50

Fiftieth Anniversary

Meeting New York's energy needs... past, present, and future

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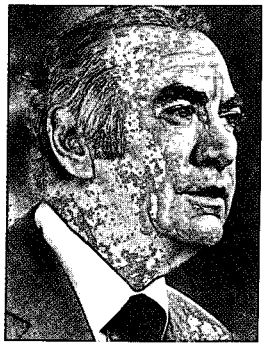
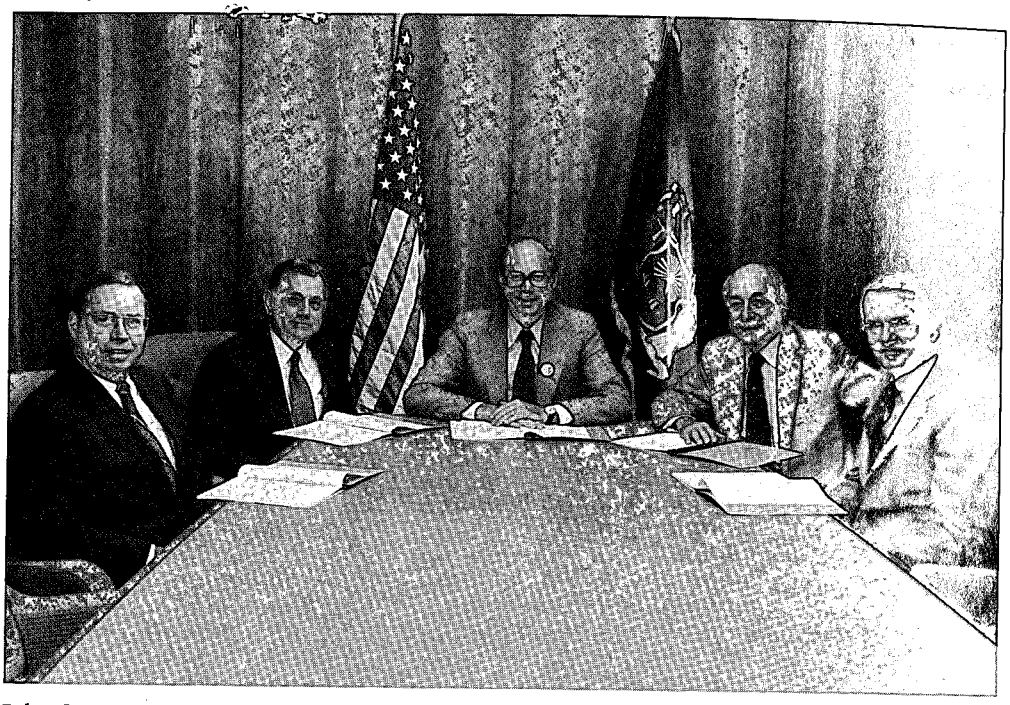


Above: Governor Hugh L. Carey

Left to right are: Vice Chairman George L. Ingalls, Frederick R. Clark, Chairman John S. Dyson, Robert I. Millonzi, Richard M. Flynn.



John S. Dyson, Chairman
George L. Ingalls, Vice Chairman
Richard M. Flynn, Trustee
Robert I. Millonzi, Trustee
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Chairman's Message

As we celebrate our fiftieth anniversary, we at the Power Authority look back on a half century of remarkable accomplishment. Thanks to the vision, courage and stamina of a succession of strong chairmen, including that distinguished public servant, Robert Moses, the Authority undertook and completed truly Herculean tasks. Under their leadership, the Authority harnessed the power of the St. Lawrence River and Niagara Falls and brought electricity to factories, farms and homes throughout the state. The industrial, residential and commercial development of large areas of New York was furthered by the efforts of those who led the Power Authority and those who worked with them during the past fifty years.

This legacy of leadership was initiated by Franklin D. Roosevelt, who signed the bill creating the Authority on April 27, 1931, during his second term as governor. Later, as President of the United States, FDR continued to lead the fight for public power, establishing the Tennessee Valley Authority (TVA), itself modeled on the Power Authority of the State of New York.

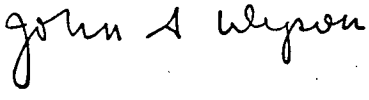
In 1931, the inability to distribute electrical power to all the people was but one of many problems facing New York State and the nation. We were in the midst of the Great Depression. Two years after the establishment of the Power Authority, Roosevelt took the oath of office as President of the United States. Under his inspiring leadership the United States emerged as the most prosperous nation in the history of the world. In today's energy crisis we face a challenge of similar proportions, and the solution to our problem depends upon the strength, vision and willpower of the American people and their leaders.

No state is more vulnerable than New York to the potentially grave consequences attending energy dependence. Nearly two-thirds of New York's oil comes from foreign sources. The long lines at gas stations and the shortages of heating oil in 1973 and 1979 were early warnings that at any time and for any reason our supplies of imported oil could be cut off.

The time has come to free ourselves from the grip of foreign oil producers. We must declare our energy independence by developing new alternatives to imported oil before it is too late.

The qualities of vision and leadership that enabled us to conquer the Great Depression will again serve us in our quest for energy independence. The Power Authority has undertaken to lead the way toward a comprehensive energy program by means of which our state will reduce its oil imports by 50% before the end of this decade. Using other sources of energy that include hydropower, nuclear power, coal, natural gas and such new technologies as waste recovery, in combination with a concerted program of conservation, we can and will achieve our goal.

Indeed, we have no other choice. Our dependence on foreign oil is both expensive and perilous. Another oil embargo could prove catastrophic to the entire economy of the State of New York and to the welfare of its people. New York has the resources, the technology and the will to achieve energy independence. We are in a fight for our economic lives. We will win that fight.



John S. Dyson
Chairman

"From the very beginning I have fought for the use and distribution of this hydropower for the great purposes of bringing more and cheaper electricity into the homes of the state, into the small shops and small industries and into the farms."

Franklin D. Roosevelt, April 7, 1931

The Concept of Public Power

As governor of New York, Franklin D. Roosevelt signed the bill establishing the Power Authority of the State of New York on April 27, 1931. FDR and his predecessor, Alfred E. Smith, were the guiding spirits behind the concept of public power, and they established a lasting tradition in the Executive Mansion. Every New York governor since their time has enthusiastically supported the Authority and the concept that underlies it. During the course of half a century, they have created the largest state-owned utility in the nation, a model for the other 49 states and for the world. The internationally-acclaimed Tennessee Valley Authority (TVA), another of FDR's many permanent legacies to the American people, was modeled upon the Power Authority of the State of New York.

The principle of public power, which still guides the activities of the Power Authority, provided the impetus and means to serve the energy needs of New York. Besides harnessing publicly owned resources such as the St. Lawrence River and Niagara Falls to generate electric power for the people of the State, the Authority has maintained since its inception standards of quality and performance acknowledged by private utilities as well as by the public it serves.

The power generated by falling water was one of man's earliest sources of energy, and it continues to be among the most plentiful and economical. Unlike most other fuels, hydropower is infinitely renewable. It will remain a key element in the state's long-term program to free our people from dependence upon OPEC oil.

The Authority is a non-profit, public benefit agency. It exists to carry out the instructions of the Legislature and the Governor in the field of energy. The Authority's projects are not funded by tax dollars. Instead, they are financed by the private sector, by means of investment in the Authority's bonds. Thus, the Authority is a unique combination of public and private enterprise, operating on a very large scale, for the benefit of, and at no cost to, the taxpayers of New York State.

The Power Authority's original mission was to develop the hydroelectric power of the mighty St. Lawrence River for the benefit of the people of the state. This proved to be a far from easy assignment. Although the project was supported by Governor Roosevelt and his successors, Herbert H. Lehman and Charles Poletti, it wasn't until the administration of Thomas E. Dewey in 1954 that construction actually began. And it took another four years—until 1958, when Averell Harriman was governor—before the project began to generate power.

During that long interval of more than twenty years, Congress wrestled with the issue of a treaty with Canada that would lead to the development of the St. Lawrence Seaway and Power Project. The two were tied together, and

"In the quest for sustained economic growth, we must ensure the reliability of an adequate supply of reasonably priced energy and reduce our excessive dependence upon oil."

Hugh L. Carey, January 7, 1981

both were delayed by the Constitutional requirement for a two-thirds vote of the United States Senate for the passage of treaties. Although each successive president and a majority of Congress favored the St. Lawrence treaty, the opposition to public power and to the seaway was able to forestall passage for a whole generation. Eventually, they were built under provisions of the 1909 boundary waters treaty, and special congressional action.

Later, the Authority was given other major assignments, which led to construction of the Niagara power project, two nuclear plants, a fossil-fired unit, and the state's only self-contained pumped storage facility.

The Authority established a transmission network that connects with the statewide power grid to permit Authority electricity to flow to every private utility, municipal electric system and rural electric cooperative in the state. Working together, public power and private power have been able to provide the people with more electricity at lower cost, carrying out Governor Roosevelt's mandate.

The same underlying concept has guided all of the Power Authority's activities over the years. Power generated by the Authority continues to assist the private utilities and enable the municipally-owned utilities of New York to serve the energy needs of the public. The fifty-year history of the Authority stands as a convincing demonstration of the benefits that a well-integrated combination of public and private power can bring to the people.

Today, the Authority has undertaken the most difficult task in its history, providing a reasonably-priced alternative to OPEC-controlled oil. More than any other major state, New York is dependent upon supplies of foreign oil; indeed, nearly two-thirds of the oil used in the state is imported.

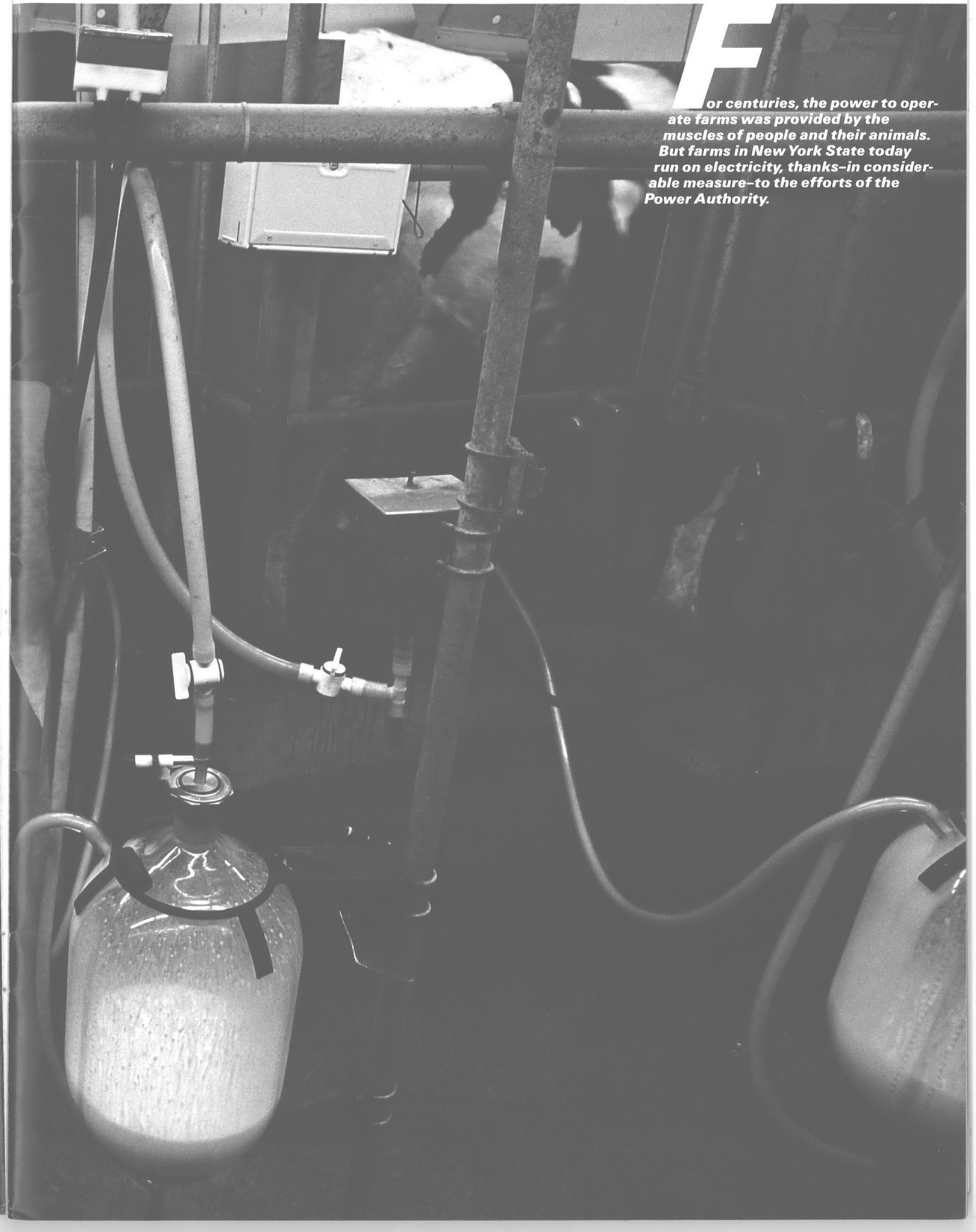
Since 1973, our flow of oil has been controlled by a cartel, whose economic and political interests are diametrically opposed to those of our people. Our position is absolutely untenable. We New Yorkers are paying a prohibitive price for our fuel—a price that continues to rise—and, no matter what we are willing to pay, our supplies can be cut off at any time. The Power Authority believes that the time has come for the people of New York State to launch a counterattack against OPEC. We must reassert control of our own energy destiny.

The Authority is now implementing a ten-point program to free the people of our state from dangerous dependence upon OPEC oil. Utilizing other sources of energy, combined with conservation on a statewide basis, the program is expected to reduce New York's oil imports by 50% during the next decade.

The Authority cannot do the job alone. But with its vast resources, it can lead the way.

On the following pages, we will report on the measures we have taken and will take to solve New York's energy problems. The solutions are divided into six broad categories—hydropower, transmission lines, nuclear, coal and natural gas, conservation and alternative technologies.

New York's system of public transportation is the best in the nation. Most of the trains and all of the rail and bus terminals are powered by electricity. At many airports, take-offs and landings in any weather are made possible by sophisticated control equipment that runs on Power Authority-generated electricity.



For centuries, the power to operate farms was provided by the muscles of people and their animals. But farms in New York State today run on electricity, thanks–in considerable measure–to the efforts of the Power Authority.

"Niagara and St. Lawrence are more than power projects. They are multiple purpose park, power, navigation, restoration and conservation programs extending for miles and representing international cooperation on an unprecedented scale."

Robert Moses, December 31, 1962

Hydropower

The St. Lawrence Power Project was approved in 1954, during the chairmanship of Robert Moses, and from that moment on, the future of public power in New York State was assured. Since 1958, the St. Lawrence project has generated more than 143 billion kilowatt hours of electricity. In 1980 the output was 7.2 billion kwh, the equivalent of 504 million gallons of oil. (There are approximately 14 kwh in a gallon of oil.)

This international project, gigantic in scale, consists of three dams and sixteen miles of dikes. Sixteen turbine-generators, with a total firm capacity of 800,000 kwh, are located in each country.

The St. Lawrence Seaway and the power project are the result of close cooperation between the two friendliest neighbors on earth, the United States and Canada. These two joint ventures have brought about profound changes in North America's commerce and in New York State's ability to provide for its own energy needs.

In 1950, the United States signed a treaty with Canada which called for harnessing the enormous power generated by Niagara Falls. In 1957, the Power Authority was licensed to construct a power project that would use the full share of Niagara River waters available to the United States under the treaty. Less than four years later, on February 10, 1961, during the administrations of Governor Nelson A. Rockefeller and Power Authority Chairman Robert Moses, the largest hydroelectric complex in the western hemisphere produced its first power.

President John F. Kennedy and three of his predecessors, Presidents Hoover, Truman and Eisenhower, all took note of the occasion. In Gen. Eisenhower's words, "This marks the culmination of three years of intensive construction activities after many years of fruitless controversy. The achievement reflects enlightened international, national and state leadership."

The Niagara project is one of the world's largest producers of electricity. In 1980, it generated 16.7 billion kwh, the equivalent of the burning of 1.2 billion gallons of oil.

The water intakes for the project are located 2½ miles above the Falls, and the main generating station is located 4½ miles below them. Thus the project is able to utilize 310 feet of the 326-foot drop between Lakes Erie and Ontario.

Maintenance of the scenic beauty of Niagara Falls is guaranteed by the treaty, which requires that 100,000 cubic feet of water per second must flow over the Falls during daylight hours throughout the tourist season, and at least 50,000 during the rest of the year. The power generating project, a tourist attraction in its own right, does not detract from the awesome beauty of the Falls.

The Authority produces power through a variety of means but no source is more important than water. In addition to the two major projects, at Niagara and on the St. Lawrence, the Authority operates a pumped water storage facility located in the Blenheim-Gilboa region of Schoharie County.

This 1,000,000 kilowatt project generates electricity by recycling water between an upper and lower reservoir. At times of slack demand for electricity, water is pumped from the lower to the upper reservoir, using energy from other sources.

When power demands increase, the motorized pumps are reversed to become turbine generators, powered by falling water to produce electricity.

Pumped storage provides the interconnected network with the capacity to

"These great power projects signify a new and more prosperous era and are an example to the world of North American efficiency and determination."

John F. Kennedy, February 9, 1961

"For years, I have advocated the completion of the St. Lawrence seaway and power project. The incomparable resources of the St. Lawrence River should no longer be wasted."

Thomas E. Dewey, January 3, 1945

meet peak requirements of short duration at the lowest possible cost. The project also permits conservation of fuels in short supply—using coal, for instance, in place of oil.

During 1980, the Blenheim-Gilboa Project, the state's only self-contained pumped storage unit, produced a record 1.68 billion kwh, replacing expensive oil-burning generators that otherwise would have been used.

Existing hydroelectric facilities, notably the St. Lawrence and Niagara projects, now provide a considerable portion of the state's electricity at a relatively low cost. Additional hydropower from Canada and from a number of small projects in New York State can play an important role in the state's energy future.

The new program is already underway. During 1979 and 1980, the Authority imported more than 15 billion kilowatt hours of water power from Quebec. This resulted in a saving of more than one billion gallons of OPEC oil. And it saved New York consumers $50 million in utility fuel charge adjustments.

But that is only the beginning of the ambitious new program to purchase electricity from Canada. The Authority is negotiating for the purchase of billions of additional kwh from Quebec.

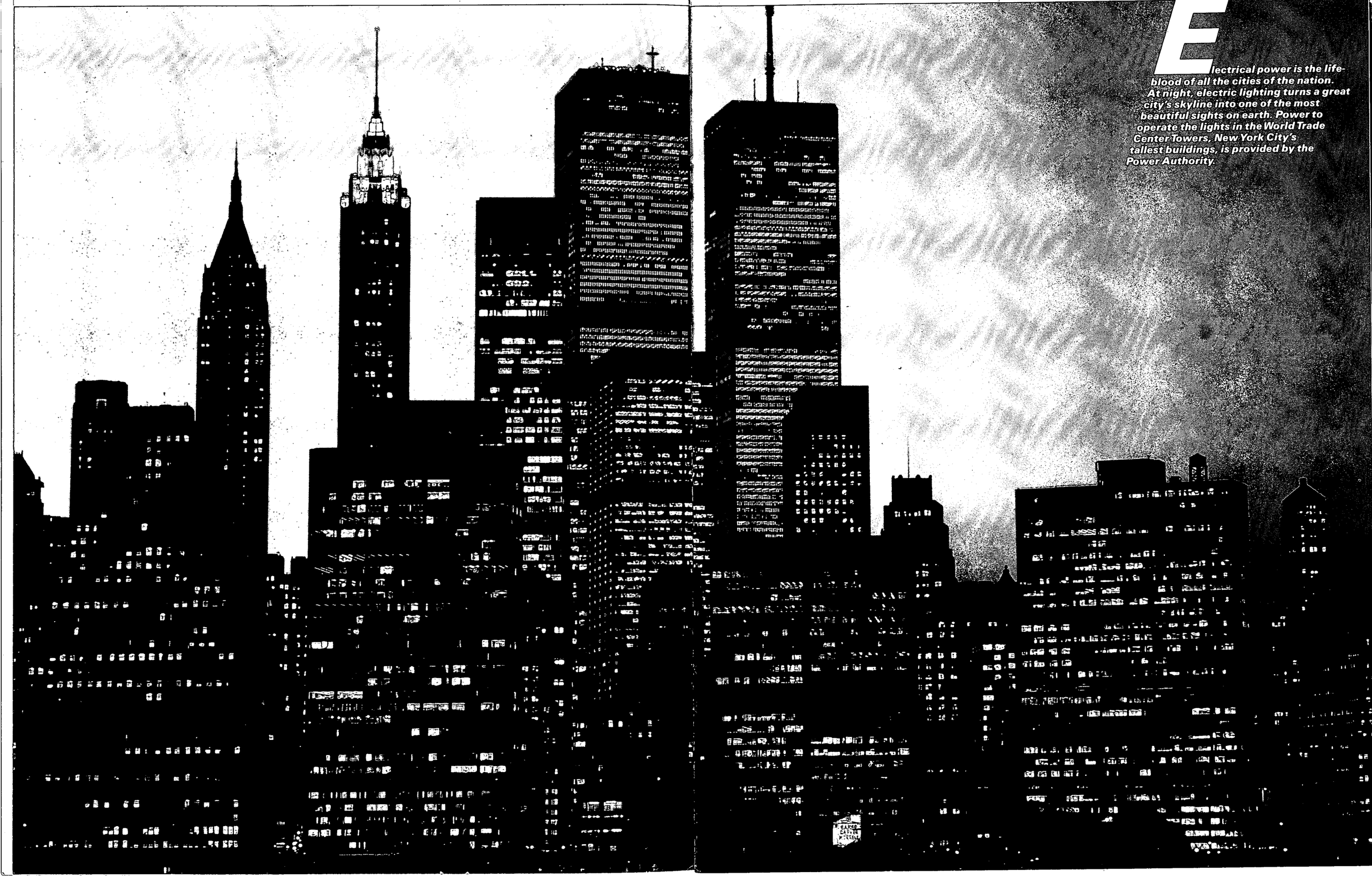
The Authority is also negotiating with Labrador, Newfoundland, Nova Scotia and New Brunswick. The Maritime Provinces are blessed with exceptionally productive sources of hydroelectricity, capable of generating far more power than is needed by their people, and for them New York, with its huge population, is an ideal trading partner.

Hydropower is the least expensive of all known forms of energy, and by doubling imports from Canada, the Authority can save the state's consumers up to $400 million annually.

The Power Authority has also begun the development of new sources of hydroelectric power within New York. When these projects are operating at full capacity, in the middle of the next decade, they will save New Yorkers a total of 63 million gallons of OPEC oil annually. As a group, these small projects, located throughout the state, will generate 200,000 kilowatts, saving consumers about $175 million between now and 1995.

In 1980, the Authority began construction on the first of these projects, at the New York City-owned reservoir in the Ulster County community of Ashokan. Construction will begin later in 1981 at a second New York City reservoir at Kensico in Westchester County. In addition, the Authority has applied to the Federal Energy Regulatory Commission for preliminary permits to develop seven sites owned by the New York State Department of Transportation (DOT). The DOT uses these sites for water control and regulation on the state barge canal systems.

The Authority's Blenheim-Gilboa pumped storage project is serving as the model for a similar project that the Authority has proposed to locate at Prattsville, about 40 miles southwest of Albany. This one million kilowatt hydroelectric project would cut our dependence on oil an average of 80 million gallons a year, and it would also represent a saving for the state's consumers of hundreds of millions of dollars during its first decade of operation. Hearings for a federal license to construct this project are now in progress.



Electrical power is the life-blood of all the cities of the nation. At night, electric lighting turns a great city's skyline into one of the most beautiful sights on earth. Power to operate the lights in the World Trade Center Towers, New York City's tallest buildings, is provided by the Power Authority.

Miracle drugs have revolutionized medicine; electricity supplied by the Power Authority makes a critically important contribution to the lifesaving work of doctors, nurses and technicians in the operating rooms of many public hospitals and medical centers throughout New York.

Our nation's performing arts, music, drama and dance, are centered in New York. The co-producer of evening performances at opera houses, theaters and movie houses across the state is the Power Authority's highly efficient system of electrical power.

Data processing systems, many of them operating on electricity supplied by the Power Authority, enable business and industry to compute, create and communicate at a pace inconceivable even two decades ago.

"For every bill that we pass that says use coal, we pass another bill that makes it impossible to do so. That is why we can talk about unemployed coal miners at a time when the cost per BTU of coal is about a quarter that of oil."

Daniel Patrick Moynihan, April 23, 1980

"Coal...natural gas...every available resource we have must be used to free us from OPEC oil domination. We must get America moving again."

Ronald Reagan, September 10, 1980

Coal and Natural Gas

When the Power Authority first came on the scene, fifty years ago, coal was already being dismissed as a fuel of the past. But now, following the Arab embargo of 1973 and the emergence of OPEC, coal has made a spectacular comeback, and the worldwide demand now exceeds the record levels achieved earlier in this century.

The United States has the world's largest known supplies, enough to serve all our energy needs for at least two hundred years, and the Power Authority's program for the future calls for coal as an important element in New York State's campaign to achieve energy independence during the next decade.

There are over 100 oil-burning electric generating units operated by private utilities throughout the state. Converting only nine of these units to coal would save 1.7 billion gallons of oil a year. While the Authority has no regulatory function, it is advocating fast-track applications for coal conversion.

In addition, new coal-fired plants must be built, and the Authority has developed plans to construct such a facility in the Arthur Kill section of Staten Island in New York City. The State Board on Electric Generation Siting and the Environment has issued a Certificate of Environmental Compatibility and Public Need for the plant, and construction of the project is consistent with the State Energy Master Plan, approved in 1980 by the Energy Planning Board. This 700,000 kilowatt plant, which will be fueled by both coal and refuse, is scheduled for completion in 1987. Because this will be a new plant from the ground up, it will have the most advanced system of pollution control in the nation. These controls, which will account for 25% of the entire capital cost of the project, will make it possible to burn the coal as cleanly and efficiently as oil, without adverse environmental effects.

This project, which can serve as a model for the nation, will reduce the state's dependence upon OPEC oil by 300 million gallons a year. Four coal-fired plants, each with a capacity of 600,000 kilowatts, should be built within the next 15 years in other parts of the state, according to the State Energy Master Plan.

The Authority is also studying the possibility of developing a coal port at Buffalo to handle up to 15 million tons a year, serving as a center for shipment to plants in New York and New England and, via the Seaway and Great Lakes, to other parts of the world as well. The coal port, which could also handle potash, iron ore and other bulk commodities, would help stimulate the overall development of the Port of Buffalo.

Natural gas will also play a significant role in the energy future of New York State and the nation. Recent explorations have proven that the world's supplies of this fuel are far greater than was originally believed. Additional deposits apparently exist at deeper levels beneath the earth's surface than had previously been explored.

Recognizing that natural gas is a viable substitute for oil, the Authority has equipped its only oil-fired plant, Astoria 6, in the New York City borough of Queens, so that it can burn natural gas as well as oil. As a result, New York consumers saved more than $8 million in electrical bills during 1980, and OPEC was deprived of 50 million gallons in oil sales. In 1981 the use of natural gas at Astoria 6 will enable the Authority to cut its oil requirements in half.