

# District Heating & Cooling

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## *Century City*

A City Within the City  
of Los Angeles

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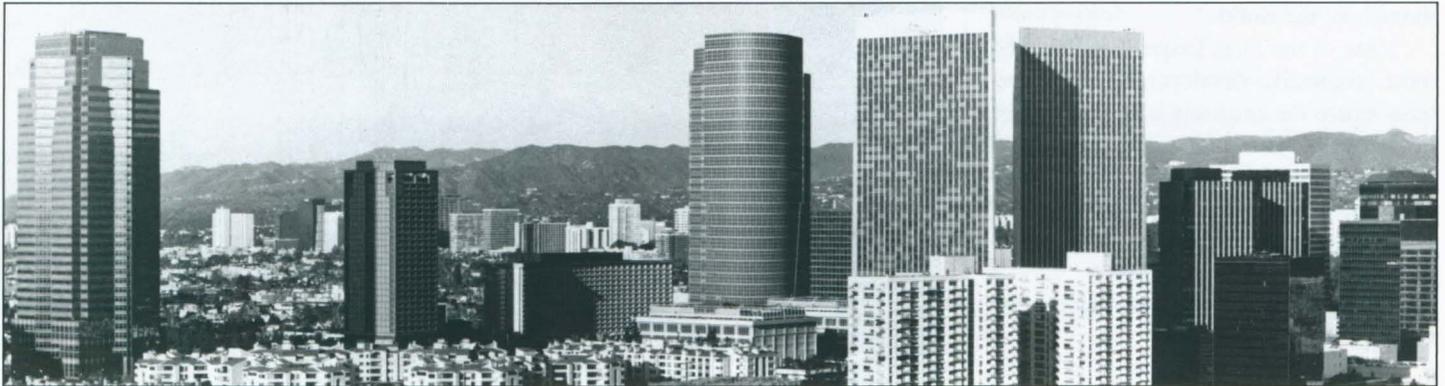
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# Century City

## A City Within the City of Los Angeles

*Heated and Cooled by Pacific Energy*

Century City was a dream coming true for world renowned architect and urban planner Welton Becket, as it erupted from the back lot of 20th Century-Fox in 1960.

Envisioned as a utopia of master planning, today Century City is a bustling megalopolis sitting on 176 acres of some of the richest real estate in the world. Overlooking Beverly Hills in west Los Angeles, Century City is the address of 2,500 businesses and some 40,000 workers.

What was once the movie turf of western stars like Tom Mix and John Wayne, as well as the backdrop of Peyton Place, Sunnyside Farms and Boot Hill, Century City has become the fashionable high rent district of Los Angeles.

*Richard Eckfield, Manager of Customer Relations and Business Development (left), and Glenn Tanner, Century City Plant Manager (right), review plans to connect the new 39 story highrise at 1999 Avenue of the Stars to the CPI chilled water system, with Roger O'Neal (center), Construction Manager for the building owner, JMB/Urban Development Company.*

The complex is a marvel of architectural design as a City within a City with 22 high rise office structures, 2,000 condominiums, a major hospital, one of L.A.'s finest legitimate theaters and the world class Century City Hotel—the western headquarters of Ronald Reagan while in the White House.

***Century City has  
become the fashionable  
high rent district  
of Los Angeles near  
Beverly Hills.***

Century City boasts 100 accounting firms, 200 law firms, 4,000 attorneys, two dozen banks, 50 advertising agencies and over 200 entertainment businesses. One of Century City's newest tenants is none other than former President Ronald Reagan.

The 4,000 condominium residents who live in Century City can walk to work, browse through 200 retail stores, or obtain

the best of medical care from over 200 physicians.

### **CPI's DHC System— Part of Original Plan**

Beneath this mass of steel and structure are miles of underground pipeline, delivering hot water and chilled water from one Central Plant, developed and operated by Pacific Energy's principal subsidiary, Central Plant, Inc. (CPI).

“Like veins and arteries, our plant circulates chilled and hot water to provide nearly all of Century City with year round heating and cooling comfort,” said CPI's manager of customer relations and business development, Dick Eckfield.

The district heating and cooling (DHC) system, designed and built by CPI, was an integral part of the development's master planning, Eckfield said. “It's an exciting, ever expanding development to be a part of.”

CPI's energy plant is one of the world's largest DHC systems, capable of producing over 22,000 tons of air conditioning capacity. It is a power house of equipment containing huge centrifugal chillers, absorption chillers, boilers, pumps, and an array of

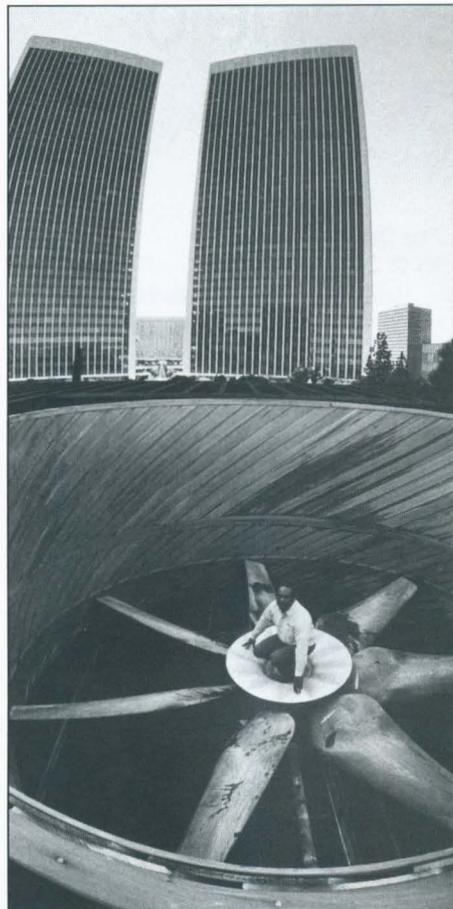
instrumentation, all monitored and maintained by CPI.

### International Interest Growing

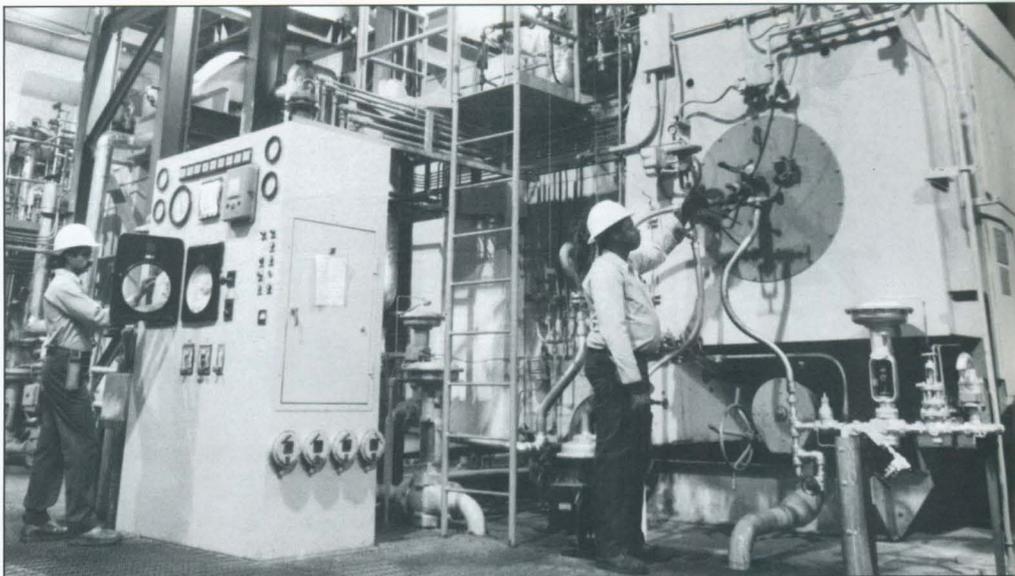
CPI's Century City plant attracts delegations of engineers and city planners from throughout the world.

One of the most frequent visitors and most progressive developers of DHC systems where the emphasis is on cooling are the Japanese. As a nation which must import its energy, the Japanese have long recognized the benefits and cost effectiveness of DHC systems. The concept is supported by the government and promoted by various trade associations located throughout the country.

The continued exchange of ideas through reciprocal trade delegations has benefited the refinement of the cooling oriented DHC systems in Japan and the United States. Besides Japan, European cities like Stockholm, Copenhagen, Dusseldorf, Bonn and Paris have long embraced the centralized energy concept and have been actively expanding their city-wide systems since the 1973 oil embargo, Eckfield noted.



**COOLING TOWER FANS:** Licensed Steam Engineer **Jim Daughtry** checks one of eleven 16-foot-diameter cooling tower fans designed to cool over 40,000 gallons of water per minute.



**HOT WATER BOILERS:** Two story high boilers provide over 380,000 lbs/hour of hot water and steam to serve Century City.

Likewise in Europe, where the coordination of community and private development is common, many cities incorporate a centralized energy system in their master plan.

### Planning in the U.S. Includes DHC

DHC is a proven idea being reborn in the United States. As old inner cities are being torn down to make way for master planned high rise developments, DHC systems are becoming increasingly popular with architects and urban planners.

In institutional settings such as airports and universities, centralized systems are one of the first items incorporated into the master plan. At the University of California at Los Angeles (UCLA), one of our nation's largest and leading educational institutions, central heating and cooling has been an integral part of the campus for over 80 years. Over the next three years, the UCLA campus located a few miles from Century City plans to incorporate an estimated \$100 million refurbishment of its entire DHC system.

### Building Owner Benefits of DHC

The benefits of a centralized district heating and cooling system are numerous.

By having a third party develop and operate the centralized system, Eckfield points out, building owners and managers can save the capital as well as maintenance and labor costs otherwise associated with an inhouse plant. They are also free of the machine noise and cooling tower mist, and can enjoy more reliable service through backup equipment provided in a large central plant.

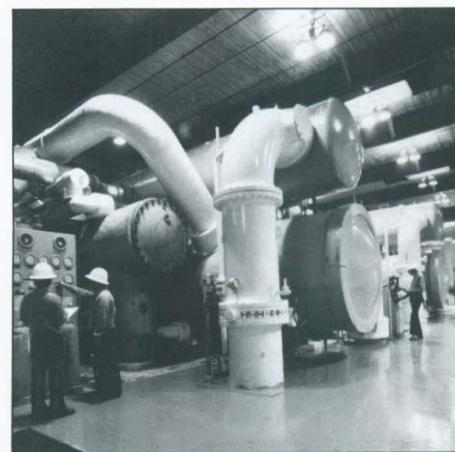
Equally important to the bottom line of the buildings served by a central plant is the added space to rent or use.

In short, what has been recognized in Japan and other countries as an efficient means of heating and cooling large developments is now gaining acceptance in the U.S. as urban developments become master planned and as energy costs continue to rise.

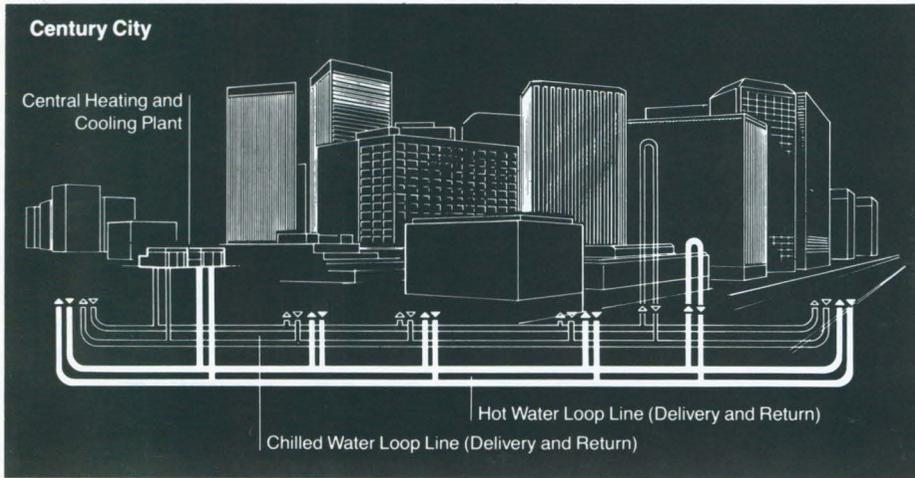
### Still Movie Magic

Century City continues to be a favorite setting for the movie industry.

CPI's plant and its complexity of piping and equipment has served as host to many directors and actors. In *Towering Inferno*, the ultimate high rise disaster film featuring Steve McQueen, Paul Newman and William Holden, CPI's large coolant storage tanks (depicted as large rooftop water tanks in the movie) were blown up by movie magic to



**CHILLER SYSTEM:** Century City's massive 22,000-ton chilled water system is manned around the clock by a crew of 16 full-time employees.



### Key Project Data

Project Location	Century City (West Los Angeles)
Facilities Served	Office high-rise, hotel, theatre, hospital, condominiums
Square Feet Served	10 million
Number of Buildings Served	20
Plant Size - Interior	50,000 sq. ft.
Plant Site Area	1 1/2 acres
Cooling Capacity	22,000 tons
Chilled Water Flow Rate	40,000 gpm @ 85 psig
Chilled Water-line Temperatures	40 F out, 55 F in
Heating Capacity	200 Million Btu Hr.
Hot Water Flow Rate	4,800 gpm @ 280 psig
Hot Water Temperatures	360 F out, 225 F in
Type of Chillers	2 - 7,500 ton, centrifugal, steam turbine-driven 1 - 1,000 ton, centrifugal, steam turbine-driven 1 - 2,200 ton, centrifugal, electric motor-driven 2 - 750 ton, absorption, steam-powered 2 - 1,000 ton, absorption, steam-powered
Type of Boilers	2 - 80,000 lbs. Hr., steam 2 - 110,000 lbs. Hr., steam
Type of Water Heater	1 - steam contactor, 160 psig, 370 F
Type of Cooling Towers	1 - 19,000 gpm induced draft 1 - 53,000 gpm induced draft
Total Pumping Horsepower	7,000
Peak Load	15,480 tons/Hr.
Heat Peak-Load	.70 million BTU's
1988 Annual Load	34,000,000 Ton Hrs 137,000 million BTU's



**FOREIGN VISITORS:** Brian Chapman, Project Engineer with CPI (upper right), leads one of many delegations of energy engineers and urban planners from Japan and other countries who visit CPI's Century City operations each year.

flood and extinguish the raging fire on the floors below, saving one and all.

Most recently, Century City itself played host to Bruce Willis and crew in the spectacular high rise espionage thriller, *Die-hard*, produced by 20th Century Fox, returning to its old home turf.

#### CPI's Energy Plant—A Silent Partner

CPI's the Century City plant occupies over 50,000 square feet on a 1 1/2-acre site on the southeastern boundary of the development.

"We're the silent partner in Century City's success and development," said CPI's plant manager, Glenn Tanner.

The 22,000 ton chilled water system consists of two 7,500-ton York centrifugal chillers, each driven by an 8,000-horsepower Murray steam turbine. An additional

7,000 tons of cooling capacity is provided by two smaller centrifugal chillers, one steam turbine-driven and one motor-driven, along with four steam-powered absorption chillers.

Tanner said that steam for in-plant use and commercial sale is provided by two natural gas fueled Murray boilers rated at 110,000 lbs./hr. (600 psig, 700°F), and two Babcock and Wilcox boilers rated at 80,000 lbs./hr. (285 psig, 417°F).

The hot water system is heated by a 200 million BTU/Hr. natural gas fueled Chicago Deaerating Heater (steam contactor) operating at 160 psig, 370°F. The majority of Century City customers receive both chilled water and hot water service. In addition, steam is piped to the Century Plaza Hotel where it is used for space and water heating, cooking and laundry service.

The chilled water loop system from the plant begins and returns as a 36-inch transite line (40°F out vs 55°F in) and narrows to 10 inches at the farthest customer. The line contains over a million gallons of water and has a maximum flow rate of 40,000 gpm at about 84 psig.

The hot water pipeline system begins and returns (360°F out vs 225°F in) through a 20-inch steel line and narrows to 4 inches at the farthest. It has a maximum flow rate of 4,800 gpm at about 280 psig.

In total, Tanner noted that CPI operates and maintains more than 5 miles of underground pipeline in Century City.

The plant also has two induced-draft Ecodyne cooling towers rated 53,000 gpm.

#### Other DHC Projects by CPI

CPI also operates five other DHC systems in Southern California.

CPI's Bunker Hill plant serves the Bunker Hill Redevelopment area in downtown Los Angeles. CPI was an integral part of the Bunker Hill development which spearheaded L.A.'s new towering skyline. The 14,500 ton plant serves over 5 million square feet of high rise facilities including the space age Bonaventure Hotel, the 50-story Security Bank Tower, the Union Bank

Tower, a twin highrise apartment complex and a 500 unit condominium tower.

The Disneyland Hotel and Convention complex, adjacent to Disneyland, hosting two million visitors and conventioners annually, is also served by CPI. Nearby in Huntington Beach, California, CPI provides DHC services to the McDonnell Douglas Space System Center, where NASA's space lab and space stations are designed and built.

In total, CPI's plants are designed to provide nearly 50,000 tons of air conditioning through its DHC service, Tanner said.

### Contractual Arrangements Emphasize Long Term Service

CPI provides this heating and cooling service under individual long-term contracts with each customer—usually 20 or more years in length, Eckfield said.

Monthly heating and cooling bills are based on actual Btu consumption determined through the continuous measurement of water flow and inlet and outlet temperature differential for each customer.

Eckfield said that what began as an integral part of a utopian master plan in 1965 "will continue to provide reliable low cost service to this ever-growing urban experiment well into the 21st Century."

### Corporate Background—A Century Old

CPI is a subsidiary of Pacific Energy, which in turn is a wholly owned subsidiary of Pacific Enterprises, a Los Angeles based multi-billion dollar holding company which was founded in 1886 and today is publicly traded on the New York Stock Exchange (PET).

Pacific Enterprises' other major subsidiaries include Southern California Gas



5K RUN: Community involvement such as CPI's sponsorship of the annual 5K-10K run is one key to a successful client relationship at Century City.

Company, the nation's largest natural gas distribution utility; Thrifty Corporation, a drug and sporting goods chain retailer with more than 1,000 stores, and Pacific Enterprises Oil Co., a leading independent oil and gas company with operations concentrated onshore in the United States.

Pacific Energy was established in 1982 to build upon the experience developed by CPI to pursue Pacific Enterprises' interests in the development and operation of alternative energy projects. To date, Pacific Energy has developed 22 alternative energy projects which, combined, produce over 100 megawatts of power using resources such as landfill gas, wastewood, geothermal hot water and hydro power. Pacific Energy is now considered among the nation's leading developers of alternative energy projects and DHC systems.

#### Central Plants, Inc.

#### District Heating and Cooling Projects

PROJECT NAME	CITY	STATE	GROSS COOLING TONS	MILLION SQ. FT. SERVED	STARTUP
Century City	Los Angeles	CA	22,000	11.0	1965
Bunker Hill	Los Angeles	CA	14,500	5.0	1965
McDonnell Douglas	Huntington Beach	CA	7,500	3.8	1963
Disneyland Hotel	Anaheim	CA	2,000	1.0	1969
College Park	Fullerton	CA	1,200	0.6	1965
			47,200	21.4	

### Project Ownership, Operation and Experience

Pacific Energy and its subsidiaries, like CPI, develop projects on their own and in joint ventures with others, Eckfield said. "Upon completion of a project, we may elect to sell all or part of our ownership interest to third-party investors, including limited partnerships, in which case we typically serve as general partner. In either case, Pacific Energy or its subsidiary normally continues to have long-term operating responsibility using its own operating and maintenance crews or by contracting with others.

"We believe this pattern of ownership and operation will continue to serve us well, as we expand our holdings in the DHC and alternative energy field," Eckfield said.

### Experience

PE brings together a diversity of corporate experience and financial strength to the alternative energy and DHC market. PE has broad experience in acquisition of federal, state and local environmental and construction permits, and in negotiating long-term energy sales agreements with private businesses and public utilities.

