

Con Ed Preparing Fuel-Cell Test Plant

By Victor K. McElheny

Aug. 16, 1977



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The Consolidated Edison Company is preparing to carry out in Manhattan the nation's first test on a practical scale of an advanced, nonpolluting fuel cell for generating electricity in urban neighborhoods.

After years of preparation, the utility learned July 22 from the Federal Government that it had won a competition with two other utilities—in New Jersey and California—to establish a 4.8 megawatt fuel cell plant in its system next year for two years of tests.

Vastly scaled up from the fuel cells used on Gemini and Apollo manned space flights in the 1960's and early 1970's, and using different fuel, the fuel-cell facility is to be established on 15th Street and the Franklin D. Roosevelt Drive.

To the astonishment of Con Edison officials, the plan for testing a system specifically designed for big-city electricity consumers on a site of less than half an acre and 1,000 feet east of Stuyvesant Town has aroused vocal opposition, on safety grounds, from residents of Stuyvesant Town and Peter Cooper Village.

Assemblyman Andrew J. Stein, who represents the district and is a candidate for Manhattan Borough President, speaks of widespread local "fear and anger" at the prospect of burying fuel tanks for the fuel cell project near the development. and local playing fields.

Con Edison's chairman, Charles F. Luce, in rebuttal, refers to the compact, noiseless fuel cell plant as "benign."

Developers of the fuel cell—which converts hydrogen-rich fuel into electricity and steam—consider the proposed urban test as vital to finding a compact, nonpolluting source of electricity within large cities in the 1980's.

Many cities, particularly New York, are running out of both sites and technologies for in-city generation, and are importing increased shares of the power they use in homes and businesses.

Increase Vulnerability

The growing number of importations create technical problems of balancing the high-voltage alternating currents running in cables beneath the streets, and increase the cities' vulnerability to the cutoff of imported power that precipitated the blackout of July 13-14.

The potential influence of the community opposition is not clear. Community Board 6, which has held sessions on the fuel-cell project, has not taken a stand. The New York City Fire Department has not handed down its rules for the project.

Community opponents, led by Assemblyman Stein and Vincent J. Albano, chairman of the New York County Republican committee, have not gone to court or circulated major petitions.

Nonetheless, Con Edison officials have been expressing uncertainty about whether the project will go ahead at one of several sites in New York City—if not at East 15th Street—or be transferred to one of two rival utilities, the Public Service Electric and Gas Company in New Jersey, or the Southern California Edison Company.

Utility Is Eager to Test

Con Edison began discussions with community leaders last spring. The utility, which has committed more than \$5 million to development of the fuel cell to large sizes, is eager, to perform the test—and at East 15th Street.

Dr. Robert Bell, Con Edison's director of research, said in an interview, "If we can't operate close to the load, a major reason for doing all this disappears.

"Building [a fuel cell] and running it shrinks the price uncertainties. We need, to know if we can train our people to run and maintain it. What will the service be like? This is the real world, here."

Success in the project could lead to fundamental change in urban electricity networks, Dr. Bell said. "If we could have these smaller plants distributed through our system," he said, "we could get back to Thomas Edison's original concept of small power plants close to the load."

Help in Balancing Currents

Because of their smooth changes of direct-current electrical output and other technical characteristics, Dr. Bell said, fuel cells could help in balancing the currents in Con Edison's thousands of miles of underground cables carrying alternating current at voltages up to 345,000.

If costs of fuel-cell equipment can be reduced as expected, the compact fuel cells could ease the problems of utilities that hesitate to even seek environmental approval for new, large plants using expensive, imported, low-sulfur oil or coal-fired plants equipped with costly, sulfur-removing "scrubbers."

With support from both the new Federal Department of Energy and its New York State counterpart, the 4.8 megawatt fuel cell is scheduled to be installed next spring on what is now a Con Edison parking lot at East 15th Street and the Franklin D. Roosevelt Drive.

The fuel-cell plant, actually consisting of many "stacks" of individual cells, is costing an estimated \$42 million to build. The cost of the planned two years of tests is estimated at \$8 million.

For the tests, the cells will use a variety of naphtha liquids closely related to jet fuel as the source for its flameless production of electricity and steam.

The site, less than half an acre, lies just north of Con Edison's East River plant, which sends out both electricity and steam, and has equipment for burning either oil or natural gas. Dr. Bell said that these factors make 15th Street convenient for possible supplemental tests that would either use gas as fuel for the fuel cell or tap the fuel cell's byproduct steam for local use.

Safety Is Major Issue

The major issue between Con Edison and local residents is the safety of two 25,000-gallon tanks that are to be buried at the site to store naphtha for the fuel cell. The site adjoins two Con Edison-owned fields used by local residents for little league baseball and softball games, and lies about 1,000 feet east of Avenue C, which runs along the edge of Stuyvesant Town.

At meetings with opponents of the project, such as a session Aug. 4 before a committee of Community Board 6 headed by Katherine Bachheimer, supporters of the project said that the fuel to be stored in the tanks is no more chemically volatile than the gasoline stored in the cars parked in the large Stuyvesant Town garages fronting on Avenue C, or in neighborhood gasoline stations all over the city.

They also said that the type of naphtha to be used at 15th Street bears little chemical resemblance to the rubber solvent that was poured into Akron, Ohio, sewers, leading to an explosion June 23 under local streets. The explosion, which injured no one, has been cited as an argument against the fuel-cell project.

Assemblyman Stein, whose district includes both Stuyvesant Town and Peter Cooper Village to the north, said in an interview: "I am not an expert in the field. My first responsibility is to represent my constituents. No matter how safe things are, major accidents occur. Nothing is foolproof. We have to weigh the dangers and the advantages, and the dangers far exceed the benefits."

Against Carter Policy

Mr. Stein said he disagreed with the project on policy grounds, as well. "This really goes against the Carter energy proposals, to use a fuel with the same source—petroleum—as gasoline," he said.

In an interview, Mr. Luce of Con Edison said: "This is an instance of in-city generation of the most-benign character, producing carbon dioxide, water and a little heat along with electricity. It will be about as safe as any facility you can think of, and yet it has sparked an enormous outcry.

He added, "We feel that this is a project that environmentalists ought to, and probably would, support."

According to the Power Systems Division of United Technologies Corporation at South Windsor, Conn., the developer and builder of the type of fuel cell to be tested by Con Edison, the cell is similar only in principle to the United Technologies fuel cells used on 11 manned Apollo space flights around the earth and to the moon.

Fuel cells resemble batteries, except that they receive continuous supplies of fuel and oxygen from outside. The Apollo fuel cells, which developed about 1.5 kilowatts of power, used pure oxygen and hydrogen from spherical tanks in the spacecraft.

Larger fuel cells, such as the one-megawatt version that has undergone more than 1,000 hours of test runs at South Windsor since last December, use a fuel like naphtha or natural gas as their source of hydrogen and air as their source of oxygen.

According to William Podolny, general manager of the power systems division of United Technologies, the 4.8-megawatt unit for the New York City demonstration will use the same materials as its one-megawatt predecessor. The New York test, he said, "does not represent any extension of any critical parameter." He added, "Scaling up from one megawatt to 4.8 literally involves just some multiplicity."

Although United Technologies engineers have found ways to cut the cost of the fuel-cell components and allied units for processing the fuel and converting the cell's direct-current output to alternating current for distribution to customers, the direct experience of an urban test is said to be essential to pinning down the price of utility fuel cells.

Industrial sources said that such a practical test, giving utilities experience with fuel cells, would also be essential in opening the door for such "second generation" fuel cells as one now being explored by the General Electric Company for possible use with coal-derived fuels.

Problem for Con Edison

In-city generation, Mr. Luce recalled, is a major problem for Con Edison. He said the utility had renounced the right to build further large generating plants in New York City when it received permission to start building the Astoria 6 plant, later sold to the Power Authority of the State of New York along with the Indian Point 3 nuclear plant.

The Power Authority's Travis project at Arthur Kill on Staten Island, the only large generating plant now projected within the city, has not received final environmental approval.

The selection of Con Edison and the 15th Street site for the first demonstration of the fuel cell in a utility was announced on July 22 by the Energy Research and Development Administration, now part of the new Department of Energy.

Under an arrangement made last year, the Federal agency has committed \$25 million to the cost of building the 4.8 megawatt fuel cell, along with \$12 million from United Technologies and \$5 million from the Electric Power Research Institute of Palo Alto, Calif., the research arm of the electric utility industry.

\$42 Million Program

Late in 1973, nine utilities including Con Edison agreed with United Technologies on a \$42 million development program aimed toward producing a total of 56 fuel-cell units, each to produce 27 megawatts of power. The 4.8-megawatt unit to be tested in New York City is a one-sixth sub-unit of the planned 27-megawatt units.

The utilities contributed to the arrangement in proportion to the orders they placed. Con Edison, having ordered 10, put up \$5 million.

For the practical test of the 4.8-megawatt unit, Con Edison had two competitors, the Public Service Electric and Gas Company of New Jersey and the Southern California Edison Company. Under the 1973 program, the New Jersey company ordered 12 fuel cells and the California company 15.

For the in-city demonstration, Con Edison formed a consortium with the New York State Energy Research and Development Authority, the Empire State Electric Energy Research Corporation, the Niagara Mohawk Power Company and Northeast Utilities, a New England utility.

Contract Set for Sept. 1

A contract between the consortium and the Federal energy department is scheduled to be signed Sept. 1. The contract will include provision for about \$8 million in costs for the two-year fuelcell test, to be divided about evenly between the New York-New England group on one side and the Federal government and the privately-financed Electric Power Research Institute on the other.

In addition to Assemblyman Stein, the leaders of the local opposition have been Mr. Albano and John Sullivan, a member of Community Board 6.

Of the possibility of a suit, Assemblyman Stein said: "We're studying some form of legal action, but we have yet to come up with the right course. We had hoped the Federal government would not come up with the \$50 million, but that hope has been dashed."

Community Board 6 is scheduled to meet again Sept. 18. A formal opinion from this board may not be required legally, Con Edison attorneys think, unless the fuel-cell project is ruled a Class I facility having a "major" environmental impact, or a "refinery" requiring action by the New York City Board of Standards and Appeals.

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Con Ed's Plan to Test Country's First Neighborhood Fuel Cell in Manhattan Is Opposed by Residents at Site

Continued From Page 1

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Con Edison's chairman, Charles F. Luce, is reticent, refers to the compact, noiseless fuel cell plant as "benign." Developers of the fuel cell—switch converters hydrogen-rich fuel into electricity and steam—consider the proposed urban test as vital to finding a compact, non-polluting source of electricity within large cities in the 1980's.

Many cities, particularly New York, are raising not only safety and technology issues, but also the possibility of increased shares of the power they use in homes and businesses.

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The growing number of importations create technical problems of balancing the high-voltage alternating currents running in cables beneath the streets, and increase the cities' vulnerability to the cutoff of imported power that precipitated the blackout of July 13-14.

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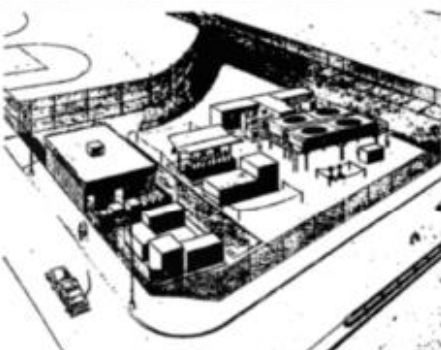
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Artist's rendering of Con Edison's proposed fuel cell facility, above, and the site where it would be constructed on Manhattan's East Side.

The cost of the planned two years of tests is estimated at \$8 million. For the test, the cells will use a variety of naphtha liquids closely related to jet fuel as the source for its flames to produce electricity and steam. The site, less than half an acre, lies just north of Con Edison's East River plant, which sends out both electricity and steam, and has equipment for burning either oil or natural gas. Dr. Bell said that these factors make 15th Street convenient for possible supplemental tests that would either use gas as fuel for the fuel cell or tap the fuel cell's byproduct steam for local use.

Safety Is Major Issue

The major issue between Con Edison and local residents is the safety of 20,000-gallon tanks that are to be buried at the site to store naphtha for the fuel cell. The site adjoins two Con Edison-owned fields used by local residents for little league baseball and softball games, and lies about 1,000 feet east of Avenue L, which runs along the edge of Stuyvesant Town.

At meetings with opponents of the project, such as a session Aug. 4 before a committee of Community Board 6 headed by Katherine Buchsbaum, supporters of the project said that the fuel to be stored in the tanks is no more chemically volatile than the gasoline stored in the cars parked in the large Stuyvesant Town garages fronting on Avenue C, or to neighborhood gasoline stations all over the city.

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The New York Times photo.

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Community Board 6 is scheduled to meet again Sept. 15. A formal opinion from the board may not be required legally, Con Edison attorneys think, unless the fuel-cell project is ruled a Class I facility having a "major" environmental impact, or a "refinery" requiring review by the New York City Board of Standards and Appeals.

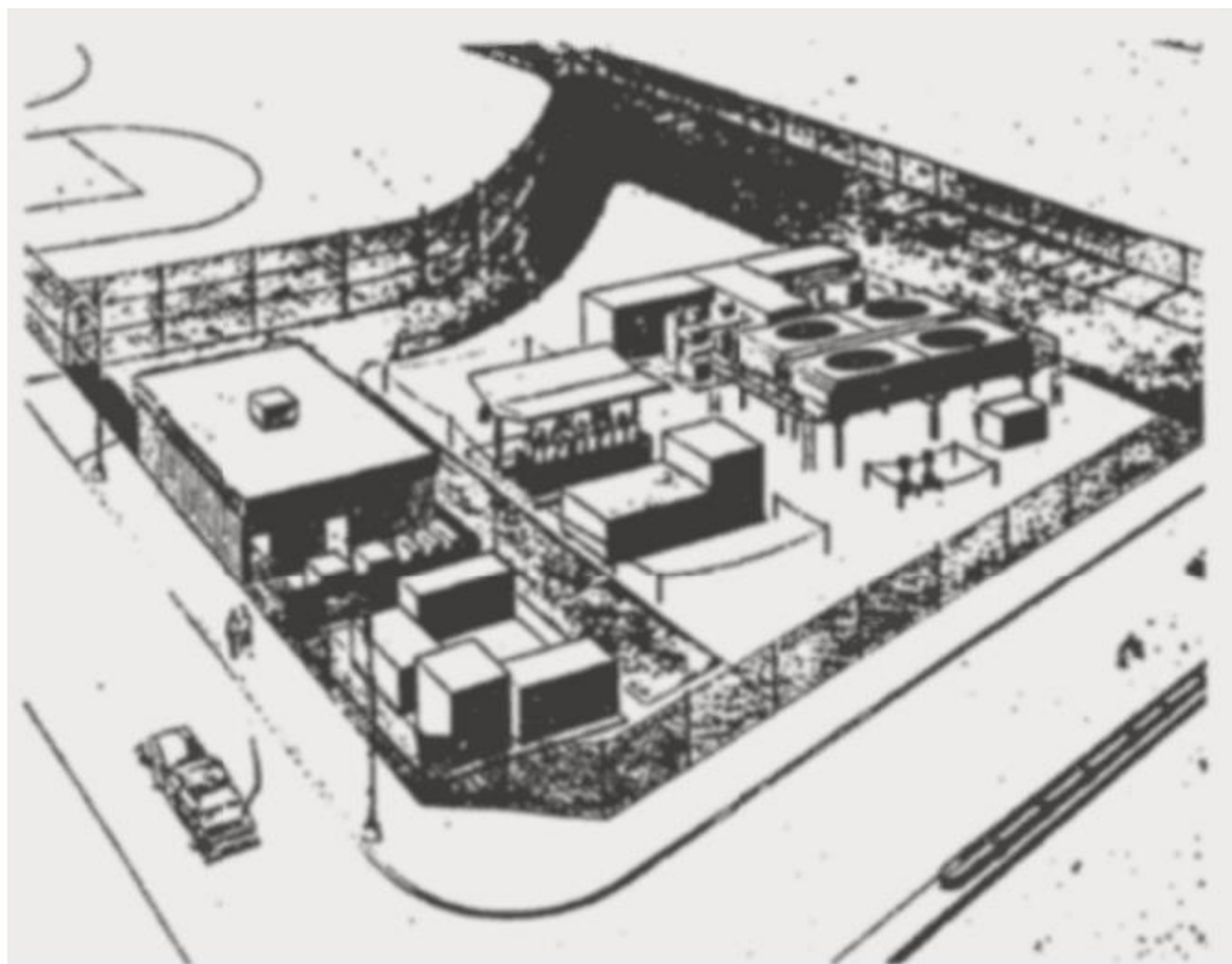
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