INTRODUCTION

Environmentalism, Energy, and the Hudson River Valley

The story of the Storm King Mountain power project involves three things, each of which was undergoing tremendous change in the 1960s and 1970s: environmentalism, energy, and the Hudson River valley. Some historical background on these topics reveals how they influenced the struggle over the Storm King project.

ENVIRONMENTALISM

There has been considerable disagreement among historians as to how to define and describe environmentalism in the United States. The term itself did not come into common usage until the late 1960s, but a growing number of historians have argued that there existed forms of environmental activism in the late nineteenth and early twentieth century, even if the word *environmentalism* was not used to describe this activism.[1]

One context in which historians have found an early form of environmental activism is the struggle against urban pollution. As long as cities have existed, they have had to deal with the problem of refuse and waste. This problem intensified as modern industrial cities increased in population density and affluence. The early years of the twentieth century witnessed the development of an urban environmental awareness. At this time, the impact of industrializa-

tion, including crowded slums, congested streets, poor sanitation, smoky skies, bone-rattling noise, and tainted water supplies, was more clearly visible, and it was addressed by a politicized middle class. Industrial cities—the products of economic determinism and rapid demographic change rather than planning—presented an image that understandably led many people to conclude that the only way to deal with urban life was to escape it.[2]

Urban reformers waged anti-smoke, anti-noise, and anti-litter campaigns through emerging civic groups. Relying on experts to provide scientific solutions, these community activists organized publicity campaigns that pressured local government to pass ordinances aimed at reducing pollution. These early reformers responded to pollution conservatively; they did not abandon the idea of material progress through industrial production and economic growth for the sake of a clean environment. Rather, their solution avoided questioning industrial progress itself by concluding that pollution was the result of wasteful and inefficient production techniques, and they therefore emphasized increased efficiency and effectiveness. The reformers' promotion of good health, sanitation, and pollution control also had strong aesthetic overtones. Civic pride became associated with urban beauty, and pollution undermined those aesthetic resources. The emergence of the City Beautiful movement in the 1890s provided the rhetoric for equating the elimination of pollution with an idealized city aesthetic.[3]

Americans at the turn of the twentieth century already understood that urban pollution did affect health and well-being. A growing body of recent scholarship examines the specific connections between human health, disease, and environment. These connections were an important source of the environmentalism that arose after World War II and serve as a materialist basis for the arguments early twentieth-century preservationists made in defense of nature (discussed below).[4]

Historians have also looked at the desire to preserve wilderness and aesthetically pleasing landscapes as another form of environmental activity. This effort has long been associated with the conservation movement. Conservationism arose amid the concern that the waters and forests of the country were being used in wasteful ways. This reform movement sought to bring rationality and management to the development of natural resources. Features of this effort included engineering works to manage rivers, sustained-yield forest management, irrigation projects in the West, reservoir construction (to enhance electric power production), navigation improvements, and flood control. These ideas and practices became firmly established during Theodore Roosevelt's presidency, and in Franklin Roosevelt's administration they found new vigor as many New Deal programs put people to work on river, public land, and wildlife development projects.[5]

Yet, there existed a tension within the conservation movement. Some believed that the best use of a particular piece of land was to exclude industry al-

together, to set some parcels of land aside as preserves. A powerful argument that resonated during the Progressive era was the idea that there existed some places so beautiful that they represented God's work on earth and should not be interrupted or destroyed by humans. In this argument, these places provided an opportunity for people to bear witness to the hand of God.[6]

Advocates for this position were known as preservationists, a dissident group within the larger conservation movement.[7] Preservationists advocated on behalf of the creation and protection of national parks. They waged a series of struggles against periodic efforts to violate the sanctity of a park system threatened by logging firms, resort developers, resource extraction companies, and dam development proponents.[8]

The New Deal added to the nation's parkland and implemented policies designed to produce a more sustainable agricultural sector.[9] It also recommitted the federal government to expanding flood control and power development projects that drew the opposition of preservationists in the 1950s and 1960s.[10]

Scholars who have found the roots or origins of environmentalism in the decades before World War II have been writing against an older tradition that rooted environmentalism in postwar America. This older tradition argued that environmentalism emerged in response to broad changes in the consumption and production patterns of the nation.[11] The shift in consumption patterns is tied to the emergence of an advanced consumer economy, one that encompassed a new set of needs and wants and was dictated by higher incomes, rising levels of education, and increased leisure time. The expanding and changing middle class of this era made new demands of the government.[12] Among these demands was a cleaner environment. Government could be used to clean up resources (such as air and water) that society shares. However, these resources could also be purchased.[13]

Suburbanization served as both an expression and a source of postwar environmentalism. The middle class was relocating to the suburbs, a change that typically entailed moving to a landscape with cleaner air and water. But the relentless pace of suburbanization meant that many suburban residents witnessed the destruction of open space and the degradation of the local environment, the very amenities that had made the suburbs an attractive landscape.[14]

A second change during the post–World War II era that helps to explain the emergence of environmentalism in the United States suggests that the movement responded to changes in agricultural and industrial production.[15] The increased use of pesticides and the growing use of synthetic materials created new environmental hazards. As a result, the environment was increasingly defined as being in a state of crisis.[16]

This view regarding environmentalism as a response to critical changes in production is perhaps best exemplified by the issue of nuclear testing and en-

ergy. The development of the atomic bomb had a profound impact on the US scientific community; immediately after witnessing the explosion of the first such device, many of the Manhattan Project scientists understood that the world had changed.[17] As one historian has noted, the bomb raised doubts about the "moral legitimacy of science, about the tumultuous pace of technology, and about the Enlightenment dream of replacing religious faith with human rationality as the basis of material welfare and virtue."[18]

While it was clear that the bomb would have a profound impact on the issues of war and peace, it soon became clear that it would also have profound environmental consequences. The invention of the bomb prompted the construction of a massive military-industrial complex, designed to build more bombs. For budgetary reasons, the government decided in 1951 to test these bombs in the American West. The public became more aware of the environmental consequences of the atomic age when the government slowly lost a monopoly on nuclear expertise as scientists began speaking to the environmental dangers posed by nuclear weapons testing.[19] Scientists such as Barry Commoner employed ideas developed in the study of ecology to describe and explain the relationship between the environment and human health and well-being.[20] For this reason, the historian Donald Worster dates the beginning of the age of ecology to July 16, 1945, when, at Alamagordo, New Mexico, the United States detonated the world's first nuclear bomb.[21]

Ecology emerged in the postwar years as not only an increasingly robust science but also a very politically useful one. It provided the opportunity to quantify the environmental destruction caused by changes in production and consumption habits. The science of ecology had changed a great deal since the term itself was coined in the 1860s. At that time, it denoted the study of the processes that made up the struggle for existence that Darwin had described; it was a new approach to the study of biology. Ecology was the beneficiary of new interest in the late nineteenth century in biogeography, the study of adaptation, and plant physiology. The word *ecology* came into vogue in the United States in the 1890s and was used to describe a form of "outdoor physiology," a science devoted to investigating the relations between organisms and their environment.[22]

But early ecology attempted to do more than simply observe and understand the relations between organisms and their environment; it also sought to change them—to manipulate and control nature. The historian Sharon Kingsland has written that ecology "was part of an effort to control life and to apply rational methods to a complex set of problems generated by the American desire to migrate into and adapt to new landscapes." Ecology was driven by the same economic imperatives to rationalize resource use that funded conservation. "If conservation was an applied science," Kingsland argues, "ecology was the research side of the same coin."[23]

In this way, ecology was shaped by American values and interests prevalent in the late nineteenth and early twentieth centuries. Over time, those values and interests changed, and ecology changed from a science that was seen as supporting economic development into a "subversive science" that questioned the consequences of mindless economic expansion.[24]

This change in the perceived nature of ecology was driven by scientists seeking to understand the proper role of human ecology within this discipline. Was ecology principally a botanical subject with a focus on "natural" communities of organisms rather than being principally concerned with human health and evolution? Or should humans be placed at the center of ecology? Should medicine, public health, eugenics, and human biology be part of ecology? Was humankind part of nature or separate from it? Until the post–World War II period, ecologists constructed their discipline primarily as a biological subject.[25]

The concept of ecology began to change because the Cold War and the nuclear arms race brought home the reality that understanding the "natural" world was impossible without taking into account the significant and ongoing impact of human activity.[26] The federal government played an important role in revealing this impact when the Office of Naval Research (ONR) and the Atomic Energy Commission (AEC) began funding efforts to examine the effects of aboveground nuclear testing on people and the environment.[27]

Nuclear testing led toward a more sustained interest in understanding how humans were affecting the environment. This interest gained new prominence when, in 1955, the geographer Carl Sauer organized a conference at Princeton entitled "Man's Role in Changing the Face of the Earth."[28] Sauer sought not only to broaden the frontiers of ecology by exploring the impact of modernization but also to examine the long-term impact of human populations on nature and to encourage the ecological analysis of human-dominated environments.[29]

Perhaps no one played a more important role in popularizing these ideas than Rachel Carson. Carson had been interested in pesticides since 1945, but she began to think about a magazine article in response to a 1957 lawsuit that unsuccessfully attempted to stop spraying over Long Island. The article became a book, *Silent Spring* (1962), which created a popular sensation as Carson explained in clear and compelling prose how hundreds of millions of pounds of cancer-causing chemicals had been dumped into the environment and were moving up the food chain. [30] In writing *Silent Spring*, Carson set out to show that humans were endangering their own lives through arrogant manipulation of other forms of life. There needed to be both an ethical shift, from a spirit of conquest toward one of respect for all forms of life, as well as an acknowledgment of human dependence on them.[31]

Consolidated Edison announced its plans to build a pumped-storage hydroelectric plant near Storm King Mountain on September 27, 1962, the very day

Rachel Carson's *Silent Spring* was first published. While the effort to protect Storm King Mountain began as a struggle relying on arguments used by preservationists since the early twentieth century (i.e., the aesthetic, historical, and recreational values of the mountain), by 1964 opponents of the plant had increasingly come to rely on ecological arguments.[32]

To be sure, the Storm King episode was not the first time ecological arguments were advanced by environmental activists, nor was it the first time environmental activism had been informed or inspired by ecology, nor was it the first time such arguments were deployed against a proposed dam.[33] But this story does provide a window, a before and after picture, of the increasing importance and centrality of ecology to environmental struggles in the 1960s.[34] The evolution, direction, and effectiveness of environmentalism changed after its proponents placed ecological arguments front and center; this book argues that a strong focus on ecology is a central component of modern environmentalism.

Christopher Sellers deftly traces this change and its impact in his examination of an emerging "politics of ecology" in the 1960s. The insights popularized by Rachel Carson were most enthusiastically embraced in the nation's suburbs. Ecology could quantify the rising alarm about pollution at the very site (the suburbs) that was long perceived to be free from those concerns. And suburbanites were well positioned to see the connections between local pollution and land preservation.[35]

While a growing ecological consciousness might inspire new environmental activism, the Storm King controversy suggests that there also existed pragmatic reasons for the swift rise of ecological arguments. During the struggle over Storm King, Consolidated Edison never had trouble convincing regulatory authorities, or the courts, that aesthetic damage to the mountain could be effectively minimized.[36] But it had a much more difficult time confronting the science that suggested that the proposed plant would do tremendous damage to the Hudson River striped bass.[37]

This difference owes something to the venue in which these arguments were being advanced. In addition to lobbying for change before legislatures, environmentalists found themselves advancing their cause in the courts and in administrative hearings. Their access to these venues came via changes to the law (through the Administrative Procedure Act of 1946 and the Fish and Wildlife Coordination Act of 1948) and through new jurisprudence, the most important of which was a federal appellate judicial decision that emerged directly from the Storm King controversy.[38]

These venues (the courts and state and federal administrative agencies) favored expertise that could make definitive claims about the present and future. Unlike the legislative arena, the courts and various government agencies were ill-equipped to judge competing value claims and priorities (i.e., aesthetics). As a

result, environmental activists found greater success in these venues, where they could frame their efforts in ecological terms.

Increasing reliance on ecology provided environmental activists with new power that, in the story of the Storm King project, was deployed to change the balance between the demand for energy and the desire for a clean environment. Indeed, it is striking to think of all the environmental struggles across the twentieth century that involved efforts to constrain the impact of expanding energy production (which could include nearly all the fights against dams and nuclear power plants).[39] This pattern extends to the present, when the most pressing environmental challenge is widely believed to be the issue of global warming—a problem largely caused by the burning of fossil fuels to produce energy.[40]

While this newfound power presented new directions and possibilities for environmentalism, it also served to alter the movement at the grass-roots level. Understanding how a project will alter the ecology of a landscape requires scientists. Understanding an environmental impact statement requires scientific expertise. The rising importance of ecology augured a shift toward professionalization. The earliest foot soldiers in the struggle against Con Ed's plans for Storm King were individuals whose interest in the Hudson River valley was an avocation. Eighteen years later, while many of these individuals remained involved, they were surrounded by environmental lawyers and scientists.[41]

The Storm King story provides an examination of how the tension between energy and environment was slowly, and with great difficulty, altered by an activist grass-roots movement.[42] As a result, Storm King demonstrates how environmentalism was changing in the 1960s and 1970s and how, in turn, that environmentalism was changing America. This change can be better understood by examining the challenges facing Consolidated Edison of New York.[43]

ENERGY

The controversy at Storm King began when New York City's utility company, Consolidated Edison of New York, announced its intention to build a pumped-storage hydroelectric plant near Storm King Mountain in 1962. Why was Con Ed attempting to build a hydroelectric plant so far outside its service area?[44] Why did the company doggedly maintain these plans in the face of environmental opposition that persisted and grew for eighteen years?

Many of the books and articles that have examined this story have cast Consolidated Edison in a less than flattering light.[45] By the mid-1960s, Con Ed's opponents had become very successful in influencing public opinion to their advantage. In subsequent decades, the company's secrecy and its refusal to make available its archives have added to the difficulty of understanding its perspective.[46] But this perspective is necessary, and gaining it must begin with a history of the company.

Con Ed

The Consolidated Edison Company of New York was created through a series of gas and electric company mergers and acquisitions beginning in the late nineteenth century. Between 1800 and 1840, franchises to gas companies (gas was used both as a fuel and as illumination) were awarded to service various parts of New York City (as well as the city of Brooklyn and what would later become the boroughs of Queens, Staten Island, and the Bronx). Franchises to electrical companies began to be awarded in the late nineteenth century after Thomas Edison successfully developed a workable incandescent light bulb. To stifle competition in the sale of gas and to be able to compete with the new electrical utilities, the Consolidated Gas Company was organized in 1884 by J. P. Morgan. Morgan and the new company then turned their attention to the electrical companies, gradually acquiring them. Consolidated Gas was renamed Consolidated Edison in 1936.[47]

As Consolidated Edison built a vertically integrated utility with a monopoly position in New York City, it was forced to confront the concerns of political leaders. In 1907, New York established the Public Service Commission (PSC) in the midst of a dispute with the company over appropriate gas rates. The commission was designed to oversee the company's operations and rule on the reasonableness of its rates.[48]

The establishment of the PSC represented a compromise with those wanting full public ownership of this essential public service, and the concept had been widely adopted across the country by the 1930s. In this system, utility companies like Con Ed were recognized as natural monopolies; this approach appeared logical because distribution and transmission costs were high and inflexible. Due to the necessary infrastructure for a utility, competition was viewed as duplicative and inefficient. As a result, utilities within this system were protected from competition. In return, they were heavily regulated by the state, which guaranteed these companies a predictable rate of return on their investments.[49]

Yet, utility companies like Consolidated Edison were not passive participants in the regulation of their business. Con Ed contributed significant amounts of patronage to both political parties and forged strong links with the city's labor unions. In the postwar years, the company estimated its construction projects provided employment for 15 to 20 percent of the city's building trades workers.[50] By the early 1960s, Consolidated Edison was the nation's largest electric and gas utility, serving approximately three million customers in New York City and Westchester County.

At the dawn of the 1960s, Con Ed was led by two men with long experience in the utility industry: Harland Forbes and Charles Eble. Forbes became Con Ed's CEO in 1957; he had joined the company in 1924 after earning a master's degree

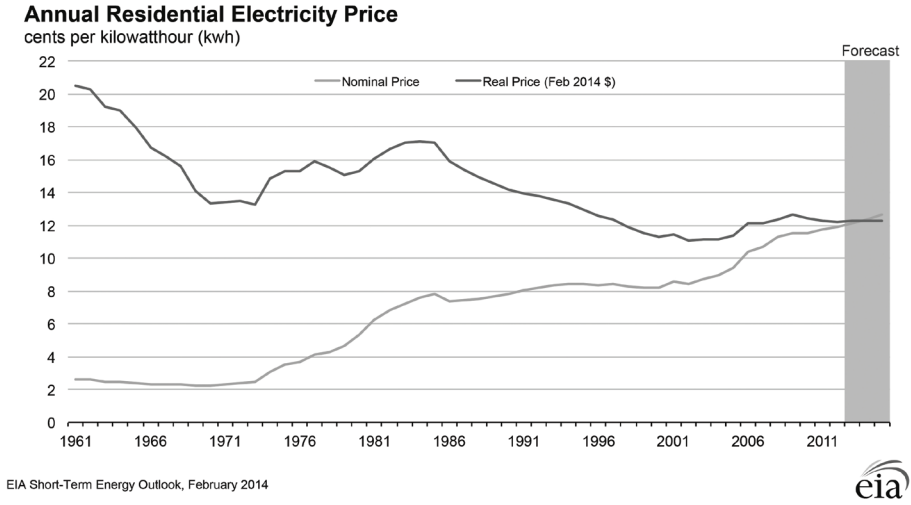

FIGURE I.1. Annual average residential electricity price. *Source*: U.S. Energy Information Administration, *Short-Term Energy Outlook, February 2014* (Washington D.C.: U.S. Energy Information Administration, 2014)

from MIT. An engineer by training, Forbes had joined a predecessor company, New York Edison, in 1924.[51] Charles Eble started as an office boy for Consolidated Gas in 1916 and rose through the ranks of the accounting and finance departments while attending night school. He became president of the company in 1957.[52] While the utility industry had been an exciting new business in the early twentieth century, by the 1960s it had a reputation for complacency and political and business conservatism. Within Con Ed, many of the senior executives had, by the 1960s, spent three and sometimes four decades with the company. This longevity was made possible by a business model that was widely followed by investor-owned utilities.

During the first half of the twentieth century, Consolidated Edison (like many utilities) had successfully met an energy demand that doubled every ten years while lowering rates. This feat was possible because as energy consumption increased, utilities built new, more efficient plants that served a more diverse range of customers. This growth improved the economics of the utility business by evening out the peaks and valleys in daily and yearly energy use.[53] With the cost of producing electricity decreasing, demand rose.[54] As aggressive advertising prompted even greater demand, there began a downward spiral in production costs and consumer prices.[55] This was the business model of the utility industry for the first six decades of the twentieth century, and its central lesson was that growth produced efficiency. Figure I.1 illustrates the end of that period, as the 1970s brought sharp price increases.

The Electrical Energy Crisis

The historian Richard Hirsh has noted that the industry's business model broke down in the 1970s. This breakdown was serious enough to be called an energy crisis, separate but related to the energy crisis sparked by the Arab oil embargo in 1973. The crisis in the utility industry can be traced to three factors: technological stasis, the energy crisis (spurred by the oil embargo), and environmentalism.[56]

The ability to build larger, more efficient plants hit a technological wall in the 1970s. For decades, greater efficiencies had been possible by building both larger plants, thereby gaining from increasing economies of scale, and more efficient plants, using steam turbine generators with improved thermal efficiency (the percentage of a fuel's energy content actually converted into electricity). Thomas Edison's first generating station, built in 1882, had a thermal efficiency of 2.5 percent. By 1965, the average thermal efficiency was 33 percent. Efficiencies were gained by increasing steam temperatures and pressures. Thermodynamic theory limits steam systems to a top efficiency of 48 percent. In the 1960s, manufacturers discovered that improving thermal efficiency began to produce diminishing returns, with metallurgical problems appearing at around 40 percent. Less efficient plants could be run more reliably, and so an avenue of technological development that had helped fuel the decreases in costs and prices was now closed.[57]

Hoping to overcome the decline of thermal efficiency improvements and meet increasing demand, utility companies tried to build larger power plants. Lacking the time to test and slowly introduce larger turbines, manufacturers extrapolated from existing designs and found that that practice produced equipment that frequently broke down.

This problem is apparent in Con Ed's postwar expansion program. In the twenty years after 1948, Con Ed experienced a 5.8 percent growth rate in electrical demand per year. Postwar planning (relying at first on surveys because historical data were considered unreliable due to the war and the Great Depression) anticipated this growth and planned for a series of new plants with an expected completion time of one to three years.[58]

These new Con Ed plants included Ravenswood (sometimes referred to as "Big Allis" after its turbine generator constructed by the Allis-Chalmers Corporation). Ravenswood is located in Queens just across the East River from the United Nations. When the plant was announced (fall 1961), it was the first time a public or investor-owned utility had ordered a single steam turbine generator of 1,000 megawatts; it would provide twice the power output of any existing generator in the Con Ed system. This willingness to push technology to the limit helps to explain why Ravenswood frequently broke down in the 1960s. These

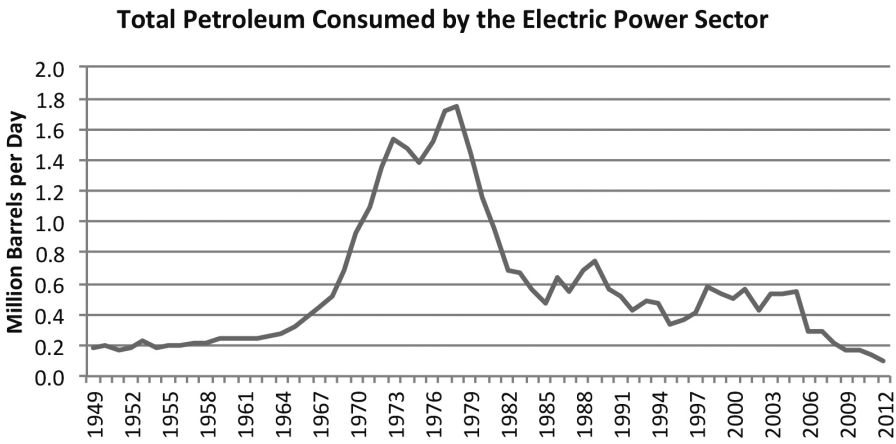

FIGURE I.2. Estimated petroleum consumption in the electric power sector. *Source*: U.S. Energy Information Administration, Monthly Energy Review, February 2014 (Washington D.C.: U.S. Energy Information Administration, 2014), table 3.7c, "Petroleum Consumption: Transportation and Electric Power Sectors"

breakdowns, often in summer, helped make that season an annual rite of crisis as the company struggled to meet summertime peak demand.[59]

During these years, the company sited an increasing amount of its new energy production outside New York City. In the 1950s and 1960s, the company planned three nuclear power plants for a site named Indian Point (located at Buchanan, New York, twenty-four miles north of New York City on the east bank of the Hudson River). Con Ed also invested in two oil-fired plants, Bowline and Roseton (both originally designed to produce roughly 1,000 megawatts of electricity), also sitting in the Hudson River valley. And, of course, there was the pumped-storage plant at Storm King, which would produce 2,000 megawatts of power. All of these plants experienced significant delays in their construction, were subject in their early years of operation to frequent breakdowns, or, in the case of Storm King, were never built. Not unlike utility companies across the country, Con Ed was in a race to keep up with demand, and it was losing. The results of this race could be seen in the near annual blackouts in New York City in the late 1960s and 1970s.[60]

A second factor in the breakdown of Con Ed's business model was the energy crisis of the 1970s. In the 1960s and 1970s, utility companies began using ever larger quantities of oil to generate electricity. Oil was a cheap fuel; domestically produced oil dropped 30 percent in price from 1957 to 1970. It was also cleaner burning than coal, an important consideration for urban utility companies

striving to meet new air pollution requirements. As oil consumption increased, the domestic production capacity diminished, making Americans more reliant on oil imported from the Middle East. Events overseas would come to have a powerful impact on the domestic utility industry. In the fall of 1973, Egypt and Syria launched a surprise attack against Israel. An American airlift to resupply the Israelis led the Organization of Arab Petroleum Exporting Companies (OAPEC) to declare an oil embargo against the United States. The OAPEC oil embargo tripled the price of a barrel of crude, from roughly $5.00 in the summer of 1973 to more than $15.00 by the following spring (from $25.94 to $70.10 in 2012 dollars). As figure I.2 reveals, these increased costs led American utilities to quickly turn away from oil as a fuel source.[61]

Con Ed passed these cost increases directly to the consumer as a fuel adjustment charge that changed monthly. But the fuel adjustment charges were not enough. The embargo not only made oil expensive, it also made it more difficult to acquire. Con Ed's oil supply that winter (1973) dwindled at times to less than two weeks worth. As a result, the company encouraged people to conserve electricity. But conservation saved money only on fuel and purchased power; many of the utilities' major expenses would not be affected, and the construction of new plants was becoming increasingly expensive.[62]

Technological stasis and rising fuel costs led Con Ed to raise rates throughout the 1960s and 1970s in an effort to meet current costs while paying for an expansion in production capacity. The company's average electricity consumer lived in an apartment and used 250 kilowatts of electricity per month. Between 1945 and 1970, the monthly bill for 250 kilowatts of electricity rose from $7.95 to $11.05, an increase of 34.6 percent. Between 1971 and 1974, the average monthly bill rose from $10.95 to $20.63, an increase of 88.4 percent (from $62.29 to $96.40 in 2012 dollars; the average bill in 2010 for 300 kilowatt-hours was $81.53).[63]

The energy crisis also pushed Con Ed to ask for permission from city, state, and federal regulators to burn coal. The burning of coal had been banned in New York City for several years due to air pollution concerns. The regulatory approvals were slow in coming, and not until December 1973 did the utility receive permission to burn coal in one plant on Staten Island. When the immediacy of the oil supply problem ended with the end of winter, the permission to burn coal failed to win a renewal.[64]

This effort speaks to third factor in the downward trend in the company's fortunes: environmentalism. Con Ed's efforts to expand energy production in the postwar era would place it in conflict with a growing environmental movement in two ways. First, the company came under pressure to reduce emissions that contributed to New York City's air pollution problem. Second, over time, the company would lose the ability to site power plants where it saw fit.

New York City's Air

Concern over New York City's air pollution can be traced back to the early years of the twentieth century. Citing a growing body of medical research, a number of American cities, including New York, developed sophisticated anti-smoke movements and passed anti-smoke ordinances.[65]

Yet, New York's topography, weather patterns, and consumption of cleaner burning anthracite coal (conveniently mined in neighboring Pennsylvania) allowed the city to avoid the smoky reputation that characterized its midwestern peers. In fact, New York City became the preferred home to midwestern industrialists (e.g., Andrew Carnegie) in the early years of the twentieth century because the relative cleanliness of New York's air helped attract the nation's wealthy, and their wealth.[66]

Efforts to improve the city's air gained momentum after World War II, in part because of the widely publicized air pollution problems experienced in other cities. In October 1948, an air pollution episode in Donora, Pennsylvania, made six thousand people ill while killing twenty. Perhaps the most infamous episode of this era took place in December 1952 in London, where a "killer fog" resulted in roughly four thousand deaths during a two-week period. New York City organized a Department of Air Pollution Control in November 1952, and within a year it was responding to a temperature inversion that later analysis revealed produced a statistically significant increase in mortality over a ten-day period in November 1953.[67]

In the 1950s, the city began installing a small number of air pollution monitors to produce data; comparing these results to surveys conducted in the 1930s revealed that the city's air quality was deteriorating. As figure I.3 demonstrates, New York City registered upwards of 180 micrograms per cubic meter of particulate matter in the air throughout the 1950s. This statistic demonstrates that, between the mid-1930s and mid-1950s, New York City's air quality had significantly deteriorated, providing context for E. B. White's quip in 1954 that "soot is the topsoil of New York."[68]

The principal source of air pollution in New York City was the combustion of fuel. Until the 1960s, the most commonly used fuel was coal. Coal was burned to provide heat to apartment buildings, to fuel various industrial processes, and to generate electricity. A New Deal–era study of air pollution conducted by the New York City Health Department found that the city burned twenty million tons of coal in 1934. Fifty-three percent of that total was the cleaner burning anthracite coal, used almost exclusively for domestic and industrial purposes. In that year, New York City burned 20 percent of the nation's anthracite coal, making it the largest anthracite-consuming area in the United States.[69]

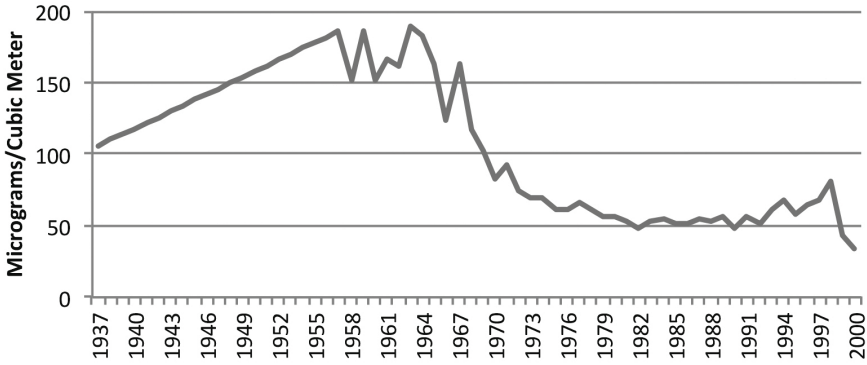

FIGURE I.3. New York City air pollution. This chart measures air pollution micrograms in cubic meters of particulate matter. *Source*: New York State Department of Conservation Air Quality Data, 1957–2000, and "A Study of Air Pollution in New York City," Department of Health, WPA Air Pollution Survey, New York, NY (1937)

Yet, the remaining 47 percent of the coal burned in the city was bituminous, a less pure and more polluting variety of coal. The vast majority of the bituminous coal in New York City was burned by a single company: Consolidated Edison of New York. As a result, Con Ed was the single largest generator of air pollution in New York City. The company's large, prominent smokestacks drew further attention to its role in generating the city's air pollution.[70]

Cheaper extraction techniques and improved transportation connections meant bituminous coal was increasing its market share in the Northeast over the first half of the twentieth century. At the same time, there was increasing industrial activity in the greater New York metropolitan area, especially upwind in New Jersey. Additionally, Pittsburgh and Los Angeles, among other cities, instituted strict air pollution regulations. As a result, by the early 1960s, New York City's air pollution problem worsened in real terms and in comparison to what other large American cities were experiencing.[71]

The New York City Council formed a special committee on air pollution in 1965. This committee held hearings, and, that summer, it released a report indicating that the most significant sources of air pollution in New York City were the on-site incineration of refuse, municipal incineration, and the combustion of fuel for space heating and electricity-generating purposes. With little heavy industry in the city, industrial emissions were not considered an important source of pollution; the reduction of automobile emissions was also given low priority due to the outsized contributions of other polluters.[72]

In 1965, as John Lindsay campaigned for the office of mayor, he appointed Norman Cousins, editor of the *Saturday Review*, to lead a task force on air pol-

lution. Cousins reported that New Yorkers suffered from some of the worst air pollution in the country. While the city's garbage incinerators were the worst offender, Con Ed was identified as the second greatest contributor to the problem. As late as 1965, Con Ed was emitting more coal smoke than any other source. New York had more sulfur dioxide gas in its air than any other American city, and Con Ed was cited as the single biggest contributor of this deadly poison.[73]

Widespread disaster had been averted only because of a topography that has enhanced the cleansing effects of the prevailing winds. If New York had the same sheltered topography of Los Angeles, the city would be uninhabitable. In an interview, Cousins said that, unless something was done, the city would face a "disaster of substantial proportions," that under certain conditions "it is quite possible for New York to become a gas chamber."[74]

The report noted that, at least three times in recent years, the stagnation of air loaded with gases and particles had resulted in a sudden rise in deaths. As if to emphasize the point, there was heavy smog during the Thanksgiving weekend that year, spurring the mayor, deputy mayor, and hospitals commissioner to assure the public that the air had not killed anyone. (One hundred sixty-eight deaths would later be blamed on the bad air that week.) The chief of the Air Pollution Division of the US Public Health Service noted that sulfur dioxide, coming mostly from the coal and oil Con Ed burned in its power plants, was found in the late 1960s in New York at levels ten times above that which affect health. The Ralph Nader Study Group on Air Pollution concluded in 1970 that the city's air was responsible for the premature deaths of between one thousand and two thousand New Yorkers every year.[75]

Until the mid-1960s, Con Ed's response was to deny that a serious problem existed while working behind the scenes to reduce pollution emissions. Indeed, the plans for a pumped-storage hydroelectric plant at Storm King (as well as the siting of a number of additional plants, and plans for expanding nuclear power generation into the Hudson River valley) were part of an effort to address the company's role in contributing to the city's air pollution. Meanwhile, Con Ed publicly dismissed the danger of air pollution.[76]

However, the mounting public pressure did help produce, in December 1966, a memorandum of understanding with the city whereby the company promised to undertake additional research programs, to shut down the oldest generating plants in the city, to use more natural gas, and to try and build additional power plants outside the city.[77]

While the mayor was announcing nonbinding agreements with Con Ed, the city council revised the Air Pollution Control Code, setting new limits on the sulfur content of fossil fuels burned in the city and banning the burning of bituminous coal after May 1968, with an exception provided for Con Ed.[78]

The company could see the writing on the wall.[79] Between 1967 and 1973, Con-

solidated Edison significantly reduced the amount of coal it burned to produce electricity while simultaneously increasing its oil and natural gas consumption.[80] As figure I.3 demonstrates, this shift had a drastic and direct effect on the city's measured air pollution, reducing the amount of particulate matter in the air by a factor of three.[81]

While "Big Allis" (Ravenswood) was bigger, more efficient, and less polluting than the plants it replaced, there appeared to be another alternative. Nuclear power plants could be built on a large scale, they generated no air pollution, they were fueled by relatively small amounts of domestically mined uranium, they had the panache and excitement of a new technology, and they promised, in the 1960s, very large amounts of cheap power. Indeed, Lewis Strauss, chair of the Atomic Energy Commission (AEC), famously remarked in 1954 that nuclear power promised a future in which electricity would be "too cheap to meter."[82] Nuclear energy was the last hope of the growth strategy.

Part of Con Ed's postwar expansion already included building nuclear power plants. After the Atomic Energy Commission dissuaded the company from filing an application to locate a plant within the city, Con Ed announced in 1955 the first of many nuclear power plants to be sited in New York's Hudson River valley.[83] This first nuclear plant, sited roughly twenty-four miles north of the city on the east bank of the Hudson River at Indian Point, became operational in the fall of 1962. Indian Point No. 1 was the first nuclear power plant in the United States to receive an AEC license but the third to enter service.[84] At 275 megawatts, Indian Point No. 1 was an experimental reactor designed to provide the company with experience in using a new energy source. Company management firmly believed that concrete technological development required extensive operational experience and that the private sector was the proper forum for acquiring that experience. This belief explains why Con Ed refused all government assistance and subsidies. The company also rejected the idea that it share the cost of a pilot program with other utilities, as had been done in the Midwest and New England. This decision proved to be costly, as the plant originally budgeted at $55 million suffered a series of engineering difficulties that brought its final price tag to $127 million, making it considerably more expensive than a comparable coal- or oil-fired plant.[85]

Consolidated Edison would build two additional nuclear power plants at Indian Point, each rated at roughly 1,000 megawatts. However, while Indian Point Nos. 2 and 3 were planned and announced in the 1960s, they would not become operational until 1974 and 1976, respectively. The time it took to build such plants, indeed to build any plants, increased in the 1960s and 1970s as utility companies lost the control they had traditionally enjoyed in the siting of power plants. (It should be noted that the time it took to complete a nuclear plant increased for a large number of reasons; the growing power and influence of environmentalists

was merely one among many factors.)[86] This new problem in plant construction is perhaps best exemplified by Con Ed's efforts at Storm King.

While New York City's air pollution problem helps to explain why the company fought to build a plant at Storm King long after the project ran into delays and opposition, environmentalists contested the claim that a plant at Storm King would reduce New York City's air pollution. However, the opportunity to effectively store electricity had long been a dream of utility company managers.[87] This pumped-storage hydroelectric plant would lift water to a holding pond high above the river during times when demand was low and release it to generate electricity during times of high demand. The fact that the plant would consume more power to lift the water than it would generate when the water was released back into the Hudson was irrelevant since the energy it would be consuming at night was being produced but not used.[88] The energy potential of the water sitting in that holding pond high above the Hudson would effectively act as a battery for Con Ed's system.[89]

Con Ed's Troubles

Technological stasis, rising fuel prices, and the challenge of environmentalism all served to degrade Con Ed's financial performance. For most utility companies, these problems would manifest themselves in the 1970s. However, Con Ed was already in a weakened state by the mid-1960s.

This situation may be attributed in part to the company's unique service area. Although Con Ed served only 600 square miles and its customer density was five thousand persons per square mile (both advantages to the utility), 20 percent of its customers lived on the verge of poverty and most were apartment dwellers, who typically use less than half the electricity that average American consumers use. To service this relatively small area Con Ed invested large amounts of capital. Transmission costs to its service area were high because, by law, all electrical cables in Manhattan must be placed underground. To maintain this 66,700-mile subterranean web of cables the company required a labor force of five thousand to do on average forty thousand excavations a year. For every one dollar in plant costs, Con Ed spent two dollars on transmission, a figure that was 25 percent above the national average.[90]

At the same time, Consolidated Edison faced a steep and rising tax bill in the postwar years, making it the most heavily taxed utility in the United States. In 1968, the company failed to acquire the power to pass these tax increases along to its consumers in the form of an automatic tax adjustment.[91]

As a result, in 1962, Con Edison, among the nation's major utilities, ranked first in assets ($2.8 billion), second in revenue ($725 million) and net income ($90.7 million), but thirty-fourth in profitability, with only a 5.9 percent return on equity. In addition, the company's average residential rate was the highest

of any major utility by a wide margin: 4 cents per kilowatt-hour compared to a national average of 2.41 cents (Public Service Electric & Gas of New Jersey was 2.94 cents). In 1963, the company asked the Public Service Commission for one of the biggest rate increases in its history: $27.5 million. It was also Con Ed's fifth request for a rate increase since 1958.[92] An additional 3 percent rate increase in 1966 became a political issue after the PSC granted the increase *before* scheduling a hearing to determine if it was necessary.[93]

The press soon focused its attention on Con Ed and its regulator, the PSC. What emerged were revelations of accounting irregularities, all of which furthered the widespread image that, by the 1960s, the PSC had ceased to be an effective regulator. These disclosures damaged the company's relationship with the city and with its customers.[94]

By the mid-1960s, Consolidated Edison would become known as the company "you love to hate." One newspaper declared that "Consolidated Edison seems to have an unhappy predilection for sticking its finger in the public's eye." Another announced that the company "seems to have a knack for generating nearly as much suspicion and distrust as it generates electricity." And underscoring the involvement of the Public Service Commission, the *New York Times* published an editorial blaming the commission's problems on the unfortunate practice of staffing the commission with "men whose only apparent qualifications have been their loyal and lengthy service in Republican ranks."[95]

The company's reputation was clearly suffering from the large and sudden rate increases. This growing public hostility arose in a context defined by both half a century of declining energy prices and the company's efforts to encourage energy consumption. For two generations, Con Ed's customers were taught to believe that energy was cheap and that consuming increasing amounts of energy was the very definition of economic and social progress. It did not help that the company's customer service had earned a reputation for inefficiency and rudeness.

Alternatively, some writers have attributed the increasing antagonism toward the company to the constant digging needed to service underground transmission lines.[96] Another explanation was the growing number of blackouts experienced by New Yorkers in the 1960s and 1970s.

The Blackouts

No analysis of Con Ed's problems can be complete without an examination of the company's difficulty in meeting its most basic function. New York City experienced large, system-wide blackouts in 1965 and 1977. Both of these blackouts powerfully undermined Con Ed's standing with the public.

The blackout of November 9, 1965, was one of the largest power failures in American history and affected nearly all of New York City and parts of nine northeastern states and two provinces of southeastern Canada. It was dubbed

the Great Northeast Blackout, and it covered roughly 80,000 square miles and affected an estimated 25 million people.[97]

The blackout began at 5:17 p.m. along the Niagara frontier of New York State and quickly spread across the Northeast and into Canada. New York City lost power at 5:27 p.m., the height of rush hour. At that time of the day in early November there was no daylight left, and Manhattan, Bronx, Queens, and most of Brooklyn were plunged into darkness. Staten Island and parts of Brooklyn were unaffected because they were interconnected with a New Jersey utility that did not lose power. The blackout spread west and south, as far as Pittsburgh and parts of Philadelphia. Five thousand off-duty police officers were summoned; ten thousand members of the National Guard were called up. Eight hundred thousand were believed trapped in the New York City subway system, and tens of thousands were trapped in elevators. Kennedy and LaGuardia airports closed. Commuter railroads shut down, and streets and bridges were clogged with cars, buses, and pedestrians attempting to get home with no working streetlights or traffic signs. Power was not restored in many parts of the city until 7:00 a.m. the following morning.[98]

For those who did not live within walking distance of work, for those trapped in elevators or subways, for those who depended on mass transit to get home, the experience of the blackout became increasingly frustrating with each passing hour. Many commuters were drawn to Grand Central Station because it was one of the few lighted buildings in the city. Thousands sprawled across the floor, and crankiness replaced good humor. The *Times* reported that "people spoke of Con Ed as though it were not a utility but the personification of some monstrous evil." The big blackout, they said, was the ultimate affront to American know-how. A few sounded as though the power failure meant the death of the American dream and that basic creature comforts such as electric power could no longer be taken for granted.[99]

Yet, New Yorkers were viewed as having taken the disruptions in stride. The historian David Nye has written that it is not only the electrical system that breaks down in a blackout but "the social construction of reality breaks down too."[100] That type of breakdown could clearly be seen in the 1977 blackout.

On Wednesday, July 13, 1977, the power went out at 9:34 p.m. in New York City and Westchester County.[101] Before it was restored at 10:40 p.m. the following evening, widespread looting, described as riots, had swept parts of Brooklyn, East Harlem, and the Upper West Side. Nearly four thousand persons were arrested, three were killed, and fifty-nine firefighters were injured while battling 1,037 fires. A *New York Post* headline described the experience as "24 Hours of Terror."[102] President Carter later refused to approve disaster status for the city, thereby denying it federal relief money, reasoning that the blackout was not a natural disaster.

One explanation for why the city reacted to the 1977 blackout differently can be found in the very different state of the city in the late 1970s. More than half a million jobs had left, police officers and firefighters had been laid off, and the city nearly went bankrupt. Nye argues that "the 1965 blackout had been perceived as an aberration in a prosperous economy with an exemplary infrastructure. The one in 1977 was perceived as part of an ominous energy crisis that confirmed that social, political, and economic structures were in disarray."[103]

These blackouts were extraordinary events, and they attracted national attention. But they were only the tip of the iceberg. The sense of decline and disarray described by Nye found expression in the smaller periodic blackouts the city experienced nearly every summer between 1965 and 1974 that contributed toward what many felt was a declining quality of life.

Much has been written about how New York became an increasingly unlivable city in the decades after World War II. Indeed, the problems apparent to New Yorkers and others at the time inspired some to ask if cities were becoming too complex and difficult to manage—an idea that persisted in New York well into the 1990s.[104] What has been left out of these analyses has been a closer look at how the failure of something people had come to take for granted can contribute to pessimism and the idea that the city was becoming unlivable. "Law and order" is only one criterion of the "quality of life." When the everyday lived experience of New Yorkers is examined, Con Ed's nearly annual summer power failures and consistent rate increases must be considered a factor both in how New Yorkers began to think of their own city and in how they were perceived by others.[105]

The blackouts would become an important issue to both sides in the fight over Storm King. Con Ed would use them as evidence that more power generation was required. Those opposed to a power plant at Storm King would harness the negative perceptions of the company from the power failures and suggest that the blackouts were symptomatic of the company's incompetence. As one might expect, neither perspective was entirely accurate. Con Ed was correct to argue that increased generating capacity might have helped to avert some of the summer blackouts in the late 1960s and early 1970s. However, many of these blackouts were the products of an aging distribution system, which was the case with both the 1965 and 1977 blackouts.[106] Another factor explaining the blackouts is the performance of "Big Allis." The 1,000-megawatt fossil-fuel plant at the Ravenswood station in Queens began generating power in 1965. Its generator, "Big Allis," was by far the largest in the Con Ed system and represented 12 percent of the company's total generating capacity. "Big Allis" broke down every summer between 1965 and 1974, often more than once. Con Ed's overreliance on a single troubled power plant, along with its inability to successfully maintain an aging distribution system, suggests that the environmentalists were not incorrect to assert that management failures helped explain the city's blackouts.

By the 1970s, Con Ed was charging more money for less reliable service, and it was consistently being attacked by environmentalists for its contribution to the city's air pollution problem, its fuel choices, and its power plant siting. In retrospect, one can see the company entering the 1970s on the precipice of a serious decline that would begin to bottom out only when Con Ed narrowly averted bankruptcy in 1974.[107]

However, from the perspective of the early 1960s, Con Ed was among the nation's largest and most powerful utility companies, and it counted itself among the most politically connected and powerful corporations in New York City. In addition, this company was in the process of shifting energy production away from the city and into the Hudson River valley.[108] There was little in the company's past experience to prepare it for a serious fight over the siting of a power plant; no one could have predicted how the company's prerogatives would come to be questioned both by environmentalists and by increasingly activist city, state, and federal government.

While the air pollution problem could force the company to choose from a more limited range of fuels, the challenge to the company's prerogatives in siting power plants threatened its ability to meet demand and effectively stay in the generation business. Until Storm King, there was very little resistance to Con Ed's efforts to site new power plants in the Hudson River valley. An examination of that region reveals how and why the resistance to a plant at Storm King Mountain developed.

THE HUDSON RIVER VALLEY

The Hudson River valley is beautiful, with mountains dramatically rising from the banks of a river that widens and narrows, with occasional twists and turns. From a wide variety of vantage points, generations of residents and visitors have taken pleasure in being a part of this landscape.[109]

Residents of the Hudson River valley in the 1960s were not the first to have a strong connection to their environment. For generations, the aesthetic qualities of this region had been celebrated in American art and literature and had inspired efforts to preserve this beauty. These efforts created the institutional and social wellspring for the challenges to Con Ed's prerogatives in the valley.

Despite this appreciation for the beauty of the Hudson River valley, the region also served as an important site for commercial and industrial growth. Con Ed, and its defenders, had good reason to believe that siting power plants in the Hudson River valley was not inconsistent with the area's character. Part of the controversy surrounding Storm King owes something to the growing tension and apparent inconsistency between, on the one hand, a past characterized by the area's aesthetic and recreational possibilities and, on the other, a past defined by commercial and industrial advancement.