

CITY OF TRENTON

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DISTRICT HEATING: HEATING

A DEVELOPMENT INCENTIVE



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TRENTON
DISTRICT
ENERGY
COMPANY

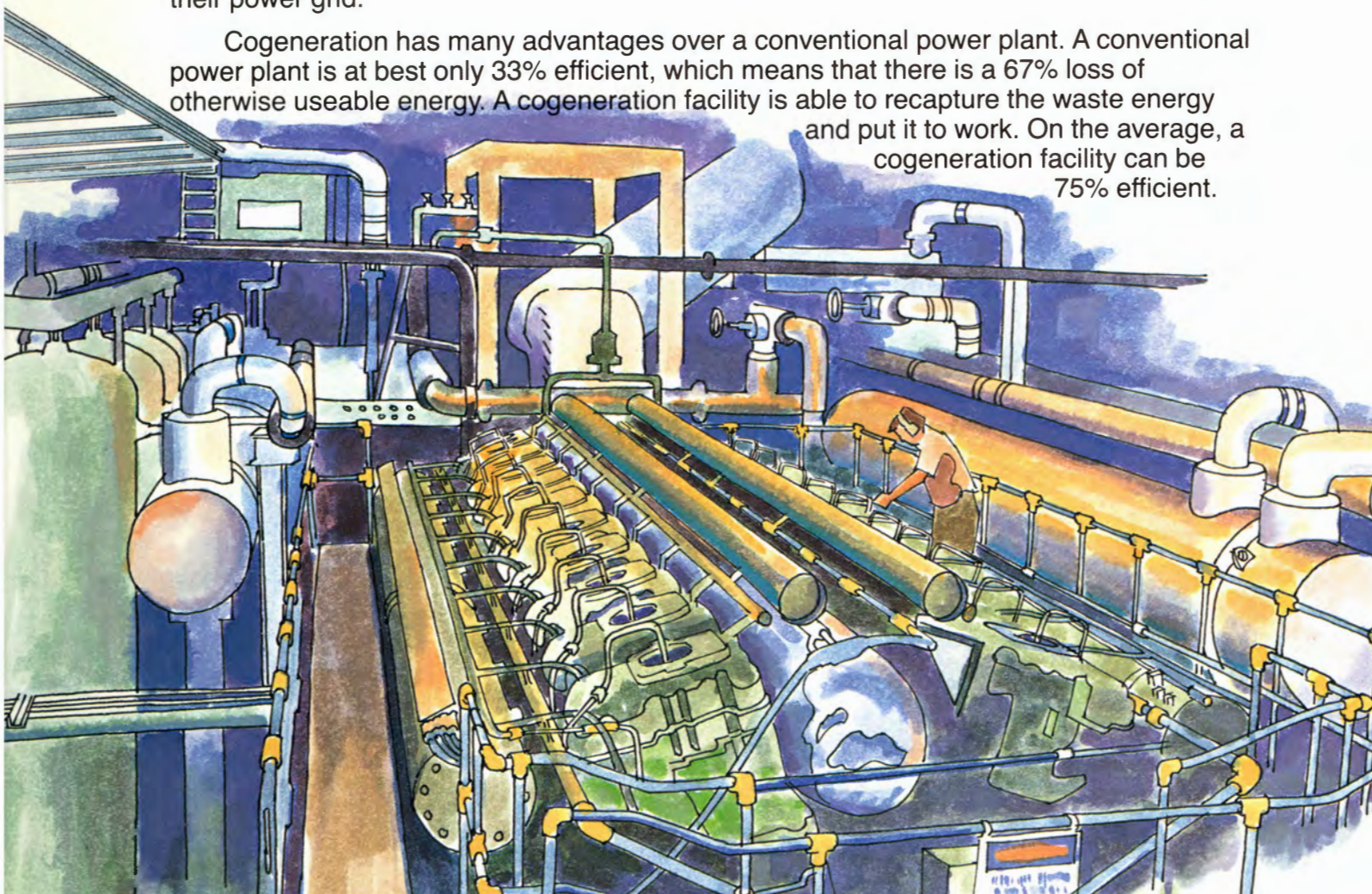
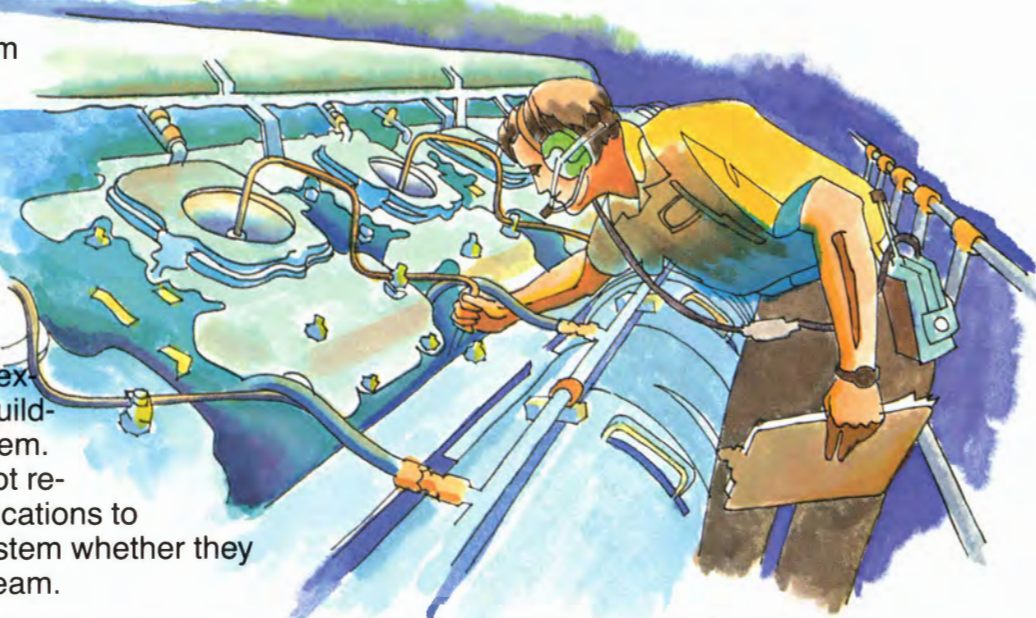
DESCRIPTION

Trenton is the home of one of the first modern hot water district heating/cogeneration plants in the Nation. The Cogeneration/district heating plant simultaneously produces or “co-produces” electricity and thermal energy. The thermal energy, which takes the form of hot water heated up to 400° fahrenheit, is piped to various industrial, office, residential and medical buildings to heat these facilities. The system is known as “district heating” and is operated by the privately owned and financed Trenton District Energy Company (TDEC).

The thermal distribution system is connected to buildings through heat exchangers feeding into a building's existing heating system. Thermal customers are not required to make any modifications to their building's heating system whether they be hot air, hot water, or steam.

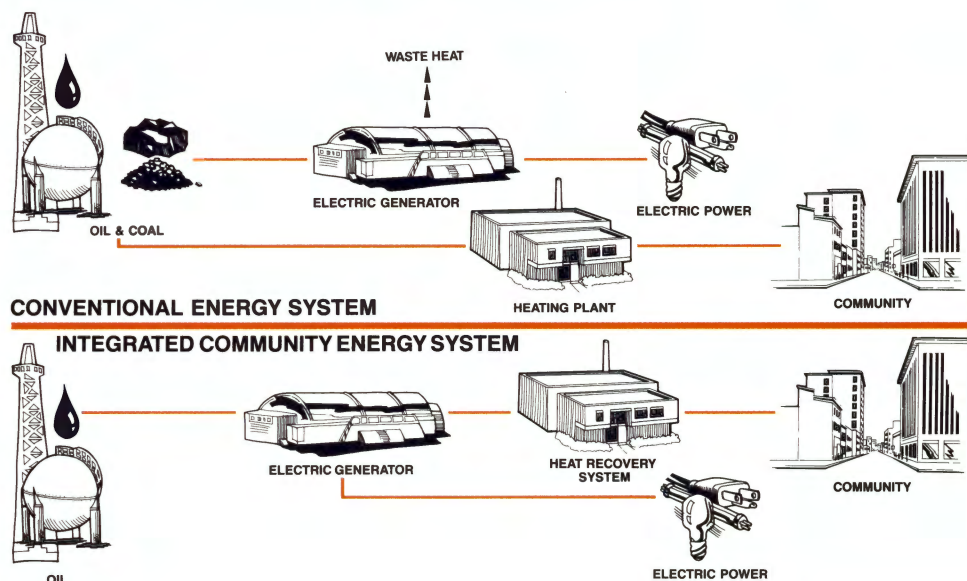
The electricity generated is sold to the public utility (PSE&G Co.) and is hooked into their power grid.

Cogeneration has many advantages over a conventional power plant. A conventional power plant is at best only 33% efficient, which means that there is a 67% loss of otherwise useable energy. A cogeneration facility is able to recapture the waste energy and put it to work. On the average, a cogeneration facility can be 75% efficient.



A ADVANTAGES

- A minimum of 10 to 15% savings on heating/cooling costs and even more if the cost of installing or replacing a boiler is avoided. Cost savings include fuel operations and maintenance of boilers.
- Greater reliability and fewer interruptions in heat delivery.
- Environmentally superior — emits less pollutants.



C COST

100,000 SQUARE FOOT OFFICE BUILDING

Fuel: #2 oil • Annual consumption 64,013 gals. per year • Fuel Price \$.90

Age of Building:
New requiring 4,993 MMBTU to heat

Heating System:
Boiler — Hydronic

Fuel Cost Increase: Based on average yearly increase of 7% per year.

Materials and Labor Increase:
Based on average yearly increase of 4% per year

DISTRICT HEATING

Energy Charge	\$29,958
Repair	13,431
Fixed Cost	— 0 —
Demand Charge	29,550
Total	72,939
Unit Cost	
Per MMBTU \$14.61	

CONVENTIONAL HEATING

Fuel Cost	\$ 57,612
Maint./Repair & Labor Cost	46,000
Fixed Cost	7,928
Demand Charge	— 0 —
Total	111,540
Unit Cost	
Per MMBTU \$22.34	

***FIRST YEAR ANNUAL SAVINGS \$38,601**

* TDEC projections indicate an additional \$1,000 — \$2,500 annual increase in savings for the next twenty years. This is contingent upon energy costs and number and volume of commercial and industrial users.

A

AVAILABILITY

- Available to most downtown development sites (see map). New users may tie into the existing pipe line at any point along the three mile network. For potential large users the pipe network may be extended.

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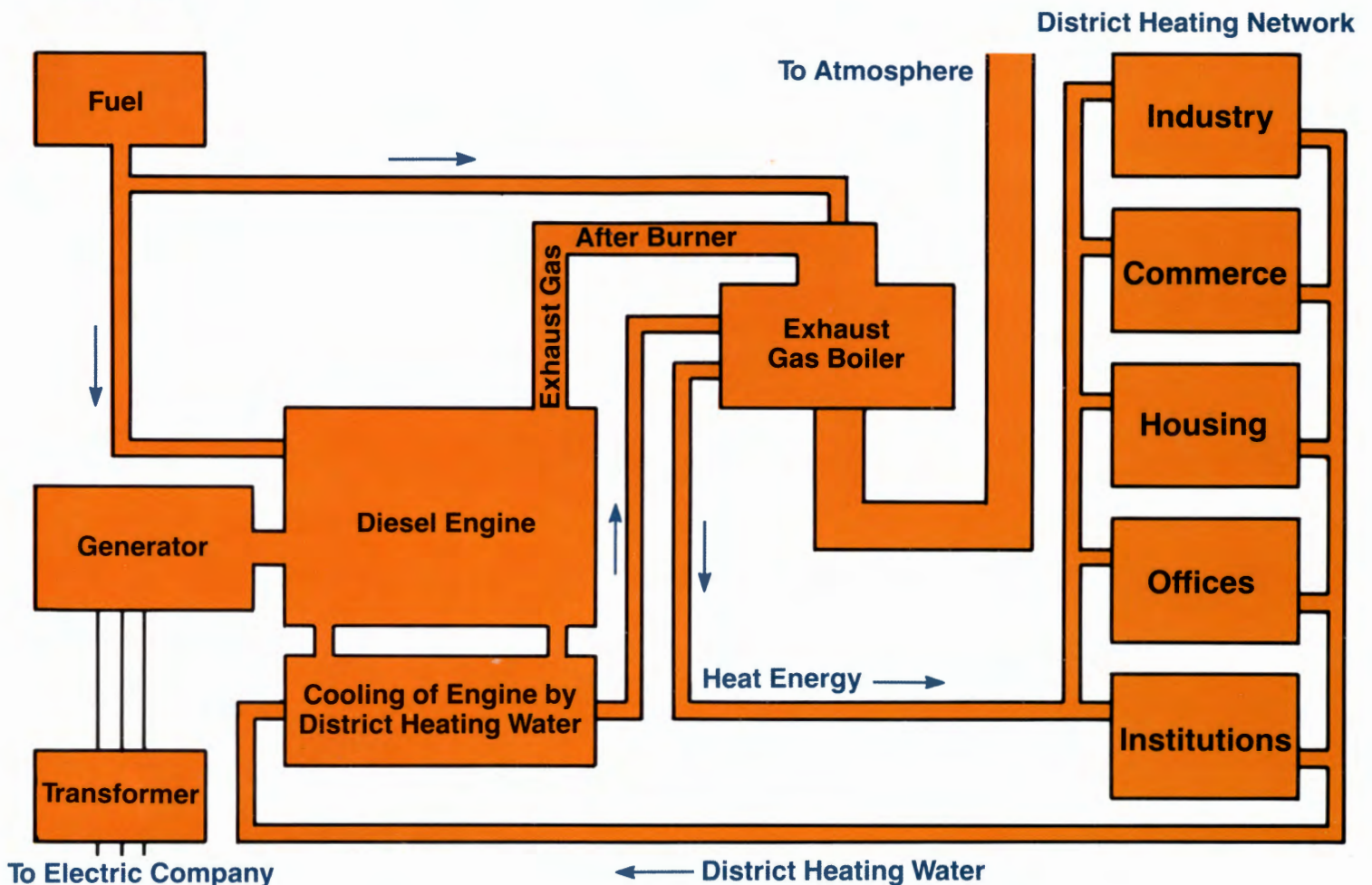
RELIABILITY

A cogeneration facility can also burn either natural gas or #2/#6 fuel oil. It will provide a non-interruptible source of heat and hot water to its consumers even in times of curtailment or shortage of a single critical fuel. In addition, if either of TDEC's two boilers are out of service, existing boilers can be started in the two largest TDEC customers' facilities in order to backfeed the TDEC system with heat. This ensures 100% reliability of thermal service.



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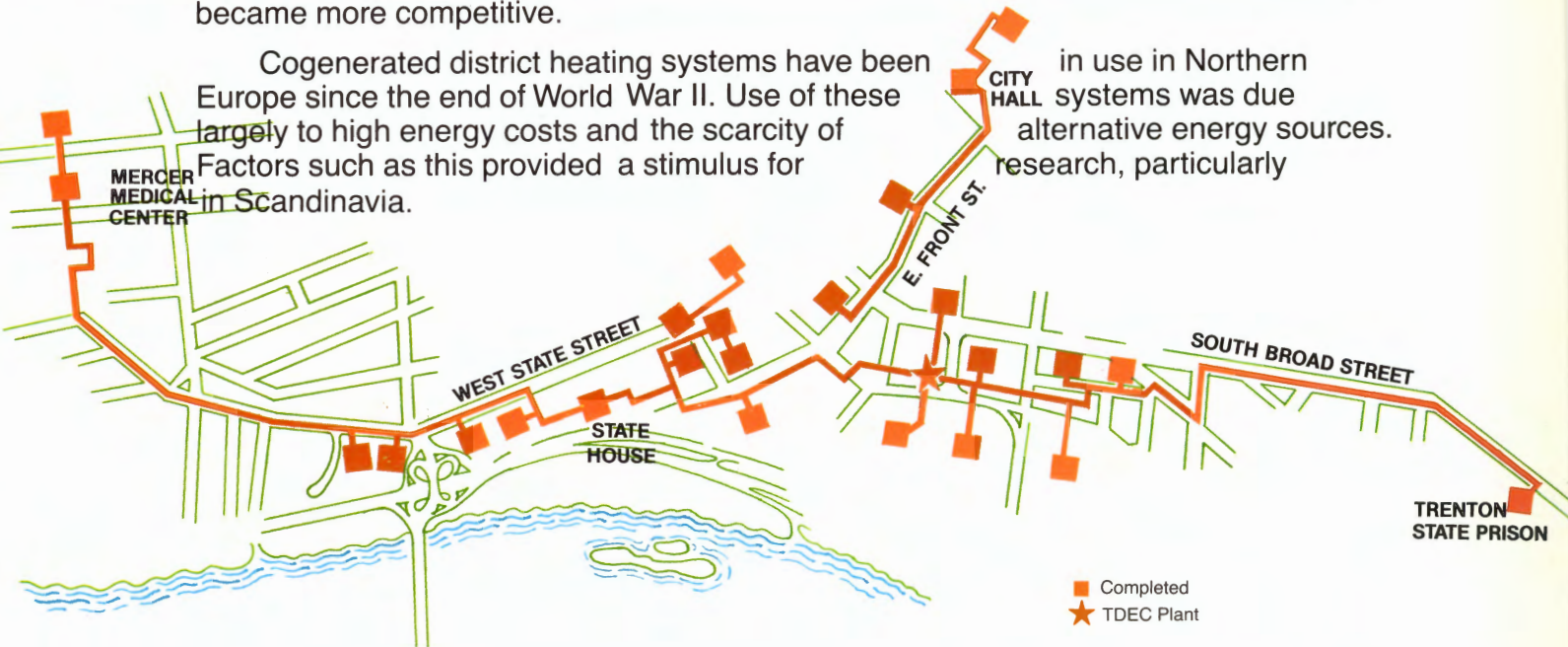
HEATING NETWORK



DEVELOPMENT OF DISTRICT HEATING

In 1877, an underground steam pipe was installed in Lockport, New York to distribute thermal energy from a central source. From that point on, district heating systems were installed in numerous United States cities until the late 1940's when oil and natural gas became more competitive.

Cogenerated district heating systems have been in use in Northern Europe since the end of World War II. Use of these systems was due largely to high energy costs and the scarcity of alternative energy sources. Factors such as this provided a stimulus for research, particularly in Scandinavia.



TRENTON DISTRICT ENERGY PROJECT(S) TO DATE

1984

- N.J. Department of Labor & Industry
- N.J. Department of Health & Agriculture
- Mercer County Detention Center & Courthouse
- Trenton State Prison
- Trenton War Memorial Auditorium
- Luther Arms Apartment Complex
- Kingsbury Apartment Complex
- N.J. State Capitol
- N.J. State Library
- N.J. Department of Education
- Mill Hill Tax Center
- Old Barracks Museum
- The Delaware Building
- The Richard J. Hughes Justice Complex

1985

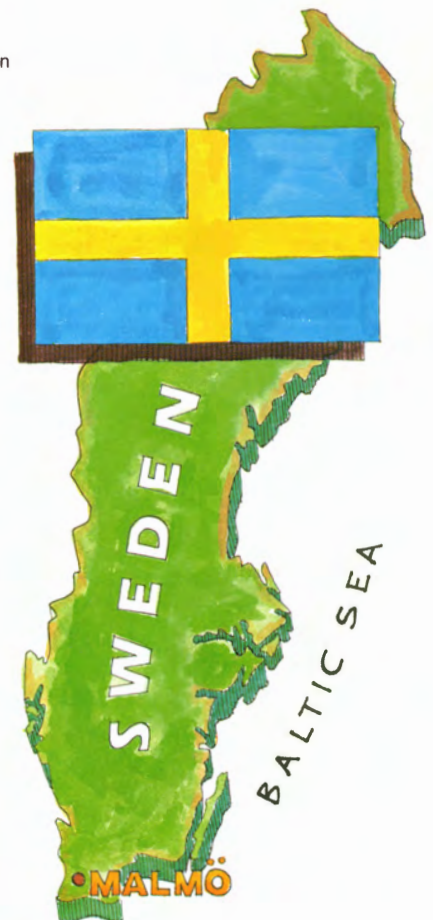
- N.J. Department of Environmental Protection
- Thomas A. Edison State College
- Gregory School
- Glencairn Arms Apartment Complex

1986

- Mercer Medical Center
- Trenton City Hall
- N.J. Department of Taxation
- N.J. Department of Commerce
- N.J. Department of Community Affairs
- Broad Street Bank Building
- N.J. National Bank Building

An example of district heating's popularity can be found in Malmo, Sweden. This community of 250,000 in southern Sweden began cogenerated district heating with three miles of main pipe in 1953 (the TDEC project is comparable in starting size). Today, Malmo has approximately 250 miles of main pipe with a corresponding increase in subscribers.

The Trenton cogeneration plant was completed and the heating system became operational in 1983. It was the first such plant located in an urban setting in the United States in over three decades. It now serves as a model for the nation and has been toured by representatives from over 114 cities around the world. If you would like to arrange your tour or to obtain additional information, call the Trenton District Energy Company at (609) 396-7651.



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This Brochure Was Prepared By
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