999). *High Performance Building Guidelines.*

New York City Department of Design and Construction. (2002). *Implementing the High Performance Building Guidelines.*

New York City Department of Design and Construction. (2005). *About this website* [website]. Retrieved 1 June, 2005, from the World Wide Web: www.ci.nyc.ny.us/html/ddc/html/ddcgreen/

New York City Economic Development Corporation. (2004). *Request for Proposals -- NYC Energy Resource Planning Consultant Services.*

New York City Energy Policy Task Force. (2004). *New York City Energy Policy: An Electricity Resource Roadmap.*

New York City Energy Policy Task Force. (2005). *2004 Status Report* [pdf file]. Retrieved 14 May, 2005, from the World Wide Web: http://www.newyorkbiz.com/About_Us/eptf2004statusreport.pdf

New York Power Authority. (2004). *Request for Proposals ("RFP") -- Long-Term Supply of Capacity and Energy (RFP-LTS No. 3).*

New York Power Authority. (2005). *Application for Electric Service (original contract date 22 September 1976, amended 1 April 2005).*

New York State Department of Public Service. (2002, December). *Fuel Sources and Air Emissions to Generate Your Electricity (January 2002-December 2002) for Con Edison* [website]. Retrieved 25 June, 2005, from the World Wide Web: www.dps.state.ny.us/end_12_02/ConEd.pdf

New York State Department of Public Service. (2003, December). *Fuel Sources and Air Emissions to Generate Your Electricity (January 2003-December 2003) for Con Edison* [website]. Retrieved 27 June, 2005, from the World Wide Web: www.dps.state.ny.us/envlabels/end_12_03/ConEd.pdf

New York State Department of Public Service. (2004a). *CASE 02-E-1282 – In the Matter of the New York State Standardized Interconnection Requirements and Application Process for New Distributed Generators 300 kVA or Less Connected in Parallel with Radial Distribution Lines, filed in C 93-M-0229 (ORDER MODIFYING STANDARDIZED INTERCONNECTION REQUIREMENTS).*

New York State Department of Public Service. (2004b). *Case 03-E-0188 Active Party List (as of 13/1/04).* Albany, New York: New York State Department of Public Service.

New York State Department of Public Service. (2004c, June). *Fuel Sources and Air Emissions to Generate Your Electricity (July 2003-June2004) for Econnergy* [website]. Retrieved 27 June, 2005, from the World Wide Web: www.dps.state.ny.us/envlabels/end_06_04/eeci.pdf

New York State Department of Public Service. (2004d, June). *Fuel Sources and Air Emissions to Generate Your Electricity (July 2003-June2004) for Keyspan Energy Services* [website]. Retrieved 27 June, 2005, from the World Wide Web: www.dps.state.ny.us/envlabels/end_06_04/kes.pdf

New York State Department of Public Service. (2004e, June). *Fuel Sources and Air Emissions to Generate Your Electricity (June 2003-June 2004) for Consolidated Edison* [website]. Retrieved 27 June, 2005, from the World Wide Web: www.dps.state.ny.us/envlabels/end_-6_04/coned.pdf

New York State Energy Planning Board. (1998). *New York State Energy Plan and Final Environmental Impact Statement.*

New York State Energy Planning Board. (2002). *New York State Energy Plan and Final Environmental Impact Statement.*

New York State Energy Research and Development Authority. (2002). *SYSTEM BENEFITS CHARGE Revised Operating Plan for New York Energy $mart Programs (2001-2006).*

New York State Energy Research and Development Authority. (2005). *Current Funding Opportunities* [website]. Retrieved 10 May, 2005, from the World Wide Web: www.powernaturally.org/funding/funding.asp?1=2

New York State Energy Research and Development Authority. (undated). *Wind Energy -- A guide for wind site development.*

New York State Energy Research and Development Authority. (working draft). *Consolidated Edison Electric Rate Case Action Plan Pursuant to Case 04-E-0572 (2004-2007) DRAFT PLAN.*

New York State Public Service Commission. (1991). *Case 90-E-1119 (Proceeding on motion of the Commission to consider establishing standards on Reliability and Quality of Electric Service) -- Order Adopting Standards on Reliability and Quality of Electric Service (Issued and Effective July 2, 1991).*

New York State Public Service Commission. (1996). *Opinion No. 96-12: Cases 94-E-0953 et al -- In the Matter of Competitive Opportunities Regarding Electric Service [Opinion and Order Regarding Competitive Opportunities for Electric Service]*. Albany, New York.

New York State Public Service Commission. (1997). *Case 96-E-0897 - In the Matter of Consolidated Edison Company of New York, Inc.'s Plans for (1) Electric Rate/Restructuring Pursuant to Opinion No. 96-12; and (2) the Formation of a Holding Company Pursuant to PSL, Sections 70, 108 and 110, and Certain Related Transactions (Recommended Decision by Administrative Law Judge Judith A. Lee).* Albany, New York.

New York State Public Service Commission. (2002). *Case 99-E-0930 (Proceeding on Motion of the Commission to Investigate the July 6, 1999 Power Outage of Con Edison's Washington Heights Network) -- Order Approving Settlement (Issued and Effective November 13, 2002).*

New York State Public Service Commission. (2003). *Department of Public Service Article X Cases (Revised 8/27/03)* [web page]. New York State Public Service Commission. Retrieved 29 January, 2004, from the World Wide Web: www.dps.state.ny.us/xtable.pdf

New York State Public Service Commission. (2004). *CASE 03-E-0188 – Proceeding on Motion of the Commission Regarding a Retail Renewable Portfolio Standard (ORDER REGARDING RETAIL RENEWABLE PORTFOLIO STANDARD).*

New York State Public Service Commission. (2005a). *Case 04-E-0572 (Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Electric Service) -- Order Adopting Three-Year Rate Plan (Issued and Effective March 24, 2005).*

New York State Public Service Commission. (2005b). *Competitive Electric and Gas Marketer Sources Directory -- Consolidated Edison Company of New York Inc. services territory* [website]. NYPSC. Retrieved 13 May, 2005, from the World Wide Web: http://www3.dps.state.ny.us/e/esco6.nsf/

New York State Public Service Commission. (2005c, 14 April 2005). *NYS Electric Retail Access Migration Reports (February 2005)* [website]. Retrieved 11 May, 2005, from the World Wide Web: http://www.dps.state.ny.us/Electric_RA_Migration.htm

New York State Reliability Council. (2003). *Executive Committee Report 1999-2002.*

New York Times. (1921, 8 June). Building Congress Elects. *New York Times,* pp. 2.

New York Times. (1927, 13 February). Will Talk on Power. *New York Times,* pp. RE2.

Newbery, D. M. (1999). *Privatization, Restruction, and Regulation of Network Utilities*. Cambridge, Massachusetts: MIT Press.

Newman, J. H. (1983, 17 January). Cuomo vs. a much-needed power plant. *New York Times,* pp. A18.

Newman, J. H. (1984, 14 May). Get Going on Trash-Burning Guidelines. *New York Times,* pp. A14.

Newman, P., & Thornley, A. (1997). Fragmentation and Centralisation in the Governance of London: Influencing the Urban Policy and Planning Agenda. *Urban Studies, 34*(7), 967-988.

Norlander, G. (2002). *Electricity Deregulation in New York State*. Albany, New York: Public Utility Law Project of New York.

NREL. (2003). Renewable Energy Cost Trends (Vol. 2003). Golden, Colorado: US DOE/National Renewable Energy Laboratory.

Nye, D. E. (1990). *Electrifying America: Social Meanings of a New Technology*. Cambridge, Massachusetts: MIT Press.

NYISO. (2001). *Power Alert: New York's Energy Crossroads*. Albany, New York: New York Independent System Operator.

NYISO. (2003a). *About Us/History*. New York Independent System Operator. Retrieved 21 January, 2004, from the World Wide Web: http://mdex.nyiso.com/About+Us

NYISO. (2003b). *Power Alert III: New York's Energy Future*. Albany, New York: New York Independent System Operator.

NYISO. (2004). *Power Trends: New York's Success and Unfinished Business*. Albany, New York: New York Independent System Operator.

NYISO. (2005). *Power Trends 2005*. Albany, New York: New York Independent System Operator.

O'Brien, E. (2002, 9 October 2002). Solar power's hot in Greenpoint. *New York Daily News*.

Odendahl, T., & Shaw, A. (2002). Interviewing Elites. In J. A. Holstein (Ed.), *Handbook of Interview Research: Context and method*. Thousand Oaks, California: Sage Publications.

ODPM. (1993). *PPG22 (Planning Policy Guidance Note: Renewable Energy)*. London: Office of the Deputy Prime Minister, Office of the Environment.

ODPM. (2004a). *Planning Policy Statement 22: Renewable Energy*. London: Office of the Deputy Prime Minister.

ODPM. (2004b). *Table 2: Planning decisions by district planning authorities by speed of decision, Government Office Region and type of authority* [website]. Office of the Deputy Prime Minister. Retrieved 30 November, 2004, from the World Wide Web: www.odpm.gov.uk/stellent/groups/odpm_control/documents/contentservertemplate/odpm_index.hcst?n=2679&I=2

ODPM. (undated). *Local Authority procurement: a research report* [report]. Retrieved 22 November, 2004, from the World Wide Web: www.odpm.gov.uk/stellent/groups/odpm_localgov/documents/pdf/odpm_locgov_pdf_023465.pdf

Office of the Governor. (2002). *Governor Signs Net Metering Legislation for New York Farmers* [press release]. Office of the Governor of New York State. Retrieved 19 February, 2004, from the World Wide Web: www.state.ny.us/governor/press/year02/sept18_1_02.htm

OFGEM. (2001). *Embedded generation: price controls, incentives and connection charging. A Preliminary Consultation Document*. London: Office of Gas and Electricity Markets.

OFGEM. (2002a). *Distributed Generation: price controls, incentives and connection charging. Further discussion, recommendations, and future action*. London: Office of Gas and Electricity Markets.

OFGEM. (2002b). *NETA at a glance*. Office of Gas and Electric Markets. Retrieved 7 June, 2003, from the World Wide Web: http://www.ofgem.gov.uk/ofgem/microsites/microtemplate1.jsp?toplevel=neta&assortment=neta

OFGEM. (2004a). *Ofgem's Administration Procedures for Small Generating Stations with a Declared Net Capacity of 50 kilowatts or less*. London: Office of Gas and Electricity Markets.

OFGEM. (2004b, 11 March). *Renewables Obligation Buy-Out Price Published* [press release]. Office of Gas and Electricity Markets. Retrieved 12 March, 2004, from the World Wide Web: http://www.ofgas.gov.uk/temp/ofgem/cache/cmsattach/6447_Ofgem21.pdf

Optimal Energy Inc., American Council for an Energy-Efficient Economy, Vermont Energy Investment Corporation, & Christine T. Donovan Associates. (2003). *Energy Efficiency and Renewable Energy Resource Development Potential in New York State (Volume Four: Renewable Supply Technical Report)*. Albany, New York: New York State Energy Research and Development Authority.

Ormiston Wire Ltd. (2004). *Solar and Wind Scheme News* [website]. Retrieved 8 June, 2004, from the World Wide Web: www.ormiston-wire.co.uk/news/solarwind.cfm

Owens, B. (2002). *An Economic Valuation of a Geothermal Production Tax Credit* (NREL/TP-620-31969). Golden, Colorado: National Renewable Energy Laboratory.

Pace Energy Project. (2001a). *Comments of the Pace Energy Project on the Draft New York State Energy Plan*. White Plains, New York: Pace University Energy Project.

Pace Energy Project. (2001b). *National Energy Policy Plan: Towards a U.S. National Energy Policy Plan and Climate Change Strategy*. Pace University Energy Project. Retrieved 25 June, 2003, from the World Wide Web: www.law.pace.edu/energy/NEPP.html

Parkinson, M. (2001). Key challenges for European Cities: achieving competitiveness, cohension and sustainability. *Area, 33*(1), 78-80.

Perez, R. (undated). *Meeting Peak Demand with Photovoltaics*. Atmospheric Science Research Center, SUNY Albany. Retrieved 24 February, 2004, from the World Wide Web: http://www.nesea.org/buildings/images/rperez.htm

Perez-Pena, R. (1999, 9 July). Power System Use is Pressing Limits in New York Area. *New York Times*, pp. A1.

Perez-Pena, R. (2002, 5 September). State to Close Queens Plant that is Biggest Polluter in City. *New York Times*, pp. B5.

Peters, B. G. (1996). *The Future of Governing: Four Emerging Models*. Lawrence, Kansas: Kansas University Press.

Peters, B. G. (1999). *Institutional theory in political science: the 'new institutionalism'*. London: Pinter.

Pierre, J. (1999). Models of Urban Governance: The institutional dimension of urban politics. *Urban Affairs Review, 34*(3), 372-396.

Pimlott, B., & Rao, N. (2002). *Governing London*. London: Oxford University Press.

PIU. (2002). *The Energy Review*. London: Performance and Innovation Unit.

Platts. (2003). *Europe's Renewable Energy Certificate System*. Platts.com. Retrieved 5 August, 2003, from the World Wide Web: http://www.platts.com/features/greencertificates/recs.shtml

Pollitt, M. (1999). Part 1: Issues in electricity market integration and liberalization. In R. Vaitilingam (Ed.), *A European Market for Electricity?* London: Center for Economic Policy Research.

Public Policy Institute of New York State. (2002). *The Power to Grow: An Analysis of the Impact of Additoinal Generating Capacity on New York State's Economic Health*. Albany, New York.

Purnick, J. (1982, 25 August). Move to Supply Low-Cost Power to City Backed. *New York Times,* pp. B1.

Quiniones, G. (2004a). *Energy Planning in NYC -- Speech to Association of Energy Engineers New York Chapter.* New York City.

Quiniones, G. (2004b). *Testimony of Gil Quiniones, New York City Council Committee on Environmental Protection, 13 February 2004.* New York City: New York City Economic Development Corporation.

Quiniones, G. (2005). *Testimony of Gil Quiniones, Senior Vice President, New York City Economic Development Corporation before the City Council Environmental Protection Committee (February 15, 2005).* New York City: New York City Economic Development Corporation.

Quinn, C. (2004, 7 August). Outlook keeps getting brighter for green energy; The cost of harnessing solar power used to be prohibitive, but not anymore. *The Independent (London),* pp. 4-5.

Ravetz, J. (2001). *City Region 2020: Integrated Planning for a Sustainable Environment.* London: Earthscan.

Rayman, G., & Robin, J. (2004, 2 February). Dueling West Side Stories: Locals' plan lacks stadium city wants. *Newsday,* pp. A5.

Read, H. J. (1998). *Defending the Public: Milo R. Maltbie and Utility Regulation in New York.* Pittsburgh, Pennsylvania: Dorrance Publishing Co.

Real Estate Weekly. (1994, 16 November). NYC electric service rated best in country. *Real Estate Weekly, 41,* p 13.

Real Estate Weekly. (2003, 22 January). City releases tax assessment roll: owners have until March 1 to file appeal with tax commission. *Real Estate Weekly.*

Regional Plan Association/Resources for the Future. (1974). *Regional Energy Consumption (2nd Interim Report).* New York City.

Resource Insight Inc. (2003). *City Energy Plan for the City of New York (Working Draft).*

Reuters. (2002, 6 November). UK green power bost will raise costs sharply -- report.

Rhodes, R. A. W. (1996). The new governance: governing without government. *Political Studies, XLIV,* 652-667.

Rhodes, R. A. W. (1997). *Understanding Governance: Policy Networks, Governance, Reflexivity, and Accountability.* Buckingham: Open University Press.

Roberts, S. (1985, 28 April). Who Runs New York Now? *New York Times.*

Roberts, S. (1991, 27 May). Business Leaders Challenging Dinkins After a "Honeymoon". *New York Times*, pp. 1.

Romano, J. (2002, 5 May). Solar Panels are Making More Sense. *New York Times*, pp. 5.

Rowland, R. C. (1997). *United States Policy on Renewable Energy Use: An Overview of the Issues Related to Increasing Renewable Energy Use in the United States*. Lincolnwood, Illinois: National Textbook Company.

Royal Commission on Environmental Pollution. (2000a). *Energy--The Changing Climate: Summary of the Royal Commission on Environmental Pollution's Report.*

Royal Commission on Environmental Pollution. (2000b). *The Royal Commission on Environmental Pollution's 22nd Report: Energy--The Changing Climate.*

RSPB. (2004). *Climate Change -- Wind Farms* [website]. Royal Society for the Protection of Birds. Retrieved 29 December, 2004, from the World Wide Web: http://www.rspb.org.uk/policy/windfarms/index.asp

Runci, P. (2000). *Energy R&D in the United Kingdom* (PNNL-13234): Pacific Northwest National Laboratory/US Department of Energy.

Rutenberg, J. (1999, 11 March). Moguls: Add Subway Lines. *New York Daily News*, pp. 30.

Rydin, Y. (1998). The Enabling Local State and Urban Development: Resources, Rhetoric and Planning in East London. *Urban Studies, 35*(2), 175-191.

Rydin, Y., Thornley, A., Scanlon, K., & West, K. (2004). The Greater London Authority -- a case of conflict of cultures? Evidence from the planning and environmental policy domains. *Environment and Planning C: Government and Policy, 22*, 55-76.

Salama, J., Schill, M., & Springer, J. (2005). *Reducing the Cost of New Housing Construction in New York City*: Furman Center for Real Estate and Urban Policy, New York University.

Samuels, D. (1997, 10 August). The Real-Estate Royals. End of the Line? *New York Times*, pp. Sunday Magazine p 37.

Sargent, G. (2003, 21 July). Pataki Doused by Big Spritzers on Water Plant. *New York Observer*, pp. 1.

Sargent, G., & Benson, J. (2003, 25 August). City Energy Aide Quit Weeks Ago, Attacking Mayor. *New York Observer*.

Sassen, S. (2001). *The Global City* (2nd ed.). Princeton, New Jersey: Princeton University Press.

Sawer, P., & Bar-Hillel, M. (2004, 26 January). Red Ken goes green. *The Evening Standard.*

Schap, D. (1986). *Municipal ownership in the electric utility industry.* New York: Praeger Publishers.

Sherman, W. (2000, 30 June). Giuliani Blows Fuse on Con Ed. *New York Daily News,* pp. 6.

Short, J. R., & Kim, Y. H. (1999). *Globalization and the city.* New York: Longman.

Simpson, J. A., & Weiner, E. S. C. (Eds.). (1989). *Oxford English Dictionary* (2nd ed. Vol. XII). Oxford: Oxford University Press.

Sinclair Knight Mertz. (2004). *Thames Gateway Energy Infrastructure Study.*

Sissine, F. (2003). *Renewable Energy: Tax Credit, Budget, and Electricity Production Issues.* Washington DC: Congressional Research Service.

Sites, W. (1997). The Limits of Urban Regime Theory: New York City under Koch, Dinkins, and Giuliani. *Urban Affairs Review, 32*(4), 536-557.

Smeloff, E., & Asmus, P. (1997). *Reinventing Electric Utilities: Competition, Citizen Actio, and Clean Power.* Washington D.C.: Island Press.

Smith, M., & Beazley, M. (2000). Progressive regimes, partnerships and the involvement of local communities: a framework for evaluation. *Public Administration, 78*(4), 855-878.

SMUD. (2003). *About Greenergy* [Fact sheet]. Sacramento Municipal Utility District. Retrieved 28 August, 2003, from the World Wide Web: www.smud.org/green/index.html

Solstice Energy Ltd. (2004). *Prices* [website]. Retrieved 10 August, 2004, from the World Wide Web: www.solsticeenergy.co.uk/prices.shtml

Steve, J. (1999, 23 July). *Production Tax Credit: Testimony of Jaime Steve, Legislative Director, American Wind Energy Association, before the House Committee on Ways and Means.* American Wind Energy Association. Retrieved 30 July, 2003, from the World Wide Web: www.awea.org/policy/_private/ptc_hwm.html

Stoker, G. (1998). Public-Private Partnerships and Urban Governance. In J. Pierre (Ed.), *Partnerships in Urban Governance: European and American Experience* (pp. 34-51). Houndsmills: MacMillan and St. Martin's.

Stoker, G., & Mossberger, K. (1994). Urban regime theory in comparative perspective. *Environment and Planning C: Government and Policy, 12*, 195-212.

Stone, C. (1993). Urban regimes and the capacity to govern: a political economy approach. *Journal of Urban Affairs, 15*, 1-28.

Stone, C. (2002). Urban Regime Analysis: The Next Generation (Unpublished working draft). Presented at London School of Economics.

Stone, C., Sanders, H. (1989). *Regime politics: Governing Atlanta 1946-1988.* Lawrence, Kansas: University Press of Kansas.

Strom, E. (1996). In search of the urban growth coalition: American urban theories and the redevelopment of Berlin. *Urban Affairs Review, 31*, 455-481.

Surrey, J. (1996). Introduction. In J. Surrey (Ed.), *The British Electricity Experiment: Privatization -- The Record, The Issues, The Lessons*. London: Earthscan.

Sustainable GLA Coalition. (2001). *Making London Work: Gaining Economic and Social Advantage from a Better Environment*. London: Forum for the Future/s Sustainable Wealth London project.

Sustainable London Trust. (1997, 20 September). *Creating a Sustainable London* [website]. Retrieved 29 December, 2004, from the World Wide Web: http://www.sustainablelondon.org.uk/contents.htm

Talbot, A. R. (1972). *Power Along the Hudson: The Storm King Case and the Birth of Environmentalism*. New York City: E.P. Dutton and Co., Inc.

Teather, D. (2003, 20 August). Blackout cost New York $36m an hour. *The Guardian.*

Thamesway Energy Ltd. (2004). *Energy Services for the New Millenium*. Woking, Surrey.

Thomas, S. (1996). The Privatization of the Electricity Supply Industry. In J. Surrey (Ed.), *The British Electricity Experiment: Privization -- the record, the issues, the lessons*. London: Earthscan.

Thomas, S. (1997). The British Market Reform: a Centralistic Capitalist Approach. In A. Midttun (Ed.), *European Electricity Systems in Transition*. Oxford: Elsevier.

Thornley, A., Rydin, Y., Scanlon, K., & West, K. (2002). *The Greater London Authority: Interest Representation and the Strategic Agenda (Discussion Paper #8)*. London: LSE London (Metropolitan and Urban Research).

TLT LLP. (2004). *TLT advises Triodos Bank on London's First Wind Park* [press release]. Retrieved 12 November 2004, 2004, from the World Wide Web: http://www.tltsolicitors.com/whats-new/P4991.asp

Tonko, P. D. (2002). *An Industry in Crisis: The Financial Condition of Electric Generating Companies in New York State*. Albany, New York: New York State Assembly Standing Committee on Energy.

Travers, T. (2004). *The Politics of London: Governing an Ungovernable City.* London: Palgrave MacMillan.

Tucker, W. (1977, 8 May). As Energy User, City is Both Rich and Poor. *New York Times,* pp. 1.

UNCED. (1992). *Agenda 21 -- Action Plan for the Next Century.* Rio de Janeiro: United Nations Conference on Environment and Development.

Union of Concerned Scientists. (2004, 21 December). *Renewable Energy Tax Credit Saved Once Again, but Boom-Bust Cycle in Wind Industry Continues* [website]. Retrieved 20 May, 2005, from the World Wide Web: www.ucusa.org/clean_energy/renewable_energy/page.cfm?pageID=121

United Nations. (1952). *World Energy Supplies in Selected Years 1929-1950.* New York: Statistical Office, Department of Economic Affairs, United Nations.

United Nations. (1999). *World Urbanization Prospects: The 1999 Revision.* New York: United Nations Population Division.

Unruh, G. C. (2000). Understanding Carbon Lock-In. *Energy Policy, 28,* 817-830.

Urban Systems Research and Engineering Inc. (1985). *Survey of Electricity Redistribution in New York City.* New York City: New York City Energy Office.

Uyterlinde, M. (2003). *Outlook for Renewable Electricity in Europe* [Powerpoint presentation]. Energy Research Center of the Netherlands. Retrieved 13 August, 2003, from the World Wide Web: http://www.ecn.nl/docs/library/report/2003/c03029.pdf

Valler, D. (1995). Local economic strategy and local coalition-building. *Local Economy, 10,* 33-47.

Vallone Jr., P. (2002). *Peter Vallone, Jr. speech at Fordham University School of Law* [web site]. Retrieved 17 February, 2004, from the World Wide Web: http://www.nyvote.com/index.cfm?fuseaction=article&articleID=280

Van Wagner, M. (2002). *Wasting our Lights in Vain: Recommendations for Energy Conservation by Municipal Agencies.* New York City: Citizens Budget Commission.

Vaughan-Adams, L. (2003, 2 December). Green Energy Target Lifted to 15%. *The Independent,* pp. 20.

Vidal, J. (2004, 7 May). An ill wind? *The Guardian,* pp. 2.

Vrolijk, C. (2002). *Climate Change and Power: Economic Instruments for European Electricity.* London: RIAA/Earthscan.

Waggoner, W. H. (1980, 11 June). Business Lobby Group for City is Organized by David Rockefeller. *New York Times,* pp. B10.

Wainwright, H. (1994). *Arguments for a new left: answering the free-market right.* Oxford: Blackwell.

Waldman, A. (1999, 22 June). In Bronx, Rift Grows Over Plan for Water Plant at Golf Course. *New York Times*, pp. B1.

Warf, B. (2000). New York: The Big Apple in the 1990s. *Geoforum, 31*, 487-499.

Weber, M. (1978). *Economy and Society: an outline of interpretive sociology (translated from Wirtschaft und Gesellschaft 4th German edition)*. Berkeley: University of California Press.

Weikart, L. (2001). The Giuliani Administration and the New Public Management in New York City. *Urban Affairs Review, 36*(3), 359-383.

West, K., Scanlon, K., Thornley, A., & Rydin, Y. (2002). *The Greater London Authority: Problems of Strategy Co-ordination (Discussion Paper No. 7)*. London: LSE London (Metropolitan and Urban Research).

Wilmerding, E. (2001). *Green Cities* [News article]. Mother Jones. Retrieved 24 July, 2003, from the World Wide Web: www.motherjones.com/web_exclusives/features/news/greencities.html

Winskel, M. (2002). When Systems are Overthrown: The "Dash for Gas" in the British Electricity Supply Industry. *Social Studies of Science, 32*(4), 563-598.

Wiser, R., Bolinger, M., & St. Clair, M. (2005). *Easing the Natural Gas Crisis: Reducing Natural Gas Prices through Increased Deployment of Renewable Energy and Energy Efficiency*: Environmental Energy Technologies Division, Ernest Orlando Lawrence Berkeley National Laboratory.

Wiser, R., Fowlie, M., & Holt, E. (2001). Public goods and private interests: understanding non-residential demand for green power. *Energy Policy, 29*, 1085-1097.

Wolfe, P. (2003, March). The Energy White Paper: signpost to a renewable-powered future. *PowerHouse: Newsletter of the Parliamentary Renewable and Sustainable Energy Group.*

Wolfe, P. (2004). The future for UK renewables. *Utilities Policy, 12*, 5-7.

Woo, C. K. (2001). What went wrong in California's electricity market? *Energy, 26*, 747-758.

Woo, C. K., Lloyd, D., & Tishler, A. (2003). Electricity market reform failures: UK, Norway, Alberta and California. *Energy Policy, 31*, 1103-1115.

Yassky, D. (2004). *Yassky, Waterfront Advocates Release State Report Opposing Power Plant on Greenpoint-Williamsburg Coast* [Press Release]. Retrieved 26 February, 2004, from the World Wide Web: http://davidyassky.com/show_art.php?id=45

Yassky, D. (2005). *Yassky on the Issues: North Brooklyn Rezoning* [website]. Retrieved 15 May, 2005, from the World Wide Web: www.davidyassky.com/show_issue.php?id=18

Yin, R. K. (1989). *Case Study Research: Design and Methods*. Newbury Park, California: Sage Publications.

Yin, R. K. (2003). *Applications of case study research*. Thousand Oaks, California: Sage Publications.

Young, A. (2001). *The Politics of Regulation: Privatized Utilities in Britain*. Basingstroke, Hampshire: Palgrave.

# APPENDICES

## APPENDIX 1
## List of Important Research Contacts and Affiliation

### New York City

| # | Name | Title | Organization | Type of Interview |
|---|---|---|---|---|
| 1 | Florence Adu | Assistant Vice President | NYC Economic Development Corp. | In-person |
| 2 | Terry Agriss | Vice President, Energy Management | Con Edison Company of New York | In-person |
| 3 | Richard Anderson | Executive Director | New York Building Congress | In-person |
| 4 | Harvey Arnett | Chief, Rates & Retail Choice, Office of Electricity and Environment | NYS Public Service Commission | Telephone |
| 5 | Jason Babbie | Energy Policy Analyst | New York Public Interest Research Group | In-person |
| 6 | Peter Blom | Project Manager | Con Edison Solutions | Telephone |
| 7 | Les Bluestone | President | MCII | Telephone |
| 8 | Thomas Bourgeois | Sr. Economist | Pace Energy Project | In-person |
| 9 | Cathleen Breen | Alternative Energy Project Coordinator | New York Public Interest Research Group | In-person |
| 10 | David Buckner | President | Solar Energy Systems | Telephone |
| 11 | Scott Butler | Vice President | NYC Economic Development Corp. | In-person |
| 12 | Marcia Bystryn | Executive Director | New York League of Conservation Voters | In-person |
| 13 | Tom Casten | Chairman/CEO | Primary EnergyVentures LLC | In-person |
| 14 | Colin Cheney | Green Roof Initiative Coordinator | Earth Pledge | In-person |
| 15 | Tim Daniels | Vice President, Energy Department | NYC Economic Development Corp. | In-person |
| 16 | Marolyn Davenport | Sr. Vice President | Real Estate Board of New York | Telephone |
| 17 | Larry DeWitt | Sr. Policy Advisor | Pace Law School Energy Project | In-person |
| 18 | Ruben Diaz Jr. | Assemblyman | New York State Assembly | Telephone |
| 19 | David Eisenbud | Project Development Manager, Northeast Region | Powerlight Corporation | Telephone |
| 20 | Ashok Gupta | Director, Air and Energy Program | Natural Resources Defense Council | In-person |
| 21 | Bill Harkins | Consultant | | Telephone |
| 22 | David Jehn | Deputy Executive Director, Division of Franchises, Concessions,and Consents | NYC Department of Transportation | In-person |
| 23 | Anne Koenig | Executive Director, Division of Franchises, Concessions, and Consents | NYC Department of Transportation | In-person |
| 24 | Matt Koenig | Network Design Unit | Con Edison Company of New York | Telephone |
| 25 | John Krieble | Director, Office of Sustainable Design | NYC Department of Design and Construction | In-person |
| 26 | Robert Kulikowski | Director | NYC Office of Environmental Coordination & Chair, Mayor's Sustainability Task Force | In-person |
| 27 | Joe Littman | Manager, NYC Regional Office | NYS Energy Research and Development Authority | Telephone |
| 28 | David Manning | Senior VP, Corporate Affairs | Keyspan Energy Corp. | Telephone |

## New York City (cont'd)

| # | Name | Title | Organization | Type of Interview |
|---|---|---|---|---|
| 29 | Richard Miller | former Sr. VP, Energy Department | NYC Economic Development Corp. | In-person |
| 30 | Carol Murphy | Executive Director | Independent Power Producers of New York | Telephone |
| 31 | Patty Noonan | VP, Research and Policy | Partnership for New York City | In-person |
| 32 | Jeff Oldham | Consultant | Real Goods Design & Consulting Group | e-mail |
| 33 | Neil Pariser | Sr. Vice President | South Bronx Overall Economic Development Corp. | In-person |
| 34 | Paul Parkhill | Project Manager | Greenpoint Manufacturing and Design Center | In-person |
| 35 | Anthony Pereira | President | AltPower | In-person |
| 36 | Richard Perez | Research Professor | SUNY Atmospheric Sciences Research Center | Telephone |
| 37 | Jeff Peterson | Program Manager for Energy Resources | NYS Energy Research and Development Authority | Telephone |
| 38 | Rob Pirani | Director, Environmental Programs | Regional Plan Association | In-person |
| 39 | Charles Puglisi | Chief of Distribution Services and Engineering | NYS Department of Public Service | Telephone |
| 40 | Gil Quiniones | Sr. Vice President, Energy Department & Chair, New York City Energy Policy Task Force | NYC Economic Development Corp. | In-person |
| 41 | Ariella Rosenberg | Project Manager, Energy Department | NYC Economic Development Corp. | In-person |
| 42 | Ira Rubenstein | Executive Director | New York State Environmental Business Association | In-person |
| 43 | Rosemary Scanlon | Consultant | | In-person |
| 44 | Lee Smith | Managing Director | National Photovoltaic Construction Partnership/International Brotherhood of Electrical Workers | Telephone |
| 45 | Deborah Taylor | Executive Director, Technical Compliance Unit | NYC Department of Buildings | In-person |
| 46 | Trey Taylor | President | Verdant Power | Telephone |
| 47 | Tom Thompson | former VP, Sustainable Energy | 1st Rochdale Energy Cooperative | In-person |
| 48 | Jim Tripp | General Counsel | Environmental Defense | In-person |
| 49 | Marcia Van Wagner | Deputy Research Director/Chief Economist | Citizen's Budget Commission | In-person |
| 50 | Andrew White | Director, Center for New York City Affairs | New School University | In-person |
| 51 | Fred Zalcman | Executive Director | Pace Energy Project | In-person |
| 52 | Allan Zerkin | Adjunct Professor | Wagner Graduate School of Public Affairs, New York University | Telephone |

## London Interviews

| # | Name | Title | Organization | Type of Interview |
|---|---|---|---|---|
| 1 | Jenny Bates | London Campaigns Coordinator | Friends of the Earth | In-person |
| 2 | Mide Beaumont | London Planning Unit | Government Office for London | In-person |
| 3 | Seb Berry | Consultant | Renewable Power Association | Telephone |
| 4 | Ben Cartmell | Director, Sustainable Design | Whitby Bird | In-person |
| 5 | Matthew Chell | Senior Policy Officer | London Sustainable Development Commission | In-person |
| 6 | Arthur Cooke | Distributed Generation Coordinator | OFGEM | In-person |
| 7 | Belinda Davis | Sustainable Development Unit | Government Office for London | In-person |
| 8 | Joanna Dawes | Sr. Policy Advisor | Greater London Authority | In-person |
| 9 | Giles Dolphin | Planning Decisions Manager | Greater London Authority | In-person |
| 10 | John Duffy | Director of Environment | Greater London Authority | In-person |
| 11 | Chris Dunham | Director | Sustainable Energy Action | In-person |
| 12 | Gareth Evans | Technical Advisor | OFGEM | In-person |
| 13 | Gary Freedman | Partnership Manager | Ecotricity | In-person |
| 14 | Nigel French | Marketing Manager | EDF | Telephone |
| 15 | Dominic Gooding | Director | Creative Environmental Networks | In-person |
| 16 | Leonie Green | Political Advisor | Greenpeace | In-person |
| 17 | Daniel Harrison | Environmental Policy Officer | Association of London Governments | In-person |
| 18 | Adrian Hewitt | Principal Environmental Officer, Environment & Regeneration Department | London Borough of Merton | In-person |
| 19 | Richard Jackson | Project Manager -- Environment and Sustainable Energy | London Development Authority | In-person |
| 20 | Darren Johnson | Member and Chair, Environment Committee | London Assembly | In-person |
| 21 | Allen Jones | Energy Services Manager | Woking Borough Council | In-person |
| 22 | Roger Kelly | Director | Energy Solutions | In-person |
| 23 | Jane Kendall | Sustainability Unit | London First | In-person |
| 24 | Suzanne LeMiere | Advisor | London Renewables | In-person |
| 25 | Anna Malos | Scrutiny Manager, Environment Committee | London Assembly | In-person |
| 26 | Russell Marsh | Head of Policy | Business Council for Sustainable Energy | In-person |
| 27 | Mark Nutley | Partner | Max Fordham | In-person |
| 28 | Ed Parry | Energy and Environmental Manager | London Borough of Hammersmith & Fulham | In-person |
| 29 | Nicola Riley | Renewables Product Developer | nPower | Telephone |
| 30 | Scott Richards | Development Manager | London Energy Partnership | In-person |
| 31 | Tony Rose | Director | GLEEN | In-person |
| 32 | Gary Shanahan | Renewable Energy Industry Development Directorate | UK Department of Trade and Industry | In-person |
| 33 | John Sinclair | Network Operations and Design Engineer | Energy Networks Association | In-person |
| 34 | Paula Smith | Project Manager | London Sustainability Exchange | In-person |
| 35 | Georgina Wong | Planning Advisor | British Wind Energy Association | Telephone |

**APPENDIX 2**
**Confidentiality Statement**

the London School of **Economics**
and **Political Science**

## Note on Audio Taping and Information Use

**Stephen A. Hammer**
**PhD candidate in Urban and Regional Planning**
**Department of Geography and Environment**
**Academic Supervisor: Prof. Yvonne Rydin (y.rydin@lse.ac.uk)**
**(Prepared September 2003)**

To facilitate data collection during the interview phase of my research, I may request that you allow me to audio record our interview. Because I respect the confidential nature of the information and opinions you are sharing with me, I am committed to maintaining your individual and organizational confidentiality when this information is published in my dissertation, or in any other article or book I may prepare in the future based on my dissertation research.

In the event I believe it is important to attribute a quote to you or your organization, I will therefore:

1) Notify you of my intent to directly quote information provided by you in our interview
2) Provide you with a copy of the written text I have prepared that incorporates your quote and how it is attributed.
3) Provide you with a written transcript of the portion of the interview containing the information on which my written text is based.

If you believe that my written text distorts or otherwise misinterprets your views on this subject, your organization, or your organizational role, I am happy to accept your comments in this portion of my writeup and will make all appropriate revisions. To ensure that my research and writing can continue in a timely fashion, I request that comments be submitted to me as soon as possible after the information is first sent to you.

If you have any questions about my audio taping policy or my research, please contact me at s.a.hammer@lse.ac.uk or at:

*(contact information deleted)*

## APPENDIX 3
**Sample Questionnaires**

### Talking Points/Questionnaire for former NYC Policymaker

Who are the leaders on energy policy making in NYC?

How does their leadership manifest itself?

Slightly different question – who has the biggest impact on energy policy making in NYC? (alternatively, where does power lie?)

How can you tell?

How does the State Energy Plan affect NYC energy policy making?

What is the City's perspective on its role in energy policy decisionmaking?
- Pre- de-regulation
- Post de-regulation

What administrative structure is in place to do that?
- Department of Energy pre-Dinkins
  - How long did such an office exist?
- DTE under Giuliani
- EDC under late Giuliani, then Bloomberg
- Given the way the office was structured, how has power/visibility changed over time?
- What issues did you emphasize at Energy Dept? How differ from your predecessors?

History of recent NYC energy policy
- Koch, Dinkins, Giuliani
- What were their major initiatives?
  - Previous plans I can examine? (Haven't found any to date)
- Consultant (Resource Insight) developed City Energy Plan (draft only)
- Mid-summer Bloomberg energy plan announced with little fanfare (according to Observer article)
- July roundtable meeting
- Energy Plan task force
- Comments on these/other issues?

**Former NYC Policymaker questions (cont'd)**

Where does energy lie on Bloomberg's radar screen?

Do you think Bloomberg has a pre-disposition to certain types of technologies or policy solutions?

Genesis of Roundtable Meeting

- Who initiated?
- If EDC, why was NYBC Energy Committee the right forum?
- Who determined attendance?
- How did it progress from Roundtable to a full-blown task force?

Energy Task Force

- How was subcommittee structure of task force decided?
- What were parameters of policy/mandate given to task force?
- Do you think EDC is by necessity "guiding" them in certain directions?
- In your view, what will be a successful outcome for this task force/Energy Plan?
- Failure?

<u>Misc questions:</u>

Who or what is to blame for NYC being a load pocket?

Renewable power project developers tell me that commercial project interconnections have faced major stumbling blocks in the form of Con Ed

- Can you enlighten me about this issue?

Other than this, what are the key factors affecting renewables deployment in NYC?

- Are there specific steps you think City should be taking?

Rate the status of the Building Congress Energy Committee on energy policymaking in NYC

- Authored key reports
- Attendance at critical meeting with Bloomberg
- Lots of representation on Task Force

If they had not been active participants in the Task Force, would the outcome be very different?

# Talking Points/Questionnaire for Local Energy Agency in London

Describe what your group does, history, etc.

**Enviro/Energy politics**
Before the Mayor issued his Energy Strategy, was there an energy agenda in London?
What did it look like?

Who provided vision to this agenda and who was responsible for implementation?

What are the big differences between the old energy agenda, and the Mayor's new strategy?

What/who caused the change?

Who/what exerted the most influence in setting the direction of the Mayor's new energy strategy?

If not mentioned, stakeholders to inquire about include:

- Ken Livingston?
- Central government
- Local authorities
- Business groups
- Green groups
- London Assembly
- European Union

Can you identify any significant changes (good or bad) between the first two drafts and the final strategy?

- What/who caused these changes?
- How can you tell? Are there any obvious fingerprints on the plan?

Do you feel the GLA was open to new ideas/changes from the first drafts?

Do you feel like the public consultation process was effective at changing the direction/scope of the strategy, or do you think the outcome was predetermined?

If central government continued to "run" London, do you think we'd see an energy strategy like this?

**Local Energy Agency Questions (cont'd)**

Now let's think about implementation of the plan...what will be the most important factors in implementing the energy strategy?

Who will play the most important roles when it comes to implementation?

If not mentioned, stakeholders to inquire about include:

- Central government
- Local authorities
- Business groups
- Enviro groups
- London Assembly
- European Union

<u>Renewables</u>
In terms of comparison with other major foci of Strategy, where do renewables stand? Biggest priority, etc.?

Are targets reasonable/achievable?

Will green power be easier/harder than direct deployment?

What are biggest impediments to successful or widespread deployment of renewables in London?

How amenable will Local Authorities be to Mayor's call to mandate renewables deployment in local building projects?

# APPENDIX 4
## Policies and Proposals in the 2004 London Energy Strategy That Have a Clear Relevance to Renewable Energy

**POLICY 1** The Mayor considers that London should take a proactive approach to ensure that it meets or exceeds its fair contribution to national targets for carbon dioxide emissions, renewable energy, combined heat and power, and eradicating fuel poverty.

**POLICY 9** The Mayor considers that London should seek to maximise its own generation of renewable energy through developing urban renewables, and use its considerable purchasing power to support renewable energy across the rest of the UK.

**POLICY 10** The Mayor encourages the mutually supportive link between the use of renewable energy technologies and hydrogen as a fuel in London, as part of a move to establish widespread use of low and zero-emission sources of heat and power.

**POLICY 16** The Mayor opposes the development of any new nuclear power capacity in the UK, and wishes to see energy efficiency, renewable energy, combined heat and power, and other low-carbon energy technologies replace nuclear capacity when nuclear power stations are decommissioned from 2005 onwards. To reflect this, nuclear power is placed at the bottom of the Mayor's Energy Hierarchy.

**POLICY 18** Through the London Plan, planning referrals, and consulting on borough UDPs, the Mayor will encourage and facilitate an accelerated rate of deploying renewable energy to meet London's targets.

**POLICY 23** As part of the London Development Agency's work to promote the growth of a distinct environmental business sector, the Mayor requests strong support for the sustainable energy industry, and particularly renewable energy technologies, where opportunities can be identified.

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**PROPOSAL 6** London should generate at least 665GWh of electricity and 280GWh of heat, from up to 40,000 renewable energy schemes by 2010. This would generate enough power for the equivalent of more than 100,000 homes and heat for more than 10,000 homes.

To help achieve this, London should install at least 7,000 (or 15MW peak capacity) domestic photovoltaic installations; 250 (or 12MW peak capacity) photovoltaic applications on commercial and public buildings; six large wind turbines; 500 small wind generators associated with public or private sector buildings 25,000 domestic solar water heating schemes, 2,000 solar water heating schemes associated with swimming pools, and more anaerobic digestion plants with energy recovery and biomass-fuelled combined heat and power plants. London should then at least triple these technology capacities by 2020.

**PROPOSAL 11** The Mayor urges English Heritage and the boroughs as planning authorities to look actively for ways to reconcile the need for energy efficiency and renewable energy with conserving character. To inform negotiations on individual schemes, boroughs should promote and share experience and expertise on the successful incorporation of energy efficiency and renewable energy in areas of heritage.

**PROPOSAL 12** The Mayor requests boroughs to set targets, consistent with London's targets, for the generation of renewable energy in their areas, to include them in their Unitary Development Plans, and to use their planning powers, land and property control, and awareness-raising activities to meet them.

**PROPOSAL 13** To contribute to meeting London's targets for the generation of renewable energy, the Mayor will expect applications referable to him to generate at least ten per cent of the site's energy needs (power and heat) from renewable energy on the site where feasible. Boroughs should develop appropriate planning policies to reflect this strategic policy.

**PROPOSAL 14** The Mayor expects those presenting planning applications for renewable energy schemes referable to him to conduct best practice in public consultation where relevant, particularly in the case of highly visible schemes, such as wind turbines.

**PROPOSAL 16** The Mayor expects consideration to be given to the effects of proposed new developments on existing renewable energy schemes, for example by overshadowing, and reasonable steps to be taken to minimise any such negative impact.

**PROPOSAL 17** The Mayor requires all planning applications referable to him to incorporate solar water heating and photovoltaics, where feasible. Developments not initially incorporating solar technologies should, where practicable, be of suitable design to support them later. Applications considering prestige cladding should incorporate photovoltaics where feasible. Applications including new street appliances (eg bus shelters, bus stops, parking ticket machines and road signs) should incorporate off-grid solar power where feasible. Boroughs should apply the same policies.

**PROPOSAL 21** As part of its work to improve the environment, the Mayor requests the London Development Agency to monitor and report annually on how it has sought to reduce carbon dioxide emissions and use renewable energy through its regeneration work.

**PROPOSAL 28** The Mayor will work with the London Development Agency to investigate the barriers and opportunities for supporting and accelerating the growth of the sustainable energy sector as part of its green business strategy. This work will include addressing the skills shortage for installing renewable energy technology.

**PROPOSAL 34** The Mayor will work with relevant organisations towards meeting a significant and growing proportion of power for the Underground from renewable sources during the next ten years. To achieve this, the Mayor encourages London Underground Ltd to investigate the possibility of entering into a long-term relationship with one or more renewable electricity suppliers.

**PROPOSAL 38** The Mayor expects Transport for London and the London Development Agency to seek to power all their buildings from renewable electricity by the end of 2005. The Mayor requests the Metropolitan Police Authority and London Fire and Emergency Planning Authority to do the same.

**PROPOSAL 39** The Mayor requests all the functional bodies to investigate the feasibility of employing renewable energy technology in their buildings. To facilitate this, the Mayor encourages the functional bodies to conduct surveys of their building stock with a view to identifying those buildings most appropriate for renewable energy installations.

**PROPOSAL 40** The Mayor requests that Transport for London reviews operational design guidelines and project appraisal methods to ensure that it assesses energy use and considers the use of renewable energy.

**PROPOSAL 41** The Mayor requests Transport for London to install photovoltaics to power street applications, such as street lights, bus shelters and bus stops, where viable, to avoid costly connection to the national grid and disruption to the roads. All new street lights should be energy efficient and minimize light pollution. The Mayor will work with Transport for London towards powering the street furniture that is not powered by solar from green electricity supply by 2005.

**PROPOSAL 42** The Mayor requests Transport for London to investigate the potential for high-profile schemes integrating photovoltaics into noise barriers along arterial road and rail networks. Partnerships should be sought with utilities, energy companies and advertising agencies.

**PROPOSAL 51** The Mayor encourages boroughs, other public sector organisations and the business community to use their purchasing power to stimulate demand for energy-efficient buildings and renewable energy, for example through leasing arrangements and design specifications for buildings.

**PROPOSAL 52** The Mayor requests each borough to seek to establish at least one well founded 'showcase' renewable energy project in their area, to raise the profile of renewable energy best practice and help to bring it to the mass market.

**PROPOSAL 55** The Mayor will invite the London Energy Partnership to adopt the objectives and targets in the Mayor's Energy Strategy. The Mayor suggests that the Partnership takes forward the key issues of energy services, fuel poverty, energy efficiency in housing and commercial and public sectors, renewable energy, combined heat and power and community heating, and hydrogen and fuel cells, by implementing major projects, securing project funding, and effective communication.

**PROPOSAL 65** The Mayor urges the Government to use the next review of the Building Regulations to improve energy efficiency standards in line with the best in Europe and to include renewable energy.

**PROPOSAL 66** The Mayor urges the Government to include the contribution to furthering renewable energy deployment as a criterion in the assessment of applications for a range of project grants, such as regeneration funding or lottery funding for community projects.

**PROPOSAL 67** The Mayor strongly urges the Government, Ofgem and electricity supply companies to ensure that the green electricity purchasing system is simple and transparent and to ensure that any possible double counting of carbon dioxide savings is avoided.