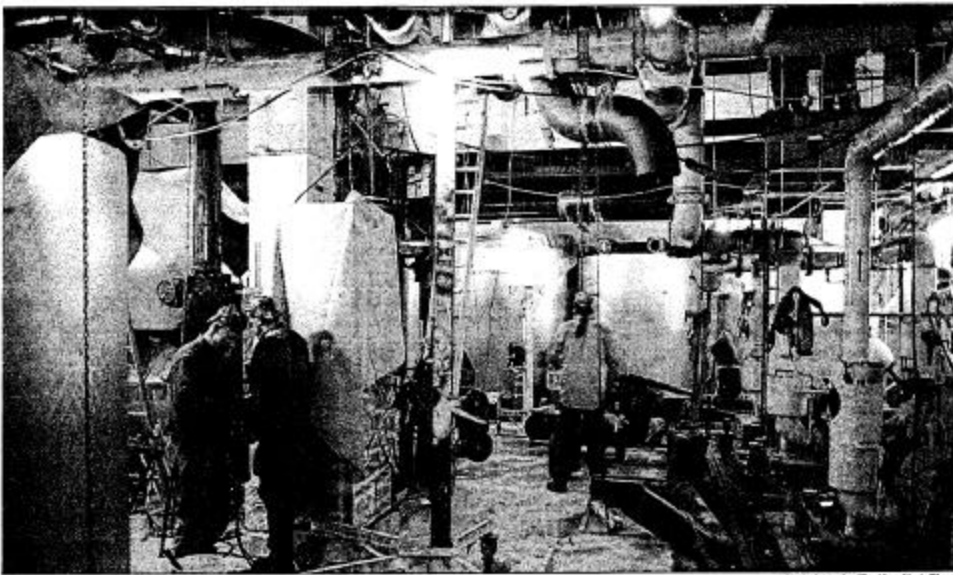


## On Avenue of the Americas, the Iceman Cometh

By JOHN HOLUSHA



Justin Lane for The New York Times

The ice storage technology at 1155 Avenue of the Americas employs 28 cylindrical tanks in the basement.

---

With electricity prices high, a landlord has an novel idea for cooling.

---

**T**O cope with the high price and uncertain reliability of electric power in Manhattan, Douglas and Jody Durst, the co-presidents of the Durst Organization, a major commercial landlord, have chosen an unlikely alternative: ice.

Not ice cubes or ice floes, but 28 cylindrical tanks with a capacity of 32,840 gallons of ice in the basement of the 41-story building on the west side of Avenue of the Americas between 44th and 45th Street.

Ice storage takes advantage of the fact that the cost of power varies — sometimes greatly — by the time of day. A chiller is used to make ice during the night, when power is cheapest. Then as the price of power rises with the time of day and the temperature, the ice is used to chill air supplied to the building, instead of turning on additional power-gulping refrigeration units.

Ice storage is an established technology that has been used at research centers and learning institutions in suburban or rural areas, where there is plenty of space to place the ice tanks. But installing ice storage in the crowded confines of Manhattan is quite a different matter.

"Mechanical space in New York is like living on a ship," Jody Durst said. "Every bit of it is valuable." He said that the building, opened in 1984, was at the limit of its cooling capacity, as tenants have added employees (who produce about 400 British thermal units of heat per person a day) and heat-producing computers, printers and copiers to their offices.

He said the power reduction advantages of ice storage were attractive enough that the company was willing to devote a rentable storeroom in the basement to the project to fit in additional tanks. As far as he and others associated with the project know, this is the first time such a system has been installed in Manhattan.

The Dursts are no strangers to novel approaches for managing energy. The Condé Nast building at 4 Times Square is equipped with two 400-kilowatt fuel cells, which convert natural gas into electricity while emitting only water vapor. Douglas Durst, Jody's cousin, said the fuel cells had "become a reliable source of power" to supplement electricity bought from outside suppliers.

The building also has photovoltaic cells in the skin of the upper floors that convert sunlight directly to electricity. Douglas Durst said the cells were not providing much of the building's power supply now but were demonstrating that such an approach could be a viable source of electricity in the future when more efficient cells have been developed.

The company has begun excavation for a building on 57th Street between 11th and 12th Avenues that is being designed for use by operators of data centers. Since the structure will be filled with computers and other machines that operate round the clock, it has a flat, constant demand for power. This is in contrast to office buildings that are filled with people and machines that operate during business hours and are largely vacant at night.

The Dursts have proposed equipping the building with a highly efficient co-generation system that would make tenants independent of the Con Ed distribution system and power suppliers. Nor would they need to incur the expense of leasing additional space and installing generators and fuel storage tanks to guard against the kind of power interruption that occurred in downtown Manhattan after Sept. 11.

The system would burn gas or oil to spin a turbine to generate electricity. The hot exhaust gases from the turbine would be used to generate steam that would power cooling equipment to keep the computers and switching machines in the building at the proper operating temperature. There are also discussions about selling the still-hot steam to Con Ed, which operates a steam plant across 58th Street.

**B**ECAUSE so much of the heat value of the fuel is extracted, co-generation plants can be as much as 80 percent efficient, compared with about 30 percent for a typical generating plant, Jody Durst said.

He declined to discuss how much money the ice plant at 1155 Avenue of the Americas might save, but some figures supplied by a Con Ed spokesman and an engineer consulting on the project suggest that it could be a substantial amount.

Power rates in the hours between midnight and 5 a.m. routinely range from 44 to 64 percent lower than in the hours between noon and 5 p.m., said Chris Olert, a spokesman for Con Ed. On a very hot summer day, with demand for power approaching the utility's transmission capacity, the difference could be as much as 94 percent, he said.

Just turning on a chiller unit can be an expensive proposition for a landlord, said Daniel F. Tangel, one of the owners of Tangel Associates, a consulting engineering firm in Bohemia on Long Island and a consultant to the Durst project.

"Say you have a warm day in March — most leases only require landlords to provide cooling for April or May to October — and the building manager wants to start a chiller," he said. "If it is a 500-kilowatt chiller and the rate is \$30 a kilowatt, that is \$15,000 just to turn it on."

And because Con Ed has separate charges for maintaining the capacity to deliver power to commercial users as well as a consumption charge for the electricity actually used, a brief spike in demand can result in a sharply higher capacity bill for an entire month, he said.

The ice storage is designed to shave those demand peaks as well as use lower-priced overnight power.

Reducing peak load demands has a benefit to society as well as to the Dursts, said Ashok Gupta, director of the energy project at the Natural Resources Defense Council, an environmental advocacy group based in New York. "Peak shifting results in lower emissions, because some of the plants used to meet demand peaks are among the dirtiest in the city," he said. "And to the extent that demand peaks can be reduced, everyone's energy bill can go down, because rates are set based on the last peak."

Because there was insufficient space to store enough ice to handle all the cooling needs at 1155, a hybrid system is being installed. One electrically powered machine, called the house chiller, supplies cold water directly to the building. (Air, brought in contact with the cold water, provides cooling for people and machines.)

Another machine, called the ice chiller, cools a fluid similar to automotive antifreeze to 18 degrees Fahrenheit and circulates the fluid through tubes inside 28 tanks of water, which freezes at about 32 degrees. It is important for the water to be converted from the liquid to solid state, because ice has much greater cooling capacity than chilled water.

When the ice plant is called on to operate, the antifreeze is used to start melting the ice to cool the water that circulates throughout the building providing air-conditioning — the ice chiller is not to be turned

on for this purpose.

The house chiller provides the base load cooling for the building, about 700 tons of it (a ton of cooling is the equivalent of 12,000 B.T.U.'s). The tanks of ice are designed to handle an additional 350 tons of cooling, without consuming any more electricity than is needed to run a few circulation pumps.

To make room for the ice tanks, the Dursts removed two conventional cooling machines in the building's mechanical room and built a mezzanine level in the room to accommodate the insulated tanks that are connected with a web of piping.

The Dursts are counting on the system to do the job, or the lawyers and others tenants in the building may be in for an uncomfortable summer. "The house chiller is due to start operating on April 1 and the ice chiller on April 15," Jody Durst said.

They are planning to install a co-generation plant at the 1.6 million square foot, 50- story office building they are planning for the middle of the block on 42nd Street between the Avenue of the Americas and Broadway, which they are calling One Bryant Park. "We are doing studies now about how big it should be, ranging from 20 percent in-house up to 80 percent," Jody Durst said.