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District Heating Marketing: Analysis of a Twelve-City Survey

Energy Task Force
of the Urban Consortium
for Technology Initiatives

DISCLAIMER

City of Columbus, Ohio
Department of Development
Planning Division

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PREFACE

The Urban Consortium for Technology Initiatives was formed to pursue technological solutions to pressing urban problems. The Urban Consortium conducts its work program under the guidance of Task Forces structured according to the functions and concerns of local governments. The Energy Task Force, with a membership of municipal managers and technical professionals from eighteen Consortium jurisdictions has sponsored over 120 energy management and technology projects in thirty-four Consortium member jurisdictions since 1978.

To develop in-house energy expertise, individual projects sponsored by the Task Force are managed and conducted by staff of participating city and county governments. Projects with similar subjects are organized into *Units* of four to five projects each, with each Unit managed by a selected Task Force member. A description of the Units and projects included in the Seventh Year (1985-86) Energy Task Force program follows:

UNIT -- LOCAL GOVERNMENT OPERATIONS

Energy used for public facilities and services by the nation's local governments totals about 1.5 quadrillion BTU's per year. By focusing on applied research to improve energy use in municipal operations, the Energy Task Force helps reduce operating costs without increasing tax burdens on residents and commercial establishments. This Seventh Year Unit consisted of five projects:

- **Baltimore, Maryland** -- *The Activated Sludge Oxygen-Air Aeration Process: Improved Technology for Wastewater Treatment Efficiency*
- **Boston, Massachusetts** -- *Ground Source Heat Pumps for Commercial Application in an Urban Environment*
- **Detroit, Michigan** -- *Computer Assisted Control for a Municipal Water Distribution System: Phase II - Testing and Implementation*
- **Kansas City, Missouri** -- *Water Supply System Energy Conservation through Computer Control*
- **Phoenix, Arizona** -- *Energy Use Reduction through Wastewater Flow Equalization*

UNIT -- COMMUNITY ENERGY MANAGEMENT

Of the nation's estimated population of nearly 240 million, approximately 60 percent reside or work in urban areas. The 543 cities and counties that contain populations greater than 100,000 consume 50 quadrillion BTU's annually. Applied research by the Energy Task Force helps improve the economic vitality of this urban community by aiding energy efficiency and reducing energy costs for the community as a whole. This Year Seven unit consisted of four projects:

- **Memphis, Tennessee** -- *Technology Transfer for Energy Management in Cooperation with Regional Energy Providers*
- **New Orleans, Louisiana** -- *An Incident Prevention and Response System for Hazardous Energy Resource Materials: Phase 2*
- **New York, New York** -- *A Management Approach for Reducing Business Energy Costs: Joint City/ Utility Actions*
- **San Antonio, Texas** -- *Neighborhood Energy Efficiency and Reinvestment*

UNIT -- ALTERNATIVE AND INNOVATIVE TECHNOLOGIES

Effective use of advanced energy technology and integrated energy systems in urban areas could save from 4 to 8 quadrillion BTU's during the next two decades. Urban governments can aid the capture of these savings and improve capabilities for the use of alternative energy resources by serving as test beds for the application of new technology. This Year Seven unit consisted of four projects:

- **Albuquerque, New Mexico** -- *On-Site Municipal Fuel Cell Power Plant: A Feasibility and Applications Guide*
- **Atlanta, Georgia** -- *Atlanta District Heating and Cooling Project*
- **Denver, Colorado** -- *Disposal Techniques with Energy Recovery for Scrapped Vehicle Tires*
- **Philadelphia, Pennsylvania** -- *High Efficiency Gas Furnace Modifications for Low-Income Residents*

UNIT -- PUBLIC/PRIVATE FINANCING AND IMPLEMENTATION

City and county governments often have difficulty in carrying out otherwise sound energy efficiency or alternative energy projects due to constraints in the acquisition of initial investment capital. Many of these constraints can be overcome by providing means for private sector participation through innovative financing and financial management strategies. This Year Seven Unit consisted of five city/county projects plus a combined effort supported by USHUD to define effective strategic planning guidelines:

- **Chicago, Illinois** -- *A Neighborhood Energy Conservation Program: Phase 2*
- **Columbus, Ohio** -- *Development of a District Heating System: Organizational and Financial Strategies*
- **Hennepin County, Minnesota** -- *Technology Transfer for Residential Energy Programs in New Construction and Existing Housing* (Joint project with St. Louis)
- **St. Louis, Missouri** -- *Technology Transfer for Residential Energy Conservation in New Construction and Existing Housing* (Joint project with Hennepin County)
- **San Francisco, California** -- *A Commercial Building Energy Retrofit Program*
- **Public Technology, Inc.** -- *The Hidden Link: Energy and Economic Development -- Phase I: Strategic Planning*

Reports from each of these projects are specifically designed to aid the transfer of proven experience to staff of other local governments. Readers interested in obtaining any of these reports or further information about the Energy Task Force and the Urban Consortium should contact:

Applied Research Center
Public Technology, Inc.
1301 Pennsylvania Avenue, NW
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Special mention is also due Mr. Wyndham Clarke, Deputy Director of the Energy Division of the U.S. Department of Housing and Urban Development, and to Mr. Jack F. Kattner, Director of the International District Heating and Cooling Association and Marketing Director of the Minneapolis Energy Center, for their advice and assistance in selecting the district heating enterprises to be studied. As he has for many years, Mr. Rich Zelinski of Public Technology, Inc. has provided invaluable assistance in directing the purpose and methodology of the study toward its final form.

Thanks are also awarded to Mr. Robert Miller, Unit Manager for the study, who reviewed the work throughout its development and whose encouragement and tolerance has made it possible to carry out the survey and analyze the twelve enterprises in greater depth than would otherwise have been

possible. Ms. Diane Rooney of PTI also reviewed and commented on the draft in her thorough and competent manner.

Finally, we must express appreciation to the marketing managers, engineers, and executives of the district heating enterprises selected for inclusion in the survey. Without their willing and patient cooperation in filling out forms and responding to telephone interviews, this assessment of their marketing methods and practices would not have been possible. Although most of these respondents are mentioned elsewhere in the report, we want to provide individual recognition for help given by G. Michael Larkin, Jr. (Baltimore); Doug Champ and James Gronquist (Jamestown); Dave Henson (Provo); Rich Mayer (San Francisco); James Young (Seattle); Charles Fishman (St. Louis); Monica Westerlund and Hans Nyman (St. Paul); Kevin E. Brown (Trenton); Jim Barnes (Vancouver); Bart Murphy (Willmar); Bill Addington (Youngstown); and again to Jack Kattner (Minneapolis). We apologize in advance for any inaccuracies in portraying their organizations, technical systems, or marketing programs which may have somehow found their way through the review process.

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Chapter 1. Overview

ABSTRACT

In 1985 the City of Columbus was involved in two separate federally-funded assessments of district heating potential in the downtown and riverfront areas. At that time, it was expected that for district heating to progress further in the downtown area, private interests would have to assume further responsibility for feasibility studies, development, financing, and construction of new systems. Marketing responsibilities would also be assumed by the private developer. The experience of obtaining information through customer surveys, however, led City planners to believe that the feasibility assessment phase itself involved substantial effort applied to "conceptual marketing" of district heating to prospective customers, government administrators, heat source owners, and financiers. This realization engendered a need to understand the strategies and means by which district heating marketing professionals approached potential customers.

A survey of marketing managers in a sample of U.S. cities evolved from this need. A group of twelve cities was selected to represent a range of variation in geography, type and size of system, ownership, and heat sources. The survey was carried out from December 1986 through February 1987 by means of telephone interviews. Analysis indicated

that marketing efforts carried out by the twelve enterprises could be classified into five major categories or "functions" including:

- -- corporate visibility and public relations
- -- education
- -- targeting and approaching new customers
- -- demonstrating and assuring savings
- -- customer service

The ways in which the twelve enterprises carried out these functions were examined and exceptional features noted. Major marketing brochures from ten of the enterprises were reviewed for text and graphic content, and ten separate marketing features were identified, including corporate identify, consumer savings, technological advantages, and community benefits. The competitive environment for each of the twelve systems was also examined. In general, it was found that district steam systems are offering prices in the range of $10.00 to $12.00 per MMBTU, while newer hot water systems offer prices in the range of $7.50 to $8.50 per MMBTU. At these prices, the systems we studied were still able to compete with the individual gas-fired boiler alternative.

Based on these findings, this report offers a series of marketing recommendations both for steam-based district heating systems and for hot water systems. District heating marketing in the U.S. is still in its infancy, and marketing managers are still learning which strategies and techniques allow them to concentrate their limited marketing resources for maximum effect. In conclusion, survey findings and analysis are applied to the Columbus market for the benefit

of potential district heating developers. Responsibility for implementation and oversight of future district heating projects involving the City of Columbus has now been transferred from the Planning Division to the Public Utilities and Aviation Department. It is expected that future district heating projects in Columbus will be wholly developed, financed, and owned by private interests.

PROJECT PURPOSE

This Year VII project, based on an assessment of marketing strategies and techniques carried out by twelve district heating enterprises, had three major purposes. The first was to develop an information base on district heating marketing strategies and techniques. Up until 1986, district heating studies had concentrated largely on technical and economic aspects of development, with little attention paid to marketing as a separate endeavor. Also, up until 1986, district heating professionals had not organized themselves to begin assembling a body of knowledge and accepted practice within their own profession. This study is intended to help to fill a gap in the applied knowledge of district heating in the U.S. and how its services are sold to consumers. The results may therefore provide a starting point for future district heating market research, especially for studies focusing on consumer attitudes and responses to the techniques highlighted in this report. Without such knowledge of consumer behavior and its underlying motives and patterns, little can be said about the actual effectiveness of the tools and approaches analyzed in our present study.

Secondly, this report applies the knowledge gained from an assessment of district heating marketing efforts to district heating development in Columbus. Following the City's lead in promoting district heating development, private entrepreneurs are now attempting to define a district heating market in Columbus and to create opportunities for developing that market. Assessments previously carried out in Columbus have already shown that marketing is a vital part of the feasibility assessment and development phases of a project. Knowledge gained from a survey of marketing efforts by other district heating enterprises will have immediate applicability to district heating marketing efforts in Columbus.

A final purpose of the present study is the transferral of knowledge to other government agencies or private corporations engaged in district heating marketing. Although our assessment of marketing strategies and techniques in twelve district heating enterprises is by no means a definitive effort, it provides a series of practical suggestions to improve marketing practices--and hopefully to improve service to customers, which is the only firm foundation of any effective marketing program.

District heating development efforts over the past two years have encouraged the formation of a privately-held company, the Columbus District Heating Corporation, which is now negotiating with the City of Columbus for development of a district heating island to use heat from the City's trash-burning power plant. It is anticipated that future district heating development in Columbus will be privately developed and financed. It is probable that at least one other heat island will be developed simultaneously with the trash-burning power plant system.

REPORT ORGANIZATION

An overview summary of district heating development efforts to date (May 1987) is provided in Chapter Two. This serves as the necessary background to understand the need for and origin of a marketing analysis of other district heating enterprises.

Chapter Three describes the approach and methodology used in the survey, and presents the findings and analysis based on survey interviews as well as on a review of major marketing brochures used by ten of the district heating enterprises.

Chapter Four offers a series of practical observations based on the survey findings. These are organized into recommendations both for steam and hot water district heating systems, with a further set of suggestions to be applied directly to district heating development in Columbus. Appendix material includes excerpts from marketing brochures as well as case summaries from each of the twelve sample enterprises.

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NOTE: Throughout this study, the term "district heating" when used in a generic sense should also be understood to apply to **district cooling** as well. Of the twelve enterprises in our sample, only Trenton and Minneapolis also supply chilled water directly from a central source, although several of the steam systems supply absorbtion chillers which are used for air conditioning.

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Chapter 2. History of District Heating in Columbus

In order to understand the origins of and need for a survey and analysis of district heating marketing, it is essential to review the background of district heating in Columbus. This chapter will briefly summarize district heating planning and assessment in Columbus since 1981 and will explain the need for a detailed assessment of marketing strategies and techniques in other systems.

MODULAR DISTRICT HEATING PLANNING IN COLUMBUS

The process of district heating development in Columbus is characterized by two phases: the first, covering the period 1981-86, in which the City of Columbus assumed the leading role; and the second, in which private developers are expected to take over the initiative. The project is now in transition between the two phases. The first phase began in 1981, when the City was one of twenty-eight U.S. cities to receive grants from the Department of Housing and Urban Development to assess the potential for district heating. The results of this first assessment, presented to HUD in 1982, were not positive. The analysis was based on the premise that a new coal-fired steam system would be built to connect the downtown with the Ohio State University. The massive capital costs of such a system cast

doubt on the economic feasibility of district heating within the study area.

The Danish government became interested in Columbus as a test site for Danish district heating technology upon hearing the results of the HUD assessment. In December 1982, an agreement was signed between the Danish Ministry of Energy and the City of Columbus. Under its terms, the consulting engineering firm of Harry & Mogens Larsen was contracted by the Royal Danish Government to conduct a conceptual study focusing on prospects for district heating systems throughout Columbus.

The three-volume assessment by Harry and Mogens Larsen Consulting Engineers was delivered to the Mayor of Columbus in August, 1984. This study was the first to recognize and scope out the potential for a district heating island based on the City's trash-burning power plant. A workhouse facility operated by Franklin County was identified as the first potential user.

Another possible heat island on the far northern fringe of the city was based on the potential for recovering heat from process waste water at the Anheuser-Busch brewery. Finally, the Harry & Mogens Larsen study suggested, but did not specify in detail, a number of potential district heating projects in the downtown/riverfront area of Columbus. A strategy of incremental development for the downtown area built around temporary or transportable boilerhouses was first proposed in the HML study.

In 1984, the City of Columbus applied for and received a grant from the Energy Task Force of the Urban Consortium for Technology Initiatives to study the potential for

incremental or "modular" district heating in the downtown/riverfront area, which had been singled out by the new City administration for its redevelopment potential. In the spring of 1985, the City also received a "Phase I" grant from the U. S. Department of Energy to investigate the potential for a riverfront district heating island centered around a mothballed electric plant formerly operated by the City's Division of Electricity.

The combined results of these two studies are detailed in the Energy Task Force publication, "Modular District Heating Planning as a Development Tool" (DG/85-316 05/86-100, June 1986, 109 pp.) Several potential heat islands in the downtown/riverfront area were identified, including not only the old Municipal Electric Plant but also Grant Hospital. The problem of timing of development remained critical; that is, without a comprehensive development plan for the riverfront area, it would be difficult for district heating developers to commit resources to mains and equipment to serve that area. The report to the Energy Task Force concluded that while Danish district heating concepts were compatible with the Columbus environment,

> "District heating would seem to offer greater opportunities to a city in which the timing and scale of development is at least known with some certainty, and where a consensus exists that public/private investment in infrastructure can and should be used to attract development to particular areas" (p. 100).

The 1986 report further questioned whether or not district heating could develop in Columbus in the absence of public participation or investment in the development

phases. At the time of publication, this question remained unanswered. City administrators since 1981 have expected that a district heating enterprise, once established, would be able to stand on its own without regulatory protection or financial subsidy from the City. What role the City itself would play in the establishment of such an enterprise was unclear until administrative and legislative action had to be taken in response to a direct proposal from district heating developers. Events since June 1986 indicate that if district heating is to take root in Columbus, it will be primarily reliant on private initiative and financing. It can justifiably be argued that this is the model of district heating development that makes most sense in Columbus, given the current political and business climate. In other words, the City would welcome the advantages that a healthy district heating system would bring to Columbus, and has even invested some of its own funds to assess the district heating potential of the trash-burning Municipal Electric Plant. However, the City has chosen to limit its own risk and commitment to the development of a larger downtown system.

A District Heating Task Force was convened by the Mayor in September, 1985 to comment on consultant reports and provide advice to Planning Division staff. This Task Force met several times over the course of the following year, acting as a forum in which consultant reports were critiqued and to which district heating development proposals from private entrepreneurs were presented. The District Heating Task Force met for the final time in November 1986. While it endorsed, in a general way, the concept of district heating in Columbus, the Task Force did not recommend implementation of riverfront district heating scenarios

assessed in the consultants' report. However, the Task Force did endorse development of the district heating potential of the trash-burning Municipal Electric Plant.

Meanwhile, a Danish engineering and construction company, Hans Jorgensen & Son (HJS), had indicated a long-term interest in becoming a partner with the City in district heating development. A proposal to the City was submitted by HJS in June of 1986. Three heat islands (including two in the downtown) were proposed for development "to the point of financing," including all activities normally funded under a HUD/DOE Phase II District Heating Assessment. HJS offered to provide $250,000 of its own funds for development costs, contingent upon a matching amount to be raised by the City from local or other sources.

Attempts were made by the City Council and Administration to locate a source for this funding. At the end of 1986, the decision was made that due to lack of funding, the Administration would not submit legislation to participate in downtown/riverfront district heating development. Instead, legislation was submitted to fund (for a total of $62,500) design and development of a district heating island based on the trash-burning Municipal Electric Plant, some three miles south of downtown Columbus. By this action, the City expressed its willingness to explore the district heating potential of its own facilities but without committing itself to district heating in the downtown or other areas of Columbus. Legislation to contract with the Hans Jorgensen Development Corporation (HJDC) for a district heating assessment of the Municipal Power Plant area was passed in March 1987. If the results

of this assessment are positive, and if negotiations between HJDC and the City are successfully concluded, it is expected that HJDC would construct, own, and operate a district heating system connecting the trash-burning power plant to the Franklin County Workhouse facility. Further negotiations are underway to bring in a greenhouse developer to locate on unused City land adjacent to the power plant site. Expansion of the first district heating island to include a greenhouse customer would significantly improve the profitability of the system, both for the City and for the district heating corporation.

Throughout the 1981-86 phase of district heating assessment, experience demonstrated that marketing efforts were an essential function even in the preliminary survey and analysis process. The process of gathering information itself required that the concept of district heating be "sold" to the potential buyer; without some definition and explanation, market survey respondents would not be encouraged to cooperate in gathering data. In making the initial contacts with potential customers, heat producers, engineers, or architects, the booklet "District Heating in Columbus, developed by Planning Division staff, " proved quite useful.

An intensive market study in the area of Grant Hospital begun in June 1986 made the need for marketing expertise very clear. This exercise was a joint effort by the Hans Jorgensen & Son company and the Columbus Planning Division. Requests for information from building owners and managers, facility engineers, and maintenance staff demanded some effective marketing response. This was the origin of the project decision to assemble as much marketing information

as possible from other district heating enterprises. It was expected that the ways in which marketing of district heating was carried out by other companies or municipalities would offer some clues to developing a marketing strategy for Columbus. As the previous summary of events in Columbus shows, marketing could not wait until analysis was complete, funding assured, and a development program initiated. Rather, marketing was a prerequisite of carrying out an effective assessment.

NEED FOR A DISTRICT HEATING MARKETING SURVEY

Most of the information available to the Columbus staff on marketing came from attendance at the Third and Fourth Annual HUD District Heating and Cooling Conferences in 1985 and 1986. In addition, staff had traveled to St. Paul for a HUD-sponsored workshop in March 1985. By 1985, St. Paul already had a well-developed marketing campaign (including an effective slide presentation) which was very influential with Columbus planners as they began to ponder a market assessment strategy.

After the Grant Hospital area survey carried out by Hans Jorgensen & Son in June 1986, a comprehensive survey and analysis of district heating marketing efforts was proposed by City staff. It was recognized that most district heating marketing programs were still in their infancy. Although utility-owned steam systems had obviously been around for a long time, they had not paid much attention to marketing or to customer needs for many years--one reason for their eventual decline. Revitalized steam systems such as in Baltimore and St. Louis were obviously

trying to keep and expand a customer base. In addition, new hot water systems in cities like St. Paul, Minnesota; Willmar, Minnesota; and Provo, Utah offered an example of the type of system Columbus one day hoped to obtain.

Inquiries through various sources also suggested that little had been done by the district heating enterprises themselves to assemble a body of knowledge on effective marketing strategies and techniques. A marketing committee under the auspices of the International District Heating and Cooling Association (IDHCA) was only being formed in 1986, and there was as yet no literature indicating what marketing approaches were being used, what kind of brochures and information leaflets had been developed, how targeting was being done, or how cost savings were being demonstrated in comparison with competitive heating sources. The lack of information, the still-emerging potential of a standardized approach to marketing issues, and the need for specific examples which could be useful in Columbus, generated the idea for a survey of successful district heating enterprises.

Chapter Three will describe in more detail the survey approach chosen, and explain why and how the subject enterprises were selected for interviews. Chapter Three will also present the analysis of survey results from the sample of twelve enterprises.

Chapter 3. The Marketing Survey -- Approach and Analysis

This chapter will review and analyze the findings from the survey of twelve district heating enterprises. In most cases, the data to support our conclusions will be found either in the individual case studies (see Appendix K) or in Table 1, which compares their major features. On aspects which are not directly supported by the data displayed here, we must state our claims on a subjective, but we believe justifiable, assessment based on our discussions with marketing managers. It should be stated again that it is not our intention to make unfavorable comparisons between or among district heating enterprises. We find that each of the twelve has one or more distinctive features worthy of analysis and emulation. Moreover, all of the cities were selected because their district heating systems are generally regarded among their peers as successful and well-managed.

SURVEY APPROACH

The survey (see Appendix A) was designed both to characterize each system by major features such as size, type of customers, and heat sources as well as to elicit responses about each enterprise's marketing effort. Questions on system features were fairly straightforward. The only load characteristic that could be determined with

accuracy for each of the twelve systems was that of "annual heat sales, in million BTU's."

A final piece of system data gathered from each survey subject was the prevailing gas rate for commercial customers in each city--i.e. the rate competitive with district heating--as well as the average district heating cost per MMBTU offered commercial customers. It was thought that the nature of the competitive environment expressed in these terms might help explain variations in district heating marketing approaches.

The questions on marketing features were asked each of the twelve respondents in the same way. These were intended to elicit responses which would suggest the magnitude and sophistication of the marketing effort. In most cases these questions served merely as starting points for further discussion. For example, under question (f) "Target audience," the respondents were asked to name the type of person they were most likely to contact <u>first</u>. These answers tended to divide themselves into new building contacts versus those in existing buildings. The answers to this question, we felt, would indicate something of the differences in marketing approach and rationale.

Answers were in fact received to one question that was <u>not</u> asked in the survey. Most respondents, when asked about frequency of group presentations, tended to give answers that identified the groups that had been singled out or targeted for special marketing efforts. However, due to the inconsistency of response in this case, we must rely largely on inference by induction to determine both <u>why</u> and <u>how</u> these groups were selected by district heating marketing professionals for special attention.

SELECTION OF SUBJECT ENTERPRISES

A trial group of subject jurisdictions was selected in order to demonstrate differences in region, size, and technology (steam vs. hot water). Our choice of subject cities was further determined by our assessment of the reputation of the marketing program of the district heating enterprise. Mr. Wyndham Clarke of the Energy Division of the Department of Housing and Urban Development was helpful in bringing to our attention those enterprises with active district heating marketing efforts. Further suggestions along this line were provided by some of the first survey respondents. Other cities were selected because they demonstrated some outstanding feature that had been previously used by the City of Columbus as an exemplary system feature; for example, Baltimore was chosen partly because its use of trash as a source fuel has often been used as an example of the potential for Columbus's own refuse-burning power plant.

FINDINGS AND ANALYSIS

System Characteristics

The twelve district heating systems can be arranged in several different groups, according to size, age, type of technology, and type of ownership. The pattern that makes most sense to the current study, however, is that shown in Table 1. In this arrangement, district heating enterprises are displayed in the following way: utility (San Francisco)

Table 1:

System Characteristics and Marketing Approach

	PG&E San Francisco	Baltimore Steam Co.	Thermal Resources of St. Louis	Youngstown Thermal Corp.	Central Heat Distribution, Ltd. Vancouver
1. System size; annual sales (in MMBTU)	572,000	1,430,000	990,000	531,000	769,017
2. System type (ex-utility, new steam, hot water)	utility steam	ex-utility steam	ex-utility steam	ex-utility steam	new steam (1968)
3. Fuel type(s) --Primary	gas	trash	#6 oil	coal	gas
--Secondary	oil	gas		oil/gas	oil
4. Ownership	utility	for-profit	for-profit	for-profit	for-profit
5. Brochure	yes	yes	yes	yes	no
6. Other types of literature, special promotions, etc. (description)	4-5 page customized sales proposal	newsletter, other pamphlets	newsletter, promotions; "Show Me" challenge	customer service response program	technical design handbook
7. Group presentations	not yet	yes	infrequent	yes	no
8. Target groups cited	existing buildings	engineers, B.O.M.A.	developers, owners, managers, B.O.M.A., mech engrs.	Chamber of Commerce, B.O.M.A.	owners/mgrs of existing buildings, developers, architects
9. Preferred first contact (existing buildings)	facility engineer	facility engineer	building manager	bldg. mgr., facility engineer	owner, building manager
10. Preferred first contact (new buildings)	consulting engineer, architect	architect, engineer	engineer, contractor	architect	developer, architect

Seattle Steam Corp.	Minneapolis Energy Center	District Energy St. Paul	Trenton District Energy Co.	City of Jamestown	Willmar Municipal Utilities	Provo City Utilities
863,000	986,000	749,618	321,000	78,015	98,890	37,500
ex-utility steam	ex-utility steam; new hot water	new hot water	new hot water	new hot water	steam and hot water	new hot water
#6 oil	gas	coal	gas	coal, cogen.	coal, cogen.	coal
gas		gas/oil	#2 oil			gas
for-profit	for-profit	for-profit	not-for profit	municipal	municipal	municipal
yes	yes	yes	yes	yes	yes	no
	newsletter, article reprints, flyers	newsletter, customer, mailings, quarterly report		customer testi-monials	radio, newspaper ads, "open house"	personal letters
yes	yes	yes	yes	yes	yes	no
ASHRAE, building owners, architects, contractors	B.O.M.A., engineers club, City Council, architects	building owners, facility engineers	business groups, elected officials	City Council, building owners, contractors	large customers, residential customers	
owner	owner	owner and facility engineer		owner; building manager	owner or company C.E.O.	building manager
owner or design architect				owner		

and "Catalyst" ex-utility steam systems (Baltimore, St. Louis, and Youngstown) are shown first. These are all older systems dating from before World War II. They are followed by two privately-owned steam systems, one which has been largely revitalized since the 1950's (Seattle), the other which was constructed in the late 60's (Vancouver). The hot water systems, all built during the last decade, are divided in the following way: the privately-owned (either for-profit or not-for-profit) systems, and the municipally-owned systems. The three municipally-owned systems (Jamestown, Willmar, and Provo) are coincidentally the smallest of the twelve systems. Of the privately-owned hot-water systems, Minneapolis and Trenton are operated for profit. Minneapolis is actually a hybrid (steam and hot water) system, with the hot water portion used for current service expansion. St. Paul, the largest of the new hot water systems, is owned and operated as a not-for-profit corporation.

This ordering of the twelve systems accounts for age, type of technology, and ownership. What of the overall size of the systems? This has been calculated in terms of annual heat sales, in millions of BTU's (MMBTU). Table 2 shows that the largest systems are Baltimore and St. Louis, followed directly by Minneapolis with nearly 1 million MMBTU in annual sales. Seattle, Vancouver, and St. Paul follow with sales in the 750 to 850,000 MMBTU range; then come San Francisco and Youngstown in the range of 500,000 MMBTU. Trenton shows annual sales of 321,000 MMBTU, well above the smallest group of systems, all with sales below 100,000 MMBTU per year: Willmar, Jamestown, and Provo.

Table 2.

District Heating Systems by Size
(Annual Sales in Million BTU's)

Baltimore Steam Company	1,430,000
Thermal Resources of St. Louis	990,000
Minneapolis Energy Center	986,000
Seattle Steam Corporation	863,000
Central Heat Distribution, Vancouver	769,017
District Energy St. Paul	749,618
Pacific Gas & Electric (San Francisco)	572,000
Youngstown Thermal	531,000
Trenton District Energy Company	321,000
Willmar Municipal Utilities	98,890
Jamestown District Heating	78,015
Provo District Heating	37,500

All other factors being equal, one might expect that the largest systems would tend to have the most sophisticated and probably most effective marketing efforts. It is true that the larger systems show perhaps more sophistication in the quality of information they provide; and it is certainly true that Baltimore and St. Louis, the largest systems, are outstanding in several categories of marketing effort. However, careful analysis shows that size alone does not guarantee sophistication. Some of the smaller enterprises demonstrate carefully targeted sales approaches, designed to obtain the maximum effect with limited resources.

Marketing Personnel

Before assessing in more detail the ways in which marketing is actually done, it will be helpful to discuss the people (referred to in this report as "marketers" or "marketing professionals") who are actually doing the marketing job. Of the twelve respondents (i.e. those managing the marketing effort),

- 5 had a background primarily in engineering;
- 3 had a background primarily in marketing/sales;
- 2 were planners/public administrators;
- 1 was a professional in public relations/communications; and
- 1 had a background in finance/administration.

Several of the engineers in charge of marketing in the larger corporations also had training or experience in sales and marketing. The larger enterprises also were able to field a more specialized marketing staff. As many as four

professionals staffed the larger marketing divisions, including two with training and experience in sales; one in technical sales, and one in engineering. In some of the smaller jurisdictions, the marketing effort was a one-person job.

In the enterprises in the middle-sized range (500,000 to 1 million MMBTU/year), the marketing divisions are typically managed by a "director of marketing" who is an engineer but also has additional training and experience in marketing or sales. This manager is usually supported by a professional staff of two: one who is an engineer, and another whose background includes either marketing or technical sales. There are some interesting variations on this pattern, however. In Vancouver, for example, the president of Central Heat Distribution, Ltd. takes an active personal role in making contacts with developers, architects, and building owners and managers. In St. Paul, the marketing manager was a marketing/communications specialist backed up by engineering expertise.

Certainly in the smaller enterprises, and perhaps also in the larger corporations as well, there is evidence that marketing is a "team effort" which may, depending on the sales approach and consumer needs, involve marketing, engineering, and executive staff together. In summary, there appear to be several organizational variations which can support an effective marketing effort. All of these variations, however, suggest a compatible blend of both engineering and marketing expertise--whether these elements are combined in a single person or represented by two or more specialists.

Marketing Functions

Marketing efforts carried out by the twelve enterprises appeared to fall into five major categories or "functions." On the basis of our interviews, we believe that any district heating corporation involved in marketing will have to perform each of these functions to a greater or lesser extent. These are examined in turn:

(1) Corporate visibility and public relations
(2) Education
(3) Targeting and approaching new customers
(4) Demonstrating and assuring savings
(5) Customer service

Obviously the larger district heating enterprises will have the resources to perform these functions in a more sophisticated way than is possible for smaller enterprises. However, some of the smaller organizations show a very sophisticated grasp of their consumer market and the most effective means of reaching it. In some cases, the district heating marketer will be accomplishing these purposes deliberately; in other cases he or she may be performing them almost instinctively. Such is often the case, for example, with promotion of corporate visibility: the enterprise will acquire a public image whether or not it is the one consciously intended.

Table 3 shows the functions that are performed by each enterprise. An attempt has been made to provide a simple rating system by which the skill and resources applied to each function by each enterprise can be recognized. The purpose of this rating is simply to demonstrate which

Table 3.

Marketing Functions

	PG&E San Francisco	Baltimore Steam Co.	Thermal Resources of St. Louis	Youngstown Thermal Corp.	Central Heat Distribution, Ltd. Vancouver	Seattle Steam Corp.	Minneapolis Energy Center	District Energy St. Paul	Trenton District Energy Co.	City of Jamestown	Willmar Municipal Utilities	Provo City Utilities
Corporate Visibility	••	••	•	••	•	•••	••	••	•	•	•	
Public Relations	•	••	••	••	•	••	••	•••	••	•	•	•
Education * Owners, Managers	•	•	•••	•	•	••	••	•	••	••	••	•
* Engineers, Architects	•	•	•	•	•••	••	••	•		••		•
Targeting/ Approaching New Customers	••	••	••	•	••	••	•	••	••	•	•	••
Demonstrating, Assuring Savings	••	••	•••	•	•	•	•	•	••	•	•	•
Customer Service	•	••	•••	••	•	•	••	••	•	•	•	•

••• Best of Category

•• Priority / Exceptional Effort

• Function Effectively Performed

functions are given most attention by which enterprises and to provide a means of highlighting exceptional efforts. Admittedly, the rating system is a subjective one, reflecting only the opinions of the interviewers based on the survey responses and the marketing literature provided.

The corporations were each "scored" on their performance of each function, allowing points both for the number of ways in which the function was performed and for exceptional features. For each functional category, an outstanding representative has been selected. No invidious comparison among enterprises is intended.

Corporate Visibility and Public Relations. Promoting corporate visibility is a specialized part of the public relations function. Whereas public relations aims at the general public--the broad consumer or potential consumer market--corporate visibility aims at promoting a certain image of the district heating corporation as a respected member of the corporate community. There is evidence that several of the district heating enterprises pay special attention to promoting their corporate image as part of a deliberate public relations strategy. Seattle and Baltimore, for example, emphasize the importance of their corporate "presence" on civic and business associations.

A public relations strategy is, for most enterprises, an essential part of the district heating marketing effort. We believe this function may be particularly important to the older, recently rehabilitated steam systems in the group of companies (Youngstown, Baltimore, St. Louis) owned by Catalyst Thermal Energy Corporation. Older steam systems,

before rehabilitation, have tended to suffer from deterioration and neglect. Part of the emphasis on public relations may be a necessary part of changing and updating the image of "steam heating" held by their customers. The public relations function appears also to be particularly important to some of the newer systems which need to establish themselves as successful competitors in markets dominated by the established utilities.

Means of promoting corporate visibility include memberships on local civic and business associations, as well as by design and distribution of the corporate brochure. More will be said about the use of brochures later, but in some cases they have been used to consciously promote a corporate image of the district heating enterprise. (See, for example, the heading from the 1986 Annual Report of District Energy St. Paul, Inc. : "A New Corporate Identity," Appendix B). The tools of the overall public relations effort are more varied, including slide shows for group presentations, "direct mail" pieces, newsletters and press releases, and other promotional efforts aimed at the potential consumer market.

Most of the larger district heating systems, as shown in Table 3, place some emphasis on projecting a corporate image. The Seattle Steam Corporation is chosen as the outstanding example in this category. According to James Young, Vice President for Marketing and Business Development of Seattle Steam, "I'm trying to make a clean, professional, straightforward approach. We want to project a clean, solid, conservative image." The white embossed folder/brochure containing a four-page, two-color promotional piece is admirably designed to achieve this purpose. Young also places high importance on the corporation's presence in the business community. "Word of

mouth helps a lot," he says. "Presence helps," he advises. "Be on the local Energy Committee; be on the Energy Committee of ASHRAE. Be present at the Building Owners and Managers Association."

The public relations function is given high priority by by majority of the district heating marketing programs. The best example in this category, we believe, should be awarded to District Energy St. Paul. District Energy makes use of a well-designed slide show aimed at a broad consumer market; a customer newsletter sent both to existing and potential customers; press releases; and an attractive annual report document which serves as a marketing piece. The sophistication of St. Paul's public relations program can be partly explained by the specialized marketing and communications background of the Director of Communications, Monica Westerlund. Equal sophistication is to be found in the public relations effort of sister city Minneapolis. Marketing Director Jack Kattner makes use of quarterly newsletters, press releases, and special letters to customers to promote consumer and community support. A customized slide show is presented to such groups as the Building Owners and Managers Association, City Council committees, the Engineers' Club, and local architects.

Education. As we define it here, the educational function of marketing is distinguished from image promotion or public relations. The objective of education in district heating marketing is to promote knowledge and distribute information on specific economic and technological advantages of district heating.

There appear to be at least two and potentially three different audiences for district heating education. First is the elite community of building owners, developers, corporate managers, and other public or private sector administrators. These are the people who will make the important decisions regarding district heating. Decision-makers at this level are going to be interested not so much in the technology and engineering but mainly in the economic advantages which are claimed for district heating. This includes capital savings, operations and maintenance savings, and payback.

The second potential audience for district heating education is that of mechanical engineers, HVAC engineers, and architects who are responsible for designing new buildings. Marketers responding to our survey often mentioned that architects and engineers are generally unaware of the advantages of district heating and even of its design concepts. In some cases, they reflect a negative perception of steam heating systems. Architects and engineers are relied on for advice in making the choice of heating system for a building. Unless they can be persuaded that district heating is an attractive option, they cannot give the best advice to owners or developers. We wondered if there were not some disincentives built into the design process in regard to district heating, i.e. whether architects and engineers would be reluctant to recommend capital savings in building design if their fees were structured as a percentage of total cost. The answer on this is inconclusive. Nevertheless, it is obvious from our sample that district heating marketers are aware of the importance of reaching the community of engineers and architects.

There may be a third group which district heating marketers will try to reach with an educational, as opposed to a general public relations effort. That is the larger community of homeowners in the case of residential district heating. This is a much broader and generally less-informed audience than is targeted in the typical district heating marketing campaign. In one case in our sample, that of Willmar, Minnesota, an effort is made to market to residential customers and the educational approach is modified accordingly. Marketing to residential customers must emphasize such features as simplicity and convenience as well as savings.

Thermal Resources of St. Louis captures our award in the subcategory of education for building owners and managers. The marketing approach for existing buildings in St. Louis is targeted at building managers. Evidence of this is seen in the Thermal Resources quarterly newsletter, "Energy Managers News," which features articles such as the exceptional "How Jack Learned the Truth About Gas Boilers" (see Appendix C).

Central Heat Distribution Limited, of Vancouver, B.C., takes top mention in the category of marketing to the engineering and architectural community. Central Heat has carefully defined its target market, using a highly personalized approach to the mechanical engineers and architects who are likely to do business in their service area. This approach is made more effective by the use of a "Handbook for the Efficient Use of Steam," including typical layout figures for new systems and building conversions (see Appendix D). The Baltimore Steam Company merits special mention also for its quarterly newsletter, "The Baltimore Steam Connection," aimed at the same engineering/ architectural audience.

Willmar Municipal Utilities (Willmar, Minnesota) receives special recognition in the education category for its attractive and informative folder/brochure aimed at the residential market. Willmar's annual "Open House" promotion for potential customers is also an idea which merits special attention (see Appendix E).

Targeting and Approaching Customers. For most district heating systems, the geography of the service area largely defines the target audience for the marketing program. The system features (steam or hot water at certain pressures and temperatures) will also constrain the number and type of potential district heating consumers. However, within the service area, the district heating marketer must make important decisions about whom he or she will approach as a potential customer. This "targeting" function is especially important in helping the district heating enterprise obtain maximum results for the marketing dollar. Having identified a target market, the marketer must make a "one-on-one" pitch to potential customers to persuade them of the advantages of a district heating hook-up. This function is common to all the enterprises surveyed.

There is a wide variation in our sample, however, in how new customers are targeted and approached. Some enterprises are narrowly targeted on existing buildings, say with ten to fifteen-year-old boilers (Vancouver). Seattle Steam concentrates on larger customers within their confined service area, trying to pick up potential customers who have boilers that are ready for replacement. In San Francisco, new construction is strictly limited by law; therefore, PG&E has decided to concentrate on converting existing buildings to steam. Other companies have a broader approach that aims at larger groups such as building owners, engineers,

developers, or downtown businessmen. We do not have much information from our survey regarding how this targeting is actually done by the different enterprises, whether intuitively or scientifically; nor can we determine the effectiveness of a particular approach without reference to customer responses.

Once a potential customer has been identified or targeted, how does the marketing specialist make the approach? More importantly, to whom is the approach made? There are several possible choices. The marketer may approach a building engineer or facilities manager. Or, he may choose to approach the building owner, or a decision-maker at the vice-presidential level within the corporate structure. In the case of a new (unbuilt) structure, the marketer may either deal with the building and mechanical design engineers, or with the owner/developer, or with both. Here we found a great deal of difference of opinion, which we cannot yet explain in terms of some variation in the type of system or general marketing approach.

Some enterprises, for example, strongly prefer not to contact the building manager or facilities engineer first. Kevin Brown, Marketing Manager for Cogeneration Development Corporation (which developed the Trenton system), says that his team prefers to deal with top management because they perceive that facilities managers sometimes feel threatened by district heating. James Young, of Seattle Steam, puts it more strongly: "You don't get anywhere with those guys (facilities engineers)." His preference is to maintain contact with the decision-makers, particularly building owners and design consultants. Jack Kattner of the

Minneapolis Energy Center believes that the property manager is an important target for the marketing effort. Kattner's approach is to focus on the marketability of rental space: through district heating, the manager can take advantage of competition in the energy market. The manager is made aware that his competitors in the building market are also using district heating.

Other marketers initiate their sales effort with the facilities engineer. Bill Addington, of Youngstown Thermal Corp., notes that his effort starts with the building manager or facilities engineer, specifically to reassure these people that a conversion to district heating would not affect their jobs. Even though the engineer or manager will not make the actual decision, their opinions "can help or hurt you," says Addington. Rich Mayer, marketing specialist for Pacific Gas and Electric in San Francisco, says "We've found that it's easier to get in to see the facilities engineer first. We try to get them to buy into it first, and then go to a general manager or property manager. This may be a little slower process but we have a better success rate."

A combined approach is offered by District Energy St. Paul. Although St. Paul marketers want to influence the decision-maker, they try to approach "all levels" within an organization. They do not assume that information on district heating will naturally circulate within the corporate structure. Also, says Monica Westerlund, "If you talk to the president, you better make darn sure that you know what the facilities engineer is going to say."

In the case of new buildings, district heating marketers want to influence the choice of heating system made by building owners/developers. In order to accomplish this, the marketer may approach the architect or the engineer/contractor. According to Charles Fishman of Thermal Resources of St. Louis, "Usually we go through the developer or the owner to find out who the engineer is, and ask permission to approach the engineer. The objective is to get the engineer to recommend steam as an energy source." Again, there is a split in opinion. Some district heating marketers prefer to contact the owner/developer directly rather than to start with the architect or mechanical engineer.

These differences of approach seem to have no objective relationship to the age, size, or type of system. They reflect the preferences and assessments of the marketing specialists in each enterprise, and undoubtedly grow out of the unique experiences generated by individual market conditions.

There is no single outstanding district heating enterprise in the "targeting/approach" category; rather, several of the companies show exceptional features. Worthy of mention are

-- Central Heat Distribution Ltd., of Vancouver, which targets mechanical consulting engineers and architects, concentrating on the conversion market of buildings with ten to fifteen-year-old boilers;

-- Seattle Steam, which also aims at the conversion market in existing buildings;

-- District Energy St. Paul, which targets new development as well as potential conversion customers on a broad marketing front; and

-- Baltimore Steam Company, which has articulated a marketing strategy targeted on existing customers as well as on the architectural and engineering community.

Demonstrating and Assuring Savings. A fourth function common to all of the district heating enterprises is that of demonstrating and assuring savings to customers. This is separate from the targeting and approach function because it is an analytic as well as a marketing task. Typical means of demonstrating savings are by means of a savings worksheet or computer model showing the advantages of district heating compared to the local heat alternative. Both means are commonly used by our respondents.

Savings assurances can also be provided to customers through contract guarantees. For example, district heating price increases can be held to a fixed rate, or prices can be guaranteed always to provide a certain percentage savings over natural gas heating. Our limited survey did not collect examples of such assurances that may be contained in customer contracts among our sample of district heating enterprises. One promotional device of this kind is demonstrated, however, by Thermal Resources of St. Louis in their "Show Me" challenge to customers. Under this program, the customer alternates running his own gas boiler with use of centrally delivered steam over a seven-week period. Thermal Resources will guarantee twenty percent savings over

the average cost of gas during the challenge weeks (see Appendix C).

In demonstrating savings to customers, marketers are faced with the task of showing that the costs of heating with gas are in fact higher than the simple fuel costs would indicate. This is the so-called "hidden cost" factor which is emphasized by several of the marketing programs. This aspect of the marketing effort is especially crucial at the moment, when gas prices appear to have bottomed out. Among our sample cities, average commercial rates per MCF range from $4.00 in St. Paul to $6.00 in Seattle. With gas prices in this low range, the district heating marketer must show that the lower efficiences of gas boilers, the costs of operating and maintaining one's own boilers, and the capital costs of boiler replacement actually push up the real cost of gas heating above that of district heating. Our survey shows that even in this tightly competitive market, district heating enterprises <u>are</u> able to offer attractive savings to customers and in fact make these short-term operations and maintenance savings the keystone of their marketing campaigns.

Special merit in the "demonstrating and assuring savings" category is awarded to Thermal Resources of St. Louis for their innovative promotional campaign ("Show Me") as well as for their approach to the "hidden costs" of gas heating illustrated in Energy Managers News (see Appendix C).

An additional effective technique of demonstrating and assuring savings is used by at least three respondents. This is the use of customer testimonials. Many of the

customer newsletters refer to new customer hook-ups. The testimonial, however, presents the experience with district heating in the customer's own words. This is what makes the testimonial such a powerful marketing technique.

Thermal Resources of St. Louis presents the testimony of their large customer Norcliff-Thayer (manufacturers of Tums) in their newsletter: "Tums and Steam a Winning Team." Willmar Municipal Utilities, in an approach to neighborhood customers, gives statements of homeowners Erwin Rau and Wally Peterson: "The free heat exchanger was a terrific selling point. The conversion was very easy to do...." (See Appendix E). Jamestown, N.Y. makes use of customer letters testifying to the advantages of changing to district heat. One particularly good letter is from the Jamestown Housing Authority.

Customer Service. The final marketing function performed by each of the district heating enterprises is the maintenance and satisfaction of existing customers. Although this function involves both education and public relations to an extent, and can be used to accomplish other purposes such as demonstrating and assuring savings, customer service stands as an independent function. On the basis of survey responses, we believe customer service is particularly important in the case of older rehabilitated ex-utility steam systems. In these cases, marketers must place an emphasis on modernizing both their service performance and their image with customers.

Means of providing customer service include technical assistance, quarterly newsletters, special promotional offers, and customer response programs.

Thermal Resources of St. Louis receives the special merit award in the customer service category for its "Hassle-Free" Heating Check-Up, a free inspection of primary equipment by thermal energy managers; as well as for its special "Sizzle-Stopper" promotion (see Appendix C). The Sizzle-Stopper, a free program offered during the summer, allows customers to have leaky valves packed by energy managers. Although a number of district heating enterprises demonstrated exceptional creativity in their customer newsletters, Thermal Resources' "Energy Managers News" seemed particularly well-targeted and effectively written. Among the other efforts, Youngstown Thermal Corporation deserves mention for its Customer Service Response Program "How Are We Doing?" (See Appendix F). This was intended to obtain feedback responses to service calls. Baltimore Steam Company also deserves credit for its round-the-clock customer service telephone -- 54-STEAM!

Content Analysis of Marketing Brochures

Another analytical view of the marketing efforts in this survey can be obtained from the major marketing brochures used by each enterprise. Ten of the twelve corporations used brochures in their marketing program. A careful analysis of the "selling points" emphasized in the brochure texts, together with the photographs and illustrations used, provided the basis for Table 4.

The brochures appear to be designed with several purposes in mind. Most of the enterprises are concerned with projecting some kind of corporate image through the marketing brochure. Also, in most cases, the brochure is

Table 4.

Content Analysis: Major Marketing Pieces
[Text]

	PG&E	San Francisco	Baltimore Steam Co.	Thermal Resources of St. Louis	Youngstown Thermal Corp.	Seattle Steam Corp.	Minneapolis Energy Center	District Energy St. Paul	Trenton District Energy Co.	City of Jamestown Municipal Utilities	Willmar
Corporate Identity											
* New identity, new management		•	•				•				
* Financial stability							•	•			
* Goal statement		•				•			•		
* Old, established, "not old fashioned"					•						
* "We're specialists"				•							
* "We're successful", "well-managed"				•	•		•		•		
* "We represent the trend of the future"			•				•			•	
* "We're part of a larger company"		•	•	•							
* Financial stability							•	•			
* Labor stability							•				
* System history — success story		•	•	•	•			•	•		
Size and Expansion											
* Focus on future expansion		•		•			•	•	•	•	
* Number of customers emphasized	•	•	•		•	•	•	•	•		
* Size, sales volume emphasized		•	•		•	•	•	•	•		
* New customers featured							•		•	•	
District Heating Explained											
* Definition/history	•	•	•						•	•	
* A "proven", "established" technology		•	•						•		
* "What DHC isn't"	•										
* "How it works"								•		•	
Consumer Savings											
* Capital	•				•	•					
* Operations/maintenance/fuel	•		•		•	•		•	•	•	
* Rate stability/rate structure	•	•	•	•	•	•	•				
* Personnel savings			•								
* Cost effectiveness	•										
* "Eliminate hidden costs"		•									
* "Reduce waste"		•									
* "Pay only for what you need"		•	•		•						
* Individual boiler vs. DH comparison	•										
* Life cycle savings	•										
* Reduce property tax, insurance					•						
* Energy refund	•						•				
* Peak heating alternative					•						
* Lower electric rates via cogeneration								•		•	
Technological advantages											
* Reliability/availability	•	•	•	•	•	•	•	•		•	
* Flexibility	•		•		•						
* Fuel versatility	•	•	•		•	•		•			
* Efficiency/cogeneration efficiency	•		•		•	•	•		•	•	
* Safety						•	•			•	
* Proven technical assistance team		•				•					
* Metering		•				•					
* Multiple steam uses	•										
* Temperature control										•	
* Temperature control eliminates retrofit								•			

Table 4., continued]

Content Analysis: Major Marketing Pieces
[Text]

	PG&E	San Francisco	Baltimore Steam Co.	Thermal Resources of St. Louis	Youngstown Thermal Corp.	Seattle Steam Corp.	Minneapolis Energy Center	District Energy St. Paul	Trenton District Energy Co.	City of Jamestown Wilmar Municipal Utilities
Other Advantages										
* Architectural design flexibility	●				●					
* Saves rentable or usable space	●		●		●					●
* Comfort, convenience	●			●						
* Free installation	●									
* Easy conversion, installation	●									●
* Eliminate fuel delivery, storage	●									
* Free heat exchanger										●
* "Clean"										●
* "Quiet"										●
* Creates profits for future investment								●		
* Reduces energy dependence								●		
Environmental Benefits										
* Environmental protection/improvement	●					●	●	●		
* Resource recovery/cogeneration		●	●					●		●
* Alternative energy use						●				
Community Benefits										
* Civic spirit, pride							●			●
* "We are the first, best"								●		●
* Economic development tool		●		●		●		●		●
* Savings, revenues to public sector								●		
* Community appearance enhanced								●		
Customer Service										
* Technical support team		●	●			●	●			
* Support services			●	●						
* 24 hour service			●	●						
* Quick customer response			●			●				
Customer Survey and Testimonials										
* Customer, market survey	●						●			
* Individual customer experiences cited										●
* Success of <u>other</u> DH systems cited		●								
* List of customers cited	●					●		●		

used to emphasize the potential savings and other advantages of district heating to the consumer. Besides these common features, there are also unique variations from city to city. A closer analysis gives evidence of the different ways in which marketers stress what they believe to be the most attractive aspects of their systems. Text analysis also suggests that the marketing approach will vary depending on the age of the system and its stage of development -- whether it is renovating, expanding, or just beginning.

There are at least ten identifiable marketing features emphasized in the brochures. These will be briefly examined in turn:

Corporate Identity. It is important for the newly-renovated steam systems to establish a modern, up-to-date image with the message "under new management." The Baltimore and St. Louis steam systems highlighted this message in their brochures. On the other hand, Seattle Steam claimed to be "old, but not old fashioned." The message here was that the company managed an established and proven technology in an up-to-date fashion. The three systems in the "Catalyst Thermal" family used their relationship with the parent company as a selling feature. The most common themes in the corporate identity category were intended to project images of success and good management. (See, for example, the excerpt from "District Heating...Youngstown's Comfort Utility" in Appendix F). At least three of the companies, Thermal Resources of St. Louis, District Energy St. Paul, and Willmar Municipal Utilities claimed to represent the "trend of the future."

Both financial and labor stability were employed as advertising features (District Energy St. Paul; Trenton District Energy Co.) Most notably, six of the ten brochures narrated their corporate history as a "success story" in which they took justifiable pride. For example, from the Seattle Steam brochure:

> "...The company now known as Seattle Steam Corporation has been around since the turn of the century. Founded in 1889 as a private utility, the system grew into one of Seattle's major providers of power and heat in the early 1900's....Today, Seattle Steam operates as a district heating system serving more than 300 customers via 18 miles of underground mains."

Size and Expansion. An extension of the "success" and "modernization" themes is shown in the emphasis placed on the size of district heating systems, their expansion plans, and their new customers. Each of the brochures features either current size or future expansion themes. Of particular interest are Willmar Municipal Utilities and District Energy St. Paul, which both highlight new customers (see Appendix B).

District Heating Definition. Several of the enterprises defined the concept of district heating and showed how such a system generates and circulates heat, either in text or graphics. Curiously, this was not as prevalent among the newer, less established systems as might have been expected. Pacific Gas & Electric is unique in offering a short counter-definition: "District steam isn't...." (See Appendix G).

Consumer Savings. All of the marketing booklets underscored either the short-term operations and maintenance savings or the long-term rate stability (or both) offered by the district heating alternative. A number of other savings-related issues were also mentioned, among which the most common were capital savings (in boiler costs) and the idea that with district heating, the customer pays only for needed heat--rather than for the fuel, the boiler, the operation and maintenance, labor, and other costs. Alone among the ten enterprises represented here, Baltimore cited the "hidden costs" associated with on-site generation. (See Appendix H, "The Steam Advantage.") Pacific Gas & Electric also stands out for its worksheet cost comparison of district steam vs. in-house boilers (Appendix G). Other marketers prefer not to include the worksheet with the brochure, prefering to avoid misunderstandings by filling out the worksheet personally during a one-to-one sales session.

Technological Advantages. In addition to, and related to consumer savings are the advantages of district heating technology over the gas or oil combustion alternative. Nearly all the district heating systems stress the reliability and ready availability of district heat.

> "As the owner of an in-building boiler, if your unit fails, the heat goes off. Not true with a district steam system." (Thermal Resources of St. Louis).

> "For an uninterruptible resource, you can always turn on the steam...That's right: when it comes to reliability, our record is second to none. Our boilers

never sleep, and the system is designed to permit maintenance at any point in the network without unscheduled interruptions of essential service." (Seattle Steam).

Close behind the emphasis on reliability are the advantages in efficiency of district heating as well as the versatility of fuel use:

> "District Energy can respond to changes in world fuel markets by burning our least expensive and most abundant fuel. That way, our customers have the assurance that we are using the lowest-cost fuel available. No other form of heating offers this level of flexibility." (District Energy St. Paul)

A few of the marketing programs highlight additional technical features such as safety, metering, and technical support.

Other Advantages. Subsidiary features apart from technological advantages are also used in the marketing programs. Among these, the most often cited was the fact that district heating can save rentable or usable space--whether in homes (Willmar) or in major office buildings (San Francisco). Three of the marketing brochures also asserted that use of district heating provided customers (particularly in new buildings) with greater flexibility in architectural design:

> "Since buildings connecting to a district steam system do not require a boiler or boiler stacks, a greater degree of flexibility is afforded to architects in designing the building." (Pacific Gas & Electric)

Both PG&E and Willmar Municipal Utilities listed a number of ancillary benefits of district heating. Focused on the homeowner market, Willmar stated that conversion and installation are easy, that district heating is "clean" and "quiet," and offered a free heat exchanger to customers. San Francisco offered free installation, cited convenience as a major reason for choosing district steam, and pointed out that district heating would eliminate fuel delivery and storage.

Environmental Benefits. Seven of the ten brochures cited the beneficial environmental impacts of district heating, including air quality improvements, opportunities for resource recovery, and use of alternative energy sources.

Community Benefits. Public benefits of district heating are put forward by six of the ten marketing brochures. Trenton District Energy Company states, "The major impact upon Trenton of TDEC is the retention of existing industry and attraction of new industry due to availability of low cost heat." Both the Trenton and Willmar systems claim to be among "the first" or "the best." Willmar Municipal Utilities makes its claim to be the first city in the U.S. to offer modern hot water district heating (see Appendix E). Trenton says it is "one of the first" and names a number of other civic benefits, including savings and revenues to the public sector and enhancement of "community appearance."

Customer Service. Capable and prompt support services are highlighted in our sample by the three "Catalyst family" systems as well as by the Minneapolis Energy Center and District Energy St. Paul. Both Thermal Resources of St. Louis and Youngstown Thermal advertise 24-hour service.

Customer Surveys, Testimonials. Both PG&E and District Energy St. Paul gave the results of customer surveys. These were both used to demonstrate the reasons customers chose the district heating alternative:

> "A recent survey of our customers showed economic advantages, freedom from structural limitations, and convenience as their major reasons for choosing district steam." (PG&E)

Alone among the marketing brochures, Willmar Municipal Utilities uses the direct customer testimonial, "Ask the People Who Already Have District Heating." (See Appendix E). Three of the marketing pieces provide lists of customers (PG&E, Minneapolis, and Trenton District Energy Co.) This undoubtedly enhances the interest of potential customers who may be considering the district heating alternative for the first time.

Content Analysis of Brochure Graphics

The marketing brochures in our sample use a variety of graphic formats and effects to attract attention, portray images, and convey information. These are summarized in Table 5. The glossy paper, two or three color style is used by five of the ten enterprises and is common to the three

Table 5.

Content Analysis: Major Marketing Pieces
(Graphics)

	PG&E San Francisco	Baltimore Steam Co.	Thermal Resources of St. Louis	Youngstown Thermal Corp.	Seattle Steam Corp.	Minneapolis Energy Center	District Energy St. Paul	Trenton District Energy Co.	City of Jamestown Utilities	Willmar Municipal
Photographs										
* Mayor, political officials		•		•			•	•		
* Central city, downtown landmarks		•	•	•		•				
* Customer homes or buildings		•	•	•			•			•
* Heat plant facilities		•	•	•		•	•			•
* Heat plant workers, equipment			•	•			•			•
* Pipeline construction, maintenance				•			•			
* Customer connections		•								•
* DH company staff		•	•	•		•				•
Charts, Graphs, Drawings										
* Maps of service area	•	•	•	•		•	•	•		
* 3-dimensional maps	•					•	•			
* "How it works" illustration				•						•
* Bar graphs - financial data							•			
* Bar graphs - rates							•			
* Comparison with conventional heating sources	•									
* Cost comparison worksheet	•									
* Energy flow chart								•		
Format										
* Glossy, two or three color	•	•	•	•			•			
* Glossy full color						•				•
* Textured two color, B&W photos								•		
* High quality heavy paper, two color					•					
* B&W print and photos									•	
* Folder (for additional inserts)	•			•			•	•		•

companies of the "Catalyst Thermal" family. Minneapolis and Willmar employ a glossy full-color format. As in many advertising endeavors, the direct and simple approach can work just as well as the slick and sophisticated. Seattle Steam Corporation, for example, uses a four-page two-color brochure, printed on heavy paper, and presented in a white embossed folder. Five of the ten enterprises utilize a folder, either designing the brochure so that it will hold additional materials in a pocket insert, or providing a separate folder which encloses the brochure and other materials together.

The most common photographs used in the brochures are of heating plant facilities, followed by customer buildings or homes, staff of the district heating enterprise, and heating plant workers or equipment. Portrayal of central cities and downtown landmarks indicates that district heating still finds its major service areas and customer appeal in downtown districts. Photographs of the mayor in four of the brochures help suggest not only public support and confidence in the enterprise but also the public benefits that accrue to cities with district heating systems.

Although some effective charts, graphs, and illustrations were employed in the marketing pamphlets, it is surprising that such illustrations were not used more often. Seven of the ten systems showed maps of the service area, three of them using an impressive three-dimensional method of highlighting customer buildings (PG&E, Minneapolis Energy Center, and District Energy St. Paul -- see Appendix I). Both Willmar Municipal Utilities and Youngstown Thermal used illustrations to demonstrate the production and distribution of heat through a network: this is a powerful

graphic device and educational technique which merits wider use. (See Appendix F). PG&E, alone among its corporate peers, uses a bar graph to compare the costs of district steam vs. gas-fired boilers. (See Appendix G).

Prices and Marketing

The foregoing analysis shows that district heating is often marketed on the basis of advantages other than price. Ultimately, however, the prospective customer must weigh these advantages against the fundamental criterion of price. The price issue is critically important in the current market, in which commercial gas rates are lower than at any time since 1982. Nationwide, the average delivered price per thousand cubic feet (MCF) to commercial customers in 1986 was $5.10. Among the cities represented in our survey, commercial gas rates range from $4.00 to $6.00, with interruptible rates for dual-fuel users even lower.

We speculated before initiating the survey that in this kind of competitive market, district heating would be advertised and sold on the basis of longer-term advantages such as capital and labor savings, fuel price stability, and overall efficiency. We were somewhat surprised to find that district heating enterprises are in fact marketing short-term savings, and that these savings are a key feature of their marketing strategies. In order to market the cost advantages of district heating, the marketing representative must be able to demonstrate that the true costs of heating with natural gas are not reflected in the price per MCF of delivered fuel. The true costs include capital and depreciation for boiler equipment, operations and

maintenance, labor, additional insurance costs, the need for maintaining over-capacity, and all other "hidden costs" of operating ones own boilers at a seasonal efficiency that likely does not exceed 75 percent and may in fact be even less.

We wanted to obtain some overall picture of the price competitiveness of district heating across the cities represented by our sample enterprises. We knew, however, that the basis for a comparison of district heating prices across several cities would be difficult at best and misleading at worst. Delivered district heating prices, like gas prices, may contain several components including a fuel cost recovery charge, a demand charge, and a "meter" or billing charge or other fixed cost portion in their rate structure. In fact, most of the systems had at least three components in their rate structure, which, depending on the level of consumption and recent fuel price levels, could cause significant variation in the final end-user cost. However, in spite of these complications, we have arrived at a typical figure, based on recent rate parameters, for a customer with an average level of consumption. Because of this averaging, the figures are not strictly accurate and comparable; however, they do reflect, in a general way, the relative costs of service between competing utility services within a jurisdiction and among the different jurisdictions in the survey.

In obtaining a true picture of the competitive advantage of district heating in the various cities, one would also have to account for the variability in the "hidden cost" features of gas heating prices, such as labor, operations and maintenance, and so on. The only "working

Table 6.

Average Rates for District Heating Service ($/MMBTU) and Average Commercial Gas Rates* ($/MCF) for Sample Cities (1986)

	District Heating Rate ($/MMBTU)	Commercial Gas Rate ($/MCF)**
Baltimore	$12.00	$5.10
St. Louis	11.00	4.50
Seattle	10.00	6.00
Youngstown	9.59	4.45
Minneapolis	8.90	4.35
St. Paul	8.62	4.00
Trenton	8.50	5.90
Vancouver	7.83	4.30
Willmar	7.63	4.20
Jamestown	7.50	5.50
San Francisco	6.48	5.60
Provo	3.00	4.00

* Note that the cost of gas fuel alone cannot be compared directly with the cost of district heating. This is because the price of gas is only one of several components in the cost of heating with gas (see discussion on pages 49 - 52). The two figures are displayed together here only to demonstrate that district heating can be competitive under a wide range of market conditions in which gas price is only one of several determining factors.

** The measures MCF (thousand cubic feet) for gas and MMBTU (million BTU's) for heat are comparable in the following way: one MCF of gas, when burned at 100 percent efficiency, produces about 1.03 MMBTU of heat. Thus, in theory, the heat content of one MCF equals one MMBTU.

figure" we could develop in the limited time allotted to the survey was the average commercial gas tariff against which each district heating system competed. The commercial gas price, it should be noted, is only one of several determinants in calculating the true cost of heating with gas fuel.

Table 6 shows the results of the survey, with the district heating enterprises arrayed in order of end-user district heating costs, form highest to lowest. This ordering shows that the steam based systems tend to cluster in the $10.00 - $12.00 per MMBTU range, while the new hot water systems are grouped in the $7.50 - $8.50 per MMBTU range. We should further note that several of the steam system respondents reported that, with falling gas prices, the competition from gas service was "very keen," with one respondent attempting to initiate an interruptible rate in the area of $9.00 per MMBTU. This suggests that district heating can be price competitive at rates at or below the $10.00 per MMBTU range, and that new hot water technologies can offer significant cost advantages over steam technologies in providing district heating service. Further, we believe, on the basis of these admittedly sketchy results, that new hot water systems should be able to market the service at a cost within a range of $7.00 - $9.00 per MMBTU.

CONCLUSION

This chapter has surveyed the marketing approaches and techniques used by twelve district heating enterprises from

two perspectives. The first analyzed the marketing activities by common functions performed: corporate visibility and public relations; education; targeting and approaching new customers; demonstrating and assuring savings; and customer service. Any district heating marketing program must devote some resources to each of these functions. A second perspective on the marketing efforts looked in more detail at the text, format, and graphics used in the major marketing brochures. Ten marketing features emphasized in the brochures included

-- corporate identity
-- system size and expansion
-- district heating definition
-- consumer savings
-- technological advantages
-- other advantages
-- environmental benefits
-- community benefits
-- customer service
-- customer surveys and testimonials

Not all the marketing programs emphasized all features. Rather, each program accented those features which marketers judged would have the greatest impact on their target audience. Several marketing features, such as rate stability, reliability, efficiency, and space savings were commonly used in most of the campaigns. Other features, such as capital and labor savings, elimination of "hidden costs," customer service, and comfort or convenience were less commonly used.

It should be remarked here that our analysis is only valid to the limits of the evidence we were able to gather

from survey interviews and from the marketing brochures themselves. The possibility remains that district heating marketers in fact make use of a wider variety of selling techniques and promotional features than we were able to identify on the basis of a very limited survey. However, it is also clear that district heating marketing is a new and expanding field of enterprise. Tools and techniques developed in a single market location are only now becoming well tested for adaptation to other markets. And it is only very recently that the district heating marketers themselves have formally met to share experiences and exchange ideas.

Marketing and management professionals have begun to associate under the auspices of the International District Heating and Cooling Association. Meetings of district heating marketers, begun in June 1986, have developed into a full-fledged IDHCA committee under the leadership of Jack Kattner, Director of Marketing for the Minneapolis Energy Center and current IDHCA Director. This committee has already attracted the involvement of some forty district heating professionals. Such cooperative effort has already begun to develop a body of knowledge regarding marketing methods and practices. Cooperation of this nature among district heating marketers--sharing ideas and information on the current heating and cooling market, and pooling creativity and resources in responding to that market--is probably essential if district heating businesses are to continue to compete effectively in the short term and to thrive in the long term.

There is already evidence that a body of knowledge is taking shape as a direct result of the marketing workshops held since 1986. Jim Young of Seattle Steam has summarized the principal elements of a district heating marketing

strategy, and Kattner himself has presented the workshop results in the form of ten "key points" for marketers (see Appendix J). The importance of developing a marketing strategy in each district heating market, of assembling a set of key points to target the marketing effort most effectively, and of developing a comparative body of marketing wisdom to be shared within the industry, is unequivocally supported by the evidence collected in this marketing study. Chapter Four will summarize the major lessons to be gained from our analysis and apply them both to the emerging markets for district heating/cooling in other cities as well as to Columbus.

Chapter 4. Recommendations and Suggestions for Application

INTRODUCTION

Based on the analysis in the preceding chapter, a number of observations and suggestions for application can be made. Some of these observations and suggestions are generally applicable to marketing district heating regardless of the system's type (steam or hot water), while some are more applicable to only one type of system. For this reason, we have separated our remarks according to two different scenarios to which they may apply:

(a) the acquisition and rehabilitation of an aging steam system--in most cases formerly owned and operated by an investor-owned electric utility; and

(b) the creation of a new hot water district heating system where none had existed before (or as a replacement for an older steam system), typically using European hot water technologies.

We will first make a number of observations which apply to district heating marketing generally, regardless of the system type. We will then make some further observations which are specific to the system type and situation. And finally, we will apply these observations to the specific case of Columbus.

COMMON ELEMENTS

Regardless of system type, district heating marketing programs will fulfill several basic functions:

* Promoting corporate visibility/identity
* Education
* Targeting and approaching new customers
* Demonstrating and assuring savings
* Customer service

Different situations will require different levels of emphasis among these functions, which will be performed in varied ways according to local circumstances. Nevertheless, the following recommendations assume that a district heating marketing program will incorporate each of the five functions to a greater or lesser extent.

District heating marketing programs should include the use of a professionally developed and printed brochure. The brochure is an especially valuable marketing tool because of its variety of uses -- from direct mail applications to group presentations to business proposals -- and because it fulfills both the functions of education and corporate visibility/identity. It is also invaluable because it is often the potential consumer's first introduction to the concept of district heating and to the corporation.

Professional expertise should be utilized in the brochure's development, while quality printing materials and maximum use of color should be emphasized. Because first impressions are often lasting impressions, it is important

to put forward the best possible image. The importance of the brochure to the marketing effort dictates an emphasis on the highest possible quality.

The brochure's content should include, at a minimum, the topics most commonly used by successful DHC enterprises. These include corporate size and history as a "success story;" the system's size and service coverage; technological advantages, including fuel versatility, reliability, and efficiency; and district heating's potential as an economic development tool. Customer surveys carried out in San Francisco and in St. Paul indicate that customers do respond to advantages other than capital or short-term operational savings. Among these are architectural flexibility and space savings, safety features, environmental protection, and long-term cost stability.

Group presentations should be included in the marketing strategy. These presentations should be given to the local development community, including local real estate developers, engineers, architects, and local building owners and managers. The presentations should be based around a slide show or similar medium, and a professionally developed slide show featuring multiple projectors and a pre-recorded narrative should be considered. The presentations should serve both an educational function as well as a corporate visibility/identity function.

A newsletter, issued at least quarterly, should be published as part of the marketing effort. The newsletter should contain, among other items, articles of a testimonial nature, featuring satisfied customers and their perceptions

of the advantages of district heating service. Other highlights may include new customer additions, project development milestones, system improvements and expansion plans, and special promotions. The newsletter, while a valuable customer service tool for existing customers, may also be used for broader educational and customer targeting purposes. Some enterprises use the newsletter as a direct mail piece to prospective customers, for example.

A high quality business proposal presentation folder should be utilized in person-to-person presentations. Because the folder will reflect the corporate image, attention to quality must be emphasized. The proposal must include an economic analysis of costs and savings, which should be "customized" to individual situations. For this analysis, the use of a computer model based on conventional spreadsheet software may enhance the credibility of the demonstration and help assure savings.

Press releases and media exposure in local trade and organizational publications should be utilized on a regular basis. This will enhance the project's visibility and public image. The fall and winter months are a particularly good time period for such exposure, and system development "milestones," improvements, and expansions are particularly appropriate subjects.

Membership in professional, trade, business, and civic organizations should be established. Upper level staff should be encouraged to establish membership in appropriate organizations and committees within those organizations (such as the Building Owners and Managers Association--BOMA, or the American Society of Heating, Refrigeration, and Air

Conditioning Engineers -- ASHRAE), and corporate memberships in business organizations such as the Chamber of Commerce and the International District Heating and Cooling Association--IDHCA). This will enhance corporate visibility and image.

A market survey should be carried out in the earliest stages of the project. The survey should indicate those buildings with HVAC systems most compatible to conversion to district heating service as well as the age of boiler equipment. Buildings with boilers fifteen or more years old will soon need to be replaced--and district heating may be marketed on the basis of helping owners to avoid replacment costs. Overall, the market survey should indicate which advantages offered by district heating will be attractive to which types of customers.

Marketing programs should indicate the system's commitment to customer service. This commitment should be made explicit in the brochure, in the newsletter, and through the use of techniques such as a twenty-four-hour customer service hotline and customer response surveys.

In spite of tough competition from competitive gas prices, district heating can be marketed on the basis of short term fuel and operations savings. We speculated at the inception of this study that in the currently highly competitive environment, district heating enterprises would tend to market their product on the basis of longer-term advantages such as fuel price stability, reliability, lower maintenance requirements, and overall efficiency. In fact, however, the enterprises represented in our survey are marketing the immediate savings in fuel, operations, and maintenance costs. In order to do this, marketers must demonstrate the true costs of heating with individual gas-fired boilers in comparison with the cost of district heat;

they must also point out the many "hidden costs" associated with operating individual gas-fired boilers.

District heating must be marketed in different ways to different target audiences. The advantages of district heating will appeal differently to narrowly-defined target audiences. Architects, for example, will be less concerned with long-term operations and maintenance costs than with the space savings and architectural flexibility. Building managers, on the other hand, may find the increased reliability and lower maintenance requirements especially appealing. Developers will be interested in the potential to avoid capital costs of boiler systems, while building owners will find operational savings more attractive. Each of these potential decision-makers will require a somewhat differently-tailored approach. The marketers in our survey realize the differences in their target audiences; several of their marketing programs show evidence of real sophistication in defining the groups to be approached. However, most of the enterprises appear to have placed substantial marketing resources into a brochure designed to reach the largest possible audience with a wide range of selling features.

STEAM SYSTEMS

In situations where an established steam system is undergoing a change of ownership and revitalization, certain features should be emphasized in the marketing program. The

following recommendations reflect those areas of special importance to the marketing program:

An existing steam system's marketing strategy should emphasize customer service and restoring confidence in the system within the existing customer base. It is often the case that as steam systems have deteriorated and suffered declining economic performance, the system's ability to meet customer service demands has naturally declined. A renewed emphasis on customer service is a strong message to the existing customer. Techniques such as St. Louis's customer service promotions ("Hassle Free Heat" and "Summer Sizzle Stoppers") and Youngstown's Customer Service Response Survey and twenty-four-hour customer service should be especially effective.

The marketing brochure should include a map of the system's service area. Many potential customers may not be aware that they are located within the system's service area, and that an alternative to conventional utility service is available. The inclusion of a service area map is an effective remedy. It may also be a good idea to indicate the buildings which are currently served, to diminish the sense of risk which may be associated with changing to an alternative utility connection.

Previously-served customers who have gone off of the system should receive special attention. As older systems declined in economic performance and customer service capabilities, some customers optioned to switch to conventional utility service. With the revitalization of the system and the return of competitive economic performance and improved customer service, these buildings

represent a market which can be readily reconnected. The technique used by St. Louis in their "Show Me" promotion, which allows for the comparison of in-house boilers to steam service, could be especially effective (see Appendix C).

The marketing program must emphasize the compatibility of steam service with modern heating systems. In many minds, steam heat is an outmoded technology, a "dinosaur in a jet age." The marketing program must overcome that notion. A technical guide or handbook, such as the one used by Vancouver, may be an effective tool in helping to change attitudes among the engineering/architectural community.

The marketing materials must emphasize that the system is under new management, is undergoing modernization and revitalization, and is economically competitive with conventional utility service. It is the customer perception of poor system management in allowing the steam network to deteriorate which represents the major image problem of most steam systems.

HOT WATER SYSTEMS

Establishing a new hot water system presents some challenges which older steam systems do not face. For example, in such instances, most businessmen, building owners, and homeowners are totaly unfamiliar with district heating. In some cases, half-informed "experts" may draw comparisons with older steam systems which have not functioned at peak performance for many years. The "common knowledge" within the local engineering/architectural community may be that district

heating is an inadequate and outdated technology which "can't compete." Marketing district heating in this kind of environment will require a special emphasis reflected in the following recommendations:

The initial marketing effort should focus on educating the community to the economic advantages and community-wide benefits of district heating. Because new hot water systems are often the community's first exposure to district heating technology, education must take a top priority. In the initial phase, group presentations and brochures are useful educational tools. Because a system has not yet been established, these will need to focus on previously-successful experiences in other cities. Target groups at this stage should include the local Chamber of Commerce, the Building Owners and Managers Association, and other local engineering and architectural organizations.

The marketing program must clearly differentiate modern hot water technologies from the steam technologies of older systems. Comparisons to older steam systems which have recently suffered from poor economics will be common. Hot water technologies and their advantages over steam must be clearly distinguished from steam technologies, and this distinction will likely be required again and again. Group presentations and marketing brochures can be effectively used to make this point.

Top-level political support may be a crucial, if not absolutely essential, requirement in establishing a new hot water system. This is something which we heard over and over again. The systems in Jamestown, Provo, St. Paul, and Trenton all reported the importance of mayoral support in

establishing community acceptance. These are all recently constructed hot water systems. In addition to these, Baltimore Steam reports that Mayor Schaefer's energy office has been very helpful in "opening doors" to potential customers. This suggests that while top-level political support may be useful in promoting established steam systems, such support may be absolutely essential in establishing a new system.

Competition with the local gas utility is to be expected. Most of the new hot water systems in our survey either had faced or were currently facing tough competitive practices from their local gas utilities--competition not always restricted to the market but often in the political and regulatory arenas as well.[1] However, there are also examples of peaceful coexistence or even "friendly competition" with the gas company. In Minneapolis, the district heating system was formerly owned by Minnegasco. Now, the district heating system and Minnegasco are competitors in the same downtown market, but the Minneapolis Energy Center is also the gas company's largest customer!

Early feasibility studies should be written with the marketing function in mind. The first step in establishing a new hot water system is generally to undertake a feasibility study to establish whether district heating is economically feasible or not. When positive indications for feasibility are found, the study itself becomes the first marketing tool taken to the community. The problem with this is that early engineering studies are seldom authored

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[1]Utility competitors in the sample cities have, in different situations, initiated public criticism of feasibility assessments, raised opprobrious questions at public district heating presentations, and provided negative commentary to the local press. Cogenerating district heating systems have sometimes experienced attempts to cut buy-back rates, and have even suffered difficulties in collecting accounts receivable from the electric utility.

with the marketing function in mind. A good alternative could be the creation of a separate document which summarizes the findings of the feasibility assessment in an easily comprehensible and marketable style.

RECOMMENDATIONS SPECIFIC TO COLUMBUS

The City of Columbus has been assessing the potential for district heating in Columbus for some time. In the City's efforts to promote private development of district heating, there have been some successes; however, results have sometimes fallen short of the original expectations. To date, executive and legislative support has been sufficient to pass legislation to begin assessments of district heating potential at the Municipal Electric Plant. Earlier feasibility studies in Columbus have given positive results (as detailed in Chapter Two) and a preliminary marketing brochure has been distributed. However, much remains to be done. Now that it is clear that the City will not be a developer or marketer of district heating service on its own, the existing and potential market will be cultivated by private developers with private financing. Future City involvement in district heating development will most likely be restricted to sales of heat from the trash-burning Municipal Electric Plant. The following recommendations are drawn from the preceeding pages of more general suggestions and follow the hot water model previously described. Our recommendations are intended to apply to private district heating developers who now have the initiative.

A high-quality marketing brochure should be professionally developed and published. This brochure should outline the findings of the earlier feasibility assesments and detail the advantages of district heating in a general way. The brochure should distinguish the proposed hot water technology from older steam technologies, and should feature successful district heating projects which have been developed elsewhere. Emphasis should be placed on the maximum use of color and quality in the printing and presentation. An earlier booklet, "District Heating in Columbus," was developed by city staff. This is no longer adequate and was not intended as a full-scale marketing piece.

A professionally produced slide show for group presentations should be developed. The present slide show, while quite good for a non-professional effort, is inadequate for a truly professional marketing program.

A high quality business proposal presentation folder should be developed. Several good models of presentation folders can be obtained from systems involved in this survey. The folder used by Seattle Steam offers an excellent example.

Group presentations should be carried out on a regular schedule. Early on in the project, a number of presentations were made to several local groups, including the local Building Owners and Managers Association, architects and engineers, and state and local officials. Such presentations will need to be scheduled on a regular basis and targeted toward business and professional groups which will provide maximum exposure and development impact.

Market survey research needs to be completed in order to properly target marketing efforts. A substantial portion of the downtown market has been surveyed. However, some "holes" remain in the data, and analysis of the data needs to be completed. Information on the downtown market should be carefully reviewed for areas of high heat load density, especially where potential customer buildings are large in size but small in number. Areas of substantial new development should also be targeted for concentrated marketing. On the basis of experience to date, we believe that the following buildings should be targeted for marketing within potential heat islands: (1) office buildings, including those under construction, with internal hot water systems; and (2) state, county, federal, and city buildings in the downtown area, whether owned or leased by those governments.

In approaching contacts within existing buildings and corporations, a multi-level strategy should be adopted. Although any sales approach must ultimately target the decision-makers within an organization, a sound strategy for Columbus district heating marketers will not ignore the building managers and facilities engineers. Indications are that the opinions of managers and engineers will be solicited by top management at some stage of the decision-making process.

District heating developers in Columbus should prepare for strong competition from the gas utility. As in most other cities with new hot water systems, district heating developers in Columbus should expect a serious challenge from the established gas utility. The most effective competition from the gas company will be in the area of low-

cost "self-help" gas offered to large customers. District heating marketers in Columbus will have to become experts in the many special marketing "programs" and rates that are used in the self-help gas market. At present, the local gas utility has its own self-help gas marketing subsidiary, and is in compliance with FERC order 436, which requires it to sell gas transmission through its own network to other gas marketers. However, in spite of the threat of competition as well as previous public challenges to the concept of district heating, the gas utility has indicated at points throughout the assessment process that it was willing to provide self-help gas to a district heating enterprise.

Consumer contracts should offer rate stability over the long term. Self-help gas can only be marketed in one-year contracts, and the costs of negotiating and administering an annual gas contract can be high. District heating contracts can offer or even guarantee long-term advantages to consumers. Care should be taken, however, in pegging district heating rates to competitive gas or oil prices. In short-term falling markets, such arrangements can have an exaggerated negative impact on district heating revenues.

In the present atmosphere of declining government support for district heating assessment and development, privately-obtained financing or investment for new systems is required. In spite of the limited role of government in district heating development and promotion, however, local government support remains important for "opening doors" for district heating marketers. (This is true not only in new systems but even in some of the larger, well-established steam systems such as Baltimore).

District heating developers must maintain a positive working relationship with local government development officials. In the June, 1986 project report Modular District Heating Planning as a Development Tool, we wrote that "some form of centralized growth planning is certainly helpful, if not absolutely essential, to integration of district heating with development/redevelopment efforts." Since 1986, there is some evidence in Columbus that the political climate may favor a more active leadership role for local government in planning future city development. If this is the case, district heating developers should maintain connections with local government planners and administrators. If district heating is to be employed in Columbus as a development tool, which is one of its clearest attractive features, close ties with both public and private sector development interests are required. In this regard, district heating developers should closely follow the prospects for a monorail network in the downtown. If monorail development occurs, the path of its network may offer strong indications of heat island potential. Perhaps joint right-of-way solutions for both monorail lines and district heating mains could be found.

In the initial development stages, corporate credibility and visibility of the district heating enterprise will be enhanced by the participation of prominent local companies. Due to the conservative nature of the downtown business community, the status and trustworthiness of a new district heating corporation would be strengthened both by business relationships with prominent local financial/investment firms and by acquisition of large corporate customers.

As a basic feature of the marketing campaign, a solid, conservative image should be projected by the district heating enterprise. Breaking into the local heating market, already dominated by the established utility, will require any district heating enterprise to demonstrate:

-- financial soundness;
-- a credible business plan;
-- technical reliability; and
-- a solid, conservative business image based on the above attributes.

Rather than projecting an image of technological innovation and David-vs.-Goliath-style entrepreneurship, the district heating enterprise should represent its service as a proven, established technology--easily available, reliable, safe, and price-competitive.

A technical handbook for architects and engineers should supplement other marketing materials. In addition to the major corporate brochure, the district heating developer should distribute a technical guide primarily for the benefit of mechanical engineers but also useful for explaining the basic concepts of district heating to architects. At a minimum, this handbook would show a typical district heating layout for a 500,000 square foot office building using a hydronic heating system. It would be targeted toward new construction as well as rehabilitation of older structures.

Successful customer experiences from other U.S. cities should be used as testimonial examples in the development stage. Because potential Columbus customers will have had

little or no experience with district heating, particularly with multi-user systems, developers may find it useful to obtain testimonials from similar types of customers served by other district heating systems. Testimonials could be used in marketing materials, or potential customers could be urged to contact selected customers in other U. S. cities. Alternatively, marketing seminars could be hosted which would bring prospective customers into contact with satisfied district heating customers from other systems.

Consumer confidence will be enhanced by representation on the board of a district heating enterprise. As in St. Paul, consumers may have elected representation on the board of the not-for-profit enterprise. In the case of a for-profit corporation, some form of representation on the board is also possible, or customers may be encouraged to become shareholders in the enterprise.

Surveys of customers and potential customers can be a means of keeping track of consumer needs and preferences. In the initial development phases, as well as in project construction and operation, the marketers should keep a close eye on customer preferences and should actively seek out customer opinion and input. Surveys, customer response programs, and informal visits and phone calls should be used to monitor customer satisfaction. Since the district heating company is likely to be small in its initial phases, managers can and should give individual and preferential attention to all customers.

Business image and consumer trust will benefit from membership in local business, civic, and professional organizations. The district heating enterprise and its

managers should be represented in local chapters of ASHRAE (American Society of Heating, Refrigeration, and Air Conditioning Engineers), and BOMA (Building Owners and Managers Association), as well as in the Chamber of Commerce. Membership in the International District Heating and Cooling Association, the Association of Energy Engineers, and other national professional associations is strongly advised.

Prices of delivered heat in the range of $7.00 to $9.00 per MMBTU should be competitive in the short term with the individual gas boiler alternative. Based on our survey of other district heating systems throughout the U.S., it appears that successful new hot water systems are able to offer their customers delivered heat prices in this range. Our estimate is that this range represents the best competitive possibility under current market conditions.

It should be noted that our recommendations are intended for private entrepreneurs in the Columbus market. As noted in Chapter Two, the first phase of district heating development in Columbus, in which the City government played a leading role, is now drawing to a close, and the second phase, in which private developers are expected to take over the initiative, is about to begin. While our suggestions, derived from the success stories of other North American district heating systems, are targeted primarily toward the private sector, a few words about the continuing role of the City government in district heating are in order. While the City is successfully transferring its assessment and development role to the private sector, it is reasonable to expect that future district heating development activities will remain of interest to the City. This is true for

two basic reasons: first, the City will be in the position of obtaining revenues from heat produced at its trash-burning power plant; and secondly, because district heating can be utilized to stimulate positive development trends in the downtown, along the riverfront, and in other areas of Columbus. Readers interested in the development potential of district heating in Columbus are advised to consult the Planning Division's 1986 report to the Urban Consortium Energy Task Force, Modular District Heating Planning as a Development Tool (DG/85-316; 05/86-100).

The Public Utilities and Aviation Department now has primary responsibility for development of district heating at the Municipal Electric Plant. Investigations carried out by the Planning Division in 1987 indicate a significant potential for greenhouse development on landfill sites now owned by the City and adjacent to the power plant. Greenhouse development in that area would substantially improve the market for district heating and enhance the revenue potential to the City. Such development would also be attractive for its job-producing potential, and would offer a significant opportunity for promotion of the floriculture industry in Columbus. The City of Columbus has a special interest in floriculture development in conjunction with its sponsorship of the 1992 Ameriflora exposition to celebrate the quincentennial of the discovery of America.

SUMMARY

In summary, the necessity for careful targeting in the district heating marketing approach calls for careful determination of an effective marketing strategy. District heating cannot be all things to all people. In each market, some types of customers will be more important than others; certain types of individuals will be more easily reached than others; certain decision-makers will be more influential than others. Any marketing program has only limited resources; not all potential audiences can be approached with the same persistence and depth. District heating marketers in our sample are in the process of defining their most fruitful target audiences and articulating an overall market strategy which will achieve the best results for the marketing dollar. Cooperative efforts among district heating marketing professionals will be important in this effort.

As a final observation, we would applaud and endorse the professional sophistication evident in the marketing programs which we surveyed. It is clear that a successful district heating marketing program requires full-time dedication as well as professionalism, combining both engineering and sales experience whether represented by a single individual or by a well-rounded marketing team.

APPENDIX A: DISTRICT HEATING MARKETING SURVEY

SYSTEM CHARACTERISTICS

a) System type: Steam at _____degrees F. and _____ p.s.i.
Hot water at _____ degrees F. and _____ p.s.i.

Factors influencing choice of system type_____

b) Total feet of distribution system _____
(does this include customer service branches?) ___

c) Customer types and numbers:
Office buildings_____
Hotels_____
Institutional - university_____
civic center_____
government_____
complex (any type)_____
other _____
Residential: high rise apartment buildings _____
low rise apartments _____
(any individually metered?)

Single family detached housing _____
Industrial (for process heat) _____
Other _____

d) Load characteristics:
Total contracted peak demand _____
Annual peak send-out _____
Total annual send-out _____
Annual heat sales _____
Air conditioning: individual absorbtion chillers?
central chiller?

e) Heat sources:
Primary heat source fuel _____ ,plant capacity _____
Secondary sources: fuel _____,plant capacity _____
fuel _____,plant capacity _____
Annual fuel inputs, by fuel types _____
_____

f) Capacity for system expansion_____
Plans for expansion_____
If none, reason_____

g) Number of employees_____

MARKETING FEATURES

a) Brochure used?(Y/N)_____
   Other types of informational literature?(Y/N)_____
   Describe_____
   Developed in house, or ad agency used?_____
   Approximate cost_____

b) Group presentations used?(Y/N)_____
   Did you use a slide show, film, or video tape?_____
   Preferred media?_____

c) To what extent have you used press releases (_____ per year)
   and or "media events"(_____ per year)?

d) "One-on one" sales presentations?(Y/N)_____
   Includes: computer modeling_____
   savings worksheet_____
   other_____

   Prevailing Gas Rates:

   Calculated unit boiler cost vs. DH unit cost:

   Estimated individual boiler efficiencies:

e) Sales representatives background:
   Engineering _____
   Marketing/Sales _____
   Technical sales _____

f) Target audience:facilities engineer___
   comptroller_____
   vice president_____
   general manager/CEO____
   (rank in importance)

g) Institutional support:
   Federal gov't (HUD grants,UDAG, etc.) _____
   State gov't (grants, loans, IDB's, etc.) _____
   Local gov't (mayor's political support, UDAG, etc.) __
   Local educational inst. (univ.) _____
   Local business inst. (BOMA, Chamber of Commerce, etc.)
   _____
   Other _____

h) Institutional barriers:
   Local gov't _____
   Local utility _____
   Other _____

i) Are you:

Actively seeking new customers _____
Trying to maintain existing customer base _____
Both _____

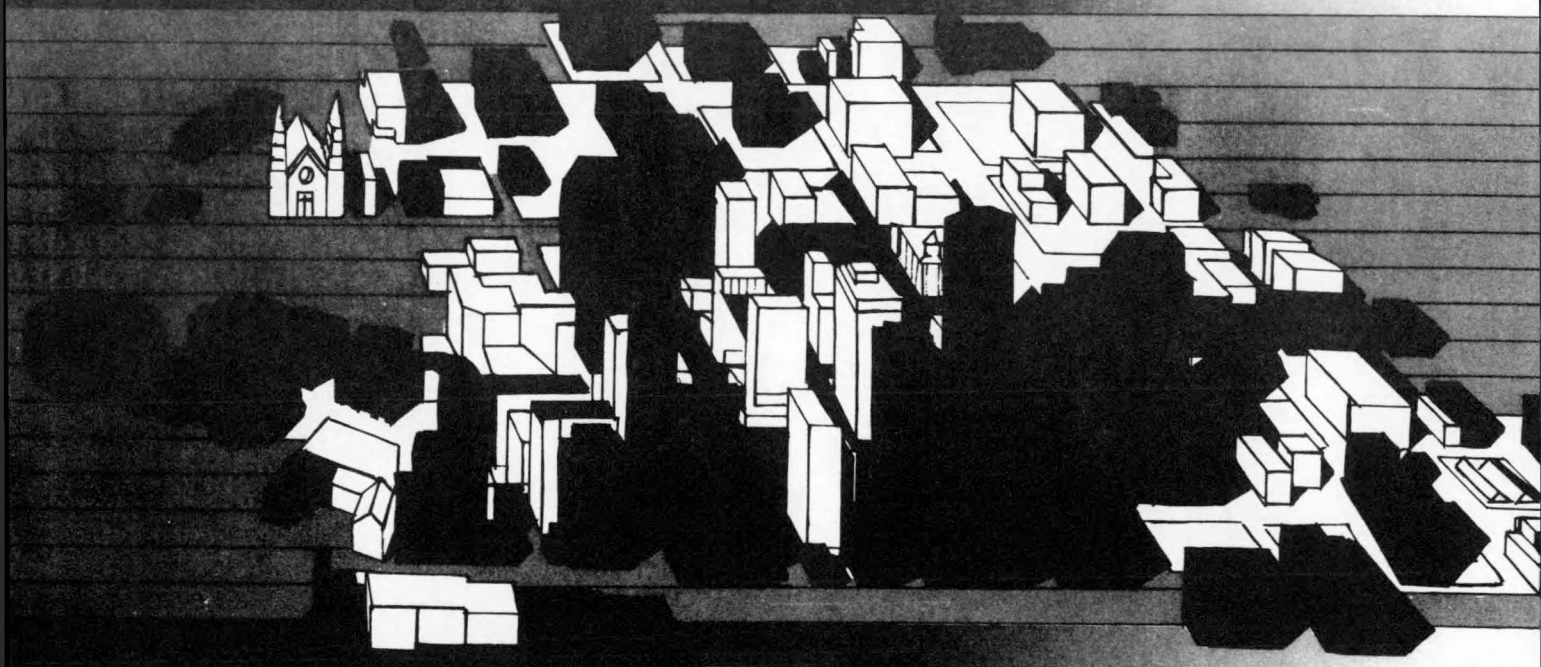
j) System history:

Revitalized utility owned steam system _____
New steam system _____
New hot water system _____
Mixture of both _____

k)Any other observations: _____

_____

District Energy ST. PAUL, INC.



1986 Annual Re

A New Corporate Identity

On Jan. 15, 1987, District Heating Development Company changed its name to District Energy St. Paul, Inc. We think the new name better reflects the evolution and vitality of our company.

The decision to change our name was made in December 1985. Our existing name was no longer appropriate for the company we have become: With more than 400 St. Paul customers, we are clearly more than a developmental company. We believe the new name accurately depicts our status as an ongoing, operating utility.

The new name also gives us an important opportunity to recognize the community we serve. District Energy is truly St. Paul's heating provider, and we want our name to reflect our strong community ties.

We've also developed a marketing theme to accompany our new corporate identity: "Discover the Advantage." This theme will help us promote the short-term and long-term benefits of District Energy's services. The new theme will appear in our 1987 advertising and on a special marketing brochure to be released in February.

We're excited about our new name, logo and plans to build awareness of District Energy's unique customer benefits. We are confident they will communicate a renewed sense of pride and excitement among our customers and our community.

Looking Forward

District Energy St. Paul is preparing for an active 1987, with major developments expected in several key areas.

By the end of 1986, we had completed several projects that will increase system efficiency. Improved environmental controls, a new feed water system, a new ash system and stack refinements are expected to lead to added economies in future fuel consumption, water use and labor requirements.

One of our most exciting efforts was the start of a 3,000-foot extension of the District Energy pipe system, which will bring district heating to the St. Paul Port Authority's Empire Builder Industrial Park, just north of Bethesda Lutheran Medical Center.

In addition to refining and expanding our heating system, District Energy will be devoting considerable energy to its business operations in 1987. For example, we will be proposing revisions to the basic Hot Water Delivery Agreement. Upon approval by our customers and city officials, these changes are expected to facilitate negotiations with potential customers. Because system growth results in lower per-customer rates, changes in the Hot Water Delivery Agreement could be of *significant* benefit to all current and future District Energy customers.

Perhaps our most intriguing look toward the future was the completion of a feasibility study for the development of a district cooling system. With such a system, District Energy could produce chilled water in the winter, and store it in an aquifer until needed for summer air conditioning. Our preliminary conclusion is that this system is not viable for the immediate downtown area, but could prove cost-effective for new development areas, thereby becoming a significant part of District Energy St. Paul's future.

These developments, and others, are part of District Energy's continuing commitment to provide exceptional service far into the future.

ENERGY MANAGERS NEWS

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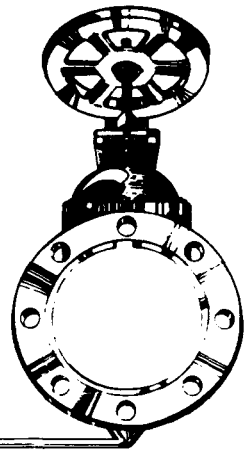


Thermal customers received a special mailing in May entitling them to free valve repacking.

Summer Sizzle Stopper Off To Super Start

Response to Thermal's Summer Sizzle Stopper, a special program entitling customers to free valve repacking based on steam usage during the past heating season, has been overwhelming.

The program, introduced by mail in May, was designed to give customers added value to the low prices and excellent service they already enjoy.

"Most people think of the benefits of district steam as savings they realize during the peak heating season," says Rick Pucak, Thermal's director of customer services. "We introduced this program to show our customers that the summer months pay back in big savings as well. It's our way of saying thanks for choosing Thermal Resources to fulfill your steam needs."

(continued on page 6)

A Message From Thermal

How Jack Learned The Truth About Gas Boilers

Last month one of our customers called, claiming he could cut his heating costs in half by purchasing a gas boiler to generate steam. He supported his belief by pages of computer printout provided by a boiler salesman.

Curious and concerned, one of our energy managers went to review the analysis. What follows is the discussion that took place. The name of the building manager has been changed to Jack. He manages a 15-story office building with 300,000 square feet in downtown St. Louis.

JACK: This says I could cut my heating bill in half by installing this gas boiler. And the savings will increase every year for the next 20 years.

ENERGY MANAGER: Sounds pretty good. Are the numbers right?

JACK: I guess so. Take a look.

ENERGY MANAGER: Well, the first thing that looks funny is the cost of steam. The analysis shows a 1986 price of $19.11 per Mlbs. Our current contract rate is $13.10 per Mlbs. Wonder how they figured that.

JACK: I don't know. Well wait, look here. They assume a 15 percent surcharge for not signing a long-term contract.

ENERGY MANAGER: That's not right. The surcharge is only 5 percent, and many of our customers avoid it by signing a 5-year agreement. He also shows our price increased 10 percent last year. In fact, it in-

(continued on page 3)

Gas Boilers

(continued from page 1)

creased less than 1/2 of 1 percent.

JACK: So your current price is $13.10, not $19.11 per Mlbs.

ENERGY MANAGER: That's right.

JACK: It says here I can generate my own steam for $7.88 per Mlbs.

ENERGY MANAGER: Sounds low.

JACK: They say this boiler is a pretty good one; ought to be, it will cost a mint. They claim it gets over 80 percent efficiency.

ENERGY MANAGER: Well, at any instant a boiler can get efficiencies over 80 percent, but the seasonal efficiency is generally 15 percent to 40 percent lower.

JACK: But the boiler manufacturer is going to guarantee 80 percent efficiency.

ENERGY MANAGER: He's going to guarantee a "combustion efficiency" based on results from a flu-gas analysis. At full load with brand new, clean burners and a factory-trained technician to adjust the fuel/air ratio, it's easy to get 80 percent efficiency. Seasonal efficiencies are lower due to additional stack losses between firings, low flame temperature caused by short cycling, boiler blowdown and inefficient partial loading. Remember, the only efficiency that counts is the one that determines how much money you spend, and that's the seasonal efficiency.

JACK: So the seasonal efficiency will be 40 to 65 percent. That's a pretty large spread.

ENERGY MANAGER: That's true. A lot depends on how much effort you and your staff put into operating and maintaining your boiler.

JACK: Well, my building engineer, Harry, is real sharp.

'They say this boiler is a pretty good one; ought to be, it will cost a mint. They claim it gets over 80 percent efficiency.'

ENERGY MANAGER: He'll need to be. Operating a boiler at peak efficiency is no simple task.

JACK: The last building I managed had a boiler, and we used a flu-gas analyzer.

ENERGY MANAGER: These indicators typically measure carbon dioxide and stack temperature and give a reading of combustion efficiency. On large boiler plants, oxygen is monitored, and automated controls are used to adjust the fuel/air ratio. These systems are expensive and a big maintenance item. The economics for your building probably don't justify installing one; instead, Harry will have to make a manual adjustment based on results of the flu-gas analysis. This will have to be done frequently since optimum combustion efficiency changes with changing loads and the stack draft.

JACK: Well, Harry's already busy, but I guess he could fit that routine into his daily schedule.

ENERGY MANAGER: Oh, he'll have more than that to do. Burners should be cleaned and adjusted periodically. The condition of the heat transfer surface is critical to the boiler efficiency. The fire side must be clean and free of soot or other deposits. The water side must be clean and free of scale deposits. Scraping and chemical treatment can be used to remove deposits during summer overhaul. During the winter, Harry will need to be very conscientious about his boiler water chemicals and follow a regular blowdown procedure for removal of dissolved and suspended solids.

JACK: This is a bigger job than I thought.

ENERGY MANAGER: Our boiler plant has more than 40 people, working around-the-clock, to maintain peak efficiency. Remember, operating boilers is our only business.

JACK: Do you think I can get close to 65 percent seasonal efficiency if Harry does all this maintenance?

ENERGY MANAGER: To be honest, I doubt it. It says here you are being quoted for installation of one boiler. One large single unit will operate intermittently during the majority of our heating season.

JACK: Yeah, but this fancy boiler has high-low firing capabilities.

ENERGY MANAGER: That may reduce cycling, but the boiler reaches its design efficiency for only short periods. And remember, heat radiation loss is constant and becomes very significant at low loads. The result is low seasonal efficiency.

JACK: Okay, I see your point. I will probably be somewhere in the range of 40 to 65 percent seasonal efficiency. What does that mean in dollars?

ENERGY MANAGER: Between $9.00 and $14.50 per Mlbs with today's gas prices.

JACK: Well, I still have a chance of beating $13.10.

ENERGY MANAGER: Wait a second.

(continued on page 4)

(continued from page 3)

What about the other costs of operating the boiler?

JACK: Like what?

ENERGY MANAGER: First, your electric bill is going to increase.

JACK: It's already gone through the roof!

ENERGY MANAGER: There have been large rate increases in the last couple of years, but I was talking about the boiler feed pump, chemical feed pumps, forced draft fan for exhaust and controls that you'll have to operate with a boiler. Measurements from actual boiler installations in St. Louis and an independent engineering study show the cost to be about 25 cents per Mlbs of steam produced.

JACK: This analysis shows 1½ cents per Mlbs.

ENERGY MANAGER: Other costs of operating a boiler are make-up water and chemicals for water treatment. Remember, to get good seasonal efficiency, you must keep the boiler water treated. An independent engineering study put this cost at 5 cents per Mlbs of steam produced.

JACK: This analysis indicates 1½ cents per Mlbs. Low again. What about maintenance? The boiler salesman's analysis shows 2.3 cents per Mlbs. That would be $172.50 per year. Does that sound right?

'Remember, the only efficiency that counts is the one that determines how much money you spend, and that's the seasonal efficiency.'

ENERGY MANAGER: You've managed an office building with a boiler before. I'll let you answer that.

JACK: I doubt I could get an experienced HVAC contractor to even fix a minor problem for that. And the darned thing always breaks down on the weekend when it's overtime.

ENERGY MANAGER: That's right. In fact, the study I mentioned before found that it typically takes 50 cents per Mlbs to maintain a boiler.

JACK: Let me see . . . that's $3,750 a year. I probably won't spend that much in the first year or two, but I bet it will be at least that later.

ENERGY MANAGER: Now comes the hard cost to quantify. You and your maintenance people now have to operate several pieces of equipment — a boiler and its auxiliaries.

JACK: Well, the analysis shows 2 cents per Mlbs. That's $150 per year.

ENERGY MANAGER: Remember all the things we said Harry would have to do in order to get good seasonal efficiency: flu-gas analysis, mixing boiler chemicals and inspecting the boiler at least once a day as well as the annual overhaul. And you'll probably want him around with the contractor when there's a problem, as you said, usually on the weekend.

JACK: Yeah, that is a tough number to come up with.

ENERGY MANAGER: What about your time — administrative costs?

JACK: I don't know how to put a dollar value to that, but I can see where it's a lot of time and money.

ENERGY MANAGER: You're not alone. Most building managers would be hard pressed to quantify that cost. Studies show about $1.50 per Mlbs is a good average number.

JACK: Okay.

ENERGY MANAGER: Now, one more cost that the boiler salesman forgot to tell you about. Boiler insurance. Either you buy it or self-insure, which means you take the risk. It's a real cost either way.

JACK: Wow, that's true. I once managed a building where the low-water cutoff failed. The boiler overheated and that caused several failures in the boiler tubes. We had to replace a 4-year-old boiler. Almost lost my job over that one.

ENERGY MANAGER: Insurance is probably a good investment. It usually runs about 10 cents per Mlbs.

JACK: Okay, let's add up the costs.

Gas	$9.00 - 14.50
Electric	.25
Water Treatment	.05
Maintenance	.50
Operation & Admin.	1.50
Insurance	.10
	$11.40 - 16.90

I still might beat $13.10.

ENERGY MANAGER: Yes, but we didn't say your operating costs might not be lower. What does the boiler cost?

JACK: Well, let's look at the proposal. $135,000.

ENERGY MANAGER: Does that include everything?

JACK: No, it doesn't include removal of piping, initial water treatment or the boiler breeching and a new vent liner for the chimney.

ENERGY MANAGER: That will add to

(continued on page 5)

YMCA

(continued from page 2)

pre-programmed unit that reduces energy usage by controlling devices such as valves, fans, compressors, heaters and lighting.

The new energy management system took Noble and Gastler about a month to install on a part-time basis and has saved the YMCA approximately 30 percent in electricity and 25 percent in steam costs annually.

"A real benefit of this system for us is the fact that it's all controlled from a central location in our office," Noble said. "No one can interfere with the temperature if they don't think it's right — they have to come to us."

"Another great feature of this system is that we were able to run RF signals through existing 110 volt wiring, so we not only saved time but didn't have to go into the women's locker room, which could have been a problem," Gastler said.

Noble and Gastler also have installed an energy management system in the Webster Groves YMCA, which they can control from the downtown location. Eventually, they plan to do the same with other YMCA buildings. "Our philosophy was to get the system in quickly, start saving money and expand after that," Noble said.

The downtown YMCA has been with the steam district since it was built in 1925, with steam being used even to heat the pool. Noble and Gastler say they wouldn't think of leaving.

"With the steam district, I think we have 100 percent better control," Noble said. "The main advantage, of course, is that there's no boiler to worry about breaking down. There are boilers in the county YMCAs and they're big maintenance problems.

"The steam district gives us peace of mind. It's a totally reliable system, and we don't have to worry about low-water cutoff, liming up, chemical treatment, and all the other problems that go along with an in-house boiler. Also, space would be a problem here for an in-house boiler because we would need a large unit and would have to have a stationary engineer."

As for service from Thermal Resources, Noble and Gastler agree it has been excellent. "The service people are great," Gastler said. "We know them all by name and the response time is excellent. Once when we called, they arrived before we could get up the elevator to the lobby!"

Gas Boilers

(continued from page 4)

the installation. I'm not sure what these costs will be, but I can tell you that one of our customers was recently quoted $20,000 for a new flu liner.

JACK: Wouldn't surprise me if the cost was $175,000 before we were done.

ENERGY MANAGER: Or more. You're being quoted on one boiler. All your eggs are in one basket. Thermal has 5 boilers and only 2 are required on the coldest day of the year. We always keep an extra boiler on hot standby.

JACK: Your service has been reliable. No one is arguing that point.

ENERGY MANAGER: To duplicate that reliability, you should have multiple boiler units.

JACK: Okay, let's assume another $25,000 for a second boiler and backup auxiliaries. Total cost is now $200,000.

ENERGY MANAGER: To finance that over 10 years at today's rates would be about $32,000 per year. Divide that by your annual steam needs of 7,500 Mlbs and you get $4.27 per Mlbs.

JACK: My boss is going to have a problem with that. All capital improvements for energy management have to be amortized over 5 years. Corporate policy.

ENERGY MANAGER: That's about $7 per Mlbs.

JACK: If I add that to the operating cost range, my total costs are between $18.40 and $23.90 per Mlbs. That's 40 percent more than your price of $13.10, even at the best possible seasonal efficiency.

ENERGY MANAGER: That's right, and Thermal provides many building heating system services at low cost or for free. In addition, our price will escalate at no more than 1/2 the rate of inflation.

Thermal urges you to consider all the costs associated with operating and installing a boiler. Unfortunately, eager salespersons may only be showing you the tip of the iceberg. If you feel your heating bill is too high, investing in energy management always provides a better return than installing a boiler. This month's featured customer, the YMCA, did just that. Call one of our energy managers if you want an energy audit. It's free.

By the way, Jack did not install a boiler.

SHOW ME STEAM

HOW IT WORKS

To accept our challenge, all you need do is agree to alternate between running your boiler for one week and using centrally delivered steam from Thermal Resources the next.

Your gas bill will be read in your presence by a Thermal energy manager at the start of each billing week. An average cost per therm will be computed based on your monthly gas bill. The cost of gas for weeks one and three will be calculated, and the average cost computed. Thermal will bill you 20 PERCENT LESS than this average cost for your steam use in week two. This process will be repeated using gas costs for weeks three and five to compute the steam charge for week four.

THE ADVANTAGES

The weeks you are using Thermal Steam you will save 20 percent on fuel. It's as simple as that.

Not to mention the savings you'll realize on costs normally associated with your in-house boiler. Your electrical costs will drop the weeks you're on Thermal steam because you'll have no condensate and feed pumps or fans to run. And there'll be no need for makeup water. You'll also save on chemicals because Thermal treats the water for you. And, of course, there will be no wear and tear on your boiler or boiler maintenance.

But, most important, your building will have the reliability of district steam.

THE CHALLENGE

When we at Thermal Resources of St. Louis sat down to design a program that would prove to you once and for all that centrally delivered steam is the most efficient and economical way to heat your building, we knew our work was cut out for us.

Not because the benefits of steam aren't tremendous—or because the concept is difficult to grasp. We realized that the main problem facing us was the fact that you're a resident of the **"SHOW ME STATE"** and, as such, would have to see for yourself how Thermal steam could improve your bottom line.

So we developed the **"SHOW ME STEAM"** challenge with you in mind. We're prepared to demonstrate, at *no cost* or risk to you, that the central steam district is your best bet for building heat. And that right now, with no long-term commitment, you can save up to 20 percent on your heating bill through this promotional rate.

The heat may be off, but we're still cooking!

At Thermal Resources, we know that a sizzle means your energy dollars are going to waste. That's why we're introducing **THERMAL'S SUMMER SIZZLE STOPPER**—a special program that allows you to have your leaky valves packed FREE by our energy managers.

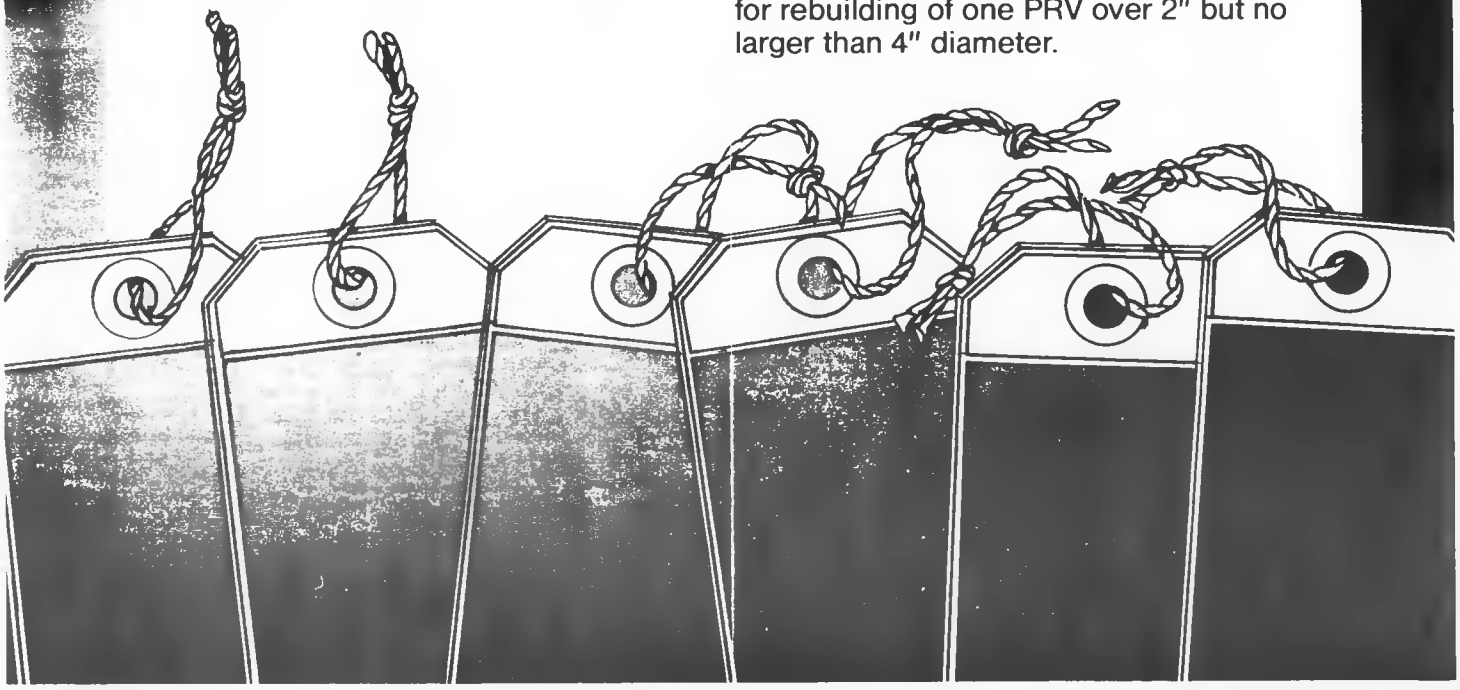
We're not content to sit back with our feet up during the summer and wait until things heat up. Instead, we're putting our time and manpower to good use by offering this energy saving special that will provide you with long-term benefits.

It's our way of saying thanks for choosing Thermal Resources to fulfill your steam needs.

Our Blue Tags are as **Good as Gold**

The blue tags we've enclosed are your key to energy savings. Each tag represents one valve you are entitled to have packed—**FREE OF CHARGE**—by our energy managers. Here's how it works.

For every 1000 Mlbs. of steam you purchase from Thermal Resources in 1985, we will pack two valves of your choice. Your steam usage has been computed, and the corresponding number of tags are enclosed. If you have a hydronic heating system, you can take us up on the same offer—or choose to have one Pressure Reducing Valve rebuilt. And, if you have a steam heating system but would prefer to have a PRV rebuilt, you can exchange 10 blue valve tags for rebuilding of one PRV no larger than 2" diameter. Twenty tags can be exchanged for rebuilding of one PRV over 2" but no larger than 4" diameter.



A HANDBOOK FOR

THE EFFICIENT USE OF STEAM

PREPARED BY

Keen Engineering Co. Ltd.
Vancouver, B.C.

and

Central Heat Distribution Limited

November, 1983

CENTRAL HEAT DISTRIBUTION LIMITED

Central Heat Distribution was constructed and operates under a certificate of Public Convenience and Necessity which was issued by the Public Utilities Commission of British Columbia and approved by Order in Council.

The Commission has full jurisdiction over all phases of the Company's finances and operations. Permanence of operation is assured by Section 7 of Part 1 of the Public Utilities Commission's Act and Regulations.

Any changes in the rate structure or Tariff must be justified to, and approved by, the B.C. Utilities Commission, and any application for such changes is subject to contest by consumers.

ADVANTAGES

(1) Cost comparisons illustrate the dollar savings to be enjoyed by the use of Central Heat as opposed to an Integral Hot Water Heating Plant.

(2) Owning and operating costs for Integral Plants will increase with time, wages, local codes, maintenance, repairs, etc. Central Heat Distribution Limited rates are more likely to remain static with increased local consumption and in competition with other fuel and heat sources.

(3) CHDL equipment requires much less space than boiler equipment, thereby providing maximum flexibility for location and additional revenue producing space.

(4) Continuing awareness by our community of the growing air pollution problems is constantly stimulating additonal laws and regulations to eliminate causes of air pollution. CHDL's plant employs the latest combustion control equipment.

(5) Conservation of energy is of vital concern to governments and the community. Time has proven that District Heating provides much greater efficiency than individual boiler plants collectively.

(6) In the long run CHDL will be in a much better position than individual building owners to develop the use of alternate forms of energy.

(7) The automatic controls that can be provided and CHDL's record of continuity of service provide long term reliability as compared to the relatively short life span of package boilers.

1.0 INTRODUCTION

1.1 OPERATIONS SINCE 1968

In the course of district heating operations commencing in 1968, Central Heat Distribution Ltd., Vancouver, B.C. has provided efficient, continuous, steam heating service to its 100 downtown customers.

1.2 STEAM ENGINEERING

During this period, it has been evident that some potential customers are not familiar with steam engineering, or how it can be applied to their building needs and the total benefits that can be derived from its use.

Some engineers may not be totally aware of the full economic applications of steam use in an era where oil, gas and electric power are commonly available.

Steam utilization is certainly old, but it is not old-fashioned.

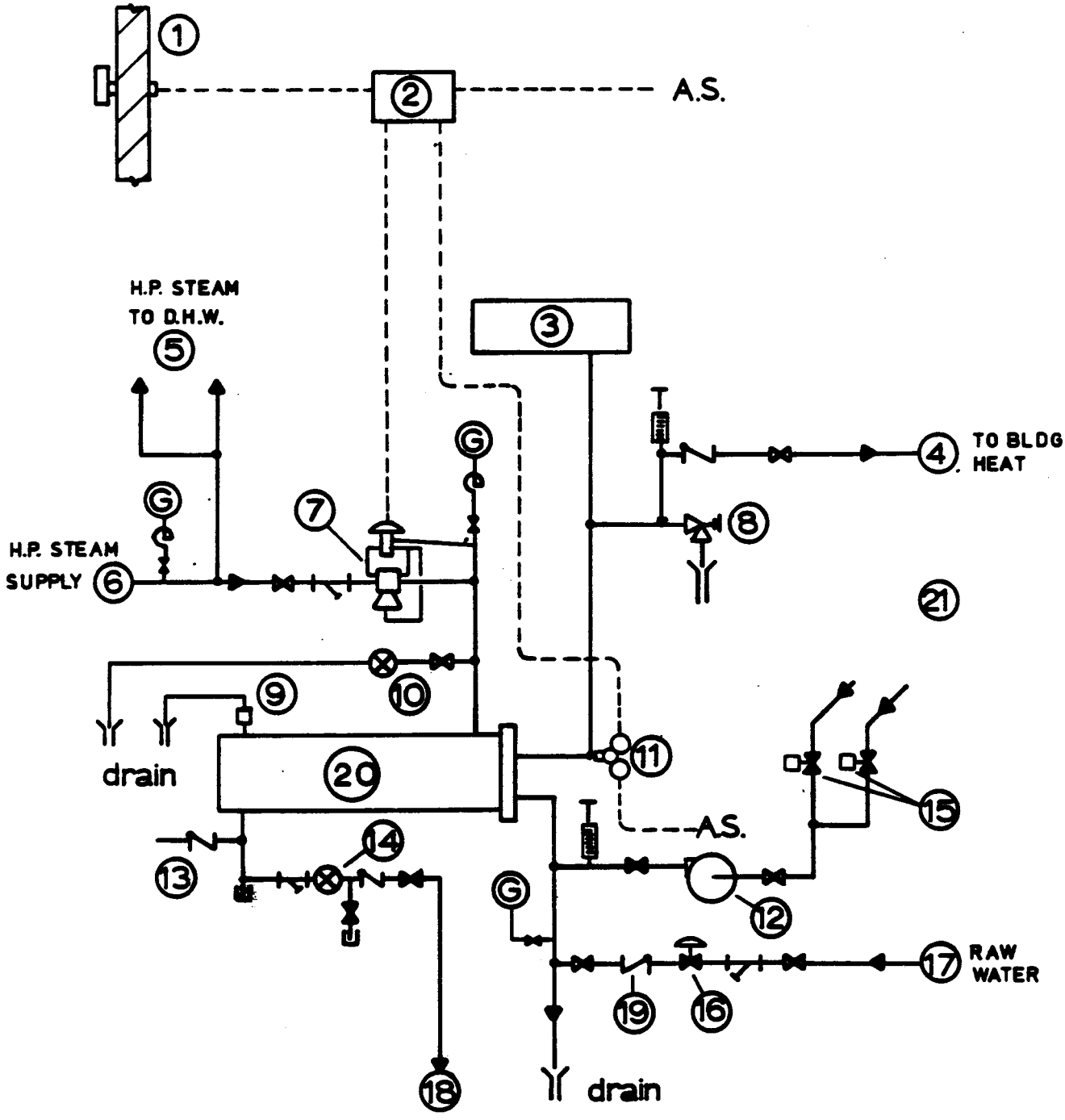
Central Heat have applied technical innovations over the years to ensure full heat utilization and believe it to be of benefit to make this knowledge freely available to all potential steam users and engineers so that a fair and competitive evaluation may be developed between the use of district steam and other fuels to the financial and operational benefit of the consumer.

In order to properly determine these benefits we feel it necessary to present the energy facts and costs about district steam and compare them with the other fuels.

Also we wish to show how the greatest benefits can be obtained by practical application of sound engineering principles.

The intention of this booklet is not to "Re-Invent the Wheel" but perhaps to familiarize those without full steam experience to appreciate all its qualities.

TYPICAL SCHEMATIC FOR A H.P. STEAM CONVERSION SYSTEM TO SUPPLY THE HOT WATER HEATING REQUIREMENTS FOR A 300,000 SQ. FT. OFFICE BUILDING



A two converter system is sometimes desired to provide redundancy. Sizing for a two converter system is mentioned in the legend.

1. Outdoor temp. sensing through exterior wall.

2. Outdoor compensating control with heating water temp. feed back.

3. Compression tank for expansion allowance.

4. Hot water heating supply piping.

5. H.P. steam supply pipe for D.H.W. and humidifier (pipe size 1½" - 2000 pph +). See (6) figure 3.

6. H.P. steam supply (pipe size 2" - 6000 pph at 185 p.s.i.) See (5) figure 1.

7. Combined P.R.V. and modulating control valve such as a "Spence EA valve".

   For single convertor 1½" - 4500 pph - 0 - 20 psi
   For dual convertor (2) 1" - 3000 pph - 0 - 20 psi

8. Temperature pressure relief valve.

9. ½" - 300 psi air vent.

10. I.B. steam trap (3/4" Armstrong #881).

11. Proportional control aquastat such as (Spence T61).

12. Circulating pump.

13. Vacuum breaker.

14. I.B. steam traps - For single convertor 1½" Armstrong #814 - ½" orifice 7,500 pph
    - For dual convertor (2) - Armstrong #813 - 3/8" orifice 3,800 pph

    As added safety protection these traps lock out in pressure exceeding 30 psig.

15. Flow balancing return valves.

16. Water make up P.R.V.

17. 3/4" raw water supply.

18. Trap returns to D.H.W. etc. pre-heat system. See (29) figure 3.

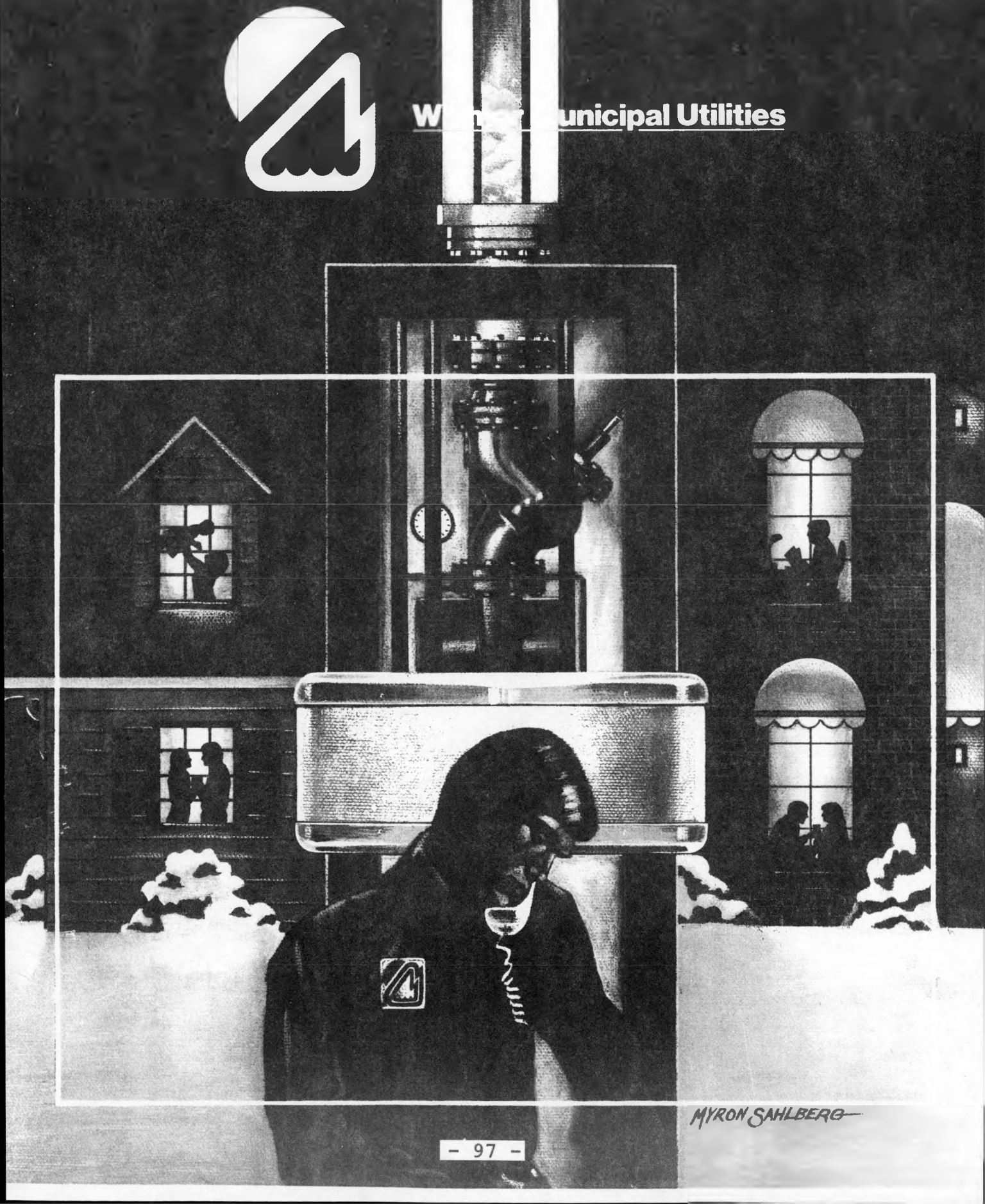
20. 300 psi rated heat exchanger. Single 14" x 72" - 4500 pph 20° F temp. rise.
    Dual (2) 12" x 60" - 3200 pph 20° F temp. rise.

21. Heating water returns.

AS) Pressure controlled air supply.

DISTRICT HEATING

Willmar Municipal Utilities



Why Is The Willmar Municipal Utilities Offering District Heating?

Co-generation Makes Sense in Today's World

Some years ago, when fuel sources were plentiful and cheap, there was not much call for conservation. But life is different now. Instead of wasting heat into the air when condensing steam back into water, why not use the steam to produce hot water that can heat businesses, industries, public buildings, and homes?

An Improvement to Steam

Modern hot water heating, a more efficient method of district heating than steam, was first developed by Scandinavian countries shortly after World War II. With the technology now tested and proven, the Willmar Municipal Utilities made the switch from steam to hot water to obtain the following benefits for its district heating customers: better temperature control, more even heating, and a system that can extend much further from the central source with virtually no heat loss ... all at a lower cost than other conventional systems.

Helps Hold Heating and Electrical Rates Down

Co-generation of electricity and hot water heat is the reason district heating has such a reasonable rate. But even for those customers who don't have district heating, there is a benefit. Revenues from district heating offset some of the operating costs of producing electricity. With that "sharing" formula, the result is lower rates for both district heating and electricity.

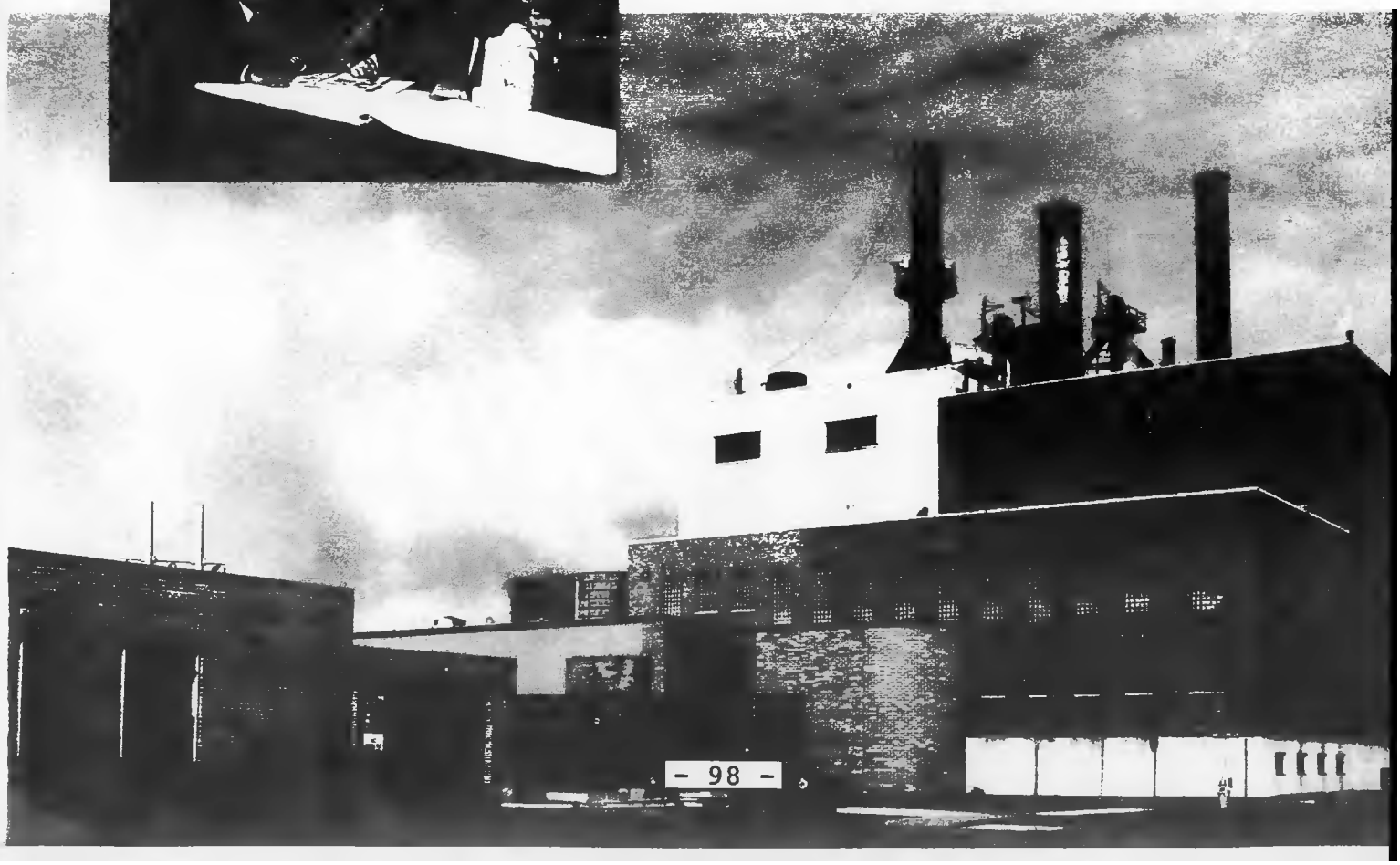
A Community Benefit

Modern hot water district heating is an important selling point in retaining and attracting business and industry to Willmar. It shows that Willmar is a progressive city that can offer reliable, low-cost heating.

As the system grows, more and more Willmar neighborhoods will be able to experience the benefits of district heating, and that will make Willmar an even more attractive city in which to live.

The First District Heating System in the United Staes

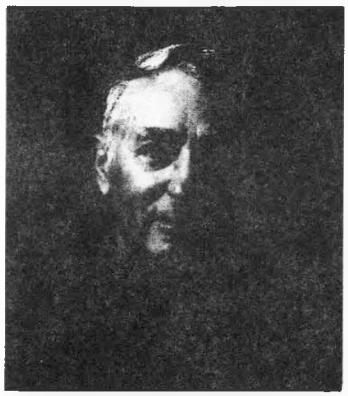
In 1982, Willmar became the first city in the United States to put in modern hot water district heating. Since that time, a number of other cities — including St. Paul, Minnesota; Provo, Utah; Albany, New York; and Trenton, New Jersey — have either installed hot water district heating or are in the process of doing so. Interestingly, they all call the Willmar Municipal Utilities for advice.



Ask the People Who Already Have District Heating.

Since 1982, when the Willmar Municipal Utilities first introduced modern hot water district heating, a number of commercial, industrial, and residential districts are now being served. Some switched over from steam district heating, while others converted from conventional heating systems.

When we introduce hot water district heating into a new commercial or residential area, we let prospective customers know of those who already use hot water heating and are willing to share their experience. We have found our present customers to be our best salespeople.



Erwin Rau

"I found that my heating bills were definitely lower and there is less maintenance required. The safety feature of no flame is really a plus. I think it's the way to go for the future. I only wish it had been available 5 years ago."

Wally Peterson

"The free heat exchanger was a terrific selling point. The conversion was very easy to do — it was no problem. My heating costs are considerably less and I really like the comfortable, even heat."

When Will It Be Available in Your Area?

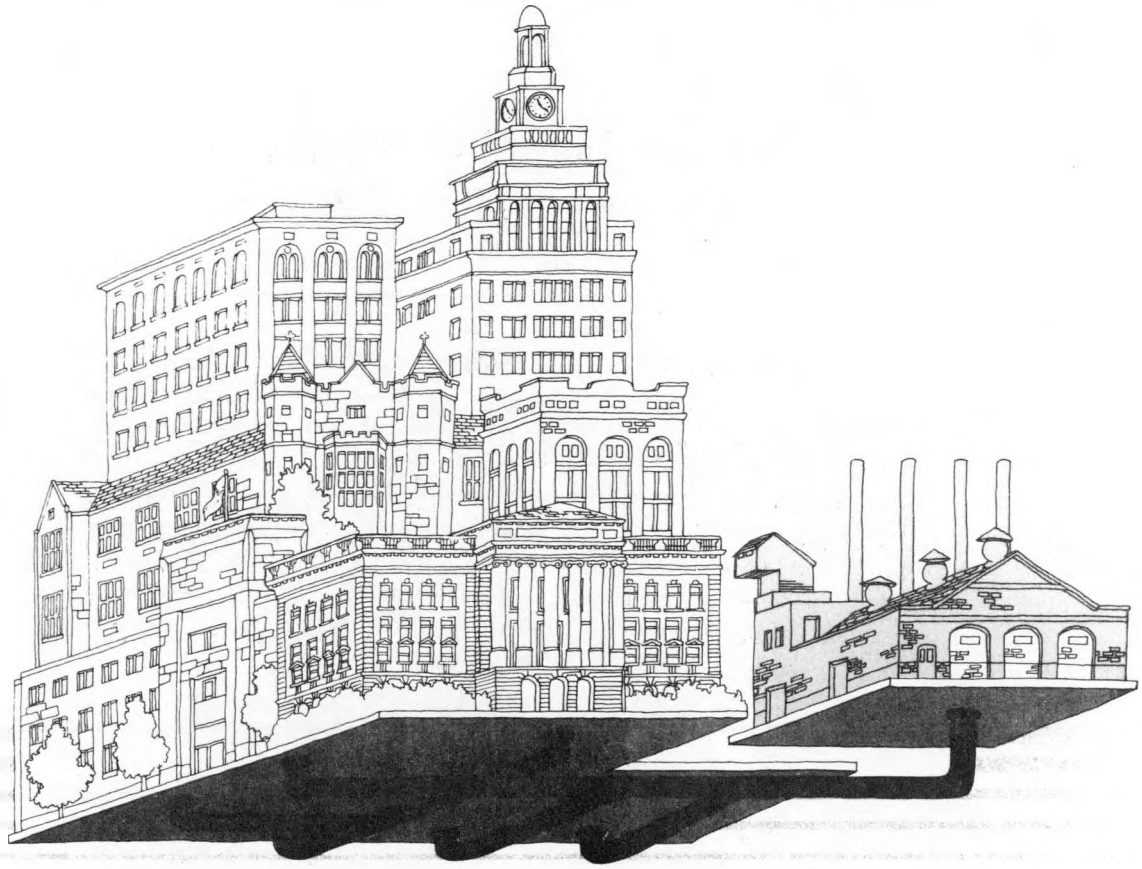
The natural progression of district heating is from those areas closest to the power plant/conversion station to those areas farther out. However, other factors figure in. Our objective is to serve both large individual users — such as a school, commercial area, industrial plant, or apartment complex — and residential customers.

There has been a steady progression of construction projects since introducing hot water district heating to Willmar, and there are plans for more expansion. Quite simply, while expanding at a controlled rate, we will gradually meet as much demand for district heating as there is in Willmar.

If you wish to know more about the exciting features and benefits of district heating, just give us a call.

Willmar Municipal Utilities
704 Southwest Litchfield Avenue
Willmar, Minnesota 56201

District Heating...
Youngstown's Comfort Utility.



Youngstown
THERMAL

Youngstown
THERMAL
CORPORATION

Successful Businesses Begin with a Purpose...

And Youngstown Thermal Corporation is no exception. We are dedicated to supplying reliable, cost-effective steam for heating, cooling and processing for commercial, institutional and non-profit facilities in Youngstown. You can rely upon us as experts in providing this important service because we are specialists in providing District Steam—this is our only business.

You Can Take Comfort in Our Customer Support Services

Our Youngstown staff has many years of proven experience in District Heating. Youngstown Thermal is a subsidiary of Catalyst Thermal Energy Corporation, also headquartered in Youngstown.

Catalyst Thermal owns and operates other District Steam companies in major U.S. Cities such as Baltimore and St. Louis. Each City has its own managers, engineers and operations people who share their experience and expertise in what they do best—District Heating.

As part of a larger corporation, Catalyst Thermal provides a reservoir of financial resources for growth, as well as significant managerial and technical talent. Even though we are part of a larger Corporation, we run our business with the personal touch of a small company. To be successful, we recognize the importance of providing customer support services and understanding your building's needs. This is our goal.

Stable Pricing

Our business plan is straight forward. Youngstown Thermal's strategy is to provide *stable pricing* over the long-term—backed-up with *quality service.* And it's working. Our average steam price today is 12% lower than the peak level reached in 1979, the year before Youngstown Thermal acquired the system.

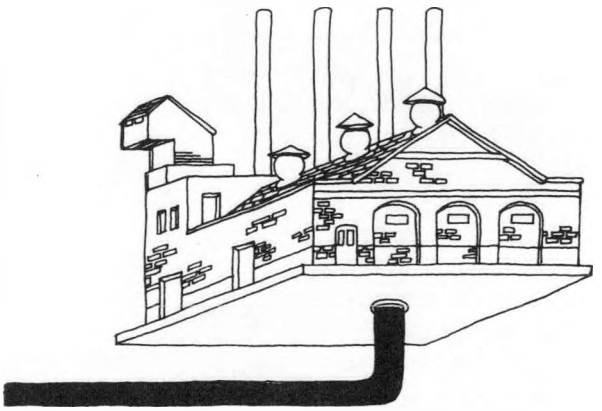
In addition, District Steam costs less than in-building gas fired systems because we have:

- ❑ Committed our plant to coal because of its stable pricing;
- ❑ Made major improvements of over $4 million in our plant and pipelines; and
- ❑ Doubled our business since 1979, which spreads the fixed costs over a larger base.

We will continue to implement our business plan and we are confident that our approach to building and improving service will result in doubling Youngstown Thermal's sales revenue again in the next five years.

Customer Service Response Program

How Are We Doing?



Youngstown THERMAL CORPORATION

205 North Avenue • Youngstown, OH 44502 • 216-743-7712

Dear Youngstown Thermal Customer,

We provide a very important service to Youngstown businesses and institutions in both the private and public sector. Youngstown Thermal has made and will continue to make a real and substantial commitment to our City. We've got staying power and Youngstown Thermal is here to serve you for "the long haul."

To do this, we must listen to your needs and always be responsive to how we can improve our services. This is the purpose of our Customer Service Response Program—to provide a direct channel of communications.

Please take a few minutes to complete this card and send it to me for my personal review.

It is Youngstown Thermal's goal to double our business in 5 years. Understanding and meeting your service needs is critical to achieving that goal. Thank you for your ongoing support.

Sincerely,

Jeffrey P. Bees

Jeffrey P. Bees
Vice President, General Manager.

Youngstown Thermal Corporation
Customer Service
Response Questionnaire

Please write the appropriate number in each box using the following rating system:

POOR	AVERAGE	GOOD	EXCELLENT
1–3	4–6	7–9	10–12

Customer Service

Staff Helpfulness ☐

Billing Accuracy ☐

Field Crews

Quality of Work ☐

Timely Completion of Work ☐

Image/Courteousness ☐

Maintenance of

Valve ☐

Trap ☐

Meter Equipment ☐

Other

_____ ☐

_____ ☐

_____ ☐

Is Youngstown Thermal improving?

☐ Yes ☐ No

How?_____

_____

When was the last time you saw a representative from Youngstown Thermal?

_____

What other services from Youngstown Thermal would be important to you?

_____

_____

_____

Are there other improvements we can make to better Youngstown Thermal's image in the community?

_____

_____

_____

Other comments:

_____

_____

_____

Customer Name (Company)_____

_____

Your Name_____

Signature_____ **Date**_____

hat district steam is and isn't

District steam is:

- *A convenient cost-effective way to meet your building's energy needs without requiring valuable office space.*
- *A reliable, efficient source of energy for the present and the long term.*
- *A flexible energy source that can use the least costly available fuels in an environmentally acceptable way.*

isn't:

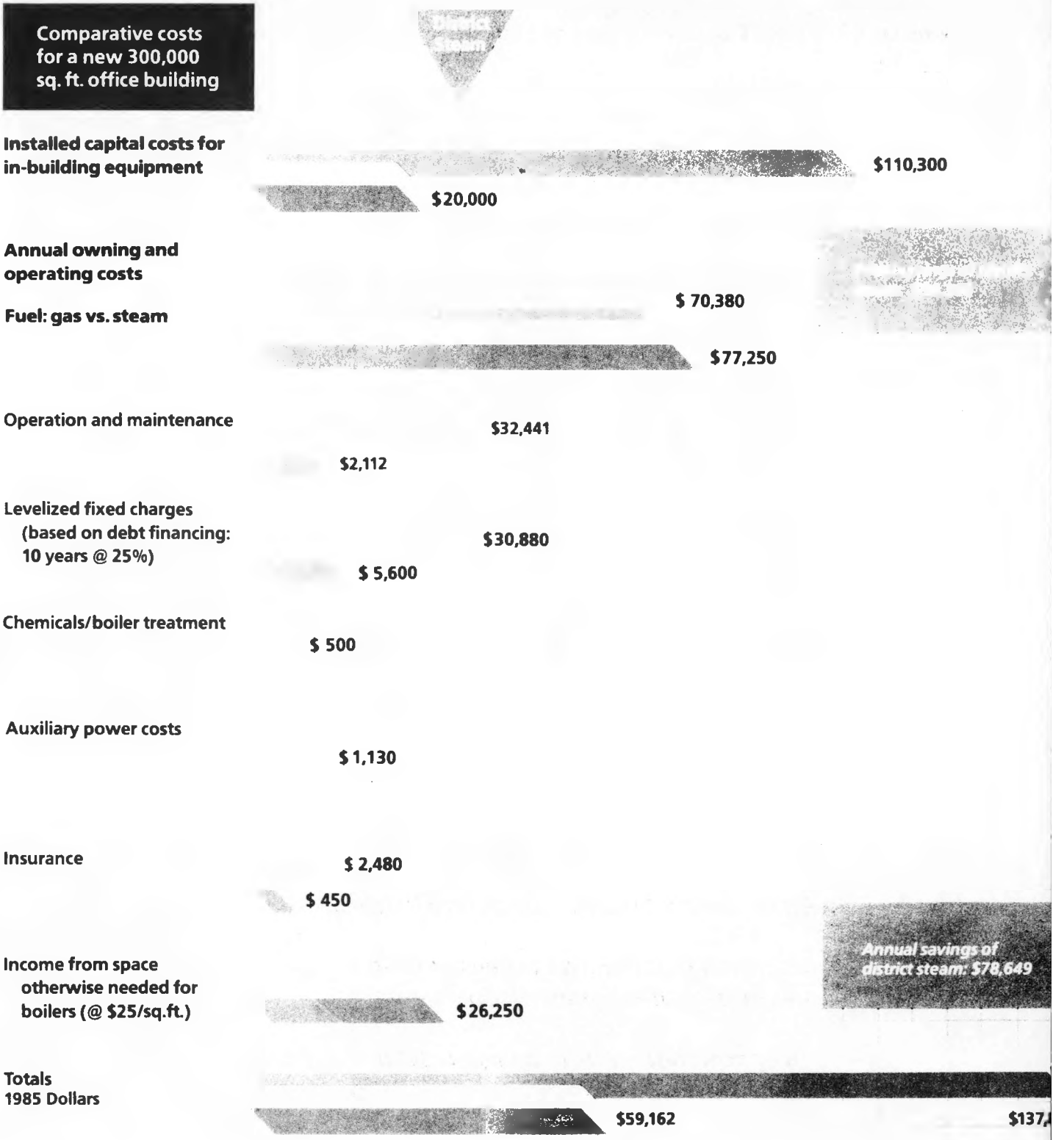
An option that requires unsightly fixtures.

An option that requires expensive on-site operating and maintenance personnel.

An option that requires a large capital investment.

An energy alternative that leaves you without heat or service unexpectedly. ⊗

Comparative costs for a new 300,000 sq. ft. office building



Annual Operating Cost

A. Steam Fuel Cost:

Without Condensate Heat Recovery
Annual Heating Needs
$\frac{(\text{MMBTU}) \div 1080 \text{ BTU/LB}}{1000} = \text{MLB} \times \$9.127/\text{MLB}$[7]

$

With Condensate Heat Recovery
Annual Heating Needs
$\frac{(\text{MMBTU}) \div 1114 \text{ BTU/LB}}{1000} = \text{MLB} \times \$9.127/\text{MLB}$

$

B. Operation & Maintenance
(In-building system maintenance)

Senior Operating Engineer (approx. 1/20 time)
8 hours/month × 12 months × $22 = $2,112

$2,112

C. Chemicals $000

D. Auxiliary Power[8] $000

E. Insurance
Equipment cost × 0.025

$

Total Operating Costs A + B + C + D =

$

Total Annual Costs:

Fixed Costs + Annual Operating Costs A =

$

Individual Boiler System

$

District Steam Alternative

$

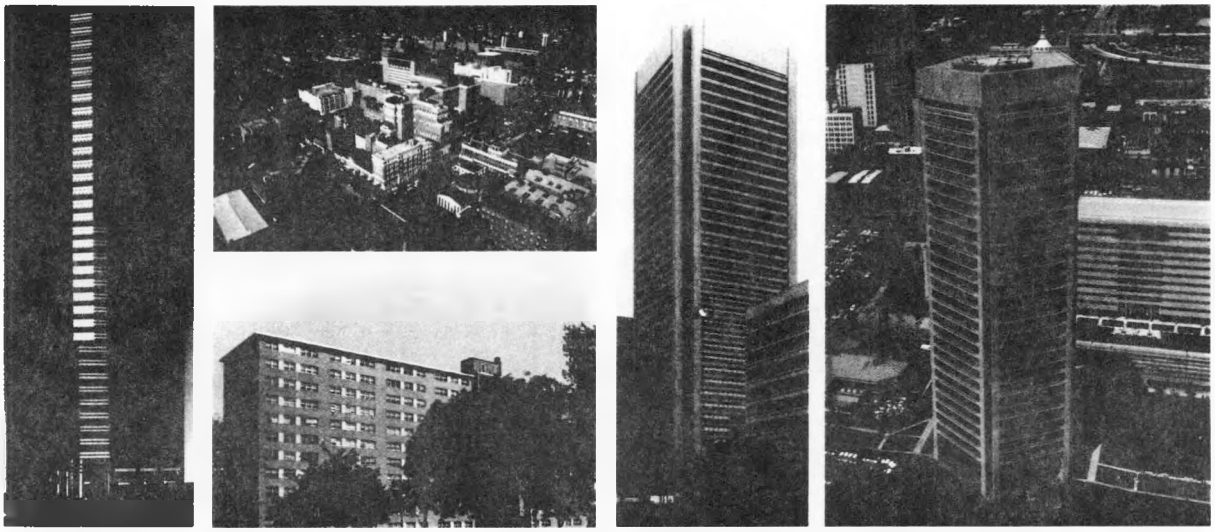
District Steam Savings

$

7 Current Steam Rate Schedule

8 This does not include electricity cost for building secondary system distribution pumps, which are common to both types of systems.

THE STEAM ADVANTAGE



These Baltimore buildings are hooked-up to District Heating. From left to right: Merritt Tower, University of Maryland Medical System (top), Lexington-Terrace – Baltimore City Housing Authority (bottom), U.S. Fidelity & Guaranty, and Baltimore World Trade Center.

MODERN TECHNOLOGY WITH A 100-YEAR TRACK RECORD

District Steam Heating is an American technology that dates back to 1877. Steam systems were built to serve most American city's central business districts. After WWII, while the availability of price regulated energy placed an artificial burden on utility-owned District Heating Systems, the technology continued to be right for others. During this period of time, District Heating technology began to provide the energy needs for rapid development of the college and university campuses, as well as the same needs for expanding military installations. And in the rest of the world, where fuel was not price regulated below market values, such as Europe, Japan and even Saudi Arabia, District Heating has proven to be the most efficient and cost-effective energy source.

Today, since the deregulation of oil and gas, District Steam, in conjunction with solid fuels, can again compete as a viable alternative.

FUEL VERSATILITY

Our ability to integrate alternative fuel sources helps to provide the savings in fuel costs. We are less dependent on both the American and the International Fuel Markets because our fuel input sources can be alternated depending on the market price. Presently, we're operating on natural gas and oil, and soon on refuse-fired energy. But based on the economics, we could make the switch to coal or other solid fuel sources.

The 20-year contract between Signal Environmental Systems Inc.'s BRESCO facility and the Baltimore Steam Company has the ability to provide 75% of Baltimore's current steam requirements. The steam purchased from this facility is escalated at rates independent of the unpredictable fuel market. This will provide long-term stability to the pricing of steam in the Baltimore marketplace.

STEAM SERVICE RELIABILITY

When you are a Baltimore Steam customer, your facility will technically have 12 extra boilers on call. To date, we use only 5 of our 17 boilers to handle our current load. In addition to the new waste-to-energy plant, Baltimore Steam Company operates two plants at Spring Gardens and the Camden Station. Baltimore Steam Company's integrated backup system ensures continuous service.

Seventeen boilers from the three plants have a peak capacity of approximately 1,653,000 LBS/HR. In 1985, the maximum load demanded by all customers was only 650,000 LBS/HR. One of these larger boilers alone can heat more than 6,000,000 square feet of space—it's easy to see the versatility and service reliability that every Baltimore steam customer enjoys 24 hours every day of the year. An in-building boiler plant does not offer that luxury. When the boiler is down—the heat is off.

BUY ONLY WHAT YOU NEED —WHEN YOU NEED IT

Architects and engineers oversize a structure's heating requirements to ensure that a tenant's changing needs are adequately met in the future. No matter how accurate energy projections are, there are always unforeseen factors and last minute design and material changes that ultimately will affect the building's heating requirements.

In-house boilers generate more heat than is needed. No matter which boiler system is in operation, energy dollars are being unnecessarily spent. When you are a District Heating customer, you buy only what you need, when you need it. Energy conservation programs that are implemented by either the building owner or the tenant will generate immediate savings—a big incentive for the user or perspective tenant. Especially when the unit cost of District Heat is lower at the outset.

ELIMINATING HIDDEN COSTS REDUCES ENERGY BILL

When you purchase steam from the Baltimore Steam Company you are buying a finished energy product that is ready to use in your building. When you buy a finished energy product you are getting rid of the many hidden costs associated with on-site generation. We can show you what the hidden costs are and how the Baltimore Steam Company can eliminate or reduce them. Some of these hidden costs include: manpower, space, insurance, property taxes, debt service and management time.

Appendix I: Minneapolis Energy Center

■ Service agreement customers as of May 3, 1984

● Service agreement customers as of May 3, 1984 (buildings not illustrated)

Base map (not including customer location marking) prepared in 1982 by City of Minneapolis Planning Department, 210 City Hall, Minneapolis, Minnesota.

Appendix J.

District Heating and Cooling for the St. Louis Arch??

40 industry professionals gather to share ideas and experiences at IDHCA Marketing Workshop

by Jack Kattner, IDHCA Director and Marketing Committee Chairman

No, forty of the industry's marketing and management professionals did not gather to try to figure out how to provide district heating and cooling to the St. Louis arch. Yes, forty DHC management and marketing professional did gather in St. Louis to exchange ideas, experiences, and concerns about the marketing and selling of DHC services. This gathering is the best testimony there is that our industry is once again expansion-oriented. If there were any doubts of a commitment to growth, competitiveness, and a positive future, they were dashed in St. Louis.

It could have been Mark Twain that once said, "There are only two things that matter, having an idea, and selling it." While Birdsill Holly is generally accredited with developing the idea, the selling of district heating and cooling must take place every day on the streets of our cities if continued growth is to be realized.

The IDHCA Marketing Workshop was held on October 16, 1986 at the St. Louis Marriott Hotel. This meeting was an outgrowth of several smaller marketing meetings held at the IDHCA Annual Meeting held in Asheville, North Carolina in June, 1986. Frustrated with never having enough time to talk about marketing our products, a mandate was issued for a full day session devoted to DHC marketing. A list of almost two dozen topics was quickly developed, and a mid-October meeting time was tentatively set.

The interesting thing was that the presentation of formal papers on various marketing issues was excluded. Rather, a strong need for informal opportunity for face-to-face discussions was expressed with a sense of urgency and enthusiasm that has been uncharacteristic in our industry for sometime. In a sense, it was like the revival of an entrepreneurial genie that had been lying dormant waiting for someone to rub the magic lantern.

Linwick discusses growth objectives and customer needs

Until approached about leading a discussion session at the Marketing Workshop, Ken Linwick, President of the Minneapolis Energy Center, hadn't really considered his 15 years of experience with selling district heating and cooling as being unique. However, he soon realized that few people in the industry had been given a clear set of operating objectives that stressed system growth.

"It was a sink or swim deal at first," recalls Linwick who came to the Minneapolis Energy Center after twenty years of experience at the total energy plant serving the Mayo Clinic in Rochester, Minnesota. "No one was sure that we could make the business work. When I came to Minneapolis the plant was nearing completion. It was designed for expansion and represented a substantial speculative investment for the owners." Linwick started with a customer base of 3.5 million square feet originally served by an older district heating system whose boiler plant was relegated to a standby facility for the new system. During the next fifteen years, some 22.5 million square feet of building space was added to the system.

The Minneapolis Energy Center analyzes a building's demand, consumption, and district heating and cooling costs in terms of square footage served. This is important for two key reasons: One, building owners and managers and their consultants typically talk in terms of energy use per square foot or costs per square foot. It is always easier to to communicate with somebody when you can speak their language. Secondly, having the data on a per square foot basis enables comparisons to be made among similar buildings when a particular owner feels that his energy costs are too high. If the particular building in question uses more energy per square foot than a similar building, maybe the problem lies within the building and is independent of the district heating system. Also, customers receive some comfort in knowing that their energy consumption per square foot is in line with buildings of similar type and purpose.

During the selling process, Linwick feels strongly that building owners must be reminded that with district heating and cooling, they only buy what they actually need and use. With their own on-site systems, extra capacity will typically be installed to make sure they can get through the extreme weather conditions, provide for some standby in case of equipment failure, and allow some margin in case the equipment is not able to produce at rated capacity. For a comparison to be accurate, the annual cost of district heating and cooling should be compared to the annual cost of owning and operating the equipment that the building would install to protect against these contingencies, and not simply equipment sized only to meet the esti-

(continued on next page)

(continued from page 23)

mated building loads. Reliability is built into the service agreement and not into the basement.

Customer Choices

Tim Tierney, Applications Engineer with Thermal Resources of St. Louis, provided the opening remarks and set the stage for the second session. While this part of the program was entitled "The Customer's Hardware—Choices and Costs," Tim challenged the attendees to think about what they are really selling to their customers. He said that even though we held this workshop to discuss the marketing of district heating and cooling, what we actually sell our customers is continuous comfort, low cost installation, easy operation, and satisfaction. We are essentially in the comfort and satisfaction business. As we work with our customers, we need to remember that we are there to help them meet these basic human needs.

Prior to joining Thermal Resources of St. Louis, Tim worked as a consulting mechanical engineer and as an estimator for a mechanical contractor. He used this background to effectively analyze the thought process that an HVAC engineer goes through with a building owner as they evaluate their heating and cooling objectives and options. Using a well illustrated example, he presented his opinion that hot water hydronic perimeter systems connected to a district heating system result in the lowest operating costs compared to other options including heat pumps. This cost effective concept does not rely on a four pipe system for heating and cooling, but rather provides heating to the perimeter with the hydronic system, and cooling to the interior with a variable air volume system.

Other HVAC systems were discussed during this session, with considerable attention being paid to heat pumps. Many of the attendees expressed some concern that detailed operating histories for major downtown buildings using heat pumps were generally not available for use by the decision-makers. Tierney pointed out that executive office guidelines typically specify about 750 square feet per zone. He has seen heat pump applications that used guidelines of 1500 to 2000 square feet per zone to reduce first cost. Unfortunately tenant comfort is also reduced by this practice, and tenant comfort is what our customers market to their customers.

The need for DHC marketers to concern themselves more with tenant comfort is emphasized in the following comments by Mr. Stanley Taeger, Director of Asset Management, South Coast Plaza, Town Center, Costa Mesa, California. In the September, 1986, issue of BOMA's *Skylines*, Mr. Taeger said: "With the market as competitive as it is now, tenant retention is critical. High end tenants tend to move every five to seven years because they need the prestige address, so you have got to maintain your property at the highest standard and anticipate their needs to keep them. You've got to retain that first class appeal. You may spend more in managing, but moving tenants in and out of your buildings is expensive too." By being helpful with tenant comfort, DHC marketers and applications engineers can also be helpful with tenant retention.

The Mission and the Plan

The third session, entitled "The Marketing Plan, the Business Plan and the Strategic Plan—An Integrated Package," focused more on marketing theory than on technical selling points. Jim Young, Vice President of Marketing and Business Development for the Seattle Steam Corporation led this discussion. "Before concerning ourselves with a marketing plan," stated Young, "we need to have a clear idea of the mission of our organization. We need to understand what kind of business or businesses we are currently in as well as those that we might want to add in the future."

In the district heating and cooling industry, we might simply be in the business of generating heating and cooling bills for existing customers, we could also be expanding our distribution system and looking for new sources of energy; we could be providing technical assistance to our customers; or we could be providing other related products and services. Young stressed that each business, or market, is defined by the buyers' perception of what he or she needs. This opinion was echoed by IDHCA President, Carl Avers in the Third Quarter 1986 issue of *District Heating and Cooling* when he said, "We need to think in terms of customer needs, with everything else serving as support to fulfill those needs. I am talking about positioning our business and creating a culture oriented to serving the customer throughout each organization."

Success, according to Young, depends on how well we understand each market and deploy our resources accordingly. We continually need to look for ways to differentiate ourselves from our competition and point out how those differences benefit the customer. Further, we need to continue to imporve our knowledge of what our customer groups are doing, how they are doing it, and who makes the decisions about what they do.

To accomplish this, continued communication with the existing and perspective customers, architects, engineers, contractors, and developers is a must. Theordore Levitt, the editor of the *Harvard Business Review* and Professor of Business Administration at the Harvard Business School stressed the importance of systematic and regular communications with customers when he said, "As our economy becomes more service and technology oriented, the dynamics of the sales process will change. The on-going nature of services and the growth complexity of technology will increasingly necessitate lengthy and involved relationships between buyers and sellers. Thus, the seller's focus will need to shift from simply landing sales to insuring buyer satisfaction after the purchase. To keep buyers happy, vendors must maintain constructive interaction with purchasers—which includes keeping up on their complaints and future needs. Repeat orders will go to those sellers who have done the best job of nurturing these relationships."

(continued on page 26)

District Heating & Cooling

(continued from page 24)

Jim Young provided a framework for the attendees to use in the analysis of their own efforts by summarizing the key elements of market planning:

- Define the market segment
- Research and understand the competitive position
- Set up a prospect tracking system
- Determine the sales tools for each segment
- Determine the sales activity for each segment (who, how, what, how much)
- Determine the desired profile in the community

He cautioned the attendees to remember that district heating and cooling is a core business but not necessarily the only business for us to consider. As we look to develop new market segments, and possibly related products and services, we have to be careful not to forget what our core business is, and that our existing customers should be our best sales people.

Key Points to Remember

1. Present DHC services in terms of customer benefits and improvements to their business or operation.
2. Conduct customer relations seminars for all employees.
3. Look for appropriate customer service opportunities consistent with mission of your organization.
4. Work with equipment suppliers to hold seminars on product applications for your customers.
5. Work hard to educate your customers on the difference between actual boiler efficiency and theoretical boiler efficiency.
6. Develop application manuals or customer instruction booklets for use before and after the sale.
7. Communicate to your customer with more than a monthly invoice.
8. Conduct district heating and cooling application seminars with architects and engineers active in your market area.
9. Continue to enforce the fact that district heating and cooling is a positive force in urban air quality improvement and economic development.
10. Work closely with the building owner and the consulting engineers to determine the total cost of owning and operating on-site equipment well in advance of key decisions.

Marketing Workshop II

Planning is already underway for another IDHCA Marketing Workshop. The consensus of the attendees at the St. Louis workshop was that we should meet again in late February or early March to discuss another three or four key issues related to the marketing of district heating and cooling. Further details about the next meeting will be presented in IDHCA's Newsletter, *Circulation*. The Marketing Committee will also be working to develop several papers for presentation at the annual meeting in Baltimore on June 21–25, 1987. A call for papers has been issued, so please contact IDHCA's office in Washington, D.C. should you be interested in participating in this annual meeting.

Special thanks should be directed to the organizing committee for the St. Louis workshop. In particular to Charles Fishman of Thermal Resources of St. Louis for his efforts with hotel arrangements, programming, and a guided tour of the St. Louis district heating system the day before the meeting; to Monica Westerlund of the St. Paul District Heating Development Company and Mike Larkin of the Baltimore Steam Company for their help in programming and workshop coordination; and to the leaders of our three discussion sessions for their willingness to share their ideas with us.

The initial plans for this workshop were based on an estimate of 12 to 15 attendees. The fact that some 40 people not only attended but participated actively in the meeting, signifies a tremendous interest in the marketing of district heating and cooling and more. It also signifies a commitment on the part of the owners and managers of DHC systems who authorized their people to attend this workshop. IDHCA's intention is that these workshops will provide growth opportunities for DHC professionals and the utilities they represent. IDHCA

Large Chilled Water Distribution System

(continued from page 20)

the return side so that supply temperatures stay as low as possible.

While the suggested approach allows some benefit from the fact that user loads in any system seldom peak coincidentally, full advantage is not taken. Variable flow pumping of the distribution system and possibly the larger secondary systems should be studied for full economic benefit.

As a matter of prejudice, I prefer the use of industrial quality, quarter-turn valves in chilled water systems, particularly eccentric plugs. These valves have excellent flow characteristics and are much more forgiving of circulating construction debris, thus allowing the elimination of permanent system strainers. Temporary pump strainers should always be installed to remove the bulk of construction debris and contamination after the initial startup.

The subject of chilled water distribution has not been comprehensively treated in book form unitl the recent publication of *Hydronic System Design & Operation* by Erwin G. Hansen, McGraw-Hill, New York, 1985 (see *HPAC*, October 1985, p. 141). This book should be in the designer's library. IDHCA

Appendix K. Case Summaries

INTRODUCTION

The Case Summaries for each of the district heating systems are intended to provide an overall view of the characteristics of each system as well as of the marketing programs, in a more comprehensive way than would be attempted in the analysis in Chapter Three.

PACIFIC GAS & ELECTRIC (SAN FRANCISCO)

District heating service in downtown San Francisco has been provided by Pacific Gas and Electric since the early 1900's, and the system represents the only case in our survey of a large steam system owned and operated by an investor-owned electric utility. In terms of size, the system is the seventh largest in the study, with a recent annual send-out of approximately 572,000 MMBTU.

PG&E has, in the past, focused its efforts on maintaining the existing customer base within the service area. However, with a recent proposal to expand the service area, a more aggressive marketing approach is now taking shape. Because of zoning restrictions which limit new construction to one million square feet per year, the focus of the PG&E marketing strategy is on the conversion of existing buildings.

One of the tools used in PG&E's marketing program is a brochure. This brochure emphasizes the benefits, uses, and economic advantages of district heating in the existing customer base--which includes many modern buildings. The brochure also includes a savings worksheet with which the potential customer can compare the costs of district heating to the costs of operating in-house boilers.

In addition to the brochure, PG&E uses a four to five-page sales proposal document, which is customized for each potential customer. Included in this proposal is an economic analysis generated on conventional spreadsheet computer software.

BALTIMORE STEAM COMPANY

District heating service in downtown Baltimore is provided by the Baltimore Steam Company, a subsidiary of Catalyst Thermal Energy Corporation, a publicly traded (NASDAQ) for-profit corporation. Baltimore Steam began operations in 1986, when it took over the district heating system formerly owned and operated by the Baltimore Gas and Electric Co. This is the largest system in the study, with a recent annual send-out of 1,430,000 MMBTU.

Like most systems in the study, Baltimore Steam utilizes a brochure as part of its marketing effort. This four page brochure emphasizes Baltimore Steam's role in the "revival" of the district heating system; the expansion of the system's service area; and the advantages of district heating utility service over the use of in-house boilers. Utilization of steam from Baltimore's BRESCO waste-to-energy plant--which helps to stabilize costs and customer rates--is also featured. The brochure is printed in two colors on a high-quality coated paper.

In addition to this brochure, Baltimore uses a quarterly newsletter to regularly update Baltimore Steam's customers on progress in district heating. This is also used as a tool to market the concept and the company to the engineering and architectural community. "Flyers" on specific issues or points of interest are also regularly issued.

Like many other systems in the study, Baltimore Steam regularly gives presentations to local groups, such as the local chapters of the American Institute of Architects (AIA), the Building Owners and Managers Association (BOMA), and the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE). These presentations are described as "non-technical" in nature and are based on an informative slide show. Points which they emphasize are the resources of their parent company, Catalyst Thermal, the BRESCO waste-to-energy plant, and the advantages of district heating.

Other aspects of the Baltimore Steam approach to marketing include a policy of membership in professional and civic groups, (such as the Mayors Energy Committee, ASHRAE, etc.) to enhance their corporate visibility and image. Baltimore Steam also advertises in local trade journals.

THERMAL RESOURCES OF ST. LOUIS

District heating in St. Louis was, for many years, provided by the Union Electric Company. However, like many other electric utilities with ageing steam district heating systems, Union Electric sought to divest itself of the district heating business in the early 1980's. As a result, Thermal Resources of St. Louis, a subsidiary of Catalyst Thermal Energy Corporation, in conjunction with the Bi-State Development Agency, acquired the system in 1982. The system presently utilizes oil-fired boilers, but future plans call for the construction of a refuse-fired plant. St. Louis is one of the larger systems in the study, with a recent annual sendout of approximately 990,000 MMBTU.

The system's age made renovation and modernization necessary in order to make it operate efficiently. Renovation is emphasized in the Thermal Resources marketing program, as evidenced by the title of their marketing brochure, "Rebirth of the St. Louis Steam Loop." This five-page brochure also itemizes the general benefits of district heating service, such as cost efficiency, reliability, operational advantages, and the potential for savings from alternative fuel choices made possible by the planned refuse-to-energy plant. The brochure is used in direct mail applications to developers, architects, and engineers, in order to maintain the visibility of the district steam option within the development community.

In addition to the brochure, Thermal Resources also publishes a quarterly newsletter, "Energy Managers News," as an important part of their marketing effort. This newsletter contains updates on new customer additions to the system, information on customer service programs, such as the "Summer Sizzle Stopper" promotion, and articles of a testimonial nature. These articles detail current customer satisfaction with steam service, highlighting customer perceptions of savings, reliability, and operational advantages. Testimonial features are considered to be of such importance that Thermal Resources attempts to use at least one in each issue. Although the newsletter appears to be targeted toward existing customers, it is used in a variety of other applications as a general purpose marketing tool.

Because the system had, under previous ownership, experienced considerable deterioration and loss of economic performance, a significant erosion of the existing customer base had occurred. To address this problem, Thermal Resources of St. Louis has introduced a number of service-oriented promotions. These include their "Hassle-Free

Heating" program (which allows for the free inspection of a customer's internal HVAC system, including piping, steam traps, valves, pressure reducing stations, and heat exchangers); the "Summer Sizzle Stopper" program (which allows customers to have leaky valves re-packed and pressure-reducing valves rebuilt at greatly reduced cost); and the "Show Me Steam" program (which allows for reconnection to the system on a trial basis with guaranteed savings for the trial period).

Other aspects of the St. Louis marketing program include the use of press releases (10-12 per year), and a somewhat limited use of group presentations.

YOUNGSTOWN THERMAL CORPORATION

District heating in Youngstown is provided by Youngstown Thermal Corporation, a subsidiary of Catalyst Thermal Energy Corporation. For many years, steam service had been provided by Ohio Edison, the area's investor-owned electric utility. Ohio Edison's desire to divest itself of district heating led to Youngstown Thermal's acquisition of the system. The company provides steam service at both medium (150 p.s.i.) and low (15 p.s.i.) pressures. In terms of size, Youngstown has one of the medium-sized systems in the study, with a recent annual sendout of approximately 531,000 MMBTU.

In spite of the long history of district heating in Youngstown, group presentations are still used as a marketing technique. These presentations are based on a slide show, and have been given to such groups as the Chamber of Commerce and the Better Business Bureau. Although there currently is no local chapter of the Building Owners and Managers Association, Youngstown Thermal has been active in trying to establish one.

Youngstown Thermal also uses a brochure as part of its marketing effort. This seven-page brochure generally outlines the advantages of steam service, the value of district heating as an economic development tool for the city, and the company's history and commitment to district heating. The brochure is often used together with a presentation folder and savings worksheet.

Other aspects of the Youngstown marketing effort include a special commitment to customer service, which includes the regular use of a customer survey, "How Are We Doing?". Youngstown has also made liberal use of press releases, especially during the winter months.

CENTRAL HEAT DISTRIBUTION, LTD. (VANCOUVER, B.C.)

District heating in Vancouver is provided by Central Heat Distribution Ltd. (CHDL), a private for-profit corporation. Operating since 1968, the system provides steam service to over 100 customers in the downtown area. In terms of size, Vancouver has one of the largest systems in the study, with a recent annual sendout of over 769,017 MMBTU.

CHDL's approach to marketing differs significantly from the other systems in the study. The Vancouver company does not use a brochure for marketing; nor does it use group presentations. Rather, their marketing efforts are targeted to specific projects and buildings, and rely on a personalized business proposal. With regard to existing buildings, they tend to target buildings with fifteen-year-old boilers, thus capitalizing on the need for boiler replacement in the near future. CHDL markets the savings possible by avoiding capital costs.

With regard to new building projects, CHDL states that they are usually dealing with one of the larger architectural design firms in the city, and that these firms are usually aware of steam service. However, in instances where a firm may be unfamiliar with steam service system design, CHDL has developed a handbook which outlines the advantages of steam service, compares capital and operating costs for steam service vs. individual boilers, and provides schematic diagrams of typical system designs.

SEATTLE STEAM CORPORATION

District heating service in downtown Seattle is provided by the Seattle Steam Corporation. This is the fourth-largest system in our study with annual sales of 863,000 MMBTU. District heat in Seattle dates back to the turn of the century, when the system was part of Seattle's electric utility. Since those times, the system has gone through a number of changes, including a major renovation in the 1950's that included establishing the system on a thermal-only basis owned co-operatively by the building owners which it served. The present corporate ownership was established in the early 1970's.

Seattle Steam's marketing program tends to emphasize a personalized approach to marketing district heating; person-to-person contact is seen as the best sales tool. This personalized effort is particularly targeted toward building owners, and, in some instances, to design consultants. Special attention is given to owners of buildings which are

about fifteen years old. Such buildings should need boiler replacement in the near future and should, at that time, be ideal candidates for conversion to district heating service. In these instances, the ability to avoid the costs of replacement boilers is seen as a particularly strong marketing point.

The personalized marketing approach is reflected in the brochure and presentation folder which Seattle uses. The folder is designed to allow the inclusion of specialized information and a computer-generated economic analysis. This information allows the person-to-person presentations to be tailored to each potential customer. The notable quality of the folder itself, with its embossed corporate logo, projects a strong business image.

Although emphasis is placed on a personalized approach to marketing, Seattle also uses group presentations to help maintain visibility within the engineering and architectural communities. These presentations, showing graphics from an overhead projector, are usually given at meetings of professional and trade organizations, such as the Building Owners and Managers Association, the American Institute of Architects, and other engineering associations. Seattle Steam also tries to place its representatives on the energy committees of these organizations.

MINNEAPOLIS ENERGY CENTER

District heating in Minneapolis is provided by the Minneapolis Energy Center, Inc., a private, for-profit corporation. The system is a hybrid of two system types: an ex-utility steam system (previously owned and operated by the local gas utility, Minnegasco), and a modern medium-temperature hot water loop. The system also provides district cooling service. This is one of the larger systems in the study, in terms of size, with a recent annual sendout of 986,000 MMBTU.

The Energy Center uses a brochure as a part of their marketing strategy. The brochure itself is rather small (4 pages on coated stock; 2 pages in full color), but is routinely supplemented with a colorful trade journal reprint and other information. This package emphasizes the number of customers and coverage of their service area, the addition of new, modern buildings to the system, and the modernization and expansion of their piping network and central plant systems. The brochure's three-dimensional drawing of the downtown area, which shows the individual buildings and highlights those which are part of the system, is particularly notable.

In addition to the brochure and supplements, the Energy Center uses a quarterly newsletter as a marketing tool. The newsletter emphasizes new developments within the system, such as new customers, additions to central plant capacity, and service area expansion. Also included are "helpful energy hints" targeted toward facilities engineers.

The Energy Center has also given group presentations on district heating at meetings of local professional organizations of engineers, architects, and mechicanical contractors, as well as certain city council committee meetings. These presentations are based on a slide show which is "customized" for each particular group, and are given on an "as needed" basis.

Other aspects of their marketing program include the use of press releases and special letters or "notices" on specific issues. Also, the marketing director of Minneapolis Energy Center is active within the marketing committee of the International District Heating and Cooling Association (or IDHCA, a trade organization of the district heating/cooling industry)--which puts Minneapolis in the forefront of new trends and strategies in district heating marketing.

DISTRICT ENERGY ST. PAUL

District heating in St. Paul, Minnesota, is provided by District Energy St. Paul, Inc., a non-profit corporation. The St. Paul system is generally recognized as the first large-scale application of European hot water district heating technology in the United States. The system began providing service in September, 1983, and is one of the larger systems in our study, with a recent annual sendout of 749,618 MMBTU.

Marketing district heating in St. Paul has been carried out in two distinct phases. The first phase involved marketing the concept of hot water district heating technology to the community. The second phase, currently underway, is that of marketing services to new potential customers.

The marketing of the concept of district heating can be traced to an overall feasibility study of district heating in the Twin Cities area which was finalized in January of 1979. The results of that study found positive indications for district heating in St. Paul. These results provided the impetus to create the non-profit corporation, originally incorporated as the District Heating Development Company, to develop district heating in St. Paul.

A number of other studies were carried out which were valuable to this stage of the marketing effort. These included studies on the costs of conversions of heating systems in downtown buildings, conversion costs at the Gillette Manufacturing facility, heat load and energy consumption studies, and economic feasibility studies. These studies all supported the conclusion that district heating was feasible and beneficial to the downtown area.

Group presentations were also an important marketing activity at this stage. These presentations were based on a sophisticted slide show which was professionally developed by a local public relations firm and which utilized multiple projectors and a prerecorded narrative. Groups targeted for these presentations included the local Building Owners and Managers Association, the local chapters of the American Institute of Architects, engineering organizations, the local Chamber of Commerce, and local business and government leaders. These presentations were followed up with personal contacts, creating a substantial base of support for district heating development. This included the support and leadership of St. Paul's mayor, George Lattimer, which was to prove invaluable in the years ahead.

Marketing to potential customers, the second phase of the marketing effort, began in May of 1981, and produced the first signed customer in July. While group presentations continue to play a role in this stage of the marketing effort, the use of brochures and other printed material has become more important. Over the years, St. Paul has used several different brochures. Currently, they use their annual report as a marketing brochure, emphasizing the financial viability of the corporation.

Other aspects of St. Paul's marketing strategy include the use of a newsletter, "DHDC News," the use of flyers in direct mail applications, and the use of press releases on a regular basis.

TRENTON DISTRICT ENERGY CO.

District heating service in Trenton, New Jersey is supplied by the Trenton District Energy Company. This for-profit company is an affiliate of the Cogeneration Development Corporation, which acted as the system's developer. The system utilizes high temperature hot water technology, with the thermal energy being derived from a cogeneration cycle. The Trenton system is moderately sized, with a recent annual sendout of 321,000 MMBTU. The system also supplies a substantial (6000 ton) district cooling load.

As the system's developer, Cogeneration Development Corporation (CDC) carried out the marketing of the system, although it should be noted that the city government, and particularly the mayor, provided considerable support. Because Trenton is the state capital and the county seat, government buildings helped provide the system's base load. Consequently, marketing the district heating concept to these political institutions became a high priority in CDC's marketing strategy.

As a first step, group presentations based on a slide show were used. These presentations were intended to introduce the concept of district heating to the targeted individuals with a "broad brush." These group presentations were then followed up with individual contacts. In addition to government agencies, the Chamber of Commerce, the board of a local hospital, a college, and the local housing authority were targeted.

CDC has also developed a brochure, "Trenton, New Jersey: A Study of Energy Development in an Urban Environment" as part of their marketing effort. This ten-page brochure describes the history of district heating development in Trenton, explains the energy-saving benefits of the technology, and outlines the benefits of district heating to individual consumers and to the community. In addition, Cogeneration Development utilizes a business folder and brochures describing CDC's other energy projects and corporate history. Other aspects of CDC's marketing efforts include the use of third-party consulting engineers' reports to verify CDC's own engineering and economic analyses. Press releases are used in a limited way.

JAMESTOWN DISTRICT HEATING

District heating service in Jamestown, New York is not new: from 1948 to 1969 a steam system was in operation in the downtown. The new hot water system began operations in 1984 as part of the Jamestown Department of Public Utilities and presently serves 19 customers with a peak load of approximately 13 MW thermal, and with a moderately-sized annual load of 78,015 MMBTU. The heat source for the system is the city's coal-fired Municipal Electric Plant which cogenerates 50-60 MW of electricity as well as the thermal output.

Jamestown's modest size (population: 38,000) and small potential service area require a marketing effort of proportionate scale. Only one full-time employee is assigned to work exclusively on district heating.

Jamestown uses an effective but unassuming brochure to tell the story of district heating development. This seven-page document focuses on the basics of district heating and its advantages, the history and chronology of district heating development in Jamestown, and the current "business" status of the district heating system. In general, the brochure projects an overall positive history and image of the local district heating system in a non-technical way. In addition to this marketing piece, flyers and handouts of different types have been used.

Group presentations are also used in Jamestown's marketing effort. Because the system is municipally owned and operated, regular presentations to the city council are necessary. Other groups to which presentations are given include local building owners and area contractors. These presentations are based around a slide show and are generally less than an hour in length.

Other elements of the Jamestown marketing strategy include the use of press releases to highlight and promote events and advertise public meetings, as well as the use of testimonials solicited from more enthusiastic customers to document savings, comfort, reliability, and other advantages.

WILLMAR MUNICIPAL UTILITIES

District heating in Willmar is provided by the city's Municipal Utilities Department. Heat is obtained from the municipal electric plant as a product of cogeneration. The current system is a hybrid type--part steam, part hot water--which grew out of the need to either renovate, replace, or abandon the city's original aging steam system. A study undertaken to determine the most economic choice determined that part of the steam system could be renovated, and that the remainder should be replaced with a modern hot water system. The system is moderately sized, with a recent annual sendout of 98,890 MMBTU.

Willmar uses an attractive marketing brochure. The full-color, glossy brochure is constructed to double as a presentation folder, containing a pocket to hold additional information circulars and flyers. The brochure has been used for a variety of applications including direct mail advertising, group presentations, and the annual "Open House" promotion for potential residential customers.

The "Open House" is Willmar's major group presentation. The annual event features a short slide-show "tour" of the system, followed by a period in which participants can ask questions of utility representatives, examine heat exchange equipment, and obtain information on contractors. This annual event is widely advertised through radio, newspaper, and direct mail.

Another interesting feature of Willmar's marketing efforts is the use of customer testimonials--perhaps especially effective in a small-town environment. Willmar Municipal Utilities also offers free heat exchange equipment ("furnaces") to residential consumers. This greatly enhances marketability to homeowners, who represent the greatest potential for expansion of the Willmar network.

PROVO DISTRICT HEATING

The municipal district heating system in Provo, Utah is operated by the electricity department. Although the heat source for the system is an electric plant, the heat is not derived from a cogeneration cycle. Instead, steam is taken directly from the main steam header to heat hot water which is circulated in the system. The present system is the smallest in the study with a recent annual sendout of 37,500 MMBTU. The system was originally conceived of as a demonstration project which could be expanded if proven successful. Although the system has been economically viable, expansion plans are on hold at present, at least partly due to recent downward trends in natural gas prices.

Provo's initial marketing efforts focused on promoting the concept of district heating to the local business community. Group slide presentations were given to the local Chamber of Commerce, as well as to architects, engineers, and the city council. Press releases were also used regularly to familiarize the general public with the concept of district heating. In marketing the service to potential customers, personal letters and direct contacts helped establish the initial customer base.

Future plans include the development of a brochure to accompany longer-term expansion of the service area into the downtown area.

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REPORT AND INFORMATION SOURCES

Additional copies of this report, "District Heating Marketing: Analysis of a Twelve-City Survey" are available from

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For additional information on the background and methodology of the study, or the acquisition and analysis of information presented in this report, or for other information on energy planning activities in the City of Columbus, please contact:

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