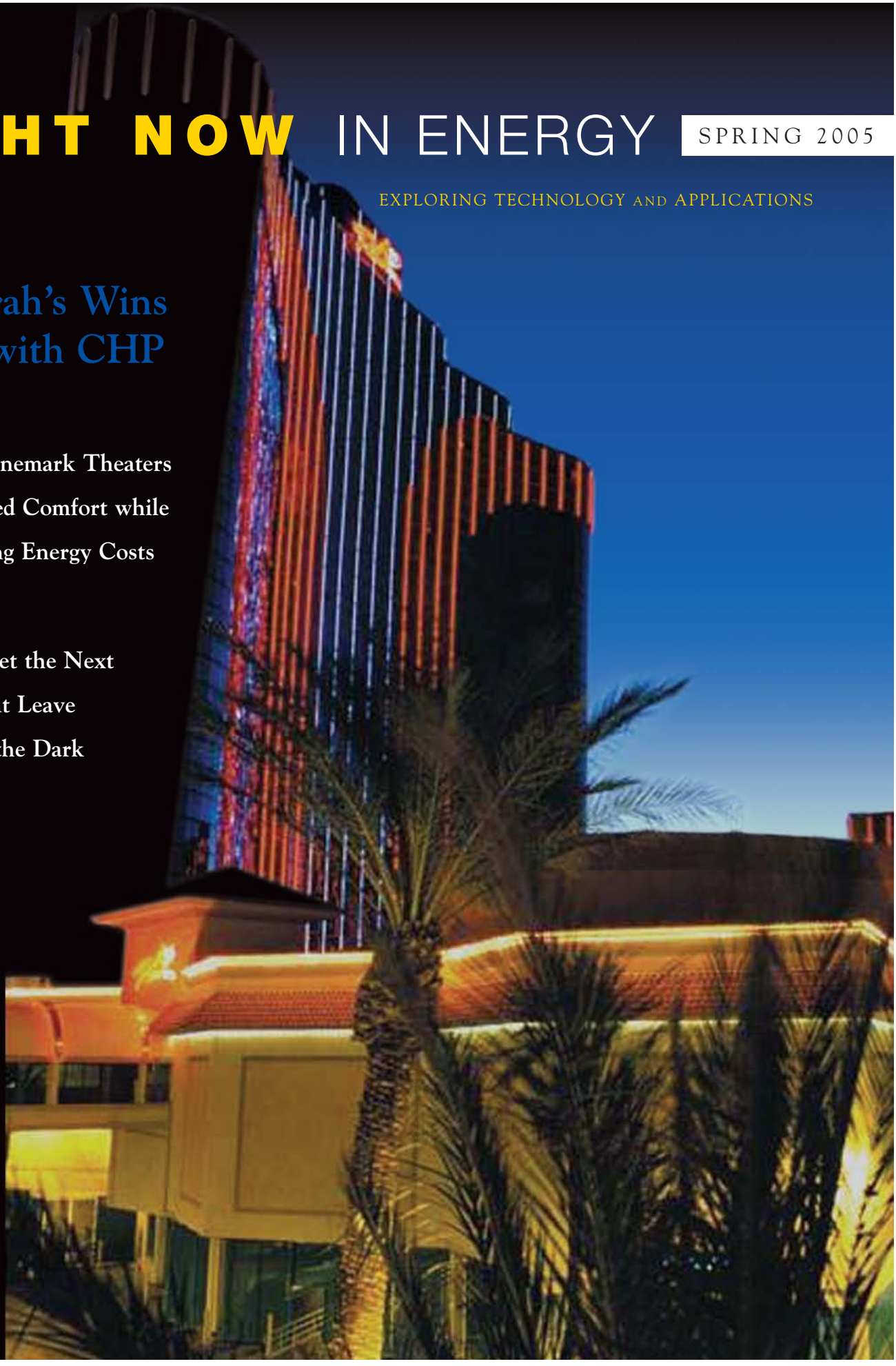
RIGHT NOW IN ENERGY
SPRING 2005
EXPLORING TECHNOLOGY AND APPLICATIONS

Harrah's Wins Big with CHP

How Cinemark Theaters Improved Comfort while Lowering Energy Costs

Don't Let the Next Blackout Leave You in the Dark



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The annual energy bill for Harrah's Rio All Suite Hotel and Casino is $9 million. Holding down those costs to improve the bottom line was the impetus for Harrah's $7 million, one-year combined heat and power (CHP) construction project recently completed at the Rio. The CHP system is expected to save an estimated $1.5 million each year just by generating Harrah's power and thermal energy more efficiently than the company can purchase it from the local utility.

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Know What's Happening Right Now In Energy?

Welcome to the inaugural issue of *Right Now In Energy*, a quarterly newsletter dedicated to providing you with policy and technology assessments that can help you improve your bottom line.

For many companies, energy may not be your highest cost or most pressing issue. But it does impact your bottom line:

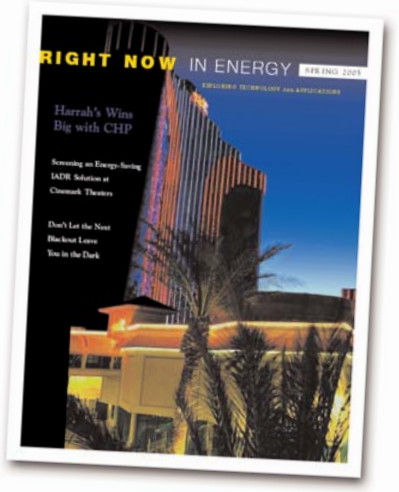
- 500 kW of electricity costs a typical 50,000 sq-ft building $100,000 to $300,000 annually for on-peak energy.

For organizations that operate or manage thousands of buildings, this represents $300 million in lost profit each year. *Right Now In Energy* will help you explore ways to capture waste energy and lost profit by providing key information on technology, policy, and practices that can help you better manage energy. We will share lessons learned from your peers, breaking news in the field, emerging technologies, energy pricing trends and more.

The National Accounts Energy Alliance (NAEA) provides a medium for leveraging federal and state technology funding to demonstrate energy-saving technology and concepts. The NAEA was expanded by the Gas Technology Institute and the federal Department of Energy to work more closely with key organizations on developing technology deployment plans and strategies, as well as to provide tools to help make better economic assessments of technology options.

I hope you find *Right Now In Energy* useful and urge you to share lessons you've learned. Send me an e-mail at john.kelly@gastechnology.org.

John Kelly
Executive Director,
GTI Distributed Energy Program



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Right Now In Energy is designed for regional and national companies who strive to take advantage of energy markets technology. The National Accounts Energy Alliance leadership recognizes the power of fast implementation of reliable technology and approaches to saving energy, and seeks to share methods that are proven through applied science and field research, test and verification projects. *Right Now In Energy* is a quarterly publication developed in cooperation with the NAEA, the U.S. Department of Energy, the American Gas Association, the Southern Gas Association and the Gas Technology Institute. If you have any questions about NAEA, its partners or *Right Now In Energy* articles, please contact:

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Harrah's Plays its Energy Cards Right

Vegas Resort Cuts Costs with CHP

Harrah's Rio All Suite Hotel and Casino is a deluxe casino resort located less than a mile west of the Las Vegas Strip. This beautiful hotel offers the extravagance of 2,800 suites, the excitement of first-class shows and lounges, the action of nonstop gaming and the luxuries of the world's top resorts. With its Brazilian Carnival theme, the Rio is a popular hotel that attracts a substantial amount of return guests. The Rio also boasts five fine dining restaurants and 10 casual dining spots.

Besides driving revenue, what else do the size and success of properties like Rio mean to Harrah's? Formidable energy costs. "Our company-wide analysis has shown that we spend close to $60 million a year in gas and electricity across 18 properties," Richard Emmons, Harrah's director of corporate facilities and engineering, told Casino Enterprise Management. "We realized that our lighting, heating and cooling requirements made up the majority of those costs."

"The CHP system is expected to save an estimated $1.5 million each year just by generating Harrah's power and thermal energy more efficiently than the company can purchase it from the local utility."

The Rio's annual energy bill, at $9 million of the overall $60 million spent by Harrah's, represents a large portion of the company's expenses. Holding down those costs will ultimately improve Harrah's bottom line. Said Emmons: "Harrah's has always had a two-pronged plan to reduce its energy cost risk: buy the power we need for the least amount of money, and use as little energy as we could while still providing the best experience for our guests."

The latter pillar of that philosophy was the impetus for Harrah's $7 million, one-year combined heat and power (CHP) construction project recently completed at the Rio.

With the 4.9 MW CHP—the first CHP system operating at a Las Vegas casino—the Rio began generating 40 percent of its electricity, 60 percent of its hot water and 65 percent of its heating on May 1, 2004. The CHP system is expected to save an estimated $1.5 million each year just by generating Harrah's power and thermal energy more efficiently than the company can purchase it from the local utility.

The Early Returns

The CHP system is expected to operate at about 75 percent overall efficiency and use 34 percent less fuel than on-site thermal generation and purchased electricity. The Department of Energy and the federal Environmental Protection Agency Combined Heat and Power Partnership recognized the Harrah's project's pollution reduction and energy efficiency with the 2003 CHP Certificate of Recognition.

Four of the six 817 kWe Caterpillar 3516 natural gas gen-sets packaged by Preventive Maintenance Services Inc. (www.pmsi-inc.com) of New Iberia, La., are located at the back of the house. These four units were sized for the thermal load and equipped with Attainment Technologies Exhaust Gas Recirculation (EGR) systems. The two other 3516 EGR-equipped natural gas gen-sets sit under the Rio's massive multi-media sign to provide electricity and power quality support for the sign. So far, the system has performed well, but not without problems. To provide high thermal performance, the initial design integrated the engine cooling system directly with the hotel hot water system. Typically, engine cooling systems are isolated using a heat exchanger. Lack of a full water-quality system caused the system to be shut down for a while to install the necessary water quality system and prevent further engine coolant problems.

Since that design change, the plant has been running fine—and turning in some noteworthy results. Examination of the 3-way catalyst performance after 4,000 hours of operation was encouraging, with very little measurable degradation. And one recent engine emissions test by Harrah's yielded an impressive 1.7 ppm NOx.

For more information on the Harrah's CHP project, contact:

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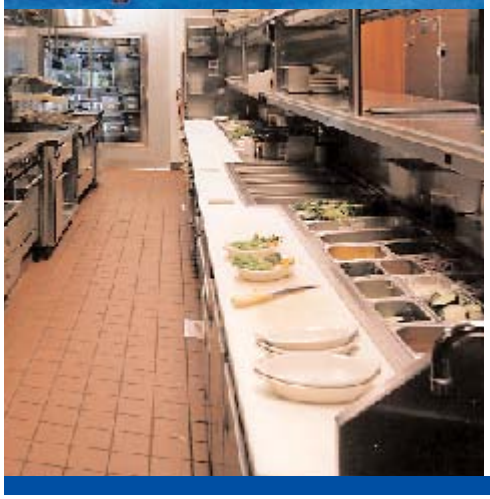


Restaurants Boost Bottom Line with Efficient Water Heating

By Tom Stroozas
CFE, RCGC, CFSP Manager-Commercial Key Accounts, Piedmont Natural Gas

A prominent national restaurant chain recently found itself in hot water—or a lack thereof.

With the restaurant open 24/7, hot water is always in high demand for general kitchen and cleaning use. The dish machine is in full use at least five hours a day to keep up with all of the china, glass and flatware. Although the electric water-heat booster produced enough 180°F water for the first two or three racks of dishes going through the machine, maintaining proper sanitizing temperatures after those racks was a struggle.

Operating costs compounded the troubles. The electric booster added about $300 per month to their overall electric bill. There also were the costs of detergents, water and sewage from the re-washes due to improper sanitizing temperatures, as well as maintenance to replace the electric elements that burned out every year or so.

Then, company management found a solution: a gas-fired heat booster to replace the electric one. The move cut nearly $3,600 per year out of the chain's electricity bills. And the restaurant now has a more reliable source of sanitizing hot water for the dish machine.

Now They're Cleaning with Gas

Other chains might be wise to follow suit. According to the National Restaurant Association, water heating can account for as much as 20 percent of a restaurateur's annual energy costs. Eateries that use dishes and glassware are likely to spend an even greater portion of their energy dollar on water heating.

Gas Heat Booster Benefits Over Electric:

- Complete ROI in 3 years or less
- Reduced energy costs and increased productivity
- More consistent heat means fewer repeat washes—and greater savings

Often, the largest consumer of hot water in a restaurant is the dishware washer. Optimizing dish-washing operations, whether the back-of-the-house relies on a single rack or a conveyor unit, can improve your bottom line through reduced energy costs, increased productivity and—most importantly—higher customer satisfaction.

Nationwide, natural gas is the preferred energy for water heating; it heats water twice as fast as electricity. While most

operators recognize this and take advantage of gas-fired water heating for the supply source, many still use electric units for their high-temperature booster water heating needs. "Gas boosters give you the fast recovery needed for today's fast-paced restaurant operation, and they're a lot more economical to operate," says Doug Allen, a consulting chef with Premier Hospitality. "They also don't contribute to the costly peak electric demand."

An Easy, Cost-Effective Conversion

The initial cost of a gas booster heated ware washer might seem prohibitive, but costs can be made up in energy savings and reduced maintenance. While prices vary around the country, natural gas is between 30 and 50 percent less expensive than electricity, even with today's record pricing levels. As an alternative, many operators find that leasing is an easy and financially "painless" way to get the benefits of a gas booster without the capital needed for a direct purchase.

Most ware washers with electric boosters can be quickly and easily converted to accommodate today's gas boosters. In many cases, installation is easier than ever; many modern gas booster water heaters can be free vented directly into the ware wash room.

Payback for investing in a gas booster will vary, but generally the return on investment will be three years or less. In the northeast, where electricity is expensive, the payback is quick. In the northwest, where power is cheaper, a longer payback is obvious. It also depends on use—a 24-hour operation will see a lot faster payback than will a school serving just one meal a day.

Improvements Increase Water-Heating Efficiency

Manufacturers have lowered gas booster operating costs by improving the design for increased energy efficiency, and their reliability has improved tenfold from earlier models that were introduced just a few years ago. These improvements include:

- Improved burner technologies, some with modulating features.
- Improved energy efficiency up to 88 percent.
- Improved heat transfer through innovative baffle design.
- Increased insulation to reduce heat loss.
- Extended tank life by reducing hard-water buildup.
- Improved pump technology.
- Solid-state controls for better reliability.
- Vent-free applications for simple installations.

For More Information

If you would like to know more about the testing and evaluations of gas-fired booster water heaters or find out more about how you can arrange for a comprehensive evaluation of your water heating or cooking equipment at one of the Gas Foodservice Equipment Network's sponsored test facilities, please e-mail Tom Stroozas at tom.stroozas@piedmontng.com or call (704) 731-4357.

The Gas Foodservice Equipment Network (GFEN) is an alliance of utilities, foodservice equipment manufacturers, gas industry associations (SGA, AGA, GTI) and foodservice trade allies organized to be a source of gas solutions for the commercial foodservice segment. GFEN's mission is to help increase the use of natural gas in the commercial and institutional foodservice markets by serving as the preferred resource for information, education, testing and marketing support. Visit www.gfen.info/ for details

Field Research Yields Energy Savings

The NAEA—in partnership with DOE, Oak Ridge National Laboratory (ORNL) and the National Energy Technology Laboratory (NETL)—has recognized the importance of applied research and field testing technology.

This is particularly true when it comes to energy technologies that increasingly impact the bottom line. NAEA has taken the lead in working with regional and national accounts. In each issue, this column will quickly bring you up to speed on results, hardware on the ground, projects in design and projects in development. We will also seek to provide some important lessons learned.

Each of these projects involves onsite power, heating, cooling and/or dehumidification. Look to this column to feature each of these projects.

Testing Underway

Test projects in various stages:

- Cinemark Theater, Plano, Texas
- HEB Supermarket, San Antonio, Texas
- Walgreens, Tampa, Fla.
- The Ritz Carlton, San Francisco, Calif.
- Basin Electric, Station 7, North Dakota
- Marriott Resort, Kauai, Hawaii
- ShopRite, Brooklyn, N.Y.

Cinemark Theater and Walgreens Demonstrate Value of Desiccants

Cinemark's original objective was to test two SEMCO Integrated Desiccant Rooftop (IADR) units in a multiplex theater application. The IADR units went online in December 2003.

During the test operation, the two SEMCO units have improved comfort and air quality in the seven south theater auditoriums. Relative humidity in south theaters was lower by 20 to 30 percent than in the north theater, even with a 20 percent increase in fresh air. Operation of the desiccant system allowed increasing fresh-air intake and increasing the room temperature setpoint from 71 °F to 75 °F, without affecting the comfort level.

Using a cool-reheat rooftop for humidity control in a conventional system costs an additional 65 percent in energy expenses. (Conventional rooftops do not manage humidity control, causing moisture problems.) Better humidity control using the

IADR Working for Cinemark

- 13% lower energy costs
- 20-30% less humidity
- 20% more fresh air

SEMCO IADR only increases energy cost by 52 percent.

Cinemark expects that redesigning the theater cooling systems will dramatically reduce installed costs and provide the desired humidity control. As a result of the test, Cinemark is working with SEMCO to develop a new theater HVAC design.

Three hurricanes that passed through the Tampa area last year delayed the start of Walgreens' tests on a SEMCO Integrated Desiccant Rooftop (IADR) unit. The storm delays highlight the need for onsite power capabilities, and Tampa's ultra-high humidity levels dictate the need for thermally activated desiccant dehumidification. Walgreens is particularly interested in reliability and humidity control because the company's stores are increasingly offering refrigerated and frozen products and more of the pharmaceuticals it sells are harmed by humidity.

The IADR Edge

- Lower energy costs
- Moisture control
- Greater reliability

HEB Supermarket and ShopRite

Two combined heat and power installations—one in the Southwest and one in the Northeast—are being tested to assess the viability of liquid refrigerant sub-cooling for supermarket applications in these disparate climates.

At a San Antonio location of southwestern grocery chain HEB, the CHP system consists of exhaust gas from a Capstone 60 kWe microturbine generator coupled to a Broad packaged single-stage absorption chiller. The chiller is integrated into the supermarket refrigeration system to provide liquid refrigerant sub-cooling for four rooftop-mounted Hussmann refrigeration systems (www.hussmann.com). The Hussmann units have compressor houses with an attached air-cooled condenser. Water-to-refrigerant heat exchangers installed in the refrigerant liquid line under each air-cooled condenser will provide sub-cooling.

The CHP system at ShopRite will significantly cut energy costs by supplying continuous on-site power generation while also recovering thermal energy to drive an absorption chiller

The results of the HEB test will be analyzed and compared to a similar project at a Brooklyn store operated by ShopRite, a northeastern grocery chain.

At the ShopRite, one Hess 140-kW synchronous Microgen unit will be installed to provide baseload power for the supermarket. Recovered heat will indirectly fire a 20-ton Yazaki absorption chiller (www.yazakienergy.com), which will provide sub-cooling for the store's refrigeration system. The CHP system at the store will supply continuous on-site power generation while also recovering thermal energy from the engine jacket water, oil cooler and exhaust to make hot water to drive an absorption chiller.

Ritz-Carlton

Based on historical data, the Ritz-Carlton Hotel San Francisco (http://www.ritzcarlton.com/hotels/san_francisco/) consumes, on average, 670 kWe of electrical power and averages 1,300 kW in combined cooling, heating and power consumption (electric plus thermal). Because of the hotel's high occupancy level, these loads are relatively flat throughout the year.

To help reduce Ritz-Carlton consumption levels, UTC Power (www.utcpower.com, a unit of United Technologies Inc.) has developed an on-site, self-contained CHP system that can produce both electric power and chilled or hot water for space conditioning. The PureComfort™ 240M has higher efficiency and lower operating costs than the more traditional methods of using separate power generation and HVAC systems.

The PureComfort™ 240M is expected to reduce the hotel's grid electric power consumption by 60 percent. And, because the hotel requires more cooling than the PureComfort™ 240M can provide, the system's high utilization should provide a rapid return on investment.

Basin Electric

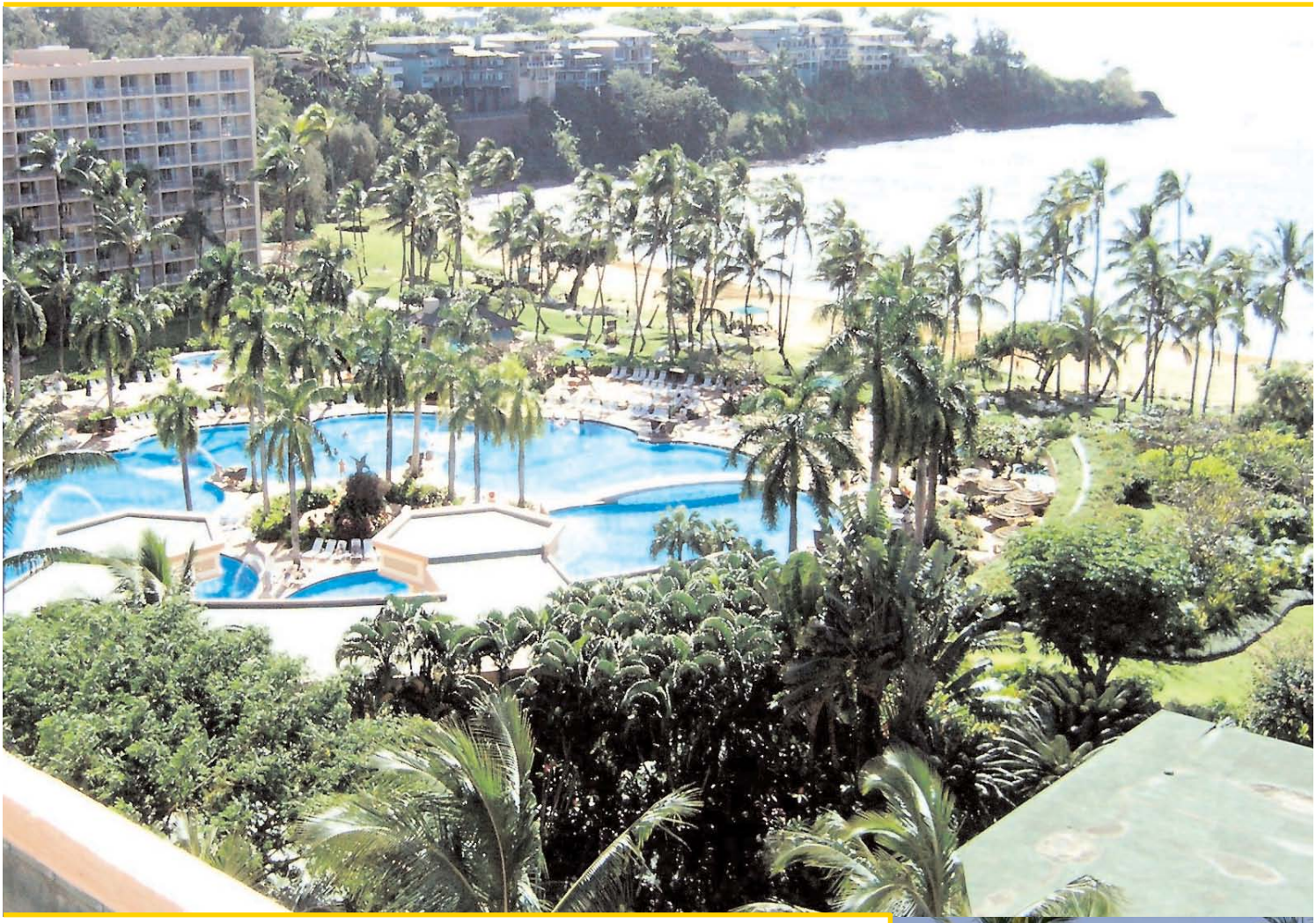
Basin Electric Power Cooperative (www.basinelectric.com), a regional electric generation and transmission cooperative, is testing the technical and economic feasibility of a unique partnership of gas pipeline and electricity-generating technology.

In the system, an Organic Rankine Cycle (ORC) machine captures thermal exhaust energy from a 30 MW gas turbine that drive a natural gas pipeline compressor. The goal is for the ORC to use the thermal energy to produce 4 MW of free (no fuel and no emissions) electricity in the summer and 6 MW in the winter.

The project integrates one ORMAT ORC generator assembly into an ownership structure involving a partnership between the utility, a developer, the pipeline and ORMAT (www.ormat.com), a Nevada-based developer and manufacturer of innovative power solutions. The pipeline owner sells the resource (waste heat) to the utility. The utility uses that resource to produce electricity with the developer's technology. The resulting overall system uses natural gas as a fuel to co-generate mechanical power (for the compressor) and electrical power (for the grid).

The test site, Station Seven, supports a grid that includes an Indian Nation with an important hospital load. Typically, each of the natural gas pipeline compressor stations in the system consists of a Rolls Royce RB-211 gas turbine driving a natural gas compressor, which compresses the gas at periodic intervals along the pipeline. The exhaust temperature of the turbine is roughly 900°F. The cogeneration system being tested uses pentane—a non-freezing, ozone-benign organic working fluid—instead of water.

Basin Electric hopes to use the ORC technology at four sites.



Kauai Marriott Resort

The Marriott in Lihue (http://marriott.com/property/propertypage/LIHHI) consists of one 13-story and two 10-story towers, as well as two support facilities covering about 715,000 square feet of conditioned space. With the facility split between timeshares and hotel rooms, the occupancy for the timeshare spaces is in the 98th percentile and the hotel space is in the mid 80s—for a combined year-round occupancy of about 88 percent.

High energy costs associated with Hawaii's remote location (21.2¢ / kWh and $13.00 / kW electricity and $15 / MMBTU propane), coupled with high coincident electric and thermal loads (hot water, pool heating and cooling), provides an important test for a large propane gas engine installation. The moisture management implications for desiccant-based dehumidification provide additional opportunity to test in an island environment.

The base design that is undergoing analysis incorporates two propane CAT 3412 engines producing 405 kWe each and a single-stage absorption chiller between 150 and 230 RT (depending on design scheme). Marriott is also considering up to four SEMCO integrated active desiccant rooftop units.

A Wireless Windfall Ahead?

Emerging electrical engineering technologies could reverse the current trend of increasing kW/sq-ft for facilities that has resulted in stranded assets for electric providers and higher costs for users.

New wireless connection technologies could significantly cut the costs of controlling building loads and monitoring critical equipment by eliminating the need for expensive cabling. Honeywell, Phillips, Samsung and Motorola are producing new devices that can communicate through wireless ZigBee technology (www.zigbee.org/). Experts estimate that over 400,000 energy-saving ZigBee devices will be made this year, up from 40,000 last year.

Later this year, look for a DOE report written by Dust Networks that will examine how wireless dimmers could cut electricity use by 30 percent.

Nano-Notes in Brief

The National Nanotechnology Co-ordination Office in Arlington says that nanoscale particles used in new solid state lighting (LED) could cut electricity used for illumination by up to 50 percent, according to an Economist survey on nanotechnology. And Cerulean International claims that their nanoparticulate diesel additive improves fuel economy by 10 percent, according to the Economist survey. http://www.economist.com/surveys/displaystory.cfm?story_id=3494722

Not so fast, the Long Island Power Authority (LIPA) says. Average residential consumption has jumped 20 percent over the past six years due to increased use of air conditioning, larger homes, personal computers, and electronic devices such as big screen TVs. –Newsday.com, Feb. 22, 2005

Data Analysis Made Easier

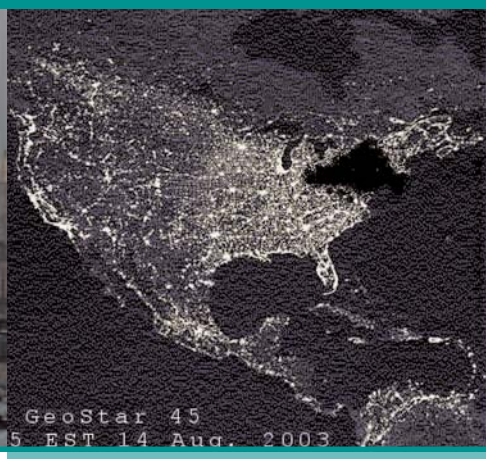
National corporations and organizations can take advantage of new low cost, easy-to-use energy modeling tools to validate contractor claims about new systems.

Calculating the performance of CHP systems is complex. It requires sophisticated, hour-by-hour calculations and detailed data on costs, energy use, weather and other variables. System designers commonly use multiple versions of spreadsheet-based CHP equipment-sizing tools that often lack the sophistication needed for design optimization.

To make the analysis easier for CHP technologies, GTI has developed several software-based engineering tools as part of GTI's InterEnergy Software project. One of the recently developed products, the Building Energy Analyzer (BEA), facilitates the evaluation of the monthly and annual energy loads and costs associated with integrated operation of building onsite power generation, cooling, heating, thermal storage and desiccant dehumidification systems. The BEA economic analysis engine provides a direct comparison between a baseline conventional system, such as an electric chiller plant, and an alternative technology selected by the user.

Find It Online

The BEA User Manual download is available at ***www.interenergysoftware.com***. GTI is also developing a simpler distributed energy and CHP sensitivity/screening tool to allow companies and organizations to perform an online "what if" analysis. Once developed, it will be available to the members at ***www.napartners.org***.



Is Your Business Ready for the Next Blackout?

On-Site Generation with Gas Can Help Avert Crises

Hurricanes, tornados, ice storms, and manmade outages remain a threat to leave businesses without power. Many businesses have turned to diesel generators for such emergencies, only to find that these systems don't start or run out of fuel within a few hours. During the 2003 Northeast blackout, diesel refueling trucks were nowhere to be found.

The New York Daily News reported that "hospital patients were moved around like checkerboard pieces yesterday as about half the city's 58 hospitals suffered backup power failures during the blackout." The only backup systems that operated flawlessly were those at nuclear power plants, which include three to four redundant diesels, redundant electrical and redundant mechanical systems. Typical businesses cannot afford this redundancy.

National accounts with thousands of buildings across the country have much to lose. A study measuring the economic impact of the August 2003 blackout has concluded that businesses paid a heavy price for lost production and man hours, but relatively few are putting measures in place to prepare for similar crises in the future. The study surveyed 142 leading executives across the affected region. Of leaders surveyed, more than two-thirds lost at least a full business day due to the blackout. And a quarter of the businesses surveyed lost more than $50,000 per hour of downtime—meaning at least $400,000 of losses for an 8-hour day. Yet surprisingly, more than a third said they have no risk management or disaster recovery plans in place. And more than half say they are unlikely to invest more in risk management, business continuance and/or disaster recovery in the future.

There's a better way. On-site power generation can provide businesses with a competitive advantage, allowing them to continue to operate in brownouts and blackouts while everyone else is without power.

A study measuring the economic impact of the August 2003 blackout has concluded that businesses paid a heavy price for lost production and man hours, but relatively few are putting measures in place to prepare for similar crises in the future.

Digital copies of the blackout economic impact report and analysis are available to the public free of charge at: ***http://blackoutsurvey.mirifex.com/blackout_2003.cfm***

A Closer Look at Natural Gas Prices

When Will the Market Stabilize?

U.S. natural gas consumption is projected to grow from 22 trillion cubic feet in 2003 to almost 31 trillion cubic feet in 2025. Most of the additional supply is expected to come from Alaska and imports of liquefied natural gas (LNG). A key issue for U.S. energy markets is whether the investments and regulatory approvals needed to make those natural gas supplies available will be forthcoming—and what the ramifications will be if they are not.

The average prices for natural gas for the next two to three years are projected to stay over $5 per MMBtu and dip to $4 per MMBtu by 2010, as the initial availability of new import sources and increased drilling expand available supply. After 2010, prices are projected to increase gradually. LNG imports, Alaska production and lower-48 production from unconventional sources aren't expected to continue their growth enough to offset the impacts of resource depletion and increased demand.[1]

Supply, Not Demand

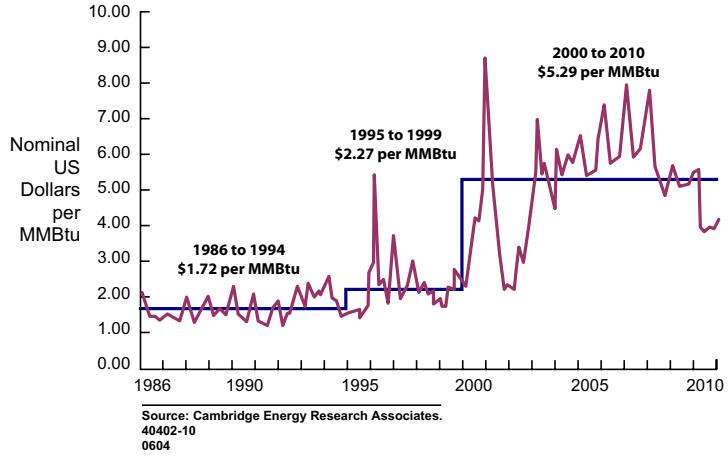
Today, the reason the United States is in a supply crunch is not that demand has surged; it's that supplies are stagnant. Unlike crude oil, natural gas is difficult to import natural from overseas. The natural gas resource base in North America has been developed for many decades, and many of the largest natural gas reserves are in decline:

- In the lower 48 United States, natural gas production has not increased for over a decade. Since productive capacity peaked at 55 Bcf per day in 1994, it has been creeping ever downward and stands at 50 Bcf per day now.

- Recently, Canada has become a major source of natural gas. Some 16 percent of U.S. consumption today is met by imports from Canada. Canada, however, is experiencing a shift—from strong growth in western Canadian production to a flattening of that production in recent years. Cambridge Energy Research Associates (CERA) expects only modest growth from Canada over the next several years, which, when combined with growing Canadian demand, translates to declining exports to the U.S.

- There have been no new, large discoveries of natural gas in the United States or Canada in the past few years.

Figure 1
Henry Hub Natural Gas Spot Prices: History and CERA Outlook



Source: Cambridge Energy Research Associates.
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New Efficiency Offsets Surging Use

It might seem that natural gas consumption would rise because of the addition of numerous natural gas-fired power plants in the last 10 years, but the reality is that power plants' natural gas consumption has risen only moderately. Why? Highly efficient combined cycle combustion turbines provide most of the new natural gas generation at efficiencies approaching 45 percent. These CCCT plants increased the overall natural gas power generation efficiency from 39 percent to 42 percent at the same time. Although the addition of new natural gas-fired power plant capacity is expected in the next five to 10 years, overall improvements in the efficiency should stabilize the natural gas consumption for electricity production.

All the new natural gas supply additions require large-scale capital investments for new facilities, requiring five years or more

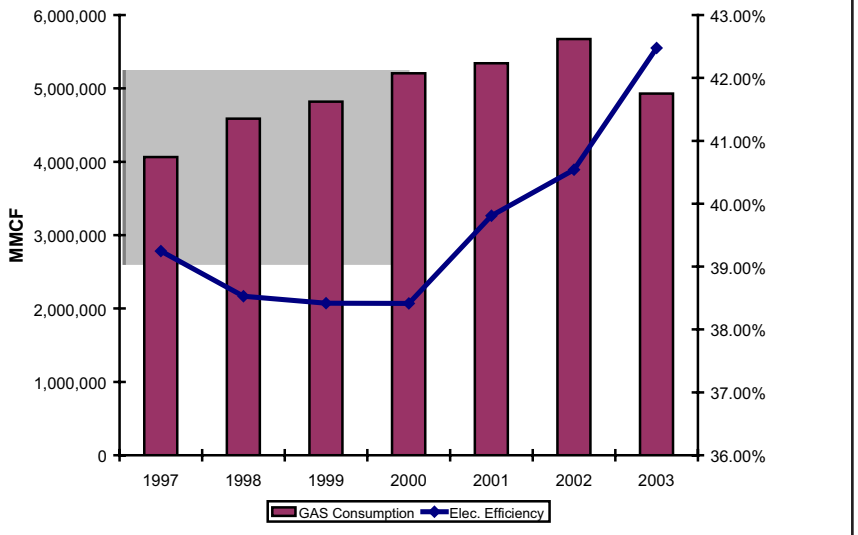

Figure 2: NG Consumption and Efficiency of Power Plants

to develop. The shift to a new set of investment expectations, along with this time lag, sets the stage for a transition period from 2004 to 2008 during which the market will remain tightly balanced, after which new resources will come to the North American market and begin to restore balance.

The timing and size of these new resources establish longer-term price levels in North America. Without these large and timely investments, a relatively stable natural gas market similar to the last 15 years is unlikely in the next 15 years.

Today's market is characterized by a race between demand growth, modest domestic supply additions, and new LNG resources arriving in North America. A combination of additional LNG receipts and a moderate up-tick in domestic supply provides modest price relief later this decade. Thereafter, growing LNG deliveries could more than offset the slide in domestic production, allowing for additional softening of prices.

Some, such as Porter Bermet of energy-industry consultant Bentek Energy LLC (www.bentekenergy.com), predict that gas prices could fall dramatically, to below $4 per MMBtu for the following reasons:

- High level of gas in storage
- Production increases, particularly in the mid-continent region of the U.S.
- Softening demand

Over the long term, natural gas prices are likely to be smoothed out by the offsetting factors of productive capacity erosion in the existing North American producing basins and new natural gas supplies coming on stream from new resources.

(Endnotes)

1 EIA: Annual Energy Outlook (AEO) 2005-overview

2 CERA North American Gas and Power Scenarios Rearview Mirror Scenario—Annual Update: Navigating the New Hybrid. Testimony to the Joint Economic Com.

LNG on the Upswing

Critical new resources include Mackenzie Delta gas, Alaskan North Slope gas, and natural gas from Hibernia in Eastern Canada. LNG imports into North America are expected to grow sharply.

New LNG terminals and terminal expansions, coupled with the ongoing erosion of U.S. productive capacity, mean that LNG will move rapidly from being a minor element in the U.S. supply portfolio in 2004—just 3 percent of U.S. supply—to an essential source of new natural gas supply.

By 2010, LNG imports to the U.S. are expected to be greater than 10 percent of U.S. lower-48 natural gas consumption.[2]

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