

District Heating & Cooling

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Mid-America Starts A Winning Tradition

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Indianapolis, the heart of Hoosier country, is a sports haven—home to the Indy “500,” the Colts, the Hoosier Dome, the Pacers and an amateur sports network second-to-none. But the newest competitor in Indianapolis won’t be scoring any baskets or racing any laps. Yet it may be winning over the hearts of downtown building owners with its district cooling system, one of the newest in the nation.

Mid-America Starts

New on the competitive energy scene, district cooling in Indianapolis is not to be taken lightly. Its owner, Mid-America Energy Resources, invested \$20 million to design and construct the system — without any signed customers. Mid-America knew it wanted to act decisively. It had conducted extensive research on energy trends and the district energy industry nationwide, and had identified district cooling as having great growth potential and a significant number of benefits for customers and the company.

For starters, district cooling

- frees building owners from their worries about chlorofluorocarbon handling and regulation and frees them to tend to other more important issues at hand — like pleasing their tenants;
- helps electric companies achieve more effective demand-side management; and
- adds a significant element to the downtown infrastructure.

Based on benefits such as these and its focus on becoming a total energy company, Mid-America’s parent company, IPALCO Enterprises Inc., has integrated district cooling development into its corporate “growth-by-design” strategy. (IPALCO is also the holding company for Indianapolis Power & Light, owner and operator of the steam district heating sys-

tem in Indianapolis, the second largest district heating system in the United States.)

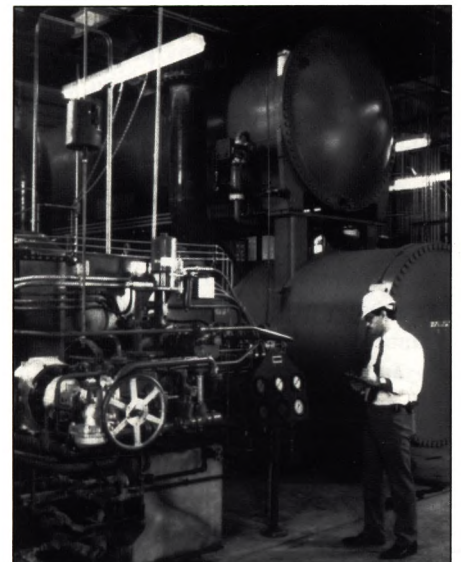
Design of the district cooling system in Indianapolis began in January 1990, with the start of construction in August. Construction was completed on schedule and within budget by spring 1991, followed by operational system testing. The first customer started taking service in July.

While growth is in store for the Indianapolis system, Mid-America has also set its sights nationally: its most recent acquisition is Cleveland Thermal Energy Corporation, the steam district heating provider and holder of the district cooling franchise in downtown Cleveland. Cleveland will soon to be home to a new sports complex for the Indians and the Cavaliers, plus a new Rock n’ Roll Hall of Fame.

Mid-America’s Mission: Become a National Player

The history of IPALCO Enterprises dates back to the late 1800s, making Mid-America Energy Resources a relatively young member of the IPALCO family. IPALCO formed Mid-America as a subsidiary of its non-regulated Mid-America Capital Resources subsidiary in November 1989. (See Figure A for IPALCO Enterprises organization chart.)

Mid-America’s mission is clear but challenging: to become a nationally respected player in the district cooling business. Charged to carry out this mission is Joseph A. Gustin, Mid-America’s president. Gustin has been with IPALCO since 1971, starting in power production at Indianapolis Power & Light and moving to vice president of steam operations in 1989.



Mid-America’s new district cooling plant has three 5,000-ton chillers ready to supply chilled water for air conditioning to downtown Indianapolis.

Courtesy Mid-America Energy Resources



a Winning Tradition

He started with Mid-America in 1990, becoming its president in 1991.

"IPALCO is committed to becoming the most valued energy provider in the United States," says Gustin. "It's a privilege to have the opportunity to help make that happen through Mid-America's district cooling development." Gustin and his staff carefully follow any and all ac-

tivities on the national energy scene that may affect district cooling growth.

"[District energy's] too good and too basic. It makes so much more sense than on-site boilers and chillers in each building."

"As far as we're concerned, there doesn't seem to be much that can happen in the energy field that could adversely affect district energy," observes Gustin. "It's too good and too basic. It makes so much more sense than on-site boilers and chillers in each building. District energy is here to stay, especially when used with cogeneration."

Indianapolis: Public-Private Commitment is Key

As in most cities, the support of local government for the new district cooling system played a key role in its fruition. Before it could begin construction, Mid-

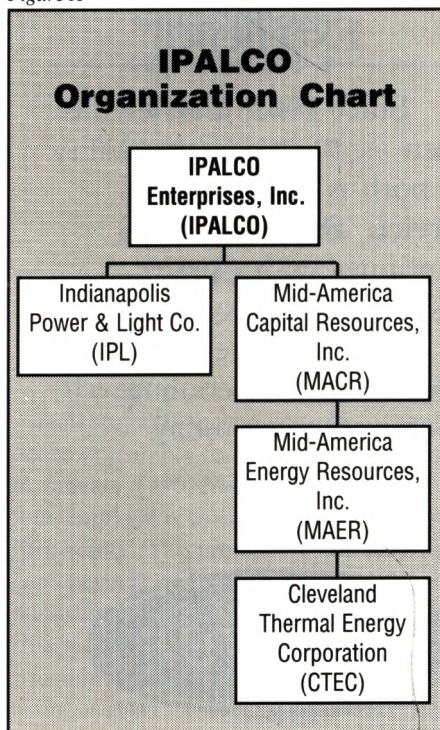
America needed to obtain permission from the City to install the piping system under city streets.

Mid-America obtained that permission by petitioning the City/County Council for a franchise to operate in the city streets. The outcome of the petition was a 25-year district cooling franchise for Mid-America to operate within a specified boundary within the city of Indianapolis. One of the keys to obtaining the petition was that the City/County Council recognized the district cooling system would not only benefit building owners, but the community as well. The system is a welcome addition to the all-important downtown infrastructure, and is also a revenue producer: Mid-America uses steam from the City's refuse-to-energy plant to help power the district cooling system.

The mayor of Indianapolis, William H. Hudnut III, proved to be a strong advocate of district cooling development. "The introduction of a district cooling system in downtown Indianapolis represents a significant investment in our future infrastructure needs," maintains Hudnut. "In addition to using steam from our 'trash-to-energy' plant, the district cooling network offers businesses and government an efficient method of cooling downtown office buildings."

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Figure A





Mid-America's new district cooling plant began construction in summer 1990 and was ready to supply chilled water in spring 1991.

Courtesy Mid-America Energy Resources

Careful Construction Planning Brings Success

While the franchise was being negotiated, Mid-America was working to ready the new district cooling system for installation. The start of construction was scheduled for mid to late summer after franchise approval.

"The introduction of a district cooling system in downtown Indianapolis represents a significant investment in our future infrastructure needs."

Mid-America decided early on to form a small project management team to shoulder responsibility for the project. Starting in January 1990, Mid-America assigned four employees to the project, adding a fifth in July. This project team directed all engineering, negotiated and placed all major equipment purchase orders and construction contracts and performed all construction management for the project. Each team member brought with him or her

individual talents from varying backgrounds in engineering, construction, purchasing, plant operations, contracting, and administration.

"Our team worked together very effectively in managing this project," says David Kiesel, Mid-America's director of engineering. "The size and experience of the group made it easy for us to make quick and positive decisions and react promptly to daily challenges. Another key ingredient was the great support we received from our consultants, equipment vendors and contractors."

The prime engineering consultant was J.W. Welsh and Associates Inc. in Indianapolis. "J.W. Welsh has been involved in a number of chiller and cooling tower projects since we started business in 1976," reflects Frank St. John, principal-in-charge of the project at J.W. Welsh. "So we were able to bring a significant amount of technical plant experience to bear on the project, ensuring Mid-America's plant is a state-of-the-art facility."

Mid-America decided early on to form a small project management team to shoulder responsibility for the project.

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The IPALCO Enterprises Family of Companies

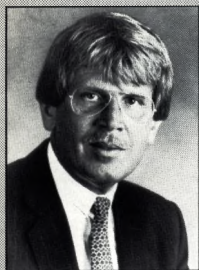
Mid-America Energy Resources is the newest member of the IPALCO Enterprises family of companies. IPALCO Enterprises Inc. is the holding company for Indianapolis Power & Light, a regulated electric public utility, and Mid-America Capital Resources Inc., which manages IPALCO's investments in nonregulated ventures. In 1990, the Corporation's regulated utility business accounted for 95 percent of IPALCO Enterprises' earnings.

Indianapolis Power & Light Company has provided electric service to Indianapolis and surrounding communities for more than 60 years. The Company currently serves a diversified mix of residential, commercial and industrial customers, more than 380,000 in all. Indianapolis Power & Light Company's 528-square-mile service territory is in the economic heart of Indiana. The Company owns four generating stations, all powered by Indiana coal. The Company also provides steam district heating service to part of downtown Indianapolis for heating and industrial uses.

Mid-America Capital Resources (MACR) was formed in 1984 as a holding company for IPALCO's nonregulated businesses. Mid-America Energy Resources was formed as a subsidiary of MACR in 1990. With a focus on energy-related development, Mid-America constructed and now operates the district cooling system in downtown Indianapolis. Mid-America Energy Resources also recently acquired Cleveland Thermal Energy Corporation which operates a steam district heating system and holds the franchise for district cooling development in downtown Cleveland.

IPALCO Enterprises:

An Interview with John R. Hodowal, Chairman of the Board and President



How does IPALCO's past reflect its philosophy for the future?

Hodowal: IPALCO's history, principally focused on electricity, dates back to the late 1800s. Our steam district heating operations, too, started about that time. Yet even though our electric revenues comprise 95 percent of total revenues, we are determined to change our focus from electricity to energy. We recognize that district heating and district cooling are also key components.

We also recognize that our hometown, Indianapolis, will always be a key part of our focus. But we also need to consider overall corporate direction and markets outside of the Indianapolis service area. That was in our thought process when we acquired Cleveland Thermal.

No matter where we go, however, we are determined to base our growth on the traditional values of our past. We like to think of ourselves as people who, when we're facing a job, will do it right and quickly. But if we have to choose between the two, we'll do it right. Our philosophy is basically "measure twice, cut once."

I believe our employees and our customers appreciate that. We have their best interests in mind. We're convinced that the core principles of human decency are important in business. We believe and we listen. Employees like to work for organizations that have a strong set of values. And we think that customers respect companies that operate with a strict set of values.

In the long term, everyone benefits by doing the right thing. But it can't just be something we say, it must be something we demonstrate on a daily basis — in every decision we make.

How is IPALCO accomplishing its "growth by design" strategy?

Hodowal: For IPALCO, "growth by design" is a process, a way of thinking. We are determining who we are, where we are and where we want to be in the next 10 years. We're taking a good hard look at our strengths and our weaknesses and have asked others to do the same. From that information we're charting a course, a "growth by design" strategy for the future.

It's really been a three-step process. First, we asked employees to participate in an employee survey. We asked them to be critical of us in terms of what we do and how we do it. With a 90 percent response rate, we feel confident the survey results are reflective of the whole. By and large, our employees expressed respect and concern for the company. Yet their responses provided us with a host of good ideas for change. From these ideas, IPALCO identified the top 16. Next, a group of IPALCO employees representing all levels of the company gathered to propose activities to make change happen. The topics included promotion practices, pay for performance, safety issues and more. We've implemented 13 of the 16 recommendations and have scheduled implementation of the final three.

Our second step was to hire a consultant to do a comprehensive business review. We feel as though we're in a relatively solid position right now... low rates, very high credit ratings, and superior customer acceptance... but we understand that the best time to do a business review is not when you're in trouble. Often that's the most difficult time to be objective. We are implementing the recommendations resulting from this outside look at what we do.

Our third step has been to broaden our strategic planning process to include more than just top management. Forty-four employees have participated to help us chart a course for the next 10 years and

another 100 or so will soon join in the process. That course included expansion into Cleveland and potentially other cities throughout the nation. So we've obviously begun our charted journey. And we intend to stay focused on that course, making adjustments as necessary along the way.

How do you define success for your organization?

Hodowal: Success for IPALCO is defined in relation to its constituencies. Have we delivered what we have promised to these groups? We've identified five major constituencies: our investors, our customers, our employees, our community and our successors. Our successors are an extremely important group. We believe that when we turn over our office to a new generation of IPALCO employees, we ought to leave the Company to them in better condition than we received it. That means a wise use of resources and paying attention to how we do our job.

We feel we've been successful for our investors if they receive a superior return on an investment they feel is safe and liquid in an organization they can trust.

For employees, we want to have the reputation that IPALCO is a great place to work. But we believe that our true measure of success with employees will be when employees believe that "job one" is to make a fellow employee look good. It's the concept of working together with a common focus, putting the interest of collective employees ahead of personal interest. And, of course, that will benefit the investors and customers.

For our customers, we want to continue our long history of providing superior quality, low-cost services. Even though our surveys report we have a 90 plus approval rating, we do not want to take that for granted and rest on our laurels. We must continually focus on how to serve the customer better.

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Mid-America's district cooling plant and piping system were designed to handle phased growth. The initial phase, now in operation, has 15,000 tons of cooling capacity provided by three 5,000-ton Carrier chillers. "The plant will house another chiller," says St. John, "enabling us to go to 20,000 tons of capacity relatively easily. We've also designed the piping system to handle increased flows and pressures to allow the plant to be expanded to an ultimate capacity of 30,000 tons."

**Mid-America's
district cooling plant
and piping system were
designed to handle
phased growth.**



Construction of the piping distribution system in the downtown area was successfully completed and the streets restored prior to the start of the NCAA Final Four Basketball Tournament.

Courtesy Mid-America Energy Resources

Right now the plant is sending out chilled water at about 90 to 100 lbs. of pressure. That is expected to increase as the system develops and grows. The chilled water leaves and returns to the plant through 48-inch diameter supply and return mains.

Thompson Construction Company was the contractor responsible for the installation of the chilled-water distribution system, approximately 5,000 trench feet of large-diameter supply and return ductile-iron piping. The pipes were placed underneath the downtown streets and sidewalks at varying depths, sometimes at as much as 26 feet. The majority of the piping was installed via open-cut trenching. To avoid utility interferences at four major intersections, horizontal tunnel casings were installed to carry the pipe.

Joseph V. Hanley, president of Thompson Construction, says that the most challenging part of the project, however,

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An Interview Continued from page 8

Finally, we must measure our success by the health of the communities we serve. We feel we must maintain a visible and active role in our communities not just in economic development, but in programs that make our communities good, pleasant places in which to live.

How have you seen the energy industry change since you first started with IPALCO?

Hodowal: Perhaps one of the most significant changes I've seen in my 23 years with IPALCO and in the energy industry is that more and more utility companies are adopting a competitive mentality. That mentality is important. IPALCO has always functioned with the belief that we can't take our customers for granted. We need to behave as though customers have a multitude of choices, and that we need to continue to work to

earn their confidence, respect and loyalty.

One thing that hasn't changed, though, is that every generation believes it is living in the most difficult period. Twenty-three years ago we believed that those were the toughest times the industry could go through. Twenty years ago it was the same, and today, many believe that these are the most difficult of times. Tomorrow's "good ol' days" are today; it all depends on your perspective.

Twenty-three years ago we were involved in discussions concerning the role nuclear power would play. Twenty years ago, during a particularly high point of environmental activism, we were concerned about visible emissions from coal units and how these emissions could be reduced. But most public policy debates at those times were at the local level, rather than in national or international forums.

Today the world has become smaller. Today, for example, one challenge is to reduce invisible emissions such as sulfur and nitrogen oxides. We are addressing these issues not because someone in Indianapolis believes they are important but because they are factored into international public policy agendas. And this is just one example of a broader challenge of learning how to deal with an increasingly national legislative and regulatory focus on energy issues.

Two years ago we said that the 1990s would be known as The Energy Decade. We still believe that to be the case and expect an exciting, perhaps tumultuous, period ahead as we move toward the twenty-first century and the second millennium. There will be winners and losers as this world and the energy industry change. We hope we are positioning ourselves to be among the winners.



Mid-America's state-of-the-art computerized control and metering systems help keep the system running smoothly.

Courtesy Mid-America Energy Resources

was beating the clock. "Our biggest challenge came in completing the installation of the final segment of pipe and restoring the city streets before the start of the NCAA Final Four basketball tournament," explains Hanley. "That was a part of Mid-America's franchise agreement with the City. We knew we had to make it — and did. All of the streets were paved, the sidewalks replaced and the grass replanted in time for the big event."

Not only was the project completed on time, but it was completed within budget as well. "Without a good team of engineers and contractors, this project could have been a nightmare," admits Gustin. "We had a tight time table — construction of the plant and piping between summer of one year and spring of the next. Everyone had to work together and did. Mid-America is extremely pleased with the job that was done."

Customers Increase Tenant Satisfaction and Reduce Capital Costs

District cooling system construction can leave a lasting impression on downtown businesses and potential customers. And that impression can be positive or negative depending on the job that was done. In fact, construction in the downtown streets is one of the first impressions that Mid-America's first on-line customer had of what was to become his new cooling provider.

"Mid-America and its construction companies were very responsive," reports Ken Asam, property manager of The Meridian Centre, Mid-America's first customer to begin taking the service. "They were concerned about how their work was going, and they were sensitive to how it affected the general public. And I wasn't even their customer then. That kind of consideration is appreciated."

Asam first heard of district cooling from Mid-America's Director of Marketing David Borst, and believes his building is a natural for the service. The pipes were right outside his building's door, service was immediately available and he had been starting to consider cooling alternatives.

"We had a tight time table — construction of the plant and piping between summer of one year and spring of the next. Everyone had to work together and did."

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District Cooling in Indianapolis: Mid-America's First

Historical Background

Mid-America Energy Resources Inc. is a non-regulated subsidiary of Mid-America Capital Resources, a subsidiary of IPALCO Enterprises Inc. It was officially formed in November 1989 to construct and operate a district cooling system for downtown Indianapolis. Construction of the system began in summer 1990 and was completed in spring 1991. The first customer began service in July 1991.

Plant Location

350 South West Street, Indianapolis, IN 46225

Office Location

25 Monument Circle, Indianapolis, IN 46205

No. of Employees

9 full time Mid-America Energy Resources employees; 9 Mid-America Capital Resource employees that work on a combination of MAER and other projects.

System Cost

\$21 million

Production Capacity

15,000 tons

Fuels Used

Steam derived from coal or refuse drives the chiller turbines

Distribution System

5,000 trench feet, supply & return ductile-iron piping (10,000 feet total)

Expansion Potential

Will install 5,000-ton chiller early 1992; ultimate capacity in excess of 30,000 tons. Phased development and construction is anticipated.

Mid-America's Newest Acquisition: Cleveland Thermal

Historical Background

Started in 1906, steam district heating system in Cleveland originally owned by Cleveland Electric Illuminating Company. Sold to United Thermal Energy Corporation 1987. Mid-America Energy Resources purchased steam system and acquired district cooling franchise from United Thermal in July 1991. This is system's 85th anniversary year.

Service Provided

Steam for district heating, steam-powered cooling, domestic hot water and process use

Service Provider

Cleveland Thermal Energy Corporation, newly acquired subsidiary of Mid-America Energy Resources, subsidiary of IPALCO Enterprises Inc. in Indianapolis

No. of Buildings Served: 230

Building Area Served

Over 19 million square feet

Largest Customers

City of Cleveland, Cuyahoga County, Cleveland State University, Tower City

Plant Locations

Primary Plant: Canal Road

Peaking Plant: 1901 Hamilton Avenue

Office Location

1801 East 12th Street, Suite 201, Cleveland, OH 44114

No. of Employees: 90

Production Capacity

Total: 1,281,000 pounds per hour of steam.
Five boilers at primary plant; six boilers at peaking plant

Fuels Used

Low-sulfur coal at primary plant; No. 6 fuel oil at peaking plant

Distribution System

5 miles of 150 psi distribution piping
15 miles of 20 psi distribution piping

Customer Demand

1990 Peak customer demand: 611,000 pounds per hour of steam

Expansion Potential

Cleveland Thermal will continue to sign up new customers and add load to steam system. Plans under way to construct and operate district cooling system for downtown area. Initial phase of district cooling system operation in Cleveland may begin as early as 1992.

Mid-America *Continued from page 11*

"We run a state-of-the-art building and we wanted a state-of-the-art cooling system to meet our needs," says Asam. "We totally rehabbed our building in 1986, creating what we call an 'intelligent' building. We're the second downtown office building to hook up to cable television to give our attorney and stockbroker tenants access to the market and legal activity updates. Plus we have a totally computerized energy management system. District cooling was a perfect match."

The Meridian Centre, two blocks from the Hoosier Dome and two blocks from the Circle (Indianapolis' geographic center), is roughly 47,000 square feet spread throughout nine floors. The building uses Mid-America's chilled water in an outer loop that was formerly used for the cooling tower. The inner loop water is cooled in a heat exchanger and then goes through the water source heat pumps. Since starting district cooling service, Asam has seen his heat pump efficiency improve and repairs drop dramatically.

"Since we converted to district cooling, I've eliminated all tenant complaints about air conditioning," notes Asam. "And I haven't had to call in a work order on my heat pumps. Before I was doing that on a regular basis. Since the changeover I just don't have cooling problems."

**"Since we
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Asam admits that this has been an unanticipated benefit of connection to district cooling. His primary reason for deciding to use district cooling is that he was able to get rid of the cooling tower on his roof. Asam was concerned about the noise of the cooling tower and the fact that a significant amount of water was sitting on his roof — right above a major tenant. He was glad to rid himself of that liability.

Asam's energy management system teams up well with Mid-America's Foxboro metering and control systems. Mid-America's metering system tracks all customer usage on an ongoing basis. The automatic control system allows Mid-America to operate the plant without an extensive amount of operating personnel. Even Mid-America's chemical water treatment system is automated, allowing for monitored, uniform water treatment. For customers like Asam, these state-of-the-art systems help district cooling meet his standards of high-quality service.

**"We figure we
saved about
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District cooling service began in August to the Indiana Government Center North Building, the first customer to actually sign up for district cooling service. John Fleck, executive director of the State Office Building Commission, says the State started to consider district cooling about two years ago when it began planning the total renovation of the 30-year-old Indiana Government Center North Building.

"Our existing Indiana Government Center North Building is about 950,000 square feet," states Fleck. "So when we were looking at a total replacement of its HVAC system we were looking for a cooling system that was not only dependable, but cost-effective. We figure we saved about \$1.2 million in capital costs by deciding to go with district cooling."

Fleck says that another state building that currently houses federal employment services is about ready to start its conversion process. "If the system works as well in that building as it has in the Indiana Government Center North Building so far," observes Fleck, "we'll be satisfied. Mid-America delivered what it promised on time and has been very understanding of our needs." The Indiana Government Cen-

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Mid-America *Continued from page 12*
ter North Building also uses steam from Indianapolis Power & Light, making it a building using 100 percent district energy.

Cleveland and Beyond: A Growth Strategy

Mid-America set its sights beyond Indianapolis before ever hooking up its first customer. "We knew we wanted to start district cooling development in our

hometown," says Gustin. "But we immediately set our sights beyond our own geographic boundaries. District cooling has great potential, and we're determined to see it implemented in other cities throughout the United States."

Mid-America took the first step toward accomplishing that vision with the purchase of Cleveland Thermal Energy Corporation from United Thermal in July 1991. With the purchase, Mid-America acquired the steam district heating system

and the rights to the district cooling franchise in downtown Cleveland.

Mid-America's presence in Cleveland is new. And so is its relative presence on the national district cooling scene. But with a successful start in Indianapolis and projected growth in Cleveland, Mid-America is pleased to have started a winning tradition of district cooling development. 

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