

# Back-up generators — Keeping you out of the dark



## Natural gas back-up generators deliver

At any time, weather, accidents, failed utility equipment, brownouts or blackouts, and natural or manmade disasters can interrupt the electric service to your building. When that happens, everyone is left in the dark. All electronic equipment, and computers go down, and people in the building are left uncomfortable.

For many businesses, a power loss can be costly. If your business can't afford a power outage, a natural gas back-up generator is the answer. A natural gas back-up generator goes to work supplying electricity for HVAC equipment, refrigerators, essential lighting, anywhere electricity is needed.

Back-up generators operate on a dependable, efficient natural gas engine. Systems are designed to turn on automatically whenever electric service is interrupted and transfers the electric load back to the utility once power is restored. Today's systems are equipped with controls to handle even brief electric interruptions.

With natural gas generators, there is no worry about storing, spilling or leaking fuel or fuel odors. The generator uses existing natural gas lines serving your building. Units can run continuously unlike liquid-fueled systems that can only run uninterrupted for 2-3 days. And, you pay for the natural gas only when you need it.

Cleaner combustion and quieter engine operation make natural gas generators a superior choice for commercial buildings. To learn more, contact us and see how back-up generators can be of service to you.



FOR MORE INFORMATION VISIT:  
[www.FPUC.com](http://www.FPUC.com)

# Booster water heaters — Making your dishes spotless



## Providing a clean, safe, and economical clean

Properly cleaned and sanitized dishes and utensils are critical in any food service operation. Natural gas booster water heaters provide the essential hot water needed for superior sanitizing results. Natural gas booster water heaters “boost” the temperature of 110-140°F hot water to 180°F for the final rinse, killing bacteria and destroying grease.

You’ll appreciate the increased efficiency and lower operating costs of natural gas booster water heaters. Booster water heaters save money by decreasing drying time, eliminating the need for expensive sanitizing chemicals, and avoiding re-washes which saves on labor, water, sewer and per-cycle charges. And they’re safe for silver, pewter and aluminum tableware.

Many booster water heater models and venting options are available to meet the size and requirements of any food service operation, including wall-mounted, under-the-counter and remotely located styles.

A food service equipment dealer can help you choose the booster water heater best suited to your business. Give us a call today to evaluate your economics.



# Natural gas vehicles — Smart, environmental, cost effective



## Solutions that work for today's fleets

Energy conservation and sustainability practices are very important in today's economic climate. Cost and environmental impact associated with transportation is a continuing concern for fleet managers. Natural gas vehicles offer environmental, energy efficient and cost saving solutions for transportation systems.

To meet increasingly stringent emissions regulations for heavy-duty vehicles, while maintaining performance, functionality, safety, and cost competitiveness, fleet managers must have a well developed solution. The use of natural gas fueled vehicles (NGVs) in your fleet provides you the answer.

NGVs produce lower levels of most exhaust pollutants than gasoline or diesel vehicles. Compared to diesel vehicles, dedicated NGVs reduce exhaust emissions of non-methane organic gases by 89%, carbon monoxide by 70%, nitrogen oxides by 87%, and carbon dioxide (greenhouse gases) by 24%. Also, power is not sacrificed with today's natural gas vehicles. Natural gas has a 117 octane rating that results in

higher engine compression ratios, improved engine performance, reduced maintenance, higher reliability, and cleaner air.

Several fueling configurations are available to meet your specific fleet needs. Quick-fill, time-fill or a combination fill system will provide you the flexibility your fleet requirements. To find out more how an NGV fleet option can benefit your operation, contact us for the solution that meets your needs.



# Combined heat & power — Providing reliability and control



## Ease your energy concerns with CHP

Combined heat and power (CHP) and co-generation are just two of the most common terms referring to generating electricity and thermal energy from a single, highly efficient, and economically integrated system. CHP systems are located on or near your facility and satisfy all or part of your buildings electricity requirements.

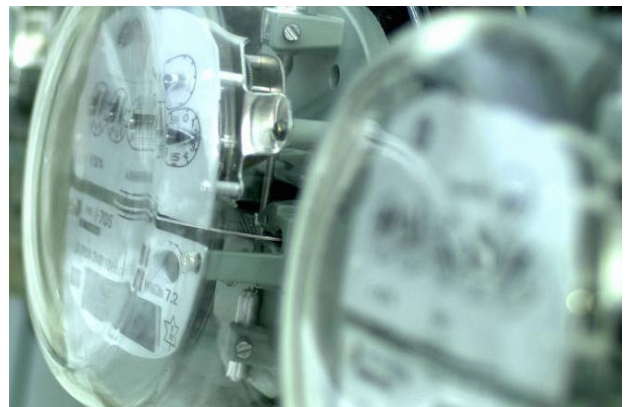
Conventional power generation converts on average only about a third of its fuel's potential energy into electricity, throwing off substantial heat during the process. The CHP system captures this wasted heat, achieving total system efficiencies of 75% to 85%, turning it into usable thermal energy for hot water, space heating, cooling, even dehumidification. A CHP system does this more efficiently, economically, reliably and with less harm to the environment than centralized, dedicated electric production.

Recent technological developments have made a wide range of cost effective CHP systems suitable for medium to large size commercial buildings. Many facilities with high, and year-round thermal loads are taking advantage of these benefits

offered by CHP including reduced emissions, utility costs, system redundancy and back-up.

System design options including design and build services, independent builder/owner/operators, and suppliers that offer comprehensive energy supply and services make projects affordable.

To determine if a CHP system is the right option for your building, contact us for more information. We can help you evaluate your options and offer solutions to consider for your CHP project.



# Piping Solutions — Innovative, cost effective options



## Gas piping option offers flexible solution

Corrugated stainless steel tubing (CSST), used in place of black-iron pipe, is taking the hassle out of installing gas piping up to 2 inches, in new and remodeled buildings. The light weight, flexibility and need for fewer connections and fittings make CSST easier to install and an ideal choice for your building project.

CSST offers many advantages compared to traditional black-iron pipe. Most importantly, because CSST installs easily without threading or welding at every turn and bend, it delivers significant savings on time and the cost of labor — up to one-quarter to two-thirds labor savings on new construction projects and as much as three-fourths on remodeling jobs.

Installers appreciate that CSST eliminates the chore of lugging and working with heavy iron pipe and its associated installation equipment, providing greater convenience and added safety. Since CSST requires fewer fittings, the potential for leaks is less, and connections and joints behind walls are virtually eliminated making CSST safer than black-iron pipe.

Since CSST is flexible, it can be “pulled” like electric wire and conforms easily for use on remodeling jobs requiring many turns. CSST can go just about anywhere — around corners and obstacles, between joists and studs, behind and through walls to upper floor levels as well as indoors, outdoors and above or, if sleeved, below ground over long distances quickly.

With a little pre-planning and thought, adding additional gas lines in the future is easy. Contact us for more information on the use of CSST on your next project.



# Natural gas cooling — Efficient, environmentally friendly



## Natural gas cooling is right for today's buildings

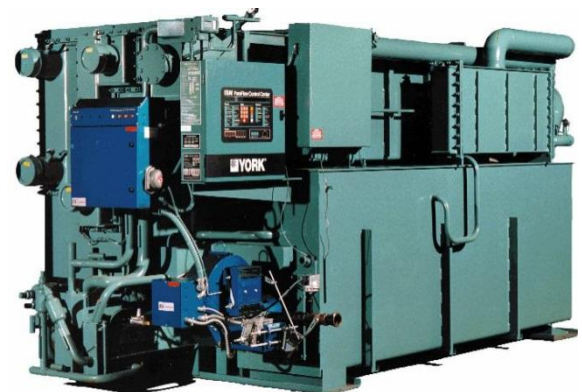
Natural gas cooling options can help reduce energy costs in commercial buildings. New natural gas cooling technologies, developed over the last decade, can lower operating costs, eliminate electric peak demand charges, and reduce power needed during a power outage. Natural gas chillers require minimal power during outages and can easily be connected to a back-up power system.

Available as standard, larger packaged units or custom-designed systems, natural gas cooling equipment can require less maintenance and offers improved environmental performance.

Natural gas systems are available in absorption or engine-driven systems. Absorption systems rely on a cycle of condensation and evaporation to produce cooling. The process is driven by a heat source — either a gas burner or recovered thermal energy is quiet, offers low maintenance and is well suited for commercial or campus-style buildings.

Engine-driven cooling systems operate similar to electric cooling units, substituting a natural gas engine for the electric motor. System efficiencies are improved by optimizing the ability to use the heat recovered from the engine to produce domestic hot water and other thermal loads.

Natural gas cooling equipment is available from smaller packaged heat pumps to systems over 1,000 tons. To determine if a natural gas cooling system is right for your facility, contact us. We will help you evaluate the advantages of a natural gas cooling system.



# Boiler control systems — Providing efficiency to your boiler



## Innovative systems put you in control

All combustion equipment requires a level of control to maintain proper combustion, high system efficiency and environmental standards. Controllers are available today to automatically measure and adjust the combustion process including fuel, oxygen, and combustion results.

By continuously monitoring and adjusting the combustion mix to your boiler burner, your boiler maintains the highest combustion efficiency and represents the lowest environmental emissions.

Boiler staging is essential to maintaining system efficiencies. Boiler sequence controllers consider load conditions and match load with the most efficient combination of boiler capacity and operating efficiencies. Not all boilers suffer part-load efficiency reductions. Today's controller continually evaluates load profiles to determine whether it is better to run 2 boilers at 1/2 fire in order to better match rapidly changing loads, or 1 boiler at full fire for peak efficiency.

Boiler blowdown is a very important part of any water treatment program. Its purpose is to limit

the concentration of impurities in the boiler water. The right amount of blowdown is critical — too much results in energy loss and excessive chemical treatment cost; too little and excessive concentrations of impurities build up.

To evaluate your boiler system and determine what steps you can take to control your boiler system, contact us. We will provide you the information you need to determine the level of control you need to operate an efficient boiler system.



# Site versus source — What's the real story



## Benefits beyond the costs of energy

Today, energy efficiency and environmental impacts are on everyone's mind. Understanding the real costs of the energy we consume in our buildings is also very important.

Statements about electricity being 100% efficient are misleading. That analysis simply focuses on the efficiency at the end use device — an energy-using piece of equipment — and doesn't take into account the entire energy delivery process from generation to end use. A significant amount of energy is wasted just to produce the electrical power that is ultimately delivered to your equipment.

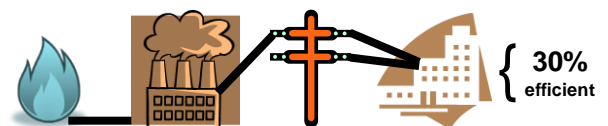
Natural gas goes directly from the well to your facility. More natural gas energy potential is delivered to your equipment on site, making natural gas a far more efficient energy choice overall.

Industry analysis shows that the production, transmission and delivery of electricity to the market has an overall efficiency of just 30%. This compares to natural gas at 90%.

These numbers reflect the total energy expended during the production-through-delivery process compared to the net energy delivered for use.

It is important to understand the true costs and environmental impacts your energy decisions make. To determine which energy choice is right for your next project, contact us for an analysis of energy and equipment options. You'll be glad you did — well into the future.

### ELECTRIC



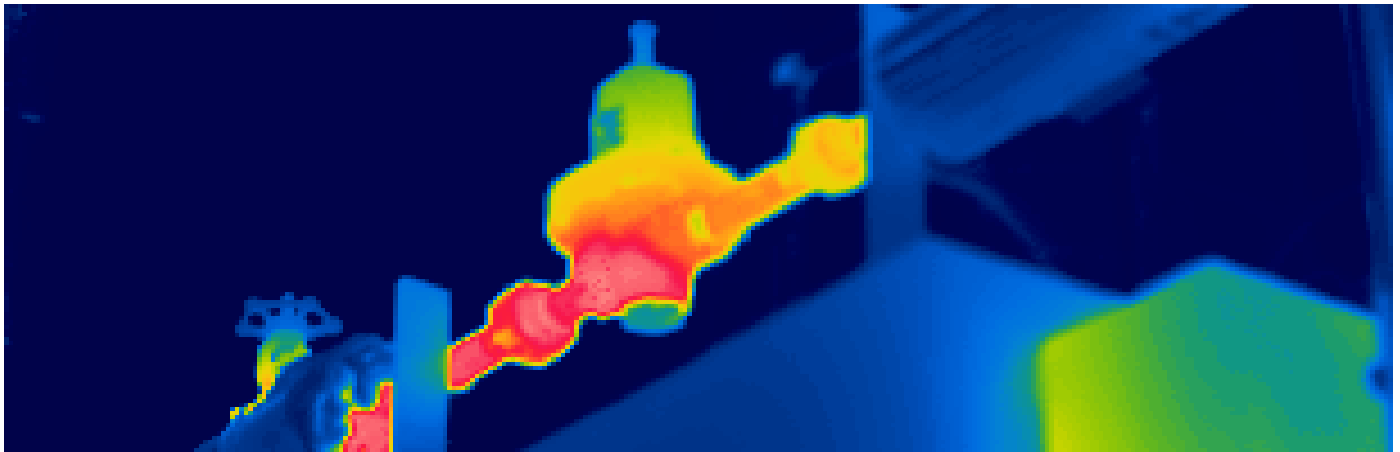
about 70% lost in generation and delivery

### NATURAL GAS



about 10% lost in extraction and delivery

# Steam Traps— Controlling energy losses easily



## Knowing the status of your steam traps can save energy

Steam traps are automatic valves used to remove condensate, air and other non-condensable gases while preventing the passing of steam. Recent estimates by the Department of Energy indicate that approximately 20% of the steam leaving a central boiler plant can be lost via leaking steam traps in businesses without proactive assessment programs.

Assessment programs will answer the following two questions:

1. Are your traps working correctly?
2. If not, has the trap failed in an open or closed position?

If the trap has failed closed, no energy is being wasted. However, no heat or reduced heating is available. If the trap has failed open, steam passes through the trap without providing its maximum heating potential, wasting energy. Also, steam can escape through the system vent if it doesn't condense in the return system. These issues will increase your operating costs —

requiring additional makeup water and the associated chemical treatment.

Trap repair/replacement costs depends on a number of factors which need to be evaluated for your project. The amount of savings to be obtained by maintaining or replacing traps depends on these factors. To find out more, contact us for tips on how to evaluate your energy savings potential.



# Venting Solutions — Unique, environmentally friendly



## Minimize energy losses through innovative components

All combustion equipment requires exhaust of flue gasses. Minimizing energy losses through exhaust ventilation systems is one way to reduce costs and improve energy efficiency. Buildings with central plant facilities can often be difficult to design or retrofit. Today, there are innovative components and equipment enhancements that can dramatically improve your buildings energy use including:

- Mechanical draft systems
- Modulating over-draft damper systems
- Modulating combustion air supply
- Modulating building exhaust systems

Many older exhaust systems incorporate numerous design restrictions — minimal changes in direction, the shortest possible distance to the outside and over-sizing to address the maximum input of all devices on the stack. Today, demand-controlled exhaust systems optimize the operation of most heating and combustion systems by maintaining a precise ratio of fuel to air.

By combining quality components and proven technology, an exhaust system that is economical, environmentally sustainable, aesthetically pleasing and reliable can be incorporated into your building design or retrofit. To learn how modern exhaust solutions can provide a space saving design, ensuring that your project meets code requirements, please contact us. We will assist you in getting the right design for your project.



# Energy Conversions — Taking the myth out of the math



## Understanding the terminology of energy

Understanding the terms used to measure energy and how these units relate can often be confusing. Since energy is typically billed on some form of volumetric scale, it is important to find a standard energy factor to perform cost comparisons. The chart on the right outlines the typical units of energy measurement and their equivalent energy content in BTUs.

By using the standard measurement of BTUs, you can easily compare energy costs and make an informed decision on new equipment for your facility. The math is simple:

### Natural Gas: \$9.86/MCF\*

$\$9.86/\text{MCF} \div 1,034,000 \text{ BTU}/\text{MCF} \times 1,000,000 \text{ BTU}/\text{MMBTU}$   
Equivalent Gas Cost = \$9.53/MMBTU

### Electricity: \$0.1021/kWh\*

$\$.1021/\text{kWh} \div 3,413 \text{ BTU}/\text{kWh} \times 1,000,000 \text{ BTU}/\text{MMBTU}$   
Equivalent Electric Cost = \$29.90/MMBTU

At 100% efficiency, natural gas is \$9.53/MMBTU versus \$29.90/MMBTU for electricity.

\* Natural Gas and Electric average Retail Commercial pricing is from EIA for the Calendar year 2009. Conversions to \$/MMBTU are input energy prices prior to equipment efficiencies being factored in.

| Conversion Factors<br>Average Energy Content of Fuels |                         |
|---|-------------------------|
| <b>Natural Gas</b>                                    | <b>Energy Content</b>   |
| 1 CCF   | 100 CF (1 Therm)        |
| 1 cubic foot (ft <sup>3</sup> )                       | 1,034 BTU               |
| 1 therm (therm)                                       | 100,000 BTU             |
| 1 dekatherm (DTM)                                     | 1,000,000 BTU (1 MMBTU) |
| 1 cubic meter (m <sup>3</sup> )                       | 36,303 BTU              |
| <b>Electricity</b>                                    | <b>Energy Content</b>   |
| 1 kiloWatt (kW)                                       | 3,413 BTU               |
| 1 megaWatt (MW)                                       | 1,000 kW                |
| <b>Oil</b>  | <b>Energy Content</b>   |
| 1 gallon #2 oil                                       | 138,690 BTU             |
| 1 gallon #6 oil                                       | 149,690 BTUs            |

To get a thorough understanding of your energy savings, contact us for an analysis of your energy costs.

# Value of Natural Gas — Knowing more than the costs



## Understanding all the advantages of supply, efficiency and price

Energy conservation and sustainability practices are increasingly common in today's building projects. Whether you're building a new facility or renovating an existing structure, understanding the energy picture is an important component to the project.

The value chain of natural gas is similar to that of many other fossil fuels. It consists of exploration & production, processing, transportation, marketing/distribution, and delivery to customers. Historically, the natural gas industry appears a lot like the electricity industry — regulated at both the wholesale and retail levels. However, unlike the electric industry, deregulation has assisted the natural gas industry and its customers by encouraging innovation and by developing reliable supplies and increasing the efficiency of combustion equipment.

By combining the Earth's cleanest fossil fuel with many newly developed technologies, natural gas equipment can reduce Green House Gas emissions, increase efficiency and reduce operators cost of doing business.

According to the Potential Gas Agency of the Colorado School of Mines, the U.S. has more than 1,500 trillion cubic feet (Tcf) of natural gas, including proven reserves, providing a 75-year supply at current production levels. Natural gas offers clean, safe, reliable, affordable, efficient energy to meet America's energy needs. It's a wise decision to select natural gas equipment for your next project. To find out more, contact us. We'll help make sense out of the issues.



# Energy for Today — Why natural gas makes sense



## Choosing the best energy value for you

All energy prices rise and fall based on changes in supply and demand, weather and economic activity, and world events. Historical price trends are an important indicator of long-term potential energy savings. The graph below by the Energy Information Administration compares prices for natural gas, crude oil, electricity and coal. Natural gas prices have remained significantly

lower than oil prices over time and forecasts indicate the same trend will continue.

Local natural gas utilities help cushion price fluctuations through storage, hedging and long-term contracts. Natural gas is the cleanest burning of all the fossil fuels. It is abundant and domestically produced and offers safe, reliable, affordable, efficient energy to meet America's energy needs. To learn more about the benefits of natural gas, contact us.

**Energy Prices – 1980-2035**  
(\$ per million BTU)

