

District Heating in Rochester

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Rochester's first public utility started in December 1848 delivering manufactured gas made from coal through a network of underground pipes for street and building lighting. The service was expensive and was focused on serving businesses and well-off residential customers in addition to providing municipal street lighting. Customers later used this fuel for cooking and water heating, and as prices dropped by the 1940s manufactured gas was used by many residents for building heating. Manufacturing gas was a particularly nasty process that has required significant environmental remediation at the former plants along the Genesee River.

Manufactured gas displaced natural gas after World War II as pipelines brought gas in from distant supplies and continues to be the most common fuel for heating.

The first of many proposals for water supply systems was made in 1822 but nothing was constructed until shortly after the Civil War, when a privately-owned system was built at great expense but proved to be a spectacular failure and never delivered any water. After Rochester's mayor and common council were unable to agree on a solution, the New York State legislature imposed a solution with an April 1872 law that authorized the mayor to appoint a Board of Water Commissioners to construct a city-owned water system and sidelining the common council from any input about its design and construction. Mayor A. Carter Wilder duly appointed the required commissioners that successfully built not one but two systems, one for fire protection in the downtown area that was demonstrated in February 1874 and a general domestic supply from Hemlock Lake that began service two years later. The water commissioners contracted with the Holly Manufacturing Company of Lockport for a system of direct pressure fire protection that used steam- and water-powered pumps installed on Brown's Race to force Genesee River water through dedicated underground pipes to hydrants in the downtown area, which still operates with many improvements.

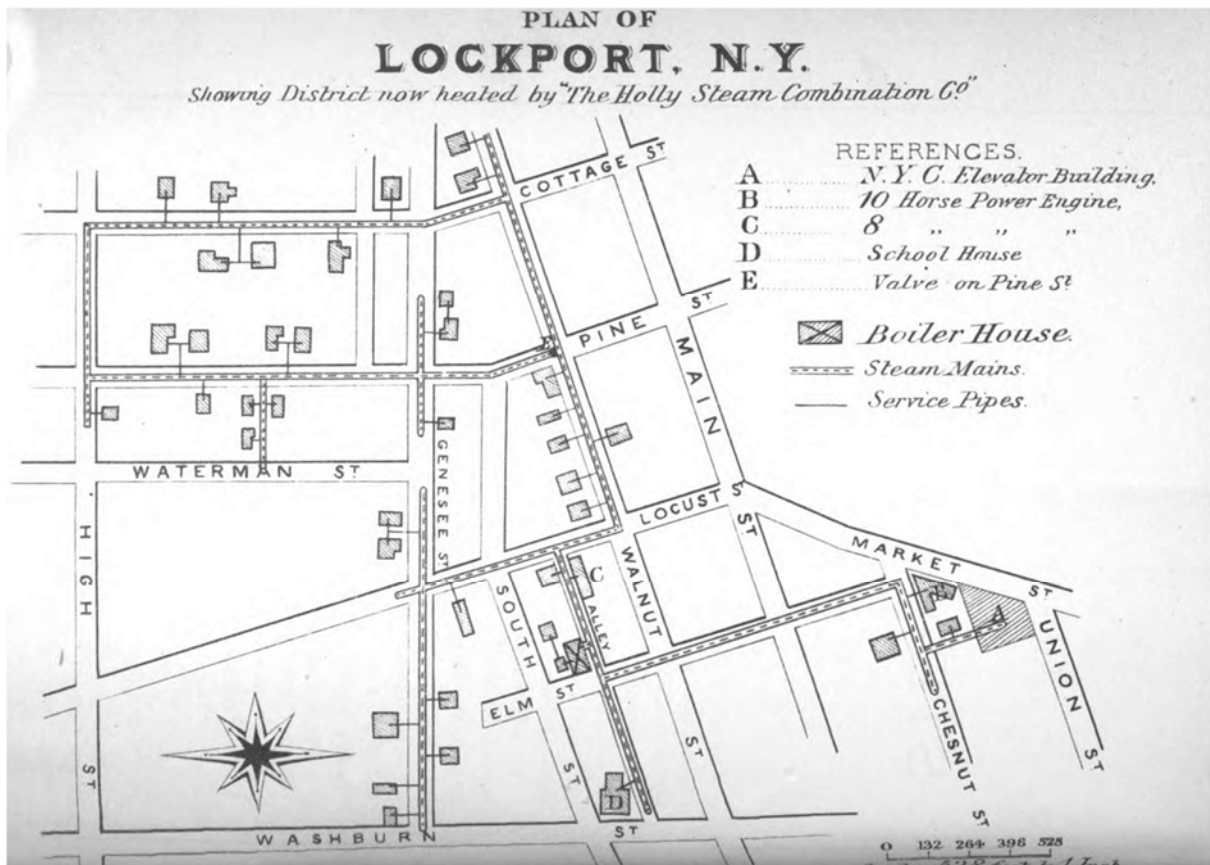
Birdsill Holly had invented the system in response to numerous fires in that community during the Civil War. After installing the first system in Lockport in 1863, a second was built in Auburn in 1865, which convinced him that there was a substantial market for such a system. He obtained a series of patents to protect his ideas and by the time the system in Rochester was demonstrated his company had built more than fifty such systems. Several firms developed competing systems and the Holly company sued them for patent infringement. The company's

trustees were unhappy about spending thousands of dollars to defend Holly's patents in these infringement cases and this, combined with a general downturn in business conditions in the country, led the trustees to decide in June 1876 to stop paying to defend the patents, leaving Holly to bear the legal expenses himself. He responded by giving up active participation in the company although he continued to provide consulting work for them.¹

Holly then applied his inventive talents into a new endeavor—supplying steam to multiple buildings from a central boiler plant on a commercial basis. This was not a new idea as many examples could be found in factories and other multi-building facilities including an 1853 system at the United States Navy Academy. Several early 1870s references mention the advantages of a central steam supply for heat, power, and even cooking. Steam supply companies were incorporated in Pennsylvania in 1869 and Boston in 1873 but did not build anything. Holly tested his concept in 1876 by transmitting steam through 500 feet of pipe buried in his back yard and measuring the amount of heat lost. Satisfied with this, he then installed 490 feet of pipe to heat a nearby residence and that proving successful Holly enlisted a group of local businessmen who had no connection with the Holly Manufacturing Company to form the Holly Steam Combination Company, Limited. The group invested \$25,000 in the company's capital stock, filed an application for incorporation on November 27, 1876 and elected David F. Bishop, a respected local homeopathic physician, as president of the firm. The Lockport *Daily Union* ran an article about the proposed system on the next day, noting Holly's belief that the expense "will not be more than a quarter of that of the private apparatus" while also "doing away with the trouble, annoyance and danger of the fire-place, stove and furnace." The story was picked up by many other newspapers over the next several weeks and accounts appeared in *Engineering News* and *Scientific American*.²

In late February 1877, the City of Lockport granted the new steam company permission to install pipes in several blocks of the city. The system was producing steam by the end of the year, initially serving twenty houses but quickly expanded to serve a school building, the largest hall in the city and forty large dwellings in addition to powering two steam engines, one of which was over a half-mile from the boiler plant on Elm Street.³ The success of the Lockport project was widely reported in the press and was amplified in May 1878 when a federal court in Indianapolis ruled in favor of Holly's water works patent, giving the inventor a large amount of favorable press coverage.

Following the example of Holly's water works system, the steam company issued a detailed pamphlet in June offering to build systems in other cities. Auburn, New York was the first to adopt the system after Lockport and was followed by Detroit and Springfield, Massachusetts.



Map of the Lockport Steam System in 1878, from [Announcement of the Holly Steam Combination Company Limited, of Lockport, N.Y.](#) (Lockport, 1878), page 4.

A group of potential investors from Rochester visited Lockport in October 1878 to inspect the system and begin negotiations for a franchise. A local newspaper reported that the Holly steam company wanted \$75,000 for the exclusive rights to use the system in that city. The investors, which included George C. Buell, I. W. Butts, George E. Jennings, Patrick Barry, M. F. Reynolds, James E. Booth, Henry W. Craig, William S. Kimball and George E. Mumford, formed the Rochester Steam Heating and Power Company in April 1879 with a capital stock of \$100,000. They received permission from the Common Council to install steam pipes in the streets but did not build a system and no more was heard about that effort. Most steam systems were owned by similar companies formed in each city, but the company also sold systems to institutions such as the Western House of Refuge in Rochester, whose November 1879 system allowed them to use a single boiler, rather than the three shown in this image from the early 1870s.⁴



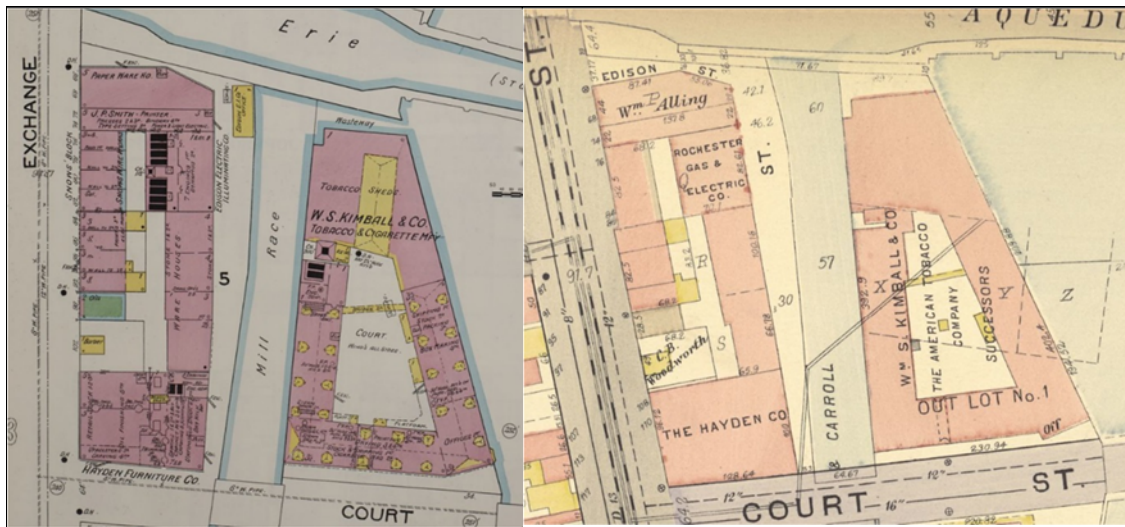
Western House of Refuge (ca 1870, Rochester Public Library)

Several other systems were built in 1879 and one in Denver that began service in November 1880 is the oldest operating district steam company in the world. By January 1881 a total of nineteen systems had been built in cities including Auburn, Detroit, Springfield MA, Milwaukee, Troy NY, Belleville IL, Dubuque IA, Garden City NY, New Haven CT, Hartford CT, Burlington IA, Lynn MA, and Davenport IA, in addition to a number of institutions. That same month the American District Steam Company was incorporated with a capital stock of \$10 million and bought the Holly steam patents and the Holly Steam Combination Company. The principal investor was Wallace C. Andrews, one of the original directors of the Standard Oil Company who had been elected president of the New York Steam Company in 1879. Andrews became vice-president of the new firm, while David F. Bishop continued as president until his death in 1885.

The New York Steam Company engaged noted engineer Charles Emery to design and build their system, and he made several modifications to the basic Holly design, including a condensate return system to increase efficiency and reduce the need to purchase water from New York City's Croton reservoir system. The New York system began service on March 4, 1882 and soon became the largest district steam system in the world, now owned by Consolidated Edison.

Emery's condensate pipes did not survive for long as the corrosive nature of steam condensate proved an ongoing challenge for steam companies.⁵

Many buildings used steam engines to power electric light generators, elevators and manufacturing processes and could utilize district steam rather than their own boilers. The New York Steam Company reportedly served 435 engines in 1887. The exhaust steam from these engines was commonly used to heat buildings. The Holly Company's *Third Annual Announcement* (1880) mentioned that the new Edison Electric Light "requires steam power in order to generate electricity for his subdivided light" and that numerous small electric generating plants could be supplied from a single Holly steam system. The only known example of this was the second Edison electric station in Manhattan that opened in 1886 at 60 Liberty Street and was driven by steam from the New York Steam Company. As late as 1890 the American District Steam Company envisioned a future of small distributed electric generators powered by district steam systems. Holly wanted to capitalize on this concept by introducing the "Holly Double System" in Lynn, Massachusetts and New Haven, Connecticut in 1880. These systems employed a dual pressure network, with live steam at 70 psig powering customer's steam engines, and the exhaust steam at 5 to 10 psig was then sold to heat other buildings through a separate low-pressure steam network. Although the "double system" didn't catch on, distributing exhaust steam from electric light plants would become very popular. The earliest recorded instance of an electric light company selling exhaust steam was the Edison Electric Illumination Company of Lawrence, Massachusetts in August 1885 and seven more were doing so by 1890. The Edison Electric Illuminating Company of Rochester was organized in April 1886 to promote Edison's incandescent lamp that offered "subdivided" electric light, making them practical for buildings of any size. The Rochester Edison Company built a steam-powered generation plant on Edison Street just south of the Erie Canal that began supplying incandescent lamps in downtown buildings in early 1887. One early employee, Thomas H. Yawger, began service as a helper in this plant on December 1, 1888 and worked 12 hours a day, seven days a week, sleeping in the powerhouse at night. After long service with the company and its successors, he wrote a series of articles in 1936 about the development of gas and electricity service in Rochester. He described the Edison plant as having dynamos driven by 125 H.P. horizontal reciprocating non-condensing engines with the exhaust steam from these engines either exhausted into the air or as the temperature varied was used to heat some of the adjacent buildings, which he and others saw as the beginning of the Company's present steam heating system.



Plant of the Edison Electric Illuminating Company of Rochester, Sanborn Fire Insurance Company, Sanborn Fire Insurance Map from Rochester, Monroe County, New York (New York: Sanborn Fire Insurance Company, 1892) vol. 2, [plate 105](#).

City of Rochester, Plat book: carefully compiled from official records and surveys (New York : J.M. Lathrop & Co., 1900), [plate 7](#).

Yawger’s account is the only direct evidence about heating service from this plant, but contemporary references show that any heating from the exhaust steam would have been limited to adjacent buildings as the company never applied for a permit to install steam pipes in streets. District steam service in the area near the first Edison plant was introduced in 1927 but system maps do not show any steam service on the block occupied by the former Edison station.⁷ The company made no mention of steam service from the 1887 Edison plant until 1930, as will be noted later.

Although the American District Steam Company had no real competitors in the district steam marketplace, William E. Prall developed a system of “superheated water” distribution in 1878 that could have made inroads into their business. Prall demonstrated his system to the American Society of Civil Engineers at a dinner he hosted at a prototype facility on West 125th Street in Manhattan where visitors were served bread and meat that had been prepared using 340° hot water. Birdsill Holly had also promoted his steam for cooking, but it was not widely embraced although many commercial kitchens use steam for warming tables. Prall was unable to secure financial backing for his hot water idea until he convinced telephone executive Theodore Newton Vail to back him. A small demonstration system was built in Washington, D.C. and a larger system was constructed in Boston. Vail also established companies in several other cities, including one in Rochester in October 1887. In response, the American District Steam Company proposed to build a steam system in Rochester and both received permission to install their pipes from the city’s Common Council. The Rochester Superheated Water Company was incorporated in October 1887 by Theodore N. Vail of Boston, Richard A. Elmer of New York, Fred W.

Kelsey of New Jersey, and John W. Martin, Marsenus H. Briggs, A. G. Yates and John N. Beckley of Rochester. A pamphlet issued by the Rochester Superheated Water Company provided details about the systems in Boston and Washington and included effusive praise by local water-works engineer Emil Kuichling. The Boston system had begun service in early 1888 and its construction and operation exhausted Vail's financial resources. The superheated water system flashed hot water at around 400° F into steam at each building to provide heat and power, after which the steam was then condensed and returned to the plant. The return water was much more critical to the superheated water system than a steam system due to the large volume of water required, but the superheated water return was nothing more than steam condensate and as was the case with condensate returns on steam systems the return pipes soon corroded and the Boston system came to an abrupt end in November 1889 after 22 months of operation. After this failure, high-temperature hot water district heating systems disappeared from this country until the 1930s after German engineers had solved the problem of returning the water to the plant. Neither the Rochester Superheated Water Company nor the American District Steam Company built a system in Rochester.⁶

The Edison Electric Illuminating Company built a second station in 1890 on property along the Genesee River owned by Junius Lee Judson, president of the company. This plant was primarily designed to generate electricity using water from Brown's Race that ran along the top of the river gorge, but the water supply was not always adequate for electric generation so the company also added boilers and steam engines to insure that electricity could always be generated. The 1887 Edison plant, known as Station #1, was placed in reserve shortly after RG&E opened their larger Station #2 in 1890 and was modified in 1899 to generate electricity using water power from the adjacent Fitzhugh and Carroll Race. The small plant proved uneconomical and was abandoned after the 1904 merger that created the Rochester Railway and Light Company. The former Rochester Railway Company powerhouse on Mill Street then became known as Station #1 until it too was abandoned. The Rochester Edison company merged with two other firms in August 1892 to form the Rochester Gas & Electric Company and Judson was elected President of the combined firm. Two years later Judson, George C. Hollister and others obtained permission from the City's executive board to lay steam pipes through Mill and Furnace streets for the purpose of furnishing heat to their factory buildings. Although Judson was RG&E's president and Hollister a company officer, the company was not interested in the steam business, although it did agree to sell steam

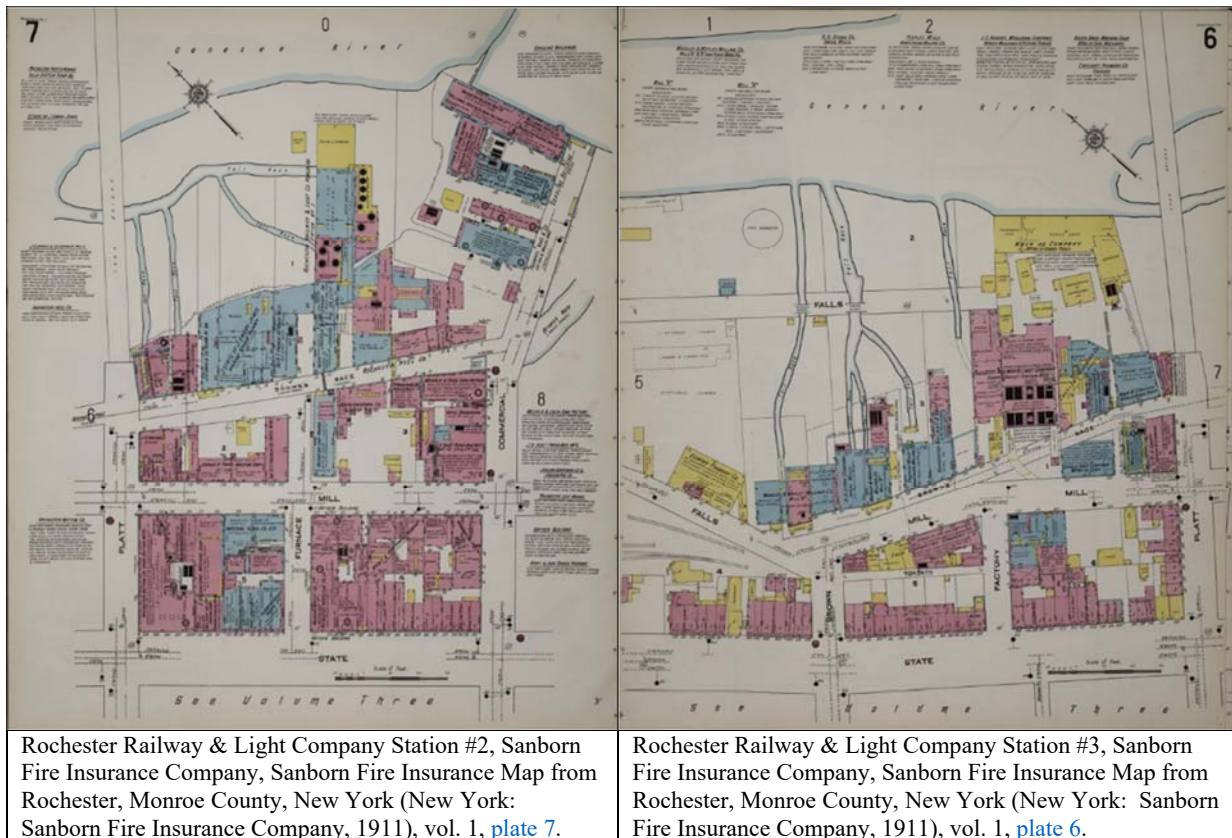


J. LEE JUDSON *1901

PRES. R. G. & E. CO. V.P. FIDELITY TRUST CO. DIR. GERM-AM. BANK. TRUSTEE R. T. & S. D. CO. TRUSTEE SEC. TRUST CO.

J. Lee Judson

to the men who would be responsible for securing the necessary street crossing permits from the city in addition to installing and maintaining the steam pipes. In addition to Judson's factory and the Briggs building owned by Hollister, the Hayden building on State Street were also to be supplied with steam.



No further details of this initial system have been found, apart from references on later Sanford Fire Insurance Maps and a brief mention by Landis Shaw Smith in a 1930 article mentioned below.⁸ The Rochester Railway and Light Company (RR&L) acquired all gas, electric and transit properties in Rochester in 1904, including those owned by RG&E and its competitors including the Citizens Light and Power Company, whose 1893 plant along the Genesee River was expanded and became RR&L's Station #3. The new company was more receptive to the steam business and agreed to supply steam to the Genesee Reduction Company's new plant several hundred feet north of Station #3 in the Genesee River gorge in 1907. This was the first time the company delivered district steam directly to a customer and marks the formal beginning of the steam system. A 1911 Sanborn fire insurance map shows three other customers receiving steam from Station #3: Booth Bros., Noblu Soap Company and E. B. Leary.

A company promoting hot water district heating systems approached the Rochester Chamber of Commerce in 1905 about installing such a system in Rochester. Sixty-one such systems were built in the U.S. between 1894 and 1919, operating at around 200F. They did not become more

widespread due primarily to a lack of a suitable metering device that could measure the flow and temperature difference on a continuous basis, along with strong opposition from companies promoting the use of steam. The company making the 1905 proposal was not identified, but the operating parameters of these systems were largely the same as modern hot water systems developed in Europe that have been widely adopted in many parts of the world, including a few in the U.S.⁹

In the early era of the electric utility industry, many industrial facilities and larger commercial buildings generated their own steam and electricity using their own on-site, or isolated, generating plants burning coal.



Rochester Railway & Light Company East Gas Plant and Bausch & Lomb Factory, Sanborn Fire Insurance Company, Sanborn Fire Insurance Map from Rochester, Monroe County, New York (New York: Sanborn Fire Insurance Company, 1911), vol. 2, [plate 12](#).

Rochester Railway & Light Company Station #35, Sanborn Fire Insurance Company, Sanborn Fire Insurance Map from Rochester, Monroe County, New York (New York: Sanborn Fire Insurance Company, 1911), vol. 3, [plate 253](#).

Electric companies were eager to turn these large electric consumers into customers, but often had to agree to also provide steam that would allow customers to shut down their own generating plant. This was the case in 1909 when Bausch & Lomb agreed to buy electricity and steam from RR&L for their manufacturing plant on St. Paul Street on the east side of the river. Rather than construct a steam line across the river from Station #3, steam was initially provided from the adjacent RR&L east gas works. The following year (1910) RR&L built a small plant (Station #35) at 30 Litchfield Street that supplied steam to the adjacent Utz & Dunn Shoe Factory and the carriage factory of James Cunningham Son & Co.¹¹

Nearly 300 commercial district heating systems companies were operating across the country by 1909, most affiliated with local electric companies. Six representatives from these companies met in Toledo during July and agreed to form the National District Heating Association (NDHA), which held their first annual convention in Columbus that November with thirty-two members paying annual dues of \$5.00. RR&L joined the new group in 1910, the same year it organized a steam department, and selected Roger D. DeWolf of the engineering department as their first representative. He gave a paper at the 1911 NDHA



Roger D. DeWolf

convention, where he was elected a vice president and appointed chairman of the rate committee. He was unable to attend the 1912 convention in Detroit, but was nevertheless elected president of the association, the first of seven company employees to hold that position. The association held the first of two annual conventions in Rochester at the Hotel Seneca in May 1914. The American District Steam Company sponsored a special Pullman train that carried more than 125 of the attendees on a trip to visit the 1877 heating plant in Lockport and their factory in North Tonawanda. The day ended with a tour of Niagara Falls and banquet at the Clifton Hotel on Canadian soil.¹²

The New York Public Service Commission was granted authority to regulate steam corporations in May 1913 and began publishing annual reports that included financial and other information about each system they regulated. As with gas and electric companies, the commission also regulated steam rates, terms of service, and capital expenditures. These reports, along with the publications from the company and NDHA provide a fairly complete picture of steam operations for several decades. Eastman Kodak built a new



Edward L. Wilder

headquarters and factory on State Street in 1914 that were supplied with steam from nearby Station #3. Later that year RR&L began supplying steam from another small plant (Station #26) in the Beehive Building at 42 Aqueduct Street. RR&L's transit operations were transferred to the New York State Railways in 1909 and the company's name was changed to the Rochester Gas & Electric Corporation on November 10, 1919. In 1922 RG&E engineer Edward L. Wilder was elected president of the NDHA. The company constructed a bridge across the Genesee River by Station #3 in 1923 to carry a high-pressure

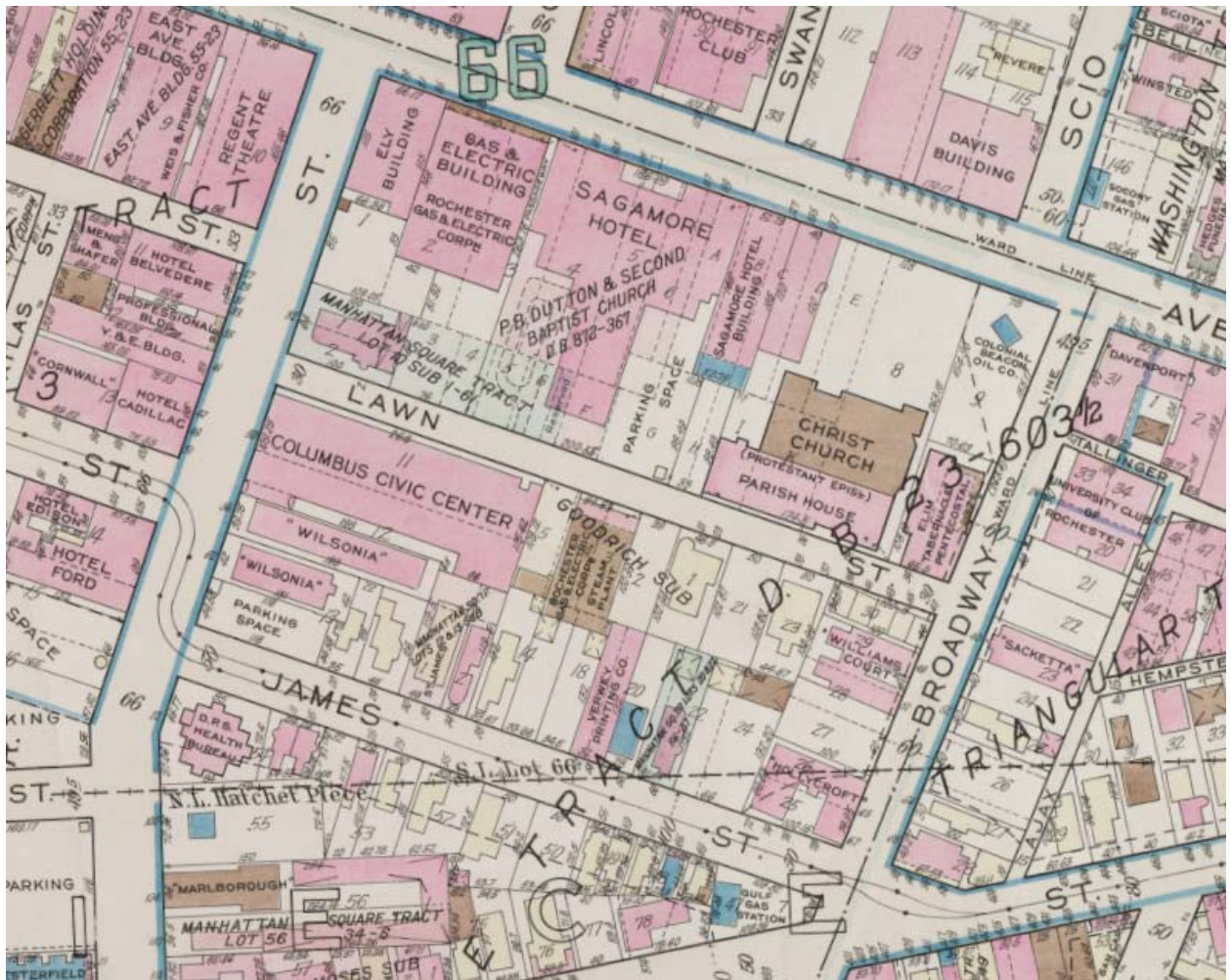
steam line to supply the Curtice Brothers and other customers on the east side of the river and this line was later extended to serve additional customers in the vicinity of St. Paul and Platt Street.¹³

The University of Rochester began planning a new Medical Center and River Campus in 1922 and RG&E proposed building a dedicated steam plant to serve their heating needs. After some consideration, the University decided to buy electricity from RG&E and build its own steam plant adjacent to RG&E's station #33 south of Elmwood Avenue, which had been built in 1907 to interconnect with the Niagara, Lockport and Ontario Power Company's lines from Niagara Falls. The university's new heating plant (shown below) was adjacent to the Lehigh Valley Railroad that allowed coal to be delivered by rail. The university had built an earlier heating plant in 1904 to serve their Prince Street Campus east of downtown Rochester.¹⁴

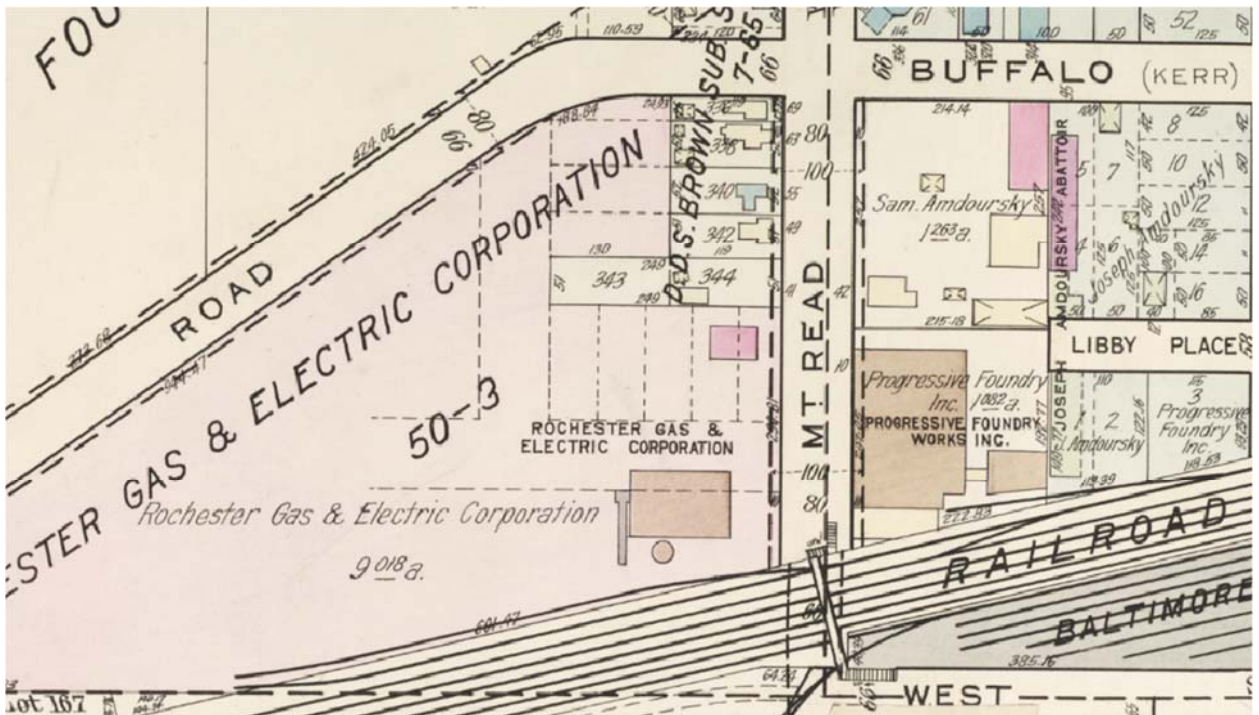


[August 4, 1931 picture](#) of the University of Rochester's Central Heating Plant adjacent to RG&E's Station 33.

RG&E continued to expand their steam system and in 1924 inaugurated a major expansion of steam service into the downtown area by purchasing the heating plant of a Euclid Avenue building that provided steam to the Cutler Building on the north side of East Avenue. The company's intent was to use this plant to supply steam to other nearby customers until the completion of new plant on Lawn Street near the company's new 10-story office building at 89 East Avenue. This plant (Station #8) began operating on October 15, 1925 and generated both high and low pressure steam to supply buildings within 3,000 feet of the plant. Two pulverized coal boilers produced 120,000 pounds per hour of steam at 375 pounds per square inch gauge (psig) sig with 100 degrees Fahrenheit of superheat. This steam drove a 2,500 kilowatt (kW)



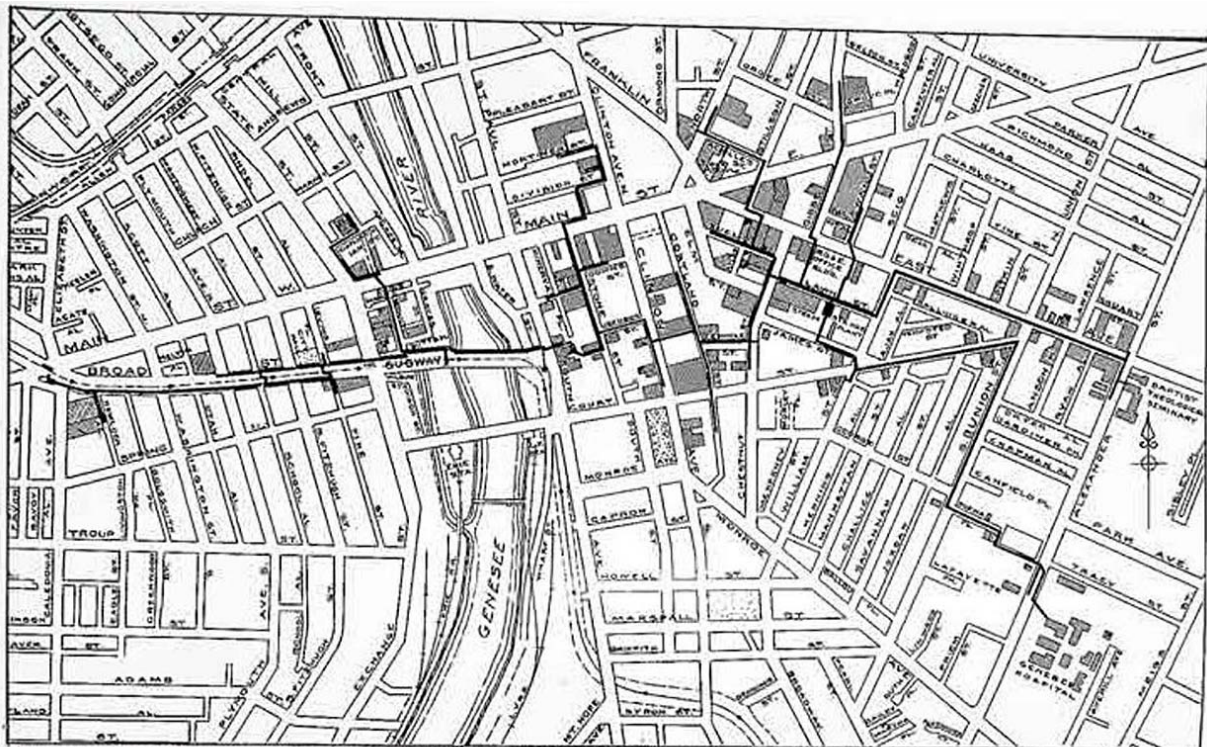
Lawn Street Steam Plant from 1935 City of Rochester Plat Book, Volume 1, [Plate 1](#)



RG&E Station #9 from 1935 City of Rochester Plat Maps, Volume 2, [Plate 38](#)

multi-stage non-condensing turbine that exhausted steam at 5 to 15 psig for heating buildings. The building was designed with ample room for additional boilers and a larger turbine to meet anticipated load growth in the downtown area. Prior to March 1926, RG&E and its predecessors had obtained street-crossing permits from the City of Rochester for each steam pipe laid in city streets. That month the company sought a franchise from the Common Council covering the services areas of the older Station #3 and the new Station #8, which was granted after the company won the required public auction of the 25-year franchise rights.¹⁶

A high-pressure steam line was built from Lawn Street in 1927 to serve customers on the west side of the Genesee River, crossing the river inside the Broad Street subway tunnel which was the bed of the old Erie Canal aqueduct. By 1928 the downtown plant's steam lines extended from the Graflex plant on Caledonia (later Clarissa) Street to the Eastman School of Music and Genesee Hospital.¹⁵



Last year 11,230 feet of steam mains of various sizes were installed underground by the Steam Department. Among the newly installed mains are all those west of South Avenue, on the above map. Shaded areas indicate buildings served with steam in the Lawn Street District only.
Map of steam line additions in 1927 and buildings served by Lawn Street Station, from [Rochester Gas & Electric News & Year Book](#), February, 1928

The successful operation of Station #8 led RG&E to build a second new steam plant, Station #9, to serve industrial customers in the Lincoln Park district in west Rochester. This plant was located on Mount Read Boulevard between Buffalo Road and the New York Central Railroad and opened in November 1927. A non-condensing steam turbine was added in January 1929.

A 1922 RG&E publication stated that “about fourteen years ago the Company started to sell steam for industrial and heating purposes on a small scale,” The first Edison plant was not mentioned in connection with the steam system until June 1930, when steam sales manager Landis Shaw Smith presented a paper at the convention of the NDHA in which he mentioned that “steam heating from a central station in Rochester first started in 1889. The steam used was exhausted from the engine at an old Edison D. C. electric plant and sold to nearby factories and buildings at a low rate. There is little data available as to just how much steam was sold or how many customers were supplied, but this plant was in operation for ten years and was the beginning of district heating in Rochester.” At this same convention Smith was elected the thirty-first president of the NDHA.



Lawn Street Station 8 from *Bulletin of the National District Heating Association* 22 (4):1 (15 July 1935)



Lincoln Park Station 9, from [The RG&E Story](#) (1957), Page 48.

Smith embellished the story in 1934 by adding that Rochester was “the third city to have district steam heating” after Lockport and New York City. The American District Steam Company’s 1890 publication mentioned above lists 21 systems they had installed before 1889, along with the 9 others installed in 1889 and 1890. RG&E’s 1948 *Centennial Book* took it further by adding that “steam from the old Edison plant near Erie Canal at Exchange Street was being sold to nearby buildings, including the Athenaeum (now the Rochester Institute of Technology), stores and taverns.” These “facts” were widely

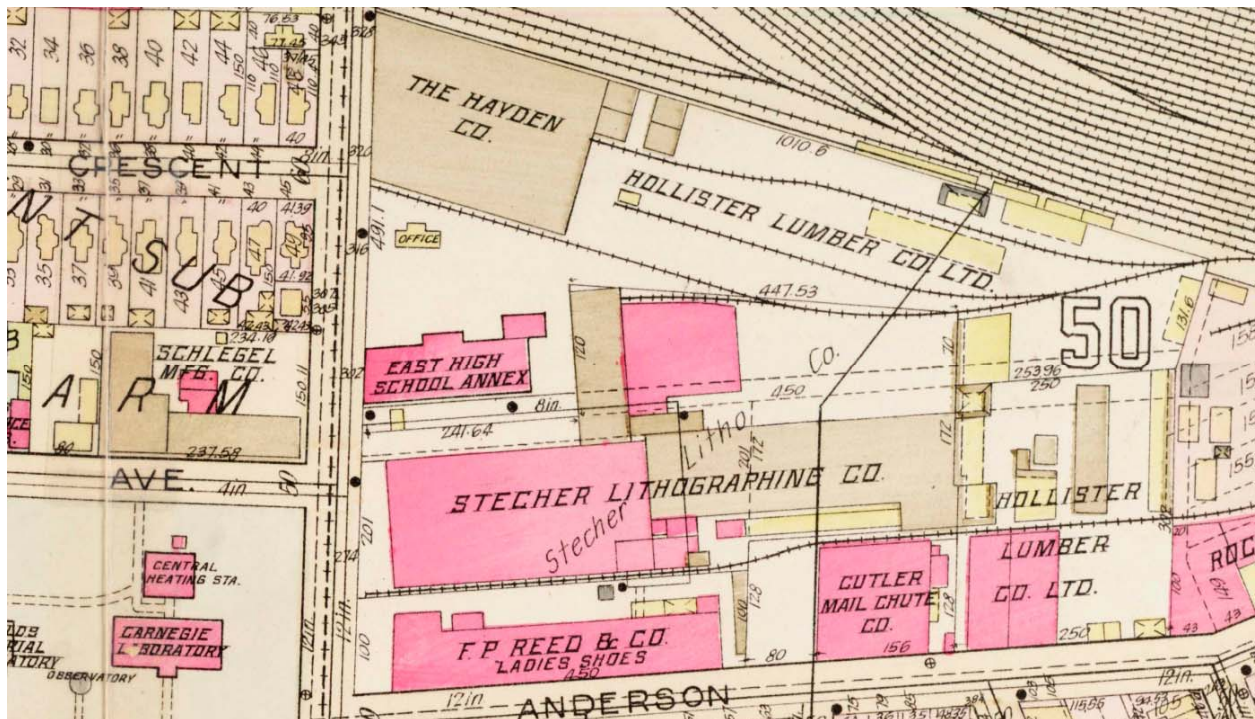


Landis Shaw Smith

repeated in later RG&E publications and can still be seen in this plaque on the Pont du Rennes bridge overlooking the former Beebee Station site..

The company bought the heating plant of the Steicher Lithographic Company at 274 Goodman Street in 1930, which became Station #11. This plant served the nearby E. P. Reed and Schlegel Manufacturing Companies and the company extended steam to the adjacent Hayden Furniture Company.¹⁷

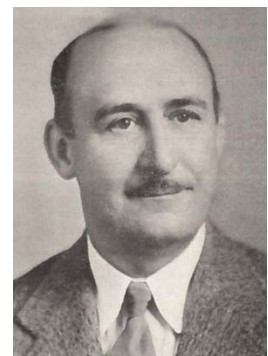
Abundant supplies of coal only arrived in Rochester in 1883 and the increased consumption of lower quality bituminous fuel led to complaints about the “smoke nuisance.” After a variety of voluntary measures failed to clean up the air, the city enacted a smoke ordinance in 1906 and installed a smoke inspector on the 15th floor of the Lincoln Alliance Bank Building who was equipped with a telescope to aid in keeping an eye on the 1,850 chimneys under his care.



Plat book of the City of Rochester, N.Y. [Plate 12](#) (1926)

The NDHA held their annual conference in Rochester for the second (and last) time at the Sagamore Hotel from June 12 to 15, 1934. The meeting was sponsored by RG&E and included tours of their steam plants and distribution system. Attendance was 150, including 33 ladies and children.¹⁸

The supervisor of RG&E’s steam department, Julius J. Schenk, was elected president of the NDHA in 1943. By the 1950s RG&E eagerly pointed out that its steam network had eliminated hundreds of small chimneys throughout the city while also working to reduce emissions from their own stacks, such as the 1941 installation of electrostatic precipitators on the



Julius J. Schenk

boilers in Stations #3 and #8.



[Plaque on Pont du Rennes bridge.](#) “In 1889 Rochester was the third city in the country to have a steam heating system, ending much of the smoke nuisance downtown.”

The company also shared its steam knowledge with others, including Philippe Schereschewsky, Director of the Cie Parisienne de Chauffage Urbain, who visited Rochester and other American cities to learn about distribution of high pressure steam. In a 1943 talk he specifically mentioned that he was “very kindly welcomed” during his visit.¹⁹

The end of World War II brought opportunities for new load growth and the company sought permission from the city to expand their steam franchise areas, which was auctioned in 1945 to the high bidder—RG&E—for \$325. Growing steam consumption by downtown buildings required more steam than Station #8 could deliver with its existing boilers. Rather than installing another coal boiler at its downtown plant that would not only require increased truck deliveries of coal but would result in more smoke production in the downtown area, the company chose to generate the additional steam at Station #3 on the Genesee River and deliver it to Lawn Street through a new high pressure steam line that was completed in 1946.

This allowed the larger Station #3 to carry the base steam load in the downtown area while Station #8 provided peaking and backup service. This worked well and allowed rapid system expansion to continue in the downtown area while minimizing the amount of coal consumed in the Lawn Street plant.²⁰



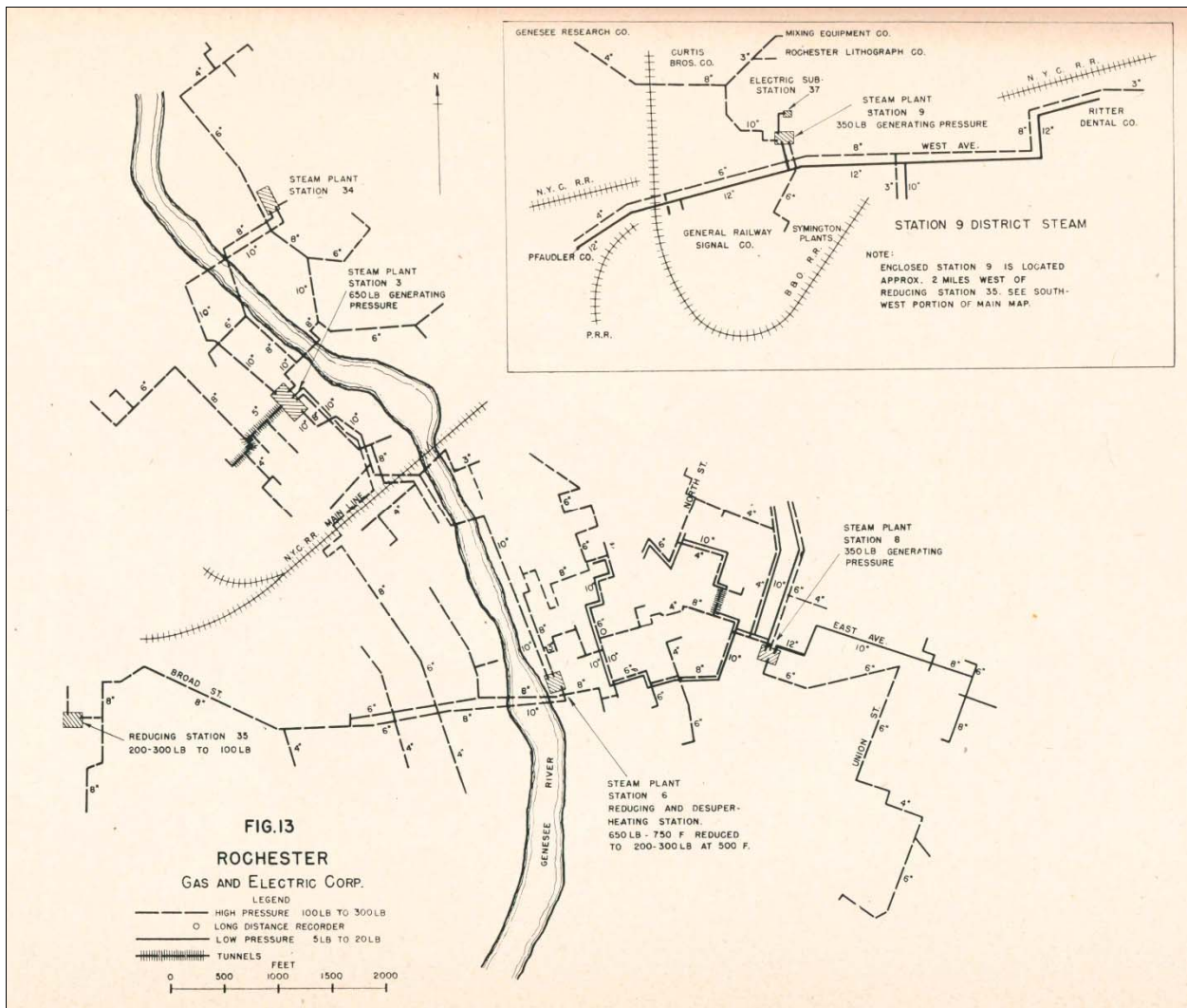
Alfred T. Veness

Steam sales supervisor Alfred T. Veness was elected president of the NDHA in 1951.



Aerial View of RG&E's Beebe Station, from Ruth Rosenberg-Naparstek, "The Development of Gas and Electricity in Rochester," *Rochester History* 60 (4): 16. (Fall 1998)

2014 [Aerial Photo of Beebe Station](#)



[Map of Rochester Gas & Electric Corporation's Steam Distribution](#), from National District Heating Association, *District Heating Handbook, Third Edition* (Pittsburgh: National District Heating Association, 1951), 143.



A smokey city—a downtown birds-eye glimpse of Rochester taken in the 1930's on a cold January day



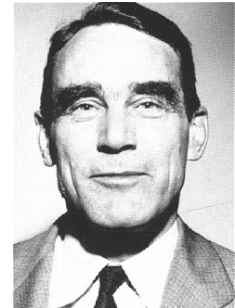
Twenty years later, with 95% of central downtown buildings heated with RG&E steam

[Smoke in Downtown Rochester in the 1930s and 1950s](#), from Arthur P. Kelly, *The R.G.&E. Story: A company dedicated to the public service*, (Rochester: Rochester Gas and Electric Corporation, 1957), 47.

A new steam line was installed in 1954 from Lawn Street to the former Steicher Plant (Station #11) on North Goodman to serve the buildings on the University of Rochester's Prince Street Campus after the College for Women merged with the College for Men on the River Campus.

The University sold most of its buildings, including the 1904 boiler plant, but kept the Memorial Art Gallery, Cutler Union and two dormitories. Many of these buildings, including the remaining University buildings, chose to use RG&E steam rather than install their own boilers, and the system continued to grow, reaching a peak of 618 customers in 1956. A 1957 company history stated that 95% of the central downtown area used steam for heating and that the overall system served 470 commercial, 120 industrial, 24 municipal, and 2 residential steam customers with annual revenues of \$3,942,365. This history also emphasized the reduction in smoke in the downtown area from eliminating smaller, inefficient boiler plants.²¹

Long-time RG&E employee Peter Barry was a member the city's common council from 1950 to 1965 and served as mayor from 1955 to 1961. He was promoted to superintendent of RG&E's steam distribution department in 1964. RG&E's steam sales were the fourth highest in the country from 1951 to 1953 and again from 1965 to 1968. The system in New York City had been the largest since the 1880s and Rochester had been in the top five since



Peter Barry

1941, competing with Detroit, Philadelphia, Indianapolis and Boston. These good times were not to last, however, as urban renewal, more stringent air pollution regulations, and rising fuel costs resulted in sharp increases in steam prices and the loss of more than 80% of customers by 1984. Large-scale urban renewal in downtown Rochester had first been proposed in the 1940s and started slowly in the 1950s before gaining traction in the 1960s. Initially focused on removing derelict buildings in the downtown business district, the movement expanded to remove slums and other blighted residential neighborhoods, mostly housing people of color. These were demolished, displacing residents who were largely barred from suburban area and limited to marginal and crowded housing conditions in the city. Along with neighborhoods, many small businesses and factories that were RG&E steam customers were also bulldozed to make room for new highways through the center city. Despite this, RG&E optimistically anticipated in 1967 that urban renewal would result in a doubling of existing steam loads as larger buildings replaced older ones. Steam sales peaked at 4.22 billion pounds in 1972, dropping rapidly as construction of new buildings was slow and many natural gas or electricity for heating rather than steam. In addition, RG&E had to pay substantial amounts to reroute their steam lines around new highways and building sites, resulting in increased rates that were spread across a declining customer base.²²

A second blow to the steam system was increasingly stringent air pollution regulations. Early regulations had focused on visible smoke while newer ones addressed sulfur dioxide, nitrous

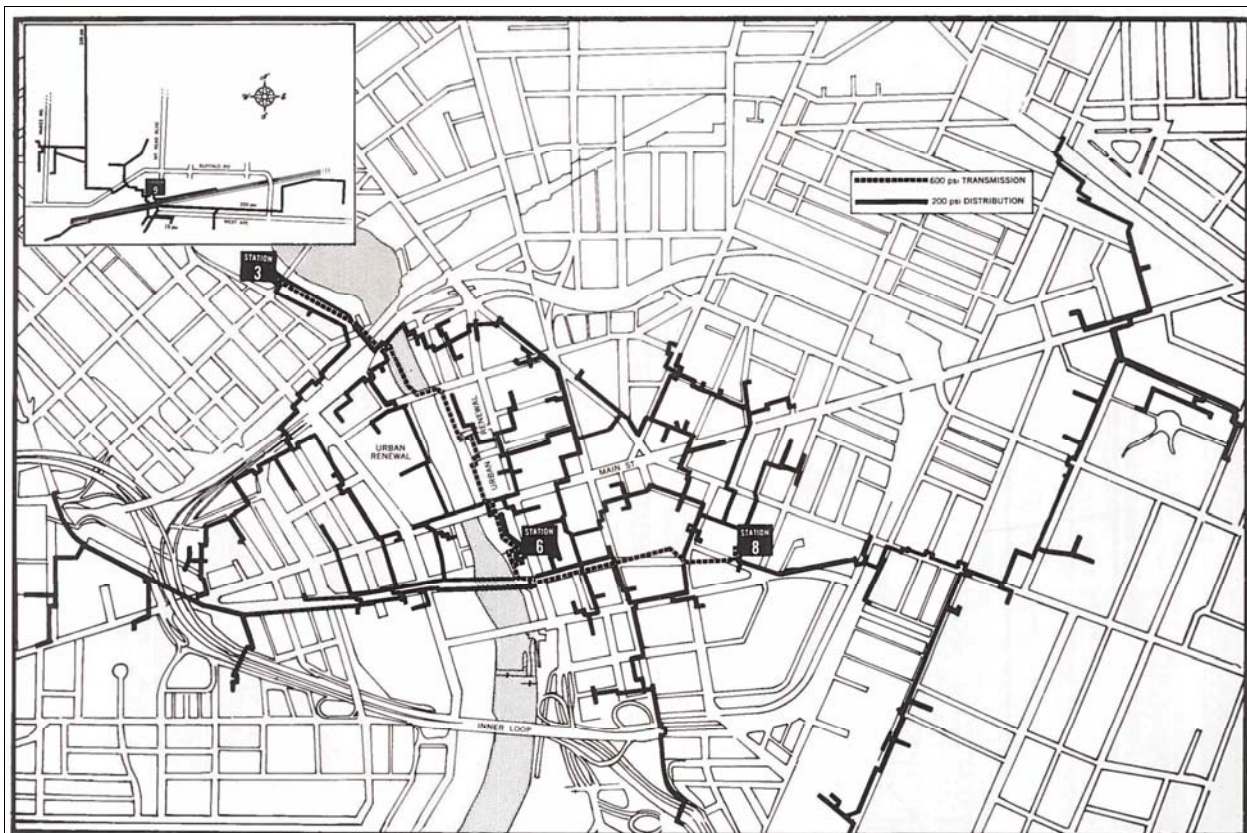
oxides and particulates among others. Although RG&E promoted the construction of its Ginna nuclear plant in the late 1960s as a means of reducing pollution from coal-fired electric generation, this plant offered no benefit to steam customers. The easiest way to meet new emissions standards was switching to a cleaner fuel such as natural gas or oil, with the Lawn Street and Lincoln Park plants converting to natural gas by 1970. A 75 MW coal-fired steam turbine was installed at Station #3 in 1959, when the facility was renamed Beebee Station after former RG&E Chairman Alexander M. Beebee. The new boilers for this larger turbine had better emissions controls that allowed it to continue burning coal, but as a straight condensing turbine it was not designed to supply district steam. The smaller, older boilers at Beebee that supplied the steam network were modified to burn #6 residual fuel oil between 1971 and 1973, a project completed just as the first Arab oil embargo triggered a rapid rise in oil prices, which was the third blow to the steam system. Fuel oil prices increased by over 500% between 1973 and 1984, while natural gas production and pricing was constrained by federal and state regulations that resulted in price increases of more than 800% between 1969 to 1984. Although these conversions were a simple way to reduce air emissions, RG&E had concerns about volatility in natural gas and oil markets that proved to be well founded. In 1970, even before fuel prices had started increasing, RG&E expressed interest in “purchasing the steam produced by a solid waste, steam generating, incinerator assuming that it is of the pressure and temperature the RG&E Corporation can use.” Municipal waste streams are fairly uniform throughout the year and its economical use as a fuel requires a constant incinerator load. District steam demand is very seasonal and temperature dependent so locating the incinerator at a site where the steam can also be used for electric generation would be very helpful. The city had built a mass burn incinerator in 1912 near the Beebee station and this was deemed to be an ideal location for a new incinerator. Most municipal solid waste incinerators use mass burn technology, but such plants were not only very expensive to build and maintain but also introduce complex air emissions challenges. Monroe County sought to avoid the issues of mass burning by proposing to build a plant that would convert a large percentage of the county’s solid waste stream into pelletized refuse-derived fuel (RDF) that could be easily transported and burned. RG&E signed a 20-year contract with Monroe County for a supply of RDF, with the question of who would build, own, and operate the incinerator at Beebee to be determined later. RG&E’s initial focus on using RDF to support the steam system soon evolved into a plan to co-fire RDF at the larger Russell Station on Lake Ontario, although a future RDF incinerator at Beebee was often mentioned. Monroe County selected the Raytheon Service Company to build and operate an RDF plant on

Emerson Street. Raytheon did finally produce RDF in 1981, but after testing it at the Russell Station RG&E concluded that it was not worth the effort. A total of \$85 million had been spent on the RDF project, which earned the nickname “Blue Elephant” for its exterior color, by the time it was abandoned in 1984.²³

The NDHA changed their name to the International District Heating Association (IDHA) in 1968 and RG&E’s steam sales superintendent Alvin B. Spetz was elected president of the organization in 1973. With no easy options to reduce steam costs, the system continued to shed customers. A September 1978 newspaper article mentions that RG&E lost one-third of its steam customers over the past 10 years while the cost of steam increased 369 percent over the same period. The cost of steam went from \$1.66 per 1,000 pounds, including a base rate of 99 cents, taxes of 13 cents, and a fuel cost of 54 cents, to \$7.64 with a base rate of \$2.93, taxes of 83 cents, and \$3.80 for fuel. In January 1980 the steam price had increased to \$10.50 with more increases planned. In October 1981 RG&E proposed spending \$13 million to revamp the steam system in hopes of attracting new customers.



Alvin B. Spetz



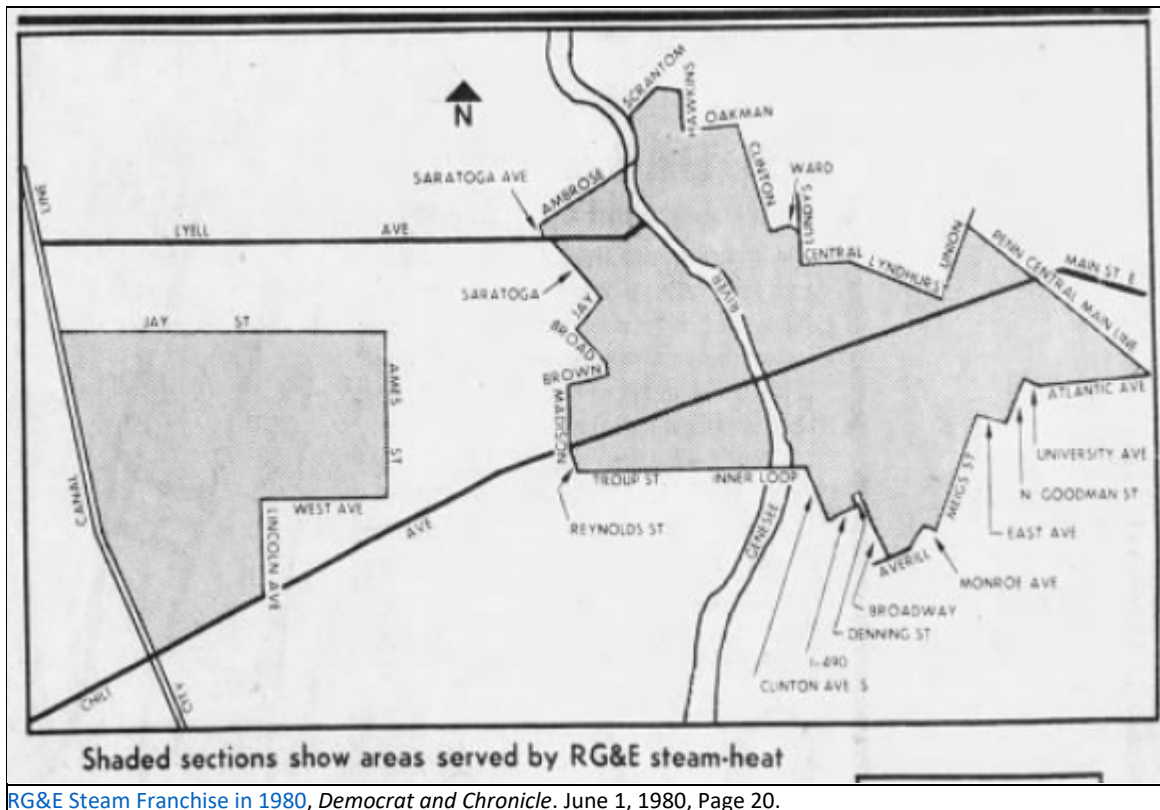
ROCHESTER STEAM SYSTEM

[Rochester Steam System](#), from Robert E. Botsford, “The Rochester Steam Story,” *District Heating* 66 (4): 10 (2nd Quarter 1981).

In 1980 the IDHA elected RG&E steam superintendent Robert Botsford as their president. The company planned to convert the boilers at the Beebee Station from oil to natural gas by the end of 1983 and convert them back to coal by the fall of 1985. This would allow the company to maintain its current steam price of \$13 per 1,000 pounds despite increased oil and natural gas prices. The company's steam franchise area was shown in a 1980 newspaper article.²⁴



Robert Botsford

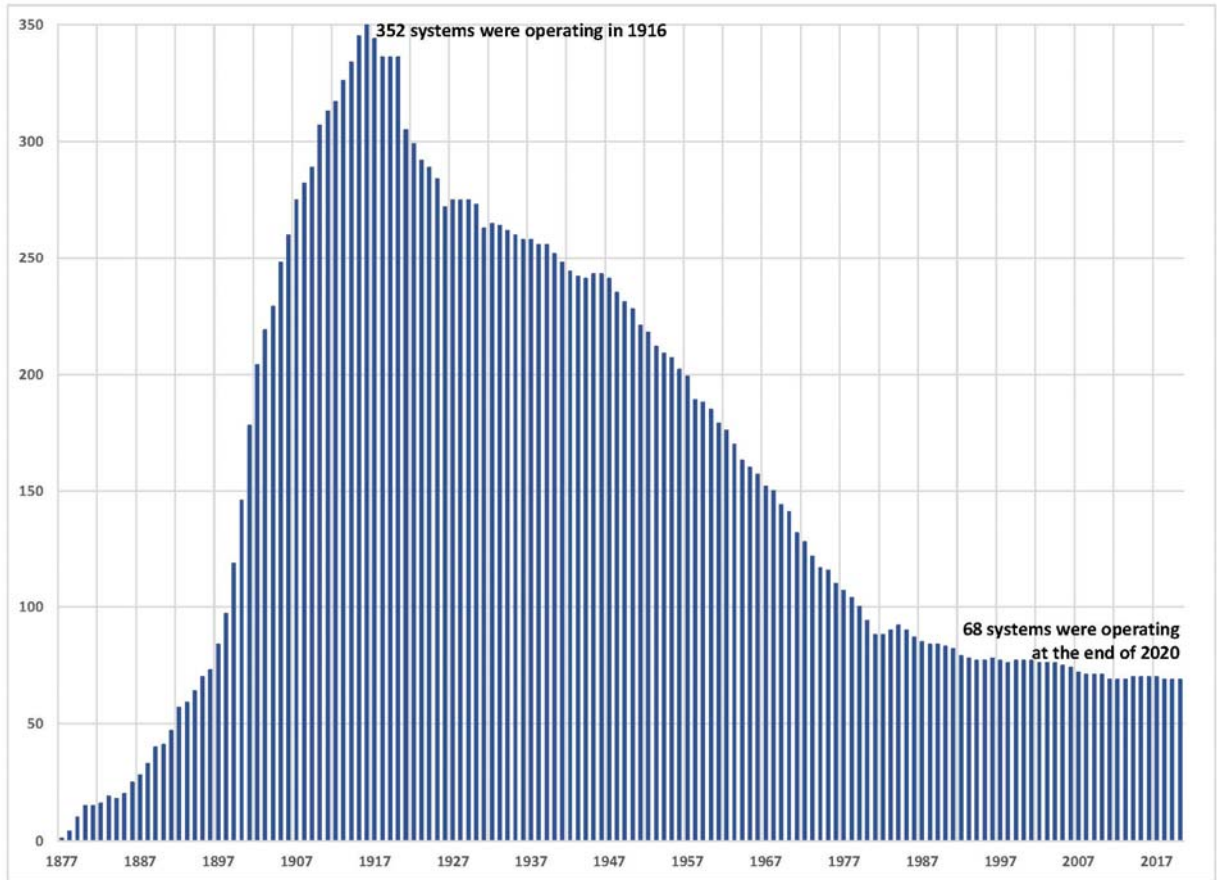


[RG&E Steam Franchise in 1980](#), *Democrat and Chronicle*. June 1, 1980, Page 20.

From 1877 to 1916, the district heating industry had grown rapidly, reaching a peak of 352 systems. The number of systems then steadily declined until the early 1970s, when the Arab oil shocks rattled American energy markets. The federal government took an interest in district heating by keeping existing systems operating and to promote new ones. Between 1975 and 1992, the Departments of Energy (DOE) and Housing and Urban Development (HUD) sponsored more than a hundred studies of existing and potential district heating systems using a variety of fuels including coal, geothermal and nuclear. One such study prepared by the Oak Ridge National Laboratory in September 1981 focused on the RG&E steam system and provided a detailed overview of the system's history and decline, along with recommended solutions to keep the system in operation. Appendix B of this report includes a fairly comprehensive list of customers who joined or left the system over the prior ten years. Customers left the system for

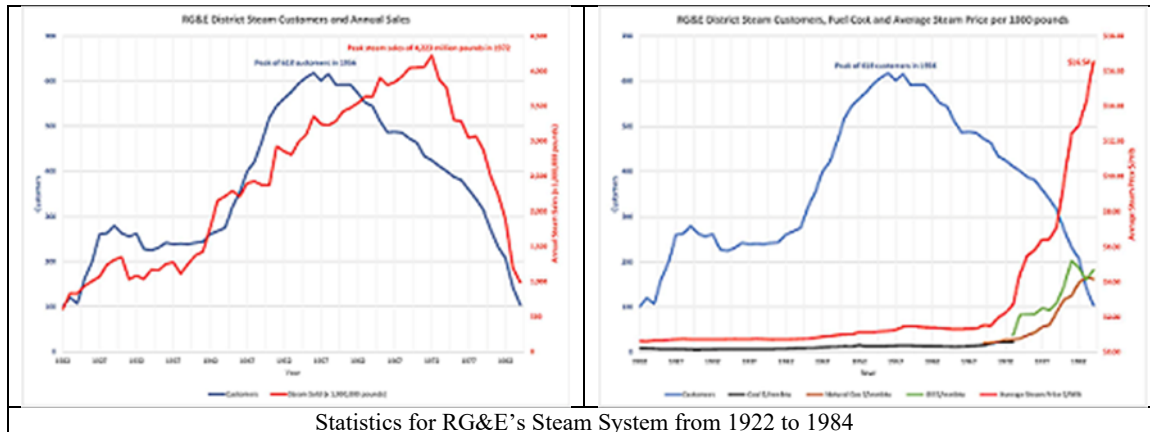
District Heating in Rochester

Number of Commercial District Heating Systems Operating Each Year From 1877 to 2020



four primary reasons, including demolitions from urban development, demolitions by building owners (often to create more profitable parking lots), conversions to natural gas, and in a few cases to the building being abandoned for a variety of reasons. The report offered two short term solutions and one longer term fix. The short-term solutions proposed were to convert the 75 MW coal-fired steam turbine unit at Beebe to allow extraction of steam for district heating and the use of RDF in one or more new incinerators to supply steam to the network. The report admits that the proposed turbine modifications were not really workable and the fuel from Monroe County’s RDF project had not proven satisfactory in test burns at the Russell Station, in addition to costing too much. The proposed long-term solution was to build several low-temperature hot water heat islands to serve groups of buildings which could be connected into a larger hot water system in the future. The report states that once the system reached a suitable size, the “preeminent energy source for the hot water system will be thermally cogenerated energy from RG&E’s Russell Station,” which is about 7 miles from downtown Rochester or even the Ginna Nuclear Plant (“only” 15 miles distant). While long-distance district heating pipelines were becoming common in Europe and particularly Denmark, the idea would be viewed skeptically by most American engineers. In addition, one of the major drawbacks to a complete

conversion to low-temperature hot water district heating was the large number of buildings with steam radiators, which would require extensive (and expensive) retrofits to accommodate, although the resulting savings might make the proposition attractive.²⁵



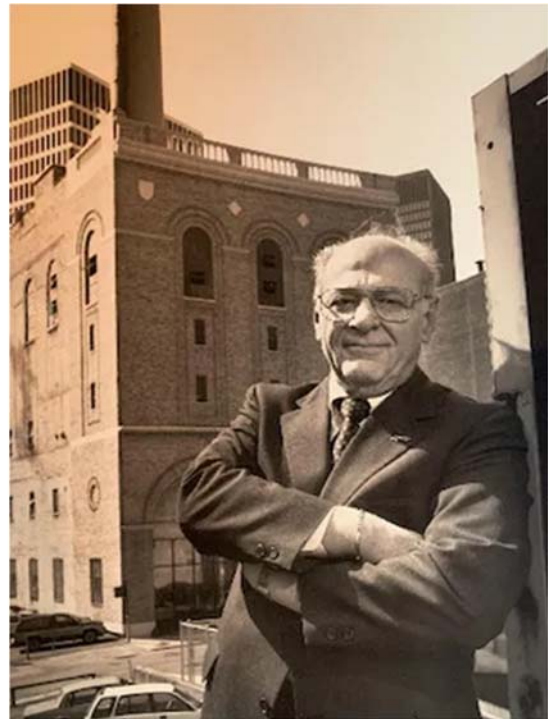
Statistics for RG&E's Steam System from 1922 to 1984

RG&E had few remaining options for the steam system by 1983 and the city, county and other large customers explored the idea of a completely new system that would be built, owned, and operated by a third-party developer. The Cogeneration Development Corporation of New York City proposed such a system and forecast significant reductions in heating costs for participating customers. This company was then in the process of installing a similar system in Trenton, New Jersey that began service in December 1983 and distributed hot water at temperatures as high as 394°F, sufficient to produce low temperature steam in buildings with steam radiators. Several grant and low-cost financing options had been identified for the proposed new system, but the company was unable to reach an agreement with RG&E for a supply of heat from the Beebee station and apparently did not pursue other potential sources of heat. It is unclear if this proposal included purchasing the existing steam network or simply bypassing it. Thomas R. Casten, the founder and president of Cogeneration Development, later formed Recycled Energy Development LLC that bought the coal-fired power plant at Kodak Park in 2012 and converted it to natural gas.²⁶

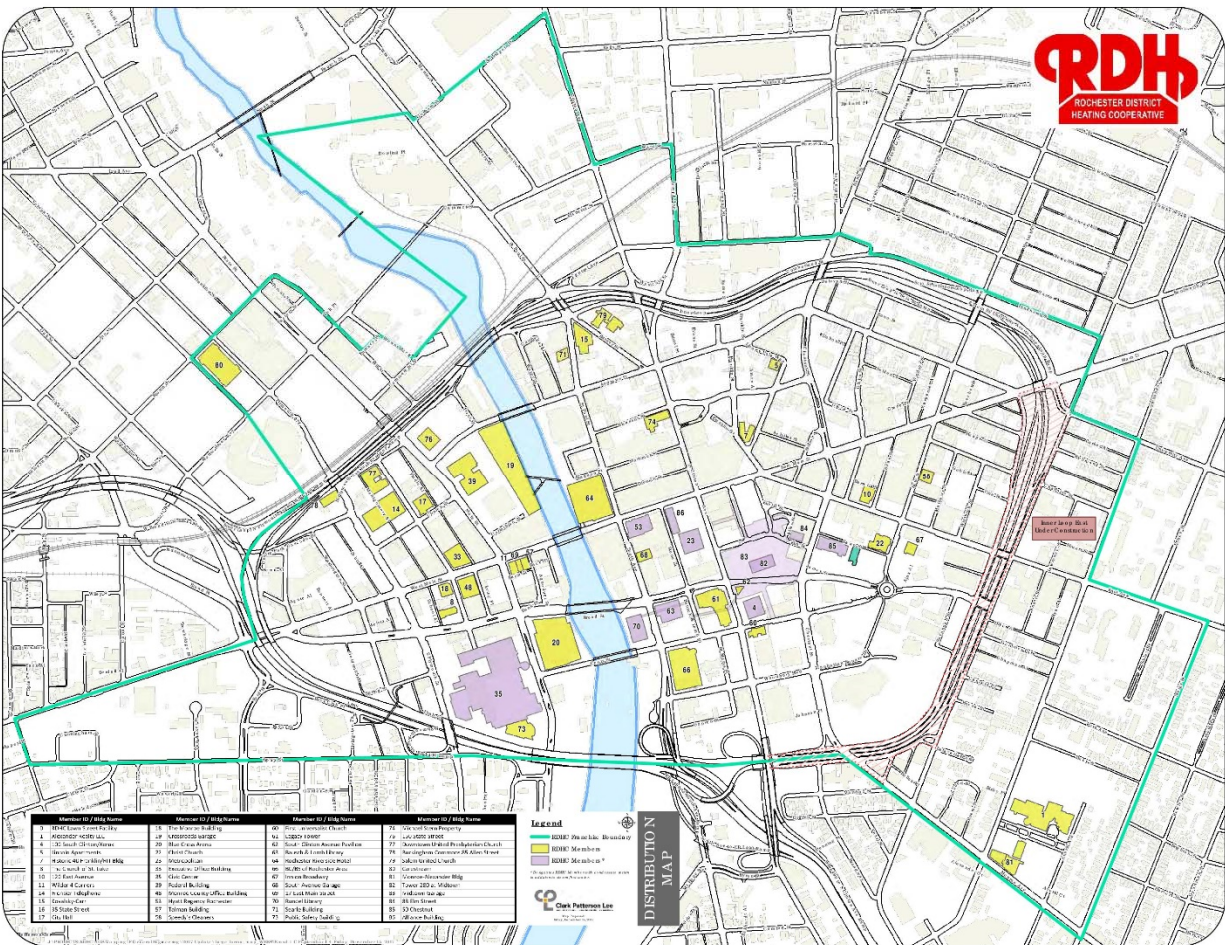
By early 1985 RG&E decided to abandon the steam system, but several large customers resisted and after discussions banded together under the leadership of Xerox Square facility manager Armand Lartigue, who became the most ardent champion of the efforts. The Rochester District Heating Cooperative (RDHC) was formed as a domestic cooperative corporation on November 13, 1984 and reincorporating it on October 16, 1985. RDHC had strong political support from the City of Rochester, Monroe County and New York State and acquired portions of the steam network in December 1985 after a bitter struggle with RG&E during which the city threatened to force RG&E to remove all of its existing steam lines if they refused to sell the system, which got

the utility's attention. RG&E agreed to tell their Lawn Street plant and the RDHC installed two temporary boilers to provide steam while the plant was rebuilt. The Lawn Street plant was renamed Lartigue Station in honor of Lartigue's contributions.

RDHC successfully stabilized the customer base and began to increase it by making significant improvements including adding a small steam turbine generator to enable cogeneration for a part of its steam supply as well as a partial condensate return system. Nearly 50 buildings in downtown Rochester currently receive steam and the RDHC is well positioned to deliver a positive energy future for downtown Rochester.²⁷



Armand Lartigue



Franchise limits and customers, [Rochester District Heating Cooperative](#)

Endnotes. Most of these are on line at waterworkshistory.us/NY/Rochester/steam.htm

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