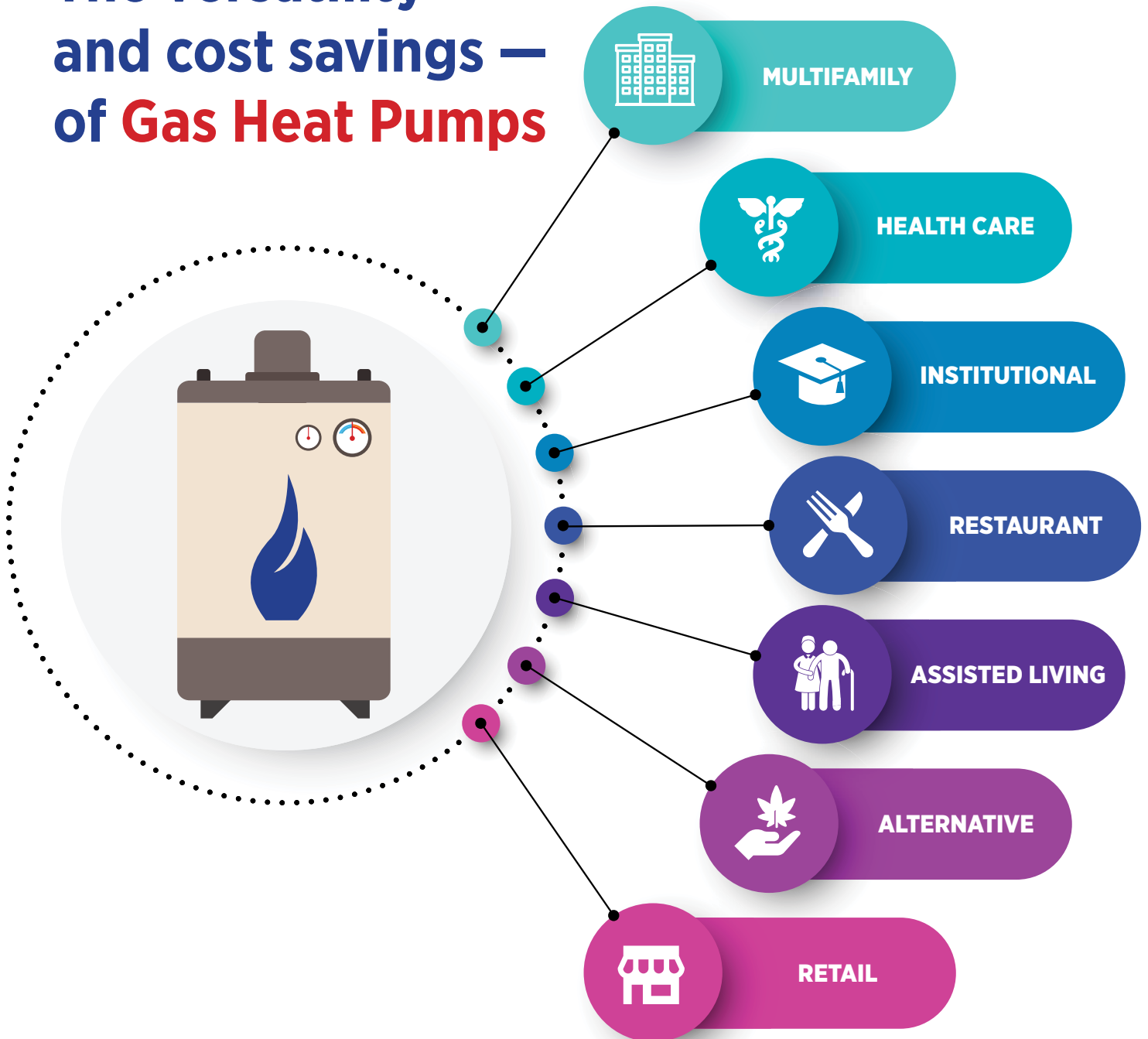


# **GAS HEAT PUMP**

## S O L U T I O N S

The versatility —  
and cost savings —  
of **Gas Heat Pumps**



## TABLE OF CONTENTS

### 2 Fired up!

Gas heat pumps find favor with multifamily facilities.

### 4 Always On

Gas heat pump technology offers a cost-effective solution for 24/7 operations.

### 6 Getting an education

Schools turn to gas heat pumps to provide energy-efficient comfort year-round.

### 8 Secret sauce

At Norms, find soup, sandwiches — and a new gas heat pump solution.

### 10 Big motivation

Gas heat pumps offer comfort and savings for eldercare facilities.

### 12 Managing the atmosphere

Cannabis facility uses gas-fired heat pump to grow crop.

### 14 From vintage to vogue

Retail outlets prove energy efficiency is timeless.

Gas Heat Pump Solutions is a product of Energy Solutions Center, and is published in cooperation with PRISM Media Group. We offer our special thanks to the utilities and other businesses that sponsored this issue.



Please recycle this magazine after you read it.



**President** Ray Larson  
**Editorial Director** Stephanie Anderson Forest  
**Graphic Designer** Nancy Kekich  
**Contributing Writers** Georgeann H. Ikuma, Tonya McMurray, Monica Stavish Skaggs

Gas Heat Pump Solutions is published by PRISM Media Group, 8951 Cypress Waters Blvd., Ste. 160, Coppell, TX 75019. Visit [www.prismmediagroup.com](http://www.prismmediagroup.com). No part of this publication may be reprinted without permission. © 2020 Energy Solutions Center



## Fired up!

Gas heat pumps find favor with multifamily facilities.

BY GEORGEANN H. IKUMA

**T**hroughout North America, gas heat pump solutions are finding a happy home in multifamily facilities. Whether it's increasing cost-savings, reducing greenhouse gas emissions or improving overall energy-efficiency, this environmentally friendly option offers good news for both owners and tenants.

### A GREAT FIT

Located in a newly renovated, historic building in Atlanta, Georgia, Solace on Peachtree was built in 1952. It was originally outfitted with natural gas boilers for water and space heating, and a chiller system for cooling.

Desperate for energy efficiency measures to help reduce costs, the owners of Solace on Peachtree chose Tecogen's Ilios water-source gas heat pumps to produce domestic hot water for the building and provide chilled water to cool new office space.

"The need for space cooling a previously unconditioned space and a large domestic hot water load made Ilios units a great fit for this project," said Carl Garofalo, director, customer solutions and sales, Southern Company Gas. "The Ilios unit, along with a newly installed condensing boiler, works in conjunction with some of the existing non-condensing boilers."



PHOTO COURTESY OF ENBRIDGE GAS INC.

Two 140-MBH (1000 BTUs per hour) ROBUR natural gas heat pumps were installed at the Toronto Community Housing's multifamily residential building as part of a domestic hot water system.

Cost savings was the primary driver for this project, he said. The Ilios unit produces domestic hot water and provides chilled water as a byproduct. This system is much more efficient than a traditional boiler/chiller combo. Additionally, since these units require minimal electricity compared to electric chillers, a smaller back-up generator is needed to provide essential power as well as cooling and hot water during a power outage, Garofalo said.

#### EFFICIENT ALTERNATIVE

Toronto Community Housing Corporation (TCHC) is Canada's largest social housing provider, with more than 58,000 units of housing

and about 164,000 tenants. In 2017, TCHC partnered with The Atmospheric Fund (TAF) to deliver an energy retrofit project to upgrade failing assets, reduce the carbon footprint and improve indoor environmental conditions. TAF is a regional climate agency that invests in low-carbon solutions for the Greater Toronto and Hamilton Area.

"To tackle this issue, the owners decided to install two 140-MBH (1000 BTUs per hour) ROBUR natural gas-absorption heat pumps (GAHP) in lieu of a conventional boiler for domestic hot water in a building constructed in 1972 and containing about 400 residential units," said Farzin M. Rad, senior advisor, commercial/in-

real estate investment trusts, owns, rents, leases and manages more than 65,000 townhouse suites and manufactured home community sites across Canada, the Netherlands and Ireland. For one of its Canadian sites, the owners were looking for ways to reduce operating costs using the latest in GHP technology.

In 2019, Capreit applied to be part of a pilot program through FortisBC Energy Inc. to demonstrate the performance, energy savings and customer acceptance of a gas absorption heat pump technology. FortisBC is an electricity and natural gas distribution utility in the Canadian province of British Columbia.

"Multifamily facilities use a lot of hot

*“Multifamily facilities use a lot of hot water. Gas heat pumps can be used to improve the efficiency of heating that water by operating at over 100%, as well as reducing the building's overall carbon emissions.”*

— Jim Kobialko, program manager, FortisBC Energy Inc.

dustrial technology and development, Enbridge Gas Inc.

According to TAF, the goal is to monitor the system and determine whether actual performance measures up to expected performance. The agency also wants to see whether this technology would be appropriate for future projects in cold climates across North America.

Gas absorption heat pumps not only help buildings consume natural gas more efficiently but also to reduce carbon emissions. For building owners, GAHPs offer an affordable and efficient alternative.

water. Gas heat pumps can be used to improve the efficiency of heating that water by operating at over 100%, as well as reducing the building's overall carbon emissions," said Jim Kobialko, program manager, FortisBC Energy Inc.

Still in the monitoring stages, substantiated project results will be available soon, Kobialko said. 🔗



PHOTO COURTESY FORTISBC ENERGY INC.

CAPREIT Inc. installed two ROBUR natural gas absorption heat pumps at its St. Johns property, which is the first of its kind installation in British Columbia.

#### A HOT COMMODITY FOR CAPREIT

CAPREIT Inc. one of Canada's largest

For more information, visit:

Energy Solutions Center  
[www.gasheatpumps.com](http://www.gasheatpumps.com)

Tecogen Inc.  
[www.tecogen.com](http://www.tecogen.com)

Robur Corp.  
[www.roburcorp.com](http://www.roburcorp.com)





## Always On

Gas heat pump technology offers a cost-effective solution for 24/7 operations.

BY TONYA MCMURRAY

**W**ith round-the-clock operations, hotels, health care facilities and other businesses that operate 24 hours a day need reliable and affordable heat, cooling and hot water. For many of those businesses, gas-fired heat pumps offer a way to reduce heating and cooling costs while also reducing their carbon footprint.

Like traditional electric heat pumps, gas heat pumps provide heating and cooling by moving heat from one place to another. However, gas heat pumps offer significant energy savings over their electric counterparts.

“This can be done by removing a power-sucking electrical motor and replacing it with a small, natural gas engine,” said Bill Fairgrieve, service manager, Diamond Mechanical Inc. “This natural gas engine quietly speeds up and down to meet the demand on the system.”

Using the heat pump for air conditioning increases energy savings even more, said Clayton M. Carlson, project manager, Diamond State Engineering Inc.

“A lot of commercial buildings heat with natural gas, but in the summertime, the air conditioning runs on

electricity,” Carlson said. “Gas heat pumps are able to use the natural gas year-round, which results in a lower cost of operation.”

Gas heat pumps have an added advantage because they feature a heat exchanger to capture and reuse exhaust heat generated by the gas engine.

“With electric heat pumps, the colder it gets outside, the less heat you’re able to produce inside,” said Dave Detrick, manager, sales and pre-customer integration, Chesapeake Utilities Corp. “With gas systems, the engine heat that’s expelled is recaptured and cycled

into the building. You're able to maintain the feeling of warm air as if you have a regular gas heater, and yet you have the efficiency of a heat pump."

#### HEATING UP

To prove the efficiency of gas heat pumps, Energy Concepts Co. LLC (ECC) partnered with a solar panel manufacturer on a hospitality industry pilot funded by a California Energy Commission grant to study high-efficiency energy solutions.

The pilot project installed solar thermal panels on a small rooftop of a large Desert Springs, California, hotel to help power ECC's HeliSorber heat pump, which uses an ammonia-water absorption cycle to provide heating and cooling.

Because the available roof space could support only enough panels for 60% of the drive heat, a gas boiler provided the additional 40% of the drive heat during daylight hours and all drive heat at night, said Ellen Makar, president, ECC. The HeliSorber supplied all domestic hot water for 800 hotel rooms and the hotel's kitchen along with 25 tons of air conditioning, she said.

The heat pump achieves efficiency of 210% by fueling production of hot water and air conditioning with energy-efficient natural gas and renewable energy,

“A lot of commercial buildings heat with natural gas, but in the summertime, the air conditioning runs on electricity. Gas heat pumps are able to use the natural gas year-round, which results in a lower cost of operation.”

— Clayton M. Carlson, project manager,  
Diamond State Engineering Inc.

Makar said. One unit of solar thermal energy produces 1.55 units of domestic hot water and 0.55 units of chilling.

“They saved about 30% on their gas bills for domestic hot water,” she said. “They were also capacity strained on their domestic hot water. Not only did this help them save gas, but it prevented them from needing to add another boiler to keep up with capacity.”

Modeling from the pilot study showed savings for hot water could reach 50% under ideal conditions, according to a 2019 report produced by Chromasun. The report estimates a typical hotel could save nearly 30,000 therms (a unit of heat equivalent to 100,000 British thermal units) and 55,000 kilowatt-hours of electricity each year.

#### PROVEN TECHNOLOGY

While gas heat pumps are relatively new to the U.S. market, they are a mature technology in other parts of the world. The Yanmar VRF system, for example, is well established in Europe and Asia, and has proven reliable and easy to maintain with a longer life expectancy than electric systems, Detrick said.

The engine-driven VRF system offers increased energy efficiency, good performance in cold climates, and the ability to control different temperature zones from a single outdoor unit, said Steven Hull, project manager, Iron Hill Construction Management Co. Inc.

He said those benefits led Peach Tree

Health Group LLC to select the Yanmar VRF system for its new 52,780-square-foot assisted living and day habilitation facility for adults with brain injuries.

Diamond State Engineering's Carlson said Peach Tree seemed an ideal environment for the VRF heat pump.

“They're a 24/7 operation with pretty even occupancy throughout the year,” he said. “The Yanmar unit also allows almost every room to have its own thermostat that can be turned up or down independently, which was ideal for Peach Tree.”

It's still too early to quantify the savings for Peach Tree. Still, Chesapeake Utilities, which has its own VRF gas heat pump system, has estimated that in its territory, a similar electric system would require electricity costs to be under \$0.03 per kilowatt-hour to equal the energy cost of the gas system, Detrick said.

“Nobody is buying electricity for under \$0.03 a kilowatt-hour,” he said. “We have a very comfortable alternative; it's expected to outlive the competition and has the lowest net cost of these kinds of systems.”

For more information, visit:

Energy Solutions Center  
[www.gasheatpumps.com](http://www.gasheatpumps.com)

Energy Concepts Co. LLC  
[www.energy-concepts.com](http://www.energy-concepts.com)

Yanmar America Corp.  
[www.yanmarenergysystems.com](http://www.yanmarenergysystems.com)



PHOTO COURTESY OF ENERGY CONCEPTS CO.

Energy Concepts Co.'s HeliSorber achieves efficiencies of 210% while providing heat, hot water and cooling. In a pilot study with a California hotel, the gas heat pump helped saved 30% on domestic hot water for an 800-room hotel.





## Getting an education

Schools turn to gas heat pump technology to provide energy-efficient comfort year-round.

BY TONYA MCMURRAY

**P**roviding efficient heating and cooling to create a comfortable learning environment can be a challenge for schools with older buildings and ongoing budget scrutiny. But several schools have found a cost-effective solution with gas heat pump technology using variable refrigerant flow (VRF).

“Natural gas heat pumps deliver increased efficiency and energy cost savings when compared to a boiler heating system,” said Antonio M. Centritto, adviser, energy solutions, Enbridge Inc.

The company offered energy efficiency incentives to allow an Ontario elementary school to upgrade to a gas

heat pump system. “A heat pump also provides cooling, which is an added benefit to older schools without air conditioning,” he said.

The gas heat pumps are using a natural gas engine that operates a compressor to transfer energy between an outdoor unit and indoor air handlers. Gas heat pumps also capture excess waste heat and reuse it to make the system even more efficient.

“Natural gas provides a low-cost, stable energy choice,” said Joshua Vick, commercial business development, Spire Energy Inc., which helped install a gas heat pump for a Pike Road, Alabama, middle school. “VRF technology,

combined with the operating efficiency of natural gas, gives customers an energy-efficient, environmentally friendly product that they can depend on.”

### BACK TO SCHOOL

The College of Southern Nevada (CSN) uses gas heat pump technology to provide heating and cooling for three laboratories while also training heating, ventilation and air conditioning (HVAC) professionals.

One of the largest two-year colleges west of the Mississippi River, CSN serves about 38,000 students at three main campuses and 11 satellite sites. In 2010, the school used a federal grant promoting

“outrageous energy-saving” solutions to install gas-fired heat pumps in spaces housing air conditioning and welding laboratories as well as the automotive technology program.

To help train students and area contractors, the school installed one of each gas heat pump model and one of each type of air handler.

“We wanted to arm students with the ability to go out there and have this in their tool belt because [gas heat pump] installations were popping up all over southern Nevada,” said Dennis Soukup, department chair, applied technologies, CSN.

The school replaced the metal panels housing the components with clear plexiglass so students could see the heat pumps in action.

“It’s a great visual for training,” Soukup said. “The byproduct was I got to finally heat and cool three laboratories that never had adequate heating and cooling.”

The gas heat pump technology offers significant benefits, including energy and cost savings along with reliable operation, he said. One key to the technology’s efficiency is that the units automatically adjust to changing conditions.



PHOTO COURTESY OF YANMAR AMERICA CORP.

Pike Road Middle School in Pike Road, Alabama, opted for the efficiency and reliability of gas heat pump technology when it renovated its 100-year-old registered historic building serving more than 600 students.

### AN EFFICIENT UPGRADE

Reliability and efficiency were key factors leading the Pike Road Middle School to install gas heat pumps during the renovation of its 100-year-old registered historic building serving more than 600 students, said Rebecca Williams, communications and federal programs coordinator, Pike Road Schools.

Spire Energy approached the Town of Pike Road as it began renovation planning to discuss the benefits of natural gas heat pumps, Vick said. Spire partnered with the town, the board of education and program manager Volk-

on an annual basis,” Spire Energy’s Vick said. “Combined with the stable low cost of natural gas, the school will experience an overall reduction in energy cost while reducing its dependency on the power grid.”

### A COMFORTABLE LEARNING ENVIRONMENT

Like Pike Road, the Waterloo Region District School Board (WRDSB) chose a gas heat pump to reduce operating costs and energy use while providing a better environment for students at its 54,000-square-foot Stewart Avenue Public School in Cambridge, Ontario, said Kazuko Newton, energy systems, Yanmar America Corp.

Initially built in the 1950s with various additions in the 1960s, 1980s and in 2012, older sections of the elementary school were built without air conditioning, as was the case with schools then. During warm periods, the school turned off its lights, opened windows and used fans to circulate air. Not only was it often uncomfortably warm, but the fans’ power cords represented a possible tripping hazard, Newton said.

“By installing the gas heat pump, classrooms are able to use an air conditioning system and provide a better study environment,” she said. “Not only is it more comfortable, but it has also improved safety for students.”

*(continued on page 9)*

“Natural gas heat pumps deliver increased efficiency and energy cost savings when compared to a boiler heating system. A heat pump also provides cooling, which is an added benefit to older schools without air conditioning.”

— Antonio M. Centritto, adviser, energy solutions, Enbridge Gas Inc.

“This unit is constantly checking itself, adjusting its speed and then determining how many compressors have to run at any given time,” Soukup said. “We know not all units need to run 100% of the time. It’s very smart. It’s communicating with the air handlers, and it’s doing exactly what it needs to do.”

ert Inc. to install a system to provide efficient heating and cooling to the 47,000-square-foot building.

“By lowering the school’s overall peak power demand and power consumption, the gas heat pumps help the school reduce the cost of its electric bill





## Secret sauce

At Norms, find soup, sandwiches — and a new gas heat pump solution.

BY GEORGEANN H. IKUMA

**S**erving comfort cuisine to communities throughout southern California for more than 70 years, Norms Restaurants is giving new meaning to its “test kitchen.” While devoted customers depend on their tried and true culinary mainstays, this historic establishment is also quick to embrace the future.

Take, for example, the recent installation of an environmentally friendly, gas-fired heat pump solution at one of its 22 restaurants across California.

“Restaurants consume more natural gas than any other commercial building type, and water heating is a significant portion of that total consumption,” said Jeff Schenkelberg, account executive,

Southern California Gas Co. (SoCalGas). “Low-cost, gas absorption heat pumps for integrated commercial hot water and air-conditioning can provide hot water more efficiently with up to a 40% reduction in energy used, while simultaneously providing free site cooling of up to 20% reduction in kWh [kilowatt-hours] used for air conditioning. These advantages, combined with low-cost equipment, represent significant potential cost savings.”

Like many restaurant operators, Norms is continually exploring ways to reduce energy consumption and

lower utility bills. In 2017 SoCalGas, in conjunction with the Gas Technology Institute (GTI), approached the restaurant chain’s owners about participating



Norms Restaurants LLC’s West Covina, California, location

PHOTO COURTESY OF SOUTHERN CALIFORNIA GAS CO.



PHOTO COURTESY OF SOUTHERN CALIFORNIA GAS CO.



Norms' West Covina location installed a single gas absorption heat pump water heater from Stone Mountain Technology Inc. with a 113-gallon storage tank and a chilled water loop with a fan coil unit. The surrounding cage was added to prevent vandalism.

in a pilot program for energy reduction using a gas-fired heat pump. Norms signed up to become one of the pro-

gram's proverbial test kitchens.

"We decided to use our West Covina location due to the availability of space and the use of water heaters instead of a boiler," said Pete Schultz, director, facilities and construction, Norms Restaurants LLC. "We started the discussion in 2017, and the equipment was installed early last year."

#### RECIPE FOR SUCCESS

GTI installed a single gas absorption heat pump water heater, from Stone Mountain Technologies Inc. (SMTI), with a 113-gallon storage tank and a chilled water loop with fan coil unit. The coefficients of performance (COP) are anticipated near 1.9 with an annual fuel utilization efficiency (AFUE) of 140% or more.

This technology delivers hot water more efficiently than traditional high-efficiency gas water heaters while simultaneously providing space cooling by supplementing site air conditioning, Schenkelberg said.

"The project is ongoing and final results are not yet available," Schultz said. "However, projected savings of \$2,100 per year from therm savings and an additional \$510 in cooling electricity savings are anticipated."

#### FUTURE OF THE FOOD INDUSTRY

This pilot program is intended to help evaluate and demonstrate the ability of integrated gas heat pump technology to help reduce therm and electricity consumption for the restaurant industry, said Schenkelberg.

"The use of natural refrigerant/absorbent also has the added benefit of zero ozone depletion and no global warming potential," Schenkelberg said. 🔥

For more information, visit:

Energy Solutions Center  
[www.gasheatpumps.com](http://www.gasheatpumps.com)

Stone Mountain Technologies Inc.  
[www.stonemountaintechnologies.com](http://www.stonemountaintechnologies.com)

PHOTO COURTESY OF PIKE ROAD SCHOOLS.



With gas heat pump technology, the Waterloo Region District School Board was able to reduce energy use and utility costs while adding air conditioning to an older section of its Stewart Avenue Public School in Ontario, Canada.

*(continued from page 7)*

Because of the building structure and tight ceiling spaces, more standard HVAC systems were not a good fit. As a result, Lou Lima, manager, mechanical electrical and environmental systems, WRDSB asked the design team first to evaluate and then design a VRF system for a section of the school being retrofitted with air conditioning.

"Once we looked at the gas heat pump option with its operation savings and efficiency, as well as its capital costs, it made sense to proceed with this system," Lima said.

"The system has continued to function well since its installation in 2016, even during the coldest winter

days and throughout the cooling season," he added.

The gas heat pump system was integrated with a building management system that offers temperature and power control to increase efficiency further, Newton said.

"The energy savings was more than we thought it would be," she said. "It is less than one-tenth of the operation cost compared to electrical baseboard heating. Compared to the rooftop unit [at a similar school], the operation cost is one-fourth. And even with adding cooling by gas, a year of gas consumption is less than the rooftop unit because the gas heat pump is much more efficient." 🔥

For more information, visit:

Energy Solutions Center  
[www.gasheatpumps.com](http://www.gasheatpumps.com)

Yanmar America Corp.  
[www.yanmarenergysystems.com](http://www.yanmarenergysystems.com)



## Big motivation

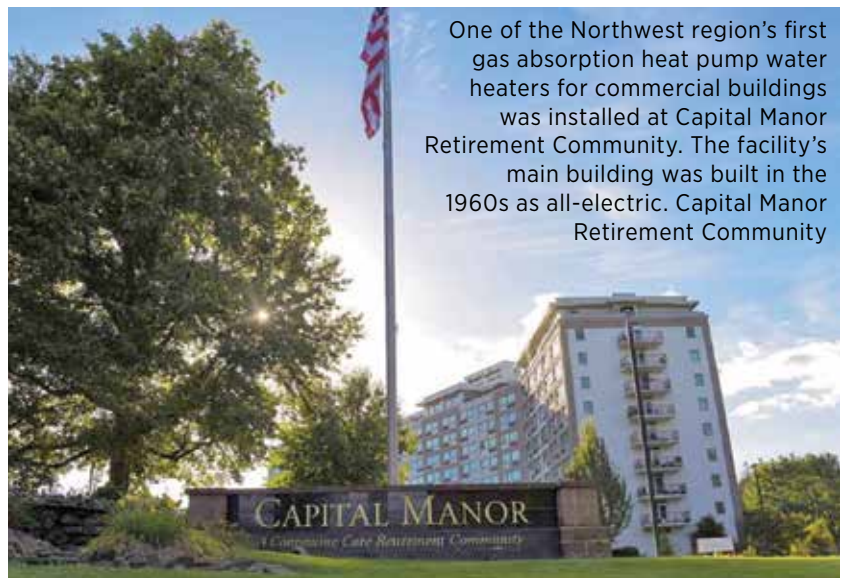
Gas heat pumps offer comfort and savings for eldercare facilities.

BY MONICA STAVISH SKAGGS

**S**enior citizens at a retirement community and a senior apartment complex located 3,000 miles from each other are enjoying a more comfortable lifestyle following the installation of new gas heat pumps (GHP). These systems provide consistent heat and hot water for residents while offering energy-efficient savings.

In Salem, Oregon, one of the region's first gas absorption heat pump water heaters for commercial buildings was installed at Capital Manor Retirement Community. NW Natural serves the facility with natural gas. The project followed a two-year field test by a group of Northwest utilities and energy efficiency organizations.

Across the country, TECO Peoples Gas installed its first commercial GHP at J.L. Young Senior Apartments in Tampa, Florida. The community is the first customer to benefit from a special, lower rate for



One of the Northwest region's first gas absorption heat pump water heaters for commercial buildings was installed at Capital Manor Retirement Community. The facility's main building was built in the 1960s as all-electric. Capital Manor Retirement Community

PHOTO COURTESY OF CAPITAL MANOR RETIREMENT COMMUNITY

GHP use recently approved by the Florida Public Service Commission for residential and commercial settings.

#### MAKING THE MOVE

The comfort of residents and monthly savings prompted both facilities to move toward natural gas.

“Natural gas helps keep residents at Capital Manor warm and provides enough hot water for showers, baths and hand-washing while helping the kitchen and laundry facilities run smoothly,” said Joe Burks, the building’s director of facility services.

Capital Manor has 450 apartments, a kitchen, dining hall, auditorium and other common areas. The main building was built in the 1960s as all-electric. Over time, the facility has been converting to natural gas, which provides more even space heating. Two gas-fired absorption heat pump units and ancillary pumps and control systems were

#### ENSURING COMFORT

The new GHP at J.L. Young Apartments was installed by TECO Peoples Gas. Built in 1970, the affordable housing community for the elderly is operated by the Tampa Housing Authority and features 450 apartments, a community room, recreational room and laundry facility.

“Since the recreation hall doubles as an emergency shelter, reliable air conditioning and heating are critical,” said Lillian Stringer, director of community affairs, Tampa Housing Authority.

The complex turned to natural gas after the state required senior centers to provide air conditioning temperatures of at least 82 degrees during a three-day power outage in 2018.

“We could not connect either of the existing AC [air conditioning] units to the generator because there was too much load,” said Keith Egner, assistant director of facilities, Tampa Housing Authority. “The generator could only handle lighting, refrigerator



PHOTO COURTESY OF ROBUR CORP.

Two ROBUR gas-fired absorption heat pump units were installed, along with ancillary pumps and control systems, at Capital Manor Retirement Community in Salem, Oregon. NW Natural services the facility.

“Natural gas helps keep residents at Capital Manor warm and provides enough hot water for showers, baths and hand-washing while helping the kitchen and laundry facilities run smoothly.”

— Joe Burks, director of facility services,  
Capital Manor Retirement Community

installed to offset load from the less-efficient boilers. Robur Corp. manufactured the GHP units, and the field installation and monitoring were conducted by Energy 350. During the initial monitoring period, the units performed well.

In addition, heating and domestic hot water loops are in close proximity. This allows the heat pump to be used for both domestic hot water and for heating hot water via a hydronic loop.

“Getting monthly savings from gas water heating was a big motivation to switch systems, and Capital Manor is seeing noticeable savings on their bills,” Burks said.

outlets and tenant equipment such as oxygen machines and electric scooters.”

In April 2018, TECO Peoples Gas contacted the complex about a new gas-driven unit, which uses much less electricity than the previous units. The GHP replaced one of two 15-ton DX split systems, which was inoperable.

A Sierra heat pump was installed. Only seven amps of electricity are needed to run the controls and fans of the GHP, so this can be added to the generator if needed. Energy savings are estimated at \$1,750 annually.

“The heat pump efficiency for cooling is

about half the cost, and the cost for heating is about a third of what electric heat strips used,” Egner said. “Many residents use the center daily for meals, playing games and socializing. They appreciate it being warm during cool weather and, of course, cool during the warm weather.”

Ensuring comfort for residents and saving money are only two benefits of natural gas.

“There is less of a carbon footprint due to less energy being needed than with a full electric unit,” Egner said. “Noise is another pollutant that many do not consider. The units are near the doors. When you pass by the GHP, you can barely hear it running.”

For more information, visit:

Energy Solutions Center  
[www.gasheatpumps.com](http://www.gasheatpumps.com)

Robur Corp.  
[www.roburcorp.com](http://www.roburcorp.com)

Sierra Fresh Air Systems  
[www.sierrafas.com](http://www.sierrafas.com)





## Managing the atmosphere

Cannabis facility uses gas-fired heat pump to grow crop.

BY MONICA STAVISH SKAGGS

In states where medical cannabis is legal, patients use it for conditions ranging from headaches and glaucoma to muscle spasms and nerve pain. The medical marijuana trend means expanded opportunities for cultivation facilities. At Redwood Warehouse LLC in Las Vegas, Nevada, entrepreneurs have turned to natural gas to reduce energy costs associated with growing the crop.

Redwood has a license to cultivate, produce and distribute its product to dispensaries around Las Vegas Valley. The 20,000-square-foot facility features automated fertilization, drip irrigation, heating, ventilation and air conditioning, lighting and carbon dioxide systems.

Recognizing natural gas as an environmentally friendly, energy-efficient fuel, Redwood's owners use gas heat pump heating, ventilation and air conditioning (HVAC) systems to cool the cannabis

grow rooms, and to heat and cool common areas. The result is lower utility bills that remain consistent month-to-month and a reduced carbon footprint.

“The GHP systems are an intricate part

“*The GHP systems are an intricate part of our atmospheric room management technology. In addition to operational savings, the units can be controlled in an industrial programming manner. This helps maintain temperature, humidity and dew point, which are all critical to high-yielding grow.*”

— Leon Kermani, partner, Redwood Warehouse LLC

PHOTO COURTESY OF REDWOOD WAREHOUSE LLC



At Redwood Warehouse LLC in Las Vegas, Nevada, entrepreneurs are using natural gas to reduce energy costs associated with growing medical marijuana.

of our atmospheric room management technology,” said Leon Kermani, a partner in the venture that includes physicians, attorneys and a philanthropist. “In addition to operational savings, the units can be controlled in an industrial programming manner. This helps maintain temperature, humidity and dew point, which are all critical to high-yielding grow.”

The facility also has a unique history. In 2014, partners Kermani and Harris Rittoff acquired the building, which had been home to “Welder Up,” a Discovery

Channel program showcasing unusual automobile customizations. After the state of Nevada rendered a license to cultivate cannabis, the facility required a modification of its own.

In 2016, Southwest Gas Corp. worked with Redwood to bring natural gas service to the site. “The facility had limited electrical capacity, and rather than spend money to enlarge that service, we opted to put the money into the better HVAC system that ran off natural gas,” Kermani said.

Redwood’s monthly electrical bill is consistently between \$9,400 and \$9,700, while the natural gas bill is between \$1,500 and \$1,700 monthly. “If we had used conventional units, our electrical bill would be at least \$18,000 monthly, so overall, we save at least \$6,600 a month,” he said.

Redwood and Southwest Gas have developed a close partnership since the equipment installation.

### GROWING LIKE WEEDS

“The customer has provided tours of their facility and insights into their industry,” said Nasrin Houston, industrial gas engineer, Southwest Gas, which serves 2 million customers in Arizona, Nevada and portions of California.

Natural gas technology is vital to controlling every element of the building’s atmosphere. To maximize crop yields, Redwood uses high-intensity lights, while the fully automated GHP HVAC units provide regulated temperatures. The building has a 20-ton unit in each of five grow rooms, providing 100 tons of capacity. Two additional 15-ton units are dynamically shared between the grow rooms. Overall, 130 tons of natural gas-fired air conditioning are used in the grow rooms. In addition, a single 20-ton unit services the rest of the building for a total of 150 tons of gas-fired heat pumps.

“This is one of the many benefits of this type of technology,” Kermani said. “We maintain a very even heat footprint over the entire crop canopy and have very little deviation in atmospheric conditions.”

Keeping energy costs low is key to Redwood remaining competitive in a rapidly growing industry, he said.

“To date, we have operated continuously without any issues. The operating costs savings have more than returned our investment,” Kermani said. 🔥

PHOTO COURTESY OF REDWOOD WAREHOUSE



Redwood’s owners use gas heat pump heating, ventilation and air conditioning systems to cool the cannabis grow rooms, and to heat and cool common areas.

For more information, visit:

**Energy Solutions Center**  
[www.gasheatpumps.com](http://www.gasheatpumps.com)



Please recycle this magazine after you read it.



# From vintage to vogue

Retail outlets prove energy efficiency is timeless.

BY GEORGEANN H. IKUMA

**I**n the world of gas heat pump solutions, the 80-year-old Cooper Design building in California and the 2-year-old Sugar Hill Retail Center in Georgia prove that age is just a number when it comes to energy efficiency and savings.

## COOPER DESIGN BUILDING

Located in the Fashion District of downtown Los Angeles, California, the 11-story Cooper Design building and attached annex houses clothing designers and hosts “Fashion Week” for store buyers twice a year. Currently, about half of the building is heated and cooled via water-source, heat pump units with two cooling



The Cooper Design Building in Los Angeles, California, found its gas heat pump solution in the form of a new Sierra system consisting of 375 tons (25 GHP 15-ton units) of equipment on a platform on the lower roof of the building.

PHOTO COURTESY OF DARROW HEATING & AIR CONDITIONING CORP.

towers and boilers on the upper roof. The other half, however, used a large central boiler; 31 ROBUR natural gas air conditioners and assorted indoor package heat pump units; split systems; and window air conditioning units ranging from 20 to 90 years old.

“Half of the building was costly to operate and wasting a lot of water in the form of evaporation and the required tower water bleed-off, which was especially problematic as it occurred during the middle of the drought in California,” said Mike Ojena, project manager, Darrow Heating & Air Conditioning Corp.

#### THE MAKEOVER

A solution came in the form of the new Sierra gas heat pump system consisting of 375-tons (25 GHP 15-ton units) of equipment on a platform on the lower roof of the building. There are also 105 air handlers inside the

oration and bleed lines. Additionally, the new system has eliminated chemical treatment to water lines or towers and bleeding into the sewer system, costly condenser water system maintenance of the cooling towers, and high electrical costs associated with water source heat pump systems.

#### SUGAR HILL E CENTER

The Sugar Hill retail development, called the E Center, is a 150,000-square-foot, mixed-use facility whose emphasis is on providing a place for exercise, eating and entertainment venues. During its construction in 2017, the city of Sugar Hill, a municipal gas provider and member of the Municipal Gas Authority of Georgia, was able to weigh its service options early on.

“The traditional solution in the south has been electric energy sourced,” said Troy Besseche, assistant city manager, City of Sugar Hill. “A discussion with



PHOTO COURTESY OF MUNICIPAL GAS AUTHORITY OF GEORGIA

Sugar Hill’s retail development, “the E Center,” chose six Yanmar gas heat pump units for their ease of installation and engineering to heat and cool the mixed-use facility.

representative, Municipal Gas Authority of Georgia.

“Their engineering and cooperation were instrumental in this project,” he said. “Yanmar has been able to monitor the units remotely and observe if any maintenance or repairs are needed.”

There are five, 14-ton three-pipe systems and one, eight-ton two-pipe system. The three-pipe system can provide cooling and/or heating simultaneously in separate rooms. The two-pipe system produces only heat or cooling as needed.

“The systems that we installed were designed to heat and cool spaces that were finished and occupied,” Besseche said. “The natural gas heat pump is just as good as an electric solution, but much more energy efficient. We are extremely pleased with the performance and cost.” 🔥

“*The systems that we installed were designed to heat and cool spaces that were finished and occupied. The natural gas heat pump is just as good as an electric solution, but much more energy efficient. We are extremely pleased with the performance and cost.*”

— Troy Besseche, assistant city manager, City of Sugar Hill

building, and one iTouch central control system to monitor the equipment.

“The new system not only replaced all of the old gas and electric equipment, including the old boiler, it now covers all the areas not conditioned previously by the old equipment,” Ojena said. “Although half of the building is still a water-source, heat pump system, the other half is all GHP equipment.”

The upgraded half of the building is now successfully operating without wasting water on a cooling tower evap-

the electric supplier regarding rates, demands and loads prompted us to look at other options that made the natural gas heat pump solution more attractive as the price, when fully operational, would be much lower using a natural gas source than electricity, notably during summer months.”

#### BEST BUY

Sugar Hill chose the Yanmar Gas Heat Pump due to the ease of installation, said Steve Edwards, senior marketing

For more information, visit:

Energy Solutions Center  
[www.gasheatpumps.com](http://www.gasheatpumps.com)

Sierra Fresh Air Systems  
[www.sierrafas.com](http://www.sierrafas.com)

Yanmar America Corp.  
[www.yanmarenergysystems.com](http://www.yanmarenergysystems.com)





Units in  
stock!

# THE RIGHT CHOICE FOR RIGHT NOW

HVAC where electrical systems are stressed



## ▣ Affordable

Sierra Gas Heat Pump (GHP) customers see a rapid payback in many locations

## ▣ Available

Sierra GHP are a natural HVAC complement to supplemental and back-up power generators.

## 🔧 Reliable

In a disaster gas grids deliver better uptime than electrical powerlines.

## 🌿 Sustainable

223 million gallons of source water saved and 50 million pounds of CO2 not released!

**The Sierra Gas Heat Pump uses an internal combustion engine to power the heat pump's internal components instead of utility supplied electricity.**



### Applications:

- ✓ Temporary Hospitals
- ✓ Clinics
- ✓ Nursing Homes and Senior Living
- ✓ Site Trailers
- ✓ Temporary Housing
- ✓ Military Installations

Scan To Visit

[sierrafas.com](http://sierrafas.com)

Or call (214) 638-6010



**AISIN**

Aisin Manufacturer,  
member of the Toyota Group

**MESTEX**  
A Division of Mestek, Inc.

North American  
Distributor



**BLUE MOUNTAIN  
ENERGY**

Sales and Services