

feature

Forging new business with CHP

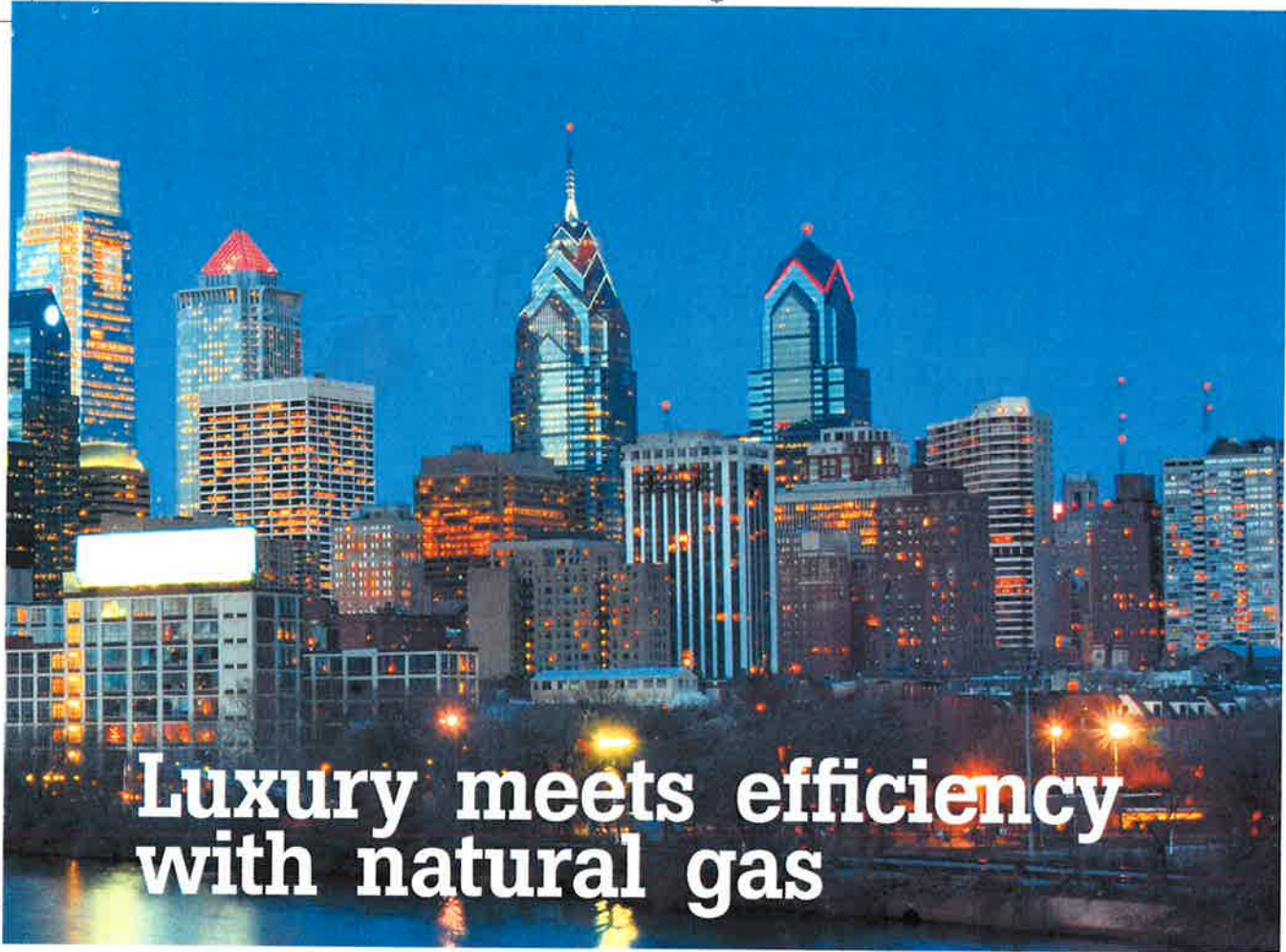
By Maryanne Campbell

Philadelphia Gas Works (PGW) recognizes the value of investing in the future and the community. As the nation's largest municipally-owned gas utility and one of the oldest, founded in 1836, we take our responsibility seriously to be a leader in developing new natural gas markets and spearheading the use of new natural gas technologies. A primary PGW mission is to educate our customers and market natural gas energy solutions, such as combined heat and power (CHP) technology to ensure Philadelphians have the best information available and can seize maximum benefits from using natural gas.

Combined Heat and Power (CHP), PGW's primary energy efficiency offering, is an integrated application of technologies for the simultaneous, on-site production of electricity and heat. CHP systems save energy by recovering heat during the power generation process and using it on-site for heating, domestic hot water, drying, cooling, refrigeration and/or humidity control,

thus improving the efficiency of the fuel used to power the plant.

In the fall of 2009, PGW helped facilitate the installation of the first three microturbines in Philadelphia at the Four Seasons Hotel. Originally projected to reduce the hotel's annual energy costs by 30 percent, The Four Seasons project gained national attention. Hotels are huge consumers of energy and when



Luxury meets efficiency with natural gas

a world-renowned property makes an investment in energy technology outside a typical approach, it is understood the CHP technology was highly scrutinized. The decision was to install three 65 kW microturbines to provide 100 percent of the building's day-to-day domestic hot water, 25 percent of its electric and 15 percent of its heating needs. The overall project was anticipated to pay for itself in five years; it wound up paying for itself in only three years with energy cost savings over \$400,000 a year.

Following in the Four Seasons' success, in 2011 PGW commissioned its own CHP plant at our headquarters in North Philadelphia, showcasing a larger 200 kW microturbine, the first of this size for Philadelphia. Our microturbine generates electricity on-site to offset a portion of the building's electric grid demand. The CHP process is completed by capturing the turbine's waste heat to run an absorption chiller in the summer that generates 40 tons of cooling,

supplementing heat in the winter and producing hot water all year round.

Our \$1.2 million investment saves PGW \$130,000 a year in operational costs. To help offset the capital investment PGW was awarded a \$465,000 matching grant. With the grant award came the responsibility to build the project as a CHP demonstration and education showcase. We proudly offer tours of our facility and in the first year over 150 existing and potential customers, industry professionals, students, academics and the like have had the chance to experience firsthand the benefits of CHP energy efficient technology and see how easily CHP can be integrated into an existing system.

Connected with the grant award was an obligation to provide an educational experience about CHP. We installed customized remote monitoring capability to provide real-time operational feedback. Prominently mounted in our building's main lobby, the dashboard

monitor displays actual economic, operational and environmental data demonstrating the advantages of utilizing CHP and natural gas fuel. Our visitors can readily see that PGW's CHP plant provides 84 percent reduction in NOx, 100 percent reduction in Sox, and 33 percent reduction in carbon dioxide or 524 tons of avoided carbon dioxide production per year. This is equal to the removal of 87 cars from the road each year or the carbon dioxide absorption of 108 acres of trees. Most interesting to our visitors, while they are taking our tour and standing in the middle of our lobby, we can easily input their own facility's operational scenario (i.e., various equipment options running on oil, steam and/or electric) so they can see how their real information compares to a CHP operation.

CHP projects are catching on in Philadelphia. In May 2012, the

continued on page 14



BUSINESS from page 13

Philadelphia College of Osteopathic Medicine (PCOM) installed a 130 kW microturbine CHP system, with a four-year payback.


We are working on over twenty CHP projects, which are at various stages of development. These projects include several industrial applications (600 kW and above), nursing homes and hospitals (750 kW and above), hotels and apartment buildings (65 kW to 300 kW) and a commercial/condo building (1.5 MW).

PGW's customers are noticing the benefits of CHP technology and the value it provides to Philadelphia's businesses.

- **Better control over energy costs translates to savings.** Not only is there an abundant supply of natural gas, but natural gas offers price stability and, in turn, gives customers better control over their energy and operating costs.
- **Increased property value.** For example, PGW's property value has

increased an estimated \$500,000 due to our CHP plant installation.

- **Increased energy efficiency.** Capturing and utilizing heat that is normally wasted from the production of electricity, CHP can achieve fuel use efficiency over 65 percent and as high as 85 percent in some cases—compared to less than 50 percent for equivalent separate heat and power systems. With this increased efficiency, a CHP system uses 35 percent less fuel to achieve the same energy output as separate heat and power systems.
- **Carbon footprint reduction.** Less fuel is combusted in the CHP process, therefore, greenhouse gas emissions such as carbon dioxide, as well as air pollutants like nitrogen oxides and sulfur dioxides, are reduced, improving the air quality for Philadelphia's citizens.
- **Increased reliability.** Decreasing the impact of power outages on Philadelphia businesses and city operations and improving power quality for sensitive equipment adds up to daily operating cost savings.

- **Corporate sustainability goal attainment.** Businesses are seeking to locate to facilities that adhere to environmental sustainability practices.
- **Increased property marketability.** Consumers are looking to do business with companies that use energy responsibly and demonstrate awareness about environmental issues in their city.
PGW would like Philadelphia to be known as more than the birthplace of our nation's independence. We want to be a leader in developing our country's energy independence, starting with CHP technology. Natural gas and CHP technology are key to America's energy strategy for the future: Delivering energy efficient, environmentally friendly solutions and providing our citizens with the best value using an American fuel and natural gas technology. 

Maryanne Campbell is the director of strategic initiatives for Philadelphia Gas Works.