

# LP Gas Applications for Rural Energy Development

## Multi-purpose LP Gas

LP Gas is the world's multi-purpose fuel. Hundreds of millions of people currently use it and depend on it to provide a wide range of productive services – not only around the home, but also for thousands of applications on the farm, in commercial business, in industry and transportation. Wherever heat, light or power is required, LP Gas delivers.



### Rural Access

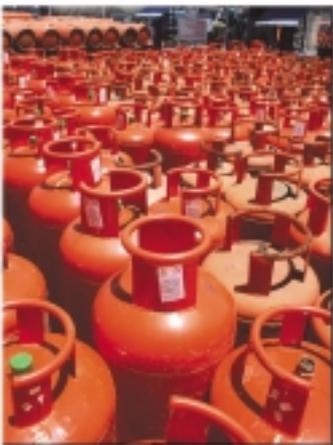
For decades rural communities have benefited from LP Gas, which has enabled access to modern conveniences, especially where costly grid-based energy services are unavailable. LP Gas can be stored and easily transported and because it is also clean and efficient, it can be used anywhere to deliver excellent energy service options.

### Cooking Plus

LP Gas is popular in residential and commercial applications where it is used for cooking, heating, water heating, drying, and refrigeration – accounting for about half of the LP Gas consumed worldwide. LP Gas is well-suited as an indoor fuel because it is inherently clean, burns without smoke or residual particulate matter and is virtually free of toxic gases. In rural communities, LP Gas can provide many households with a first modern alternative to traditional cooking fuels (e.g. firewood, charcoal, dung), contributing to a better quality of life and importantly, liberating women and children from time spent collecting fuel, thus enabling them to pursue education or value-added economic activities within the community.

### Productive Services

Beyond the household, LP Gas is capable of generating multiple productive services in the community and supporting commercial and industrial growth in the local economy. Access to LP Gas in rural communities can improve community life, health and sanitation. It also allows the creation and/or modernization of small commercial and manufacturing enterprises such as food preparation and processing, agriculture, cleaning, sanitation, and metal works. LP Gas can contribute significantly to improved living for rural communities. In combination with simple, reliable and proven technologies, it can deliver a wide range of modern energy services.



cooking • hot water • central heating • space heating • air-conditioning  
sanitary hot water • refrigeration • greenhouse heating • flame weeding •  
crop drying • waste incineration • distillation • metal working • ceramic  
and glass production • laundry • painting (drying and curing) • drying  
(cement, bricks) • cigarette lighter fuel • pre-heating of material • aluminum  
die-casting • laboratory (crucibles) • remote emergency lighting • thawing  
• pre-heating engines • paint removal (burning) • mobile & remote  
electricity generators • feedstock for production of chemicals

## FOOD PREPARATION AND PROCESSING

There are many types, sizes and arrangements of community or commercial LP Gas appliances available for the preparation of food, including steam tables, barbeques, braising pans, fryers, broilers, griddles, food and dish warmers, rice cookers, soup stations, steamers, roasting ovens, pizza ovens, and woks. These LP Gas appliances provide instant heat, precise temperature control and eliminate the need to wait for wood or charcoal fires to get hot or to carry wood over long distances.

### Roasting

LP Gas ovens provide reliable heat for roasting coffee, cacao, pimento and peanuts, eliminating smoke contamination from open fire methods and preventing spoilage associated with sun-baking.

### Water heating

LP Gas water heating is quick, clean and safe. Water may be heated in a single pot or through a water heater appliance providing large quantities of hot water for restaurants, community bathing facilities, and health clinics. With these appliances, hot water may be used immediately or stored.



### Fish smoking

Smoke ovens fuelled with LP Gas are a popular way of preserving fish while adding flavour. These simple ovens can also be used for preserving poultry and meat, adding value to local products.

### Portable heating appliances

Simple low-cost infrared burners clamp directly to the LP Gas cylinder making it possible to have temporary heat wherever needed. Infra red heat is highly efficient since it heats only objects, not air.

## COMMUNITY SERVICES

Community planners will find that they need not wait for expensive natural gas or electric grid systems to be constructed in order to provide citizens with modern energy services. LP Gas can be used to provide community services that benefit groups of residents. For example, LP Gas can be used for shared refrigeration, building and street lighting (flame and electric), water heating for public shower and sanitation facilities and even mosquito control. LP Gas, when combined with generator kits, can provide electricity to health centres and government buildings.

### Refrigeration

LP Gas can deliver cooling and refrigeration services through the absorption cycle process, either for households or for shared refrigeration banks in the community. Health clinic services, for example, can be greatly improved when crucial vaccines and medicines are preserved with LP Gas refrigeration. Likewise, shared refrigeration preserves the quality of food and improves health and sanitation. LP Gas refrigerators are reliable, have no moving parts, are easily serviceable, and have been widely used in rural areas for more than 60 years.



### Water heating

Large capacity hot water heaters can be used for community clothes washing and bathing facilities. Self contained storage or instantaneous heating without storage are readily available options.

### LP Gas Lighting

LP Gas lighting extends the hours for productive work or recreation in rural communities. The steady light is valued for reading, studying and recreation as well as providing security. Compared to candles or kerosene there is no polluting smoke or eye irritation from clean burning LP Gas lights.

### Electric lighting

An alternative to LP Gas lighting is electric lighting powered by an LP Gas generator. Various sizes of generator sets are available depending on requirements. The generators can meet a variety of electrical needs.

### Mosquito Control

An LP Gas powered device can be used in the community as a safe and effective option for controlling mosquitoes, reducing the use of potentially harmful chemical spraying.

## POWERING THE LOCAL ECONOMY - SMALL COMMERCIAL AND INDUSTRIAL ENTERPRISES

**E**nergy use is strongly linked to economic development. LP Gas can provide energy services needed to develop value-added economic activity, create jobs, and generate income in rural areas – leading to the creation of locally owned businesses and micro-enterprises.

LP Gas supports a wide range of industrial processes and services, notably where a high degree of precision and flexibility in process temperatures, as well as a strong flame are required. Common applications include: Heat treatment furnaces; direct firing of ceramic kilns; glass working; textile and paper processing; paint drying; cotton singeing; metal works; brick, glass and pottery making. LP Gas can also provide back-up reliability for industrial electricity generators. These industrial applications stimulate the development of a variety of micro-enterprises and generate income at the community level.

### Metals processing and ceramic furnaces

LP Gas is used for bright heat treatment of low-carbon steels annealing copper, braising of steel and for die-casting and metal moulding. Glass, pottery and ceramic furnaces rely on LP Gas to power melting furnaces, annealing furnaces and tempering furnaces.

### Shea butter processing

Shea butter, common in many parts of Africa, is used both for cooking and as a skin treatment. Recently, it has found new international markets as a basic component for cosmetics, ointments, beauty creams and soaps thus providing commercial business income and opportunities, often for women. Karite, or shea nuts are gathered in the wild, cooked and shelled then crushed in presses where the “butter” is extracted from the nuts. New mechanical presses have greatly increased the amount of oil that can be extracted and LP Gas is used to provide quick efficient heat for the refining process.



### Mechanical power

The Multifunctional Platform developed in Mali provides an excellent model for demonstrating the many mechanical functions that can be performed from a single bottle of LP Gas. The Multifunctional Platform incorporates a variety of functions, including a cereal grinder, a dehusker, an oil press, a cutting saw and other carpentry tools, a welding machine, power for water distribution, lighting and battery charging. All of these functions support rural women by providing them with a simple and affordable source of energy for a wide variety of tasks. The platform can be tailored to the needs of the community and the technical and financial resources.

### Boiling and Scalding water

Boiling water is often necessary to ensure sanitary and safe food processing whilst scalding water (slightly below boiling temperature) is a practical way of removing feathers from fowl (chickens, turkeys, ducks, geese). LP Gas scalders are commercially available.

### Drying and curing

Process heat dryers are used for curing and drying a variety of products including leather, meat and fish, cinder blocks, lumber, bricks, carpets and textiles.

## AGRICULTURE

**L**P Gas is used to increase the production and the quality of farm products through crop harvesting, crop drying, and weed flaming. It is also used to heat breeding houses for livestock and poultry, and to power farm equipment such as irrigation pump engines. Agriculture and horticulture industries use LP Gas as the “growing” fuel for indoor farming applications.



### Irrigation pump engines

A portable LP Gas engine is a convenient and economical way to drive irrigation pumps. These engines can also be disconnected from the pump and used for other power needs such as generating electricity, powering mechanical grinding mills, and driving various types of manufacturing equipment.

### Crop Drying

Because sun drying is not always reliable and rain and humidity can lead to ruined or damaged crops, LP Gas can be used to power rice, corn and grain dryers more efficiently and effectively – preserving the economic value of the crop regardless of the weather.

### Weed burning

Weeds can be effectively controlled with LP Gas powered portable torches. The intense heat burns brush as well as eradicates green weeds that rob crops of precious nutrients. Clearing irrigation canals of weeds improves water flow. Hand held torches connected to an LP Gas cylinder make weed control convenient and efficient.

## SAFETY

**W**hile there is considerable awareness of the environmental and economic benefits of LP Gas, it is also important to note that LP Gas is a safe fuel with an outstanding health and safety record. It is non-toxic, non-poisonous and doesn't contaminate aquifers or soil. It burns cleanly, and has a low flammability range. LP Gas bottles are strong and safe and the fuel is produced, transported and consumed in a 'closed system' that prevents exposure to the ambient air. Nonetheless, care must be taken when using combustible fuel, including LP Gas and LP Gas appliances. Proper training of those handling LP Gas and equipment always contributes to the safest usage. In particular, appliances and equipment should be built to high quality standards, and installation and use of the fuel and equipment must be in accordance with recognised standards. Practices which can undermine the inherent safety of LP Gas, including the following, should be avoided at all times: Illegal acquiring and branding of cylinders; illegal filling of cylinders; reuse of scrapped cylinders; over-filling of cylinders; and filling of cylinders at autogas service stations.

LP Gas has the highest specific energy content of traditional fuels typically used in rural areas - 5 times greater than barked wood.

### About the LP Gas Rural Energy Challenge

The LP Gas Rural Energy Challenge is a public-private partnership initiative between the United Nations Development Programme (UNDP) and the World LP Gas Association (WLPGA). It is designed to create viable and sustainable markets for LP Gas delivery and consumption as a means to generate a wide range of productive services contributing to sustainable energy solutions to improve people's lives in selected countries.

An important premise of the LP Gas Challenge is that LP Gas is a resource that generates multiple productive services extending well beyond the household, providing the means by which to improve community life, health and sanitation. Access to LP Gas in these rural communities also supports to the creation and/or modernization of small commercial and manufacturing enterprises dealing with food preparation and processing, agriculture, ceramics, glass and metal works. The LP Gas Challenge partners hold the common conviction that the growing demand for energy services in developing countries presents an historic opportunity to satisfy this demand in ways that are compatible with sustainable development. In particular, that expanded access to LP Gas can have profound and beneficial effects on the economy, environment and the quality of rural life.



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