

Citizens Thermal Update

Citizens Thermal Energy

A Division of Citizens Gas & Coke Utility

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Citizens Provides Sound Energy Solutions for Fast-Growing IUPUI

Citizens Thermal Energy is providing reliable, flexible and cost-effective energy solutions that are helping one of the state's fastest growing universities continue its key role in Indiana's economic development.

Faced with an ever-tightening state budget and limited space on its sprawling downtown campus, Indiana University-Purdue University Indianapolis is enjoying a variety of benefits from the steam and chilled water services provided by Citizens Thermal, according to Emily Wren, Assistant Vice Chancellor of Facilities at IUPUI. A steam customer of Citizens Thermal (formerly IPL) for more than 20 years, IUPUI began receiving chilled water services from the utility in 1994.

"In addition to running out of space, we had to weigh the capital spending requirements of maintaining our own energy facilities against the more pressing capital requirements of our core education and research facilities. Citizens Thermal has delivered operational cost savings as well," explained Wren when discussing why IUPUI chose Citizens for its steam and chilled water needs.

While cost savings are important, Citizens Thermal also has provided reliable, high quality service. "Reliability is our biggest issue when it comes to energy, especially at

The IU School of Medicine and the affiliated Clarian Health facilities. The various patient care and health research facilities have very specific environmental requirements when it comes to heat and humidity. Citizens Thermal has provided critical reliability while meeting our specific performance standards," Wren said.

Other benefits IUPUI has realized through choosing Citizens Thermal include:

- Not having to compete with private industry to hire highly technical energy-related personnel.
- Not having to devote time and resources to government permitting of energy-related facilities.
- Not having to research the fast-changing energy market conditions critical to making wise fuel choices.

Wren emphasized that the service provided by Citizens Thermal has been outstanding because of its people. "The people at Thermal have worked with us in a collaborative way to ensure that our energy needs are being met," Wren said.

Wren believes Citizens Thermal also is a good business partner for IUPUI because it is part of Citizens Gas & Coke Utility, which is operated under a Public Charitable Trust. "Because

Citizens is owned by a trust, I don't have to worry about whether it will be owned by some out-of-town company or driven by a strategy that

stresses service to stockholders over customers. Like the university, I know Citizens Gas is driven by service to this community," Wren concluded.



Emily Wren, assistant Vice Chancellor of Facilities at IUPUI, knows that steam and chilled water services from Citizens Thermal Energy have provided significant cost savings for the fast-growing university.

News You Can Use

This is the first issue of Citizens Thermal Update. You will be receiving the publication quarterly to keep you updated on news and other information important to Thermal's steam and chilled water customers. Among the information and features we plan to include in the publication are customer testimonials, reviews of new technology, suggestions about system maintenance and ways you can save money.

This publication is just part of our ongoing efforts to improve communications with Thermal customers. We would like to hear your ideas and comments about the publication. If you would like to submit an idea or comment, please contact your Citizens Thermal Energy Service Representative.

Citizens Thermal Energy Offers Many Benefits

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Citizens Thermal Energy provides energy-efficient, cost-effective and environmentally sound methods of heating and cooling buildings. Our district energy systems produce steam or chilled water at a central plant. The steam or water is then piped underground to individual buildings within a designated area for heating, cooling or industrial use. District energy is easy to operate and maintain, reliable, comfortable and convenient, has lower life-cycle costs and offers design flexibility.

Among the many benefits of district energy are the following:

Energy efficient — When steam or chilled water arrive at a customer's building, they are ready to use. They are 100 percent efficient "at the door," compared to 80 percent or lower efficiencies with other fuel sources. In addition, district energy systems can use the "rejected heat" that results from burning fuel to produce electricity at a central plant. When the rejected heat is used, the system becomes a combined heat and power system - generating both electricity, steam and in our case, chilled water. This greatly improves a power plant's fuel efficiency and also lowers the emissions typically associated with standard electricity generation.

Environmentally sound — District energy enables building owners and managers to conserve energy, improve operating efficiency and protect the environment. With district energy, building managers no longer need to burn fuels or store or use refrigerants on site, so the site is safer and more environmentally sound. Instead, fuel and refrigerants are used at district energy plants. These systems provide air quality benefits by employing stringent emission controls that are much more effective than those used on individual buildings.

Easy to operate and maintain — District energy is worry-free heating and/or cooling delivered directly to a customer's building - ready to use. Customers do not need boilers or chillers, so there is less maintenance, monitoring and equipment permitting. There are fewer safety and liability concerns for employees and building occupants because district energy eliminates the need for fuel deliveries, handling and storage. All this helps you focus on your particular operation, rather than energy production.

Reliable — Building owners and managers can count on district energy systems since energy professionals operate around-the-clock and have backup systems readily available. Most district energy systems operate at a reliability of "five nines" (99.999 percent).



Purchasing steam from Citizens Thermal Energy's Perry K Plant allows building owners to reduce costs for maintaining and operating their own energy facilities.

Comfortable and convenient — District energy service allows building operators to manage and control their own indoor environments. Building occupants can be both comfortable and satisfied, no matter what the outdoor temperature. District energy is available whenever a building needs heating or cooling. So even if there are unusually warm days in January, a building can receive chilled water for air conditioning, without starting up its own chillers. In addition, district energy reduces vibrations and noise problems that could annoy building occupants.

Lower life-cycle costs — Since buildings using district energy service don't need boilers or chillers, building owners and managers reduce their upfront capital requirements and their ongoing, operating, maintenance and labor costs considerably. That means less financial risk and a far better return on investment - plus the elimination of principal and interest payments, property taxes associated with new boiler and chiller installations, costly insurance and annual maintenance contracts, and costs associated with operating boilers and chillers. In addition, district energy systems have the flexibility to use a variety of fuel sources in larger, more economical volumes - from oil to natural gas to coal to biomass - reducing the impact of supply and price variations.

Design flexibility — No smokestacks, boilers or cooling towers means greater building design flexibility. Architects can easily design or renovate buildings to be more versatile and aesthetically pleasing for both potential occupants and the community.

What is District Chilled Water?

District cooling systems, like that operated by Citizens Thermal Energy, produce chilled water at a central plant and then pipe that cold water out to buildings in the district for air conditioning. Air conditioning can include cooling air, dehumidifying, and equipment or process cooling. As a result, individual buildings do not need their own chillers, cooling towers, or refrigerant air conditioners. A district cooling system does that work for them.

Buildings connected to a district cooling system have lower capital costs for their energy equipment because they do not need their own conventional chillers and cooling towers. They save valuable up-front dollars that can be invested elsewhere. In addition, they save building space that can be used for more cost-effective purposes. The building owners also avoid the costs and hassles of on-site cooling equipment, such as cooling towers, chemicals, make-up water, and unexpected maintenance costs or breakdowns.

The district cooling system of Citizens Thermal Energy sends chilled water at 40° F through a series of underground supply pipes to our district cooling customers. As the cold water passes through their building's air conditioning equipment and heat exchangers, it picks up heat and cools the air inside the buildings. Typically, the district chilled water will warm to about 52° F at which point the water is sent back to the central chilled water plant

through the underground return water pipes. At the central plant the water is re-cooled to 40° F and pumped back to the cooling customers. A district chilled water system is unconventional in that utilities normally add energy to a building, such as steam, natural gas, or electricity. In this case, the utility service is removing energy (heat) from the building, and as a result, cooling the space inside the building.

The convenience, cost savings, and space saving features of district chilled water are very attractive in today's market. Chilled water businesses are quickly developing in major metropolitan areas, including Indianapolis. Since its inception in 1991, the district chilled water system in Indianapolis now serves approximately 50 buildings and has a system capacity of nearly 40,000 tons of cooling.

Chilled Water Terminology

The units of measure used in cooling and chilled water applications can be somewhat confusing and difficult to understand. The typical terms for describing and measuring systems are "Tons" and "Ton-Hours". The following is a brief description of these important chilled water terms:

Tons — Before we had our modern mechanical cooling systems, rooms were cooled with blocks of ice. As engineers began measuring the transfer of energy with ice, it became necessary to establish some method of

measuring the cooling capability of systems. It was noted that if a one ton block of ice was melted in a 24 hour period, it would remove 12,000 Btu's (British Thermal Units) of energy from the space each hour. From this developed the standard unit for cooling. A "ton" represents cooling at a rate of 12,000 Btus per hour.

The typical home air conditioning system is about 2 1/2 tons. A system this size can remove heat from the home at a rate of 30,000 Btus/hour. Citizens Thermal Energy's West Street Chilled Water Plant has a capacity of approximately 32,000 tons, or the capacity to cool approximately 12,800 homes on a hot, humid day.

Ton-Hours — Since "tons" is a rate of energy transferred, it is often more useful to measure the total energy transferred in a given time period. This is normally

done by multiplying the average rate of energy transfer (tons) by the time period needed (hours). A simple example would be a system cooling at a rate of one ton for one hour would remove 12,000 Btus from the space being cooled. From this calculation comes the "ton-hour" unit of measure in cooling applications. One ton-hour is equivalent to 12,000 Btus.

Btu — The Btu is the basic measure of energy in our English system of measurement. A Btu or British Thermal Unit is defined as the energy needed to raise the temperature of one pound of water one degree Fahrenheit.

It is our intention in future newsletters to expand our descriptions of the terms and components of a district cooling system in order to help our customers better understand the service that we provide.



Citizens Thermal Energy's West Street Chilled Water Plant has a capacity of 32,000 tons, or enough to cool about 12,800 homes on a hot, humid day.

Air Handling Unit General Maintenance Avoids Operating Headaches

Suggested air handling unit modifications, in conjunction with seasonal general maintenance, can help unit operators avoid headaches such as overflowing condensate pans, short-lived fan motors, and other problems.

During winter, when the heat is on, maintenance is pretty much a non-event. About all that is needed is to replace the air filters once or twice. However, the “fun” can begin with the arrival of the summer air conditioning season. If possible, it is recommended that the condensate drip pan be taken down at the beginning of each summer (don’t let it go more than three summers at most) inspect it for holes and leaks, and clean it out. Rust, dust, and sludge have a way of building up in the pan. Left unchecked, this can lead to stopping up the pan drain line, causing pan overflow.

While the pan is down, use a wire brush to clean away any rust from galvanized sheet metal shrouding and wipe/clean any exposed copper piping with a soft towel. In short, clean up as much as possible before reinstalling the condensate pan.

Some units may need to occasionally make sure the actual drainpipe from the condensate pan is freely draining, although this is less of a regular maintenance chore.

Now that you have a clean pan, and lines, either buy a bottle of liquid bleach, or go to a supply store and pick up some anti-algae tabs. If you go with the tabs, set them in the

condensate tray, and they dissolve over time. Liquid bleach, while effective, is a shorter-term solution, which needs to be repeated during the summer (it is not needed when the heat is on). If you use liquid bleach be careful not to spill it on carpet or clothing (definitely put down a waterproof cloth over your rug), as it will remove the color.

Using an algacide during summer months is important, as the dark, moisture rich environment in the air handler area makes it perfect for algae growth. Algae can grow in both the pan and drain line, clogging the line up, which in turn can lead to condensate pan overflow problems.

One important caveat is not to overdo it with either liquid bleach or anti-algae tabs, because in some instances they can destroy metal condensate pans, particularly stainless steel ones. So strike a happy medium on usage, keeping a proper dilution level if liquid chlorine is used, or use anti-algae tablets that are safe on pans.

Also, it is important to replace the air filters every month or so in the summer, since the level of dust they remove is huge. Clean filters not only lead to cleaner air being blown throughout your unit (which you ARE breathing), but will prolong your fan motors by keeping excess dust out of them, thus helping save electricity too.

Steam and Chilled Water Service Telephone Numbers

Dave Toombs,
Thermal General Manager,
317-927-4356 (office)
317-727-1342 (cell)

Jamie Dillard,
Assistant General Manager
317-927-4360 (office)

Sharon Connell,
Customer Service & Billing Representative
317-261-8794

Toll Free Number - Customer Service & Billing

877-313-2467

Jeff Hansen, Manager
Customer Services and Distribution
317-693-8704 (office)
317-695-2019 (cell)

Bob Purdue,
Plant Manager (Steam Operations)
317-693-8701 (office)
317-695-0512 (cell)

Bob Taber, Foreman,
Customer Service & Metering
317-693-8883 (office)
317-695-7924 (cell)

Jim Teso, Facilities Manager
(Chilled Water Operations)
317-236-6702 (office)
317-695-0145 (cell)

Other telephone numbers: Marketing - Steam and Chilled Water

Bill Tracy, Vice President,
Market Development
317-927-4534 (office)

Jeff Harrison, Director,
Market Development
317-927-4791 (office)

Lane Dunagin,
Industrial Sales Consultant
317-927-4347 (office)
317-694-2776 (cell)

Steam and Chilled Water Service Emergency Contacts

In the event of a steam or chilled water emergency, Citizens Thermal Energy can be reached at the following numbers:

**Steam Plant Operations
Emergency 24-Hour Number
(Steam Operations Control Room)**
317-261-8804

**Shift Supervisor's Office
Ron Pinkins,** Shift Supervisor
317-261-8819 (office)
317-431-4414 (cell)

**Chilled Water Plant Operations
Emergency 24-Hour Number
(Chilled Water Control Room)**
317-236-6700

Employee Spotlight

Tiffany Reed, Executive Assistant, has joined our team and will be training with Sharon Connell as customer service and billing support. Having Tiffany as a backup to handle customer service and billing issues will allow Sharon to spend time visiting customers and addressing their questions in person. Sharon and Tiffany can be reached by calling the Citizens Thermal Customer Service Line at 261-8794.

