Community Propane Systems:
Economical, Environmentally Responsible Gas Energy Solutions

This course will familiarize you with community propane systems, sometimes called propane jurisdictional systems, central pipe systems, or master meter systems. It will outline the advantages of using propane gas over natural gas; explain the reliability, sustainability, and versatility of these systems; and discuss how propane systems affect the environment and the economy.

Community propane systems are centralized gas systems that are built and operated under stringent industry codes and regulations. They provide a reliable, freestanding community pipeline capable of serving from dozens to thousands of residences from a central facility. Propane is available everywhere in the United States and can be used anywhere without expensive natural gas main extensions — even beyond municipal and private utility service areas.

When development sites are located off the natural gas main, the developer often faces massive costs for the extension of gas mains to the site. In addition, the home builder’s product is vastly enhanced by the installation of gas applications inside the home — such as space heating, water heating, and kitchen and laundry appliances — as well as popular outdoor applications such as pool heaters, outdoor kitchens, and standby generators.

**COURSE OBJECTIVES**

After completing this course, you will be able to enumerate the advantages of using propane over natural gas as a community-level energy source. You will be able to identify community tank system configurations, piping networks, and telemetry, as well as recognize requirements to follow when installing a community propane system. You will also be able to describe residential propane applications for inside and outside the home.

You will be able to list the NAHB Green Building Standards and identify the economic advantages that utilizing propane can offer to a builder or homeowner.

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Credit earned will be reported to AIA Records on behalf of AIA Members. Certificates of Completion are also available for self-reporting and record-keeping needs. Questions related to the information within this article should be directed to the Propane Education & Research Council.

To earn credit for this learning unit you must complete the 10-question quiz online. You must answer eight of 10 questions correctly to earn credit.

This course qualifies for the following credits:

1 HSW/SD hour
1 GBCI hour
1 NAHB hour
Propane is a trusted and reliable energy source that is used by millions of Americans each day. It fulfills energy needs by burning cleanly and efficiently, giving consumers more value for their energy dollar. Propane is used in and around buildings for heating systems, water heaters, clothes dryers, cooking appliances, fireplaces, and outdoor applications such as outdoor kitchens.

Natural gas is a fossil fuel consisting primarily of methane. It is found in oil fields, natural gas fields, and in coal beds. Natural gas burns cleaner than many other fossil fuels, such as oil and coal, and produces less greenhouse gas per unit of energy released. For an equivalent amount of heat, burning natural gas produces about 30 percent less carbon dioxide (CO₂) than burning petroleum and about 45 percent less than burning coal. Propane gas shares very similar characteristics. The major difficulty with using natural gas is transportation and storage.

The network of natural gas pipelines is limited to high-density population areas and is often difficult and always expensive to expand. Where available, natural gas is used for such purposes as cooking, clothes drying, water heating, space heating, and fireplaces. Home or other building heating equipment may include boilers, furnaces, and water heaters.

The United States uses more propane gas than any other country in the world. Propane is available everywhere in the United States and supplies about 4 percent of this country’s total energy needs. From fleet vehicles, to farm equipment, to homes across the country, propane provides a cleaner energy choice to help fuel Americans’ way of life. And, unlike alternative energy sources such as geothermal or solar, propane has a proven track record of success. It’s reliable, readily available, and has an existing and affordable refueling infrastructure.

The United States has the largest propane storage capacity in the world. Pipelines, processing facilities, refueling stations, distribution centers, and storage facilities already exist across the country, making large capital investments in infrastructure unnecessary. More than 95 percent of the domestic propane supply, used by more than 60 million Americans, is produced in North America.

Homes and businesses use about one-third of the propane consumed in the United States. Propane is used in buildings for heating and air conditioning, cooking, water heating refrigerating foods, drying clothes, lighting, and in fireplaces.

Propane retailers are trained professionals and can supply propane wherever there is a need. Many propane retailers also provide a wide range of related products and services.

Some of the retail services related to home building are: Residential service and the selling and filling of tanks; appliance sales, installation, and service; tank installation; community tank systems; gas piping systems; delivery and installation of aboveground or underground propane tanks for individual residences; installation of central tank systems; and installation of new gas piping and service to existing pipe systems.

In a community propane distribution system, a central propane tank is installed above or below ground in a low-visibility, common area on the edge of a development. Underground gas mains are then run to individual lots, and, as homes are built, meters are installed.

Community systems are flexible enough to handle a few houses or a neighborhood with thousands of homes. The systems are essentially underground piped gas distribution networks that are designed to be virtually identical to natural gas systems. They can be installed almost anywhere in the United States.

Underground piping typically consists of a standard 18-inch-deep trench with sand surrounding the plastic pipe. Atop the riser at the house is a regulator that connects to the inside piping. Different types of piping that may be allowed to be installed underground include black iron, galvanized steel, brass, copper, polyamide, and polyethylene.

Community propane gas distribution systems serve residents and subdivisions from a central propane gas storage tank. Separately metered gas is provided to each home from a service line that is connected to the underground distribution main. A telemetry unit records the volume and pressure of the central storage tank and ensures a continuous supply of propane.

Propane flows through a gas piping system from the tank to appliances inside and outside the home. The gas piping system commonly used in residential applications is pressure-regulated at the tank with gas piping running underground to the home, where further pressure regulation is usually needed to meet final appliance pressure requirements. The mounting of the regulator on the outside of the home must be planned with distance

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Sunset Cove in Galveston, Texas, is an upscale community designed for vacation and second homes. A birder’s paradise with a community park bordering a nature preserve, Sunset Cove has several amenities including a pool and pool house. The challenges for this community were that natural gas was not an economical option, and the gas system had to be constructed to handle weather- and storm-related tidal surges along with the marine environment.

The solution was an underground delivery system with a state-of-the-art tie-down and zinc-cathode corrosion protection system. This provided the various builders with a single energy source that ensured high-quality standards for the community and enhanced marketing opportunities for the builders.
requirements from possible ignition sources. The propane professional who installs the tank and gas piping system will determine regulator location and other gas piping system requirements.

National Fire Protection Association (NFPA) guidelines for small LP-Gas Systems (SLGSs) must be followed for community propane systems. The NFPA 58 Liquefied Petroleum Gas Code includes provisions in the following areas: damage prevention, incident reporting, small LP-gas systems, piping system service limitations, odorization, construction records, maps, operating history, key valve maintenance, leak testing, response to gas leak reports and interruption of gas service, and operator qualification and covered tasks.

Community system operators should consult applicable federal and state pipeline safety regulations to determine the extent of their regulatory compliance obligations. Jurisdictional pipeline distribution systems are subject to the requirements of pipeline safety regulations found in title 49, Parts 191 and 192 of the Code of Federal Regulations and in the DOT Guide 27 Pipeline Operations.

These regulations cover the following: damage prevention, incidence reporting, odorization of gas, procedural manuals for operations, maintenance, and emergencies, corrosion and pressure test records, valve maintenance for distribution systems, test requirements for pipelines, service lines, plastic pipelines, and qualification of pipeline personnel.


When considering sustainability, economic and environmental factors are involved. Economically, propane can mean substantially lower utility bills for the homeowner. From an environmental perspective, gas allows communities to reduce carbon emissions. The use of gas is environmentally friendly, and is preferred by homeowners around the globe.

Inside the home, as illustrated above, unifying multiple heating applications with propane also results in combined benefits of efficiency, economics, homeowner comfort, and emissions reduction.

Century Ranch, Wolf Crossing, and Dry Creek Estates, in Austin, Texas, are part of a 4,900-lot master planned planned community. This 1,600-acre development has multiple neighborhoods, amenities, price points, and product types. The developer was faced with a costly extension of multiple off-site utilities, including natural gas. The company needed to mitigate the cost of utilities in order to maintain competitive lot prices while offering the dual-fuel homes that the buyers preferred.

The solution was to eliminate the need to extend natural gas transmission lines to the property at the cost of hundreds of thousands of dollars. Instead, the developer designed and constructed systems to accommodate various topographic and natural challenges while allowing for phased expansion at multiple sites. This solution included an underground installation that mirrored a natural gas system, but was significantly less costly to the developer. The savings allowed the developer and builders to price lots and products more competitively.
more comfortable heat. A gas dryer dries clothes faster and more efficiently than an electric dryer, and a gas cooktop heats more evenly. Optional in-line propane backup generators supply uninterrupted power so the home is never affected by an electrical power outage.

The environment is an important reason to use propane as an energy source. Propane is an approved, clean fuel listed in the 1990 Clean Air Act and the Energy Policy Act of 1992. Tests conducted by the Environmental Protection Agency show that propane-fueled vehicles produce 30 percent to 90 percent less carbon monoxide and about 50 percent fewer toxins and other smog-producing emissions than gasoline engines. Gas appliances dramatically reduce the need for electricity from power plants. Using propane for heating and hot water alone can reduce an average home’s carbon emissions by 8.5 tons of carbon per year.

Propane gas is about 98 percent efficient while coal-based electricity is about 28 percent efficient. Using gas instead of electricity from coal fired power plants reduces outdoor pollution as well as greenhouse gas and particulate emissions. Propane is non-toxic and insoluble in water; therefore, it offers minimal risks to aquifers, ground-water supplies, and soil. Because it quickly vaporizes when released from a pressurized container, it doesn’t spill, pool, or leave a residue.

It takes only one house heated with an EPA-approved wood stove to create as much particulate pollution as more than 400 houses heated with propane. Moreover, the pollution from one non-certified stove or fireplace equals the particulate pollution of 1,000 houses heated with propane.

Greenhouse gases keep the earth at a comfortable temperature, allowing most of the energy from the sun to pass through the atmosphere and warm the earth while blocking much of the earth’s outward radiation. However, increasing concentrations of greenhouse gases in the atmosphere are cause for concern. High concentrations of greenhouse gases can affect the global climate system, which can lead to climate change.

Propane is not a direct greenhouse gas when released into the air. Propane vapor is unstable in the atmosphere — it is chemically reactive and commonly removed by natural oxidation in the presence of sunlight or dispersed by precipitation. It is also removed from the atmosphere faster than it takes to affect global climate. Current measurements have not found a global climate impact from propane releases.

When quantifying the greenhouse gas emissions that result from energy use, it
is important to distinguish between the emissions released at the location where the energy is consumed and the emissions released as a result of the generation of that energy. Coal, with the largest market share of consumption — primarily from the generation of electricity — contributes a percentage of emissions larger than its rate of consumption. That means that emissions from the burning of coal for electricity have a greater impact on climate change relative to its consumption rate. With a short lifetime in the atmosphere and low carbon content, propane has a more favorable emissions profile compared to other energy sources in most applications.

The NAHB’s National Green Building Standard is the first ANSI-approved consensus standard on sustainable green building for residential construction.

Propane is a gateway energy source that enables builders to follow green building standards and offers the extra value, reliability, and versatility of gas. Propane will go anywhere a project is located and offers dependable gas service beyond natural gas mains. According to the NAHB, the green practices include: lot design, preparation, and development; resource efficiency; energy efficiency; water efficiency; indoor environmental quality; and operation, maintenance, and homeowner education.

There are four threshold levels of green building available to builders wishing to use the NGBS to rate their projects—Bronze, Silver, Gold, and Emerald. At all levels, there are a minimum number of points required for each of the categories to ensure that all aspects of green building are addressed and that there is a balanced, whole-systems approach. The Standard provides the user with the means to achieve basic, entry-level green building or achieve the highest level of sustainable green building that incorporates energy savings of 60 percent or higher.

The table above shows the green building level thresholds and the significant number of points the use of propane can contribute to each level.

The ease of installing underground tanks minimizes the length of time soil is exposed and can earn up to 5 points. While natural gas lines have to be trenched all the way across a property, propane tanks can usually be placed 10 feet from house. Line boring can be done for gas lines, and boom trucks can be used to place tanks with minimal, if any, driving on a lot. In many cases, propane can share utility trenches or easements with other utilities. This can earn up to 5 points.

The 70 percent recycled content of propane tanks is good for 2 points. Recycling copper gas line scraps earns 1 point. Propane tanks and propane systems (water heater and/or furnace) manufactured by an ISO14001 certified facility can earn between 1 and 10 points; 5 points claimed. For example, a $5,000 propane boiler made at an ISO 14001 facility and $100,000 in project materials costs would earn 5 points.

To reach the 53 energy-efficiency points that are available by building with propane, you can follow this prescriptive path: 703.4.1 Install a gas/propane heater or a propane gas boiler with the Annual Fuel Utilization Efficiency (AFUE) ratings listed to earn the corresponding points listed. For example, a propane heater with a 90 percent AFUE rating will earn up to 14 points, or a propane gas boiler with an AFUE rating of 94 percent can earn up to 17 points towards the Energy Efficiency section.

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>MAXIMUM POINTS FROM PROPANE</th>
<th>NGBS LEVEL OF CERTIFICATION</th>
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<tr>
<td></td>
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<td>BRONZE</td>
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<tr>
<td>Indoor Environmental Quality</td>
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<td>36</td>
</tr>
<tr>
<td>Operation Maintenance and Building Owner Education</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Additional Points (from any section)</td>
<td>N/A</td>
<td>50</td>
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<tr>
<td>Total Points</td>
<td>101</td>
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The exact number of points will be determined by the climate zone the home is built in (the highest values listed assume coldest climate).
Additional points can be earned depending on the type of installation. For example, programmable thermostats can earn an additional point. Other specific installations and their point values are listed below.

**Additional Installations:**
- Temperature reset control or burner delay control on boiler: 1 point
- Programmable thermostat: 1 point
- Gas water heating: 1 or 10 points
- Indirect fired water storage tank from propane boiler: 1 point
- Propane space heater without ducts (e.g. wall mount direct vent unit): 15 points
- Using trained propane HVAC contractors and installers: 1 point
- Propane heating systems can be integrated with programmable communicating thermostats, energy monitoring devices, and energy management control systems: 2, 4 or 7 points

A tank-type propane water heater can provide a homeowner with an energy solution that costs up to a third less to operate than an electric unit and heats water nearly twice as fast. Propane tankless and tank-type water heaters can meet or exceed requirements for water efficiency by being installed near the point of use and facilitate innovative plumbing systems that shorten distribution lines; they may qualify for 3 points.

Certain propane space heating and water heating equipment generally meet or exceed all indoor environmental quality guidelines and are safe for consumers to use. Propane fireplaces offer better air quality than wood-burning fireplaces. You can earn up to 20 indoor environmental quality points by building with propane. Direct-vented propane furnaces or boilers earn 5 points. Direct-vented propane water heaters earn 5 points. Propane fireplaces that comply with ANSI Z21.50 or ANSI Z21.88 earn 7 points. Propane forced air systems that accept MERV 8 or greater filters will earn 3 points.

Propane retailers are committed to providing customers with all appropriate safety information. Manufacturers’ spec sheets, location of safety valves, and a safety sheet on handling propane can earn 1 point. Instructions provided with propane mechanicals can be used to train homeowners on how to operate the system and will help earn 6 additional points.

In addition to its distinct versatility in residential settings, propane offers a wide range of alternative applications. Alternative uses include include commercial building applications for retail centers, hospitals, schools, resorts and other commercial businesses, and autogas for over the road vehicles, and in many aspects of agriculture production.

Today, more than 10 million vehicles around the world run on propane, a fuel that delivers high-octane power but fewer greenhouse gas emissions than gasoline, and considerably less nitrogen oxide and particulate pollution than diesel. Alternative fuel vehicles include law enforcement, municipal, and taxi fleets; school and transit buses; mowers and lawn care equipment; forklifts; and golf carts.

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**Laurel Ridge, a 55-and-over community in East Hampton, Conn., features homes that cost more than $400,000. The major challenge was that the developer had been building with oil-fired heating systems for more than 15 years. The solution was an aesthetically discrete underground-metered propane system designed to support an 88-home community. The system was supplied by a variety of underground 1,000- and 1,450-gallon tanks. Each home was then metered to supply propane for a full range of gas applications, including home heating, hot water, cooking, fireplaces, dryers, and outdoor grills. It also fuels a new 3,000-square-foot clubhouse.**
Propane fireplaces are an affordable luxury. The Department of Energy has estimated that propane fireplaces cost 30 percent to 60 percent less per hour to operate than wood-burning fireplaces. And with new designs and venting options, propane fireplaces are easy to install. They offer better air quality than wood-burning fireplaces, don't create ash or soot, and can be operated by wall thermostats or remote controls. Propane fireplaces also heat more evenly and efficiently than wood-burning fireplaces.

High-efficiency propane heating systems are becoming increasingly popular. They are cost-effective and warm homes evenly and comfortably. There are two types of propane heating systems: central and zoned. Zone heaters include space heaters, gas hearth stoves, and fireplaces. Propane-fueled central heating systems include forced-air furnace systems, hydronic radiant heating systems (a floor tubing system that is connected to a water heater or boiler), and combination systems (boiler plus water heater).

Propane furnaces heat air to 120 degrees Fahrenheit — up to 25 degrees hotter than electric heat pumps. The expected life of a propane furnace is about 20 percent longer than an electric heat pump's service life.

Conventional storage water heaters, also called tank type, remain the most popular type of water heating system for the home. A single-family storage water heater offers a reservoir ranging from 20 to 80 gallons of hot water. It operates by releasing hot water from the top of the tank when you turn on a hot water tap. To replace that hot water, cold water enters the bottom of the tank, ensuring that the tank is always full. However, you can expect to use only approximately 70 percent of the tank's volume; i.e., a 50-gallon tank should provide approximately 35 gallons of hot water for immediate use.

Fuel sources for storage water heaters include natural gas, propane, heating oil, and electricity. Natural gas and propane storage water heaters basically operate the same. A gas burner under the tank heats the water. A thermostat opens the gas valve as the water temperature falls. The valve closes when the temperature rises to the thermostat's set point.

Propane tankless water heaters are an environmentally friendly option for builders and homeowners. They can lower household energy bills, are incredible space savers, and supply hot water on demand. This is especially important as homebuyers demand more bathrooms.

A major benefit of tankless water heaters is that they operate only when needed. Tankless water heaters cost up to 50 percent less to operate than standard electric storage models by heating water on demand to the desired temperature, eliminating standby heat loss. Most propane tankless systems can distribute between five and 10 gallons of hot water per minute. Some tankless water heaters can be zoned to provide differing water temperatures at different locations in the home.

Scale buildup and rust may accumulate in a standard tank water heater, resulting in water that may have collected deposits or bacteria as it is reheated. In a tankless system, the water is always fresh and clean, with no tank to leak.

A tankless water heater can last for 20 years, more than double the life of a conventional tank-type water heater. Tankless water heaters are easy to install, can be wall mounted either inside or on the outside of the home, and will free up to 16 square feet of floor space used by tank-type water heaters.

Tax credits and rebates may be available through state governments and local propane gas associations. For more information on the current tax credit program, visit www.dsireusa.org and www.buildwithpropane.com.

According to the American Gas Association, 96 percent of chefs prefer cooking with gas. Propane provides the following benefits: no waiting for burners to warm up; greater control with precise temperature and even heat distribution; burners that cool quickly; being able to use gourmet commercial-grade ovens and cooktops, convection ovens, griddles, grill tops, and deep fryers.

According to Laneventure’s Home Lifestyle Report, two-thirds of respondents believe that a home’s outdoor space represents almost 30 percent of the total value of the property. Propane provides many solutions for well-designed, comfortable outdoor areas. Using propane for outdoor appliances has various benefits, including grills that heat and cool quickly and are easy to clean; grills that are more environmentally friendly than those that use charcoal, which releases 105 times more carbon monoxide than propane; and weatherproof fireplaces and patio heaters, to the pool heating to maintain...
water temperature regardless of the weather. Pool heaters are thermostat controlled, heat more quickly than electric units, and can have an efficiency rating of more than 90 percent.

Propane standby generators can keep electricity going in case of a power failure or propane off-grid generators can serve as the primary energy source for homes that may not have reliable electric service from the grid. A standby generator will turn on automatically when electricity fails and can provide power for all the homeowner’s needs. Propane generators are easy to operate and provide these additional benefits: They burn cleaner than diesel generators; they are more durable than gasoline-powered generators; they run quieter, many at fewer than 60 decibels; propane can be stored for long periods of time without deteriorating; and cogeneration units provide home heat as well as electrical power.

It is especially important to have backup power in areas that experience severe weather. Backup power can be supplied to life stations, hospitals, pump stations, schools, data centers, and virtually any facility or home as needed.

One alternative application of propane is in community centers, specifically for grills, swimming pool heaters, and space heating. Propane is also used at golf courses. Propane-fueled mowers and other lawn care equipment are much cleaner than gasoline models, and require far less maintenance while also providing a longer engine life. Furthermore, the problem of gasoline spillage and pilferage is eliminated.

Both commercial and retail centers rely on propane. These include restaurants, banks, schools, parks, stores, hospitals, and manufacturing plants. Propane can fuel the full range of energy requirements demanded by retail facilities, from gas commercial ranges to backup generators for office facilities. Combined heat and power (or cogeneration) systems can provide all heating, cooling, and power from a single system.

Central propane gas systems can provide an integrated refueling infrastructure for buses, police vehicles, and more. Fixed-base fleets such as school buses, taxis, and police vehicles are especially suited for conversion to propane. Benefits include: cost savings, less maintenance, fewer greenhouse gas emissions, a reduction of dependence on foreign oil, and a well-established infrastructure.

Propane’s higher octane burns cleaner and results in more hours and running time between maintenance stops. No carbon buildup means much less wear and less maintenance on oil filters, spark plugs, carburetors, and engines in general.

Using propane instead of gasoline or diesel reduces carbon monoxide emissions by as much as 90 percent, CO₂ emissions by around 12 percent, and nitric oxide emissions by up to 60 percent. Using propane instead of gasoline or diesel can cut hydrocarbon emissions by 80 percent and will drastically reduce particulate emissions.

According to the NAHB Research Center, “Gas is the fuel of choice for builders across the country, with 67 percent of all homes built during the past 12 months featuring gas... Propane extends the benefits of gas appliances beyond the natural gas main. More than 90 percent of builders surveyed cited reliability, customer preference, and initial costs as the top factors in choosing gas home heating systems.” For more information visit www.nahb.org.

Developers and builders have the ability to offer gas service in virtually any location, which gives them a distinct marketing advantage over competing, all-electric neighborhoods. Building homes with gas appliances gives builders the opportunity to offer profitable upgrades such as gas fireplaces and outdoor kitchen appliances. In fact, fireplaces rank among the top three features desired by new-home buyers, according to the NAHB.

Propane is an essential part of America’s energy future, and there is a well established domestic propane infrastructure already in place. More than 95 percent of the propane used in the United States is produced in North America and our propane supply is

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<th>LIGHT DUTY VEHICLES</th>
<th>HEAVY DUTY VEHICLES</th>
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<tbody>
<tr>
<td>Total Hydrocarbons</td>
<td>&gt;40%</td>
<td>&gt;80%</td>
</tr>
<tr>
<td>Carbon Monoxide</td>
<td>&gt;20%</td>
<td>&gt;90%</td>
</tr>
<tr>
<td>Nitrogen Oxides</td>
<td>&gt;30%</td>
<td>~60%</td>
</tr>
<tr>
<td>Particulate Matter</td>
<td>~100%</td>
<td>~100%</td>
</tr>
<tr>
<td>Carbon Dioxide</td>
<td>~12%</td>
<td>~12%</td>
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Percent reduction in emissions of combustion by-products from vehicles running on propane instead of conventional fuels.
abundant. Pipelines, processing facilities, refueling stations, distribution centers, and storage facilities already exist across the country, making large capital investments in infrastructure unnecessary.

A project becomes more desirable to builders with the promise of increased marketability through homeowners’ overwhelming preference for dual fuels. According to a survey by Knowledge Networks, demand for gas in homes remains high.

Tax credits and rebates for upgrades to propane water heaters and heating systems are available through some state governments and local propane gas associations. Log on to www.dsireusa.org and www.buildwithpropane.com for the most up-to-date tax credit and rebate information.

Parkside, a 96-lot planned community in Lakeport, Calif., faced the following challenges: The developer wanted to install a reticulated (centralized pipeline) system for this lakeside community where natural gas was unavailable. Other communities in the area had implemented propane distribution systems and the developer wanted to offer a competitive dual-energy solution. The developer also needed to work around a habitat to ensure the safety of a federally listed endangered species.

In order to remain compliant with the Endangered Species Act, single-family residential propane tanks were recommended; specifically, 250-gallon underground tanks were installed at each home. As a result, the developer was able to build all-propane homes that were as marketable as those of his competitors. In addition, the developer saved money on the Endangered Species Act 10-A permitting process and mitigation.

Complete this course by taking the online quiz at propanetrainingacademy.com.

Please visit www.buildwithpropane.com for more information about PERC. The case studies for this course were provided by HBH Gas Systems and AmeriGas.