

LPG INDUSTRY

Sector Update - January 2011

Liquefied Petroleum Gas (LPG) is a naturally occurring hydrocarbon fuel in gas and oil fields or extracted in oil refineries. The principal constituents of LPG are propane (C₃H₈) and Butane (C₄H₁₀) while other elements include ethane and pentane. It is a lighter gas than other petroleum products.

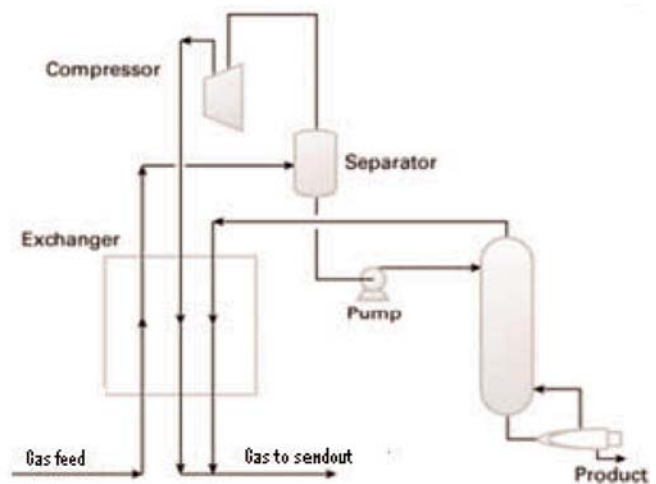
In some cases when natural gas is extracted from the Earth's crust, it is a mixture of several gases. Roughly, 95% of gas consists of methane which is distributed by utilities companies. The remaining composition comprises around 2% propane and 3% other gases such as butane, ethane, nitrogen, hexane and carbon dioxide. However, depending on the richness of the gas field, this proportion may vary across regions where the level of methane can drop to less than 80% while a single residual gas may exceed up to 10%. At times, gases required to produce LPG may even be nonexistent in a particular reservoir.

In crude oil refining, around 10% of crude processed is refined into LPG. For the purpose of transportation, it is stabilized by separating lighter gases for distribution through tankers. The primary motive of a gas processor or oil refiners is to extract fuels such as methane, gasoline, diesel, jet fuel etc. Consequently, LPG is produced as a natural derivative in the first stage of processing or refining. Although its extraction is linked to the production of gas and oil, it remains a useful fuel for domestic and commercial use. In line with global trends, around 60% of LPG is extracted from natural gas in Pakistan while the remaining comes from refineries.

LPG at normal temperature and pressure is a gas form and changes to liquid when subjected to modest pressure. For standard cooking and heating purposes, LPG is usually produced as a mixture of propane and butane. Propane starts vaporizing at -45°C while butane starts vaporizing at -2°C. Thus, a mixture of the two constituents is required to enable it to sustain longer in cold environments. A typical gas processing plant is presented in the flowchart below:

Locally, there are ten units engaged in the production of LPG. Of those, Pak-Arab Refinery Limited (PARCO) and JJVL are the major producers while others include Oil & Gas Development Company Limited (OGDC), Pakistan Petroleum Limited (PPL), National Refinery Limited (NRL),

Pakistan Refinery Limited (PRL), Orient Petroleum International Inc. (OPI), Pakistan Oil Fields (POL), Byco Petroleum Limited (BPL) and Attock Refinery Limited (ARL). Apart from refineries and oil & gas exploration companies, JJVL is the only company which is solely dedicated to the production of LPG and NGL.



The supply chain of LPG comprises a network of marketing companies and distributors. Presently, there are 76 marketing companies registered with OGRA. The marketing companies then further assign agencies and distributors.

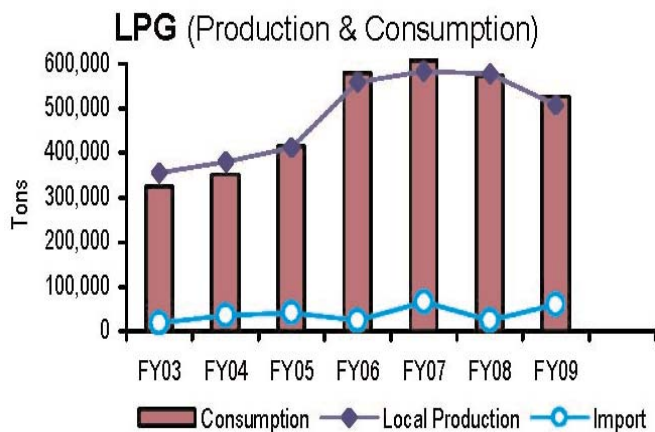
LPG is most commonly referred to as the poor man's fuel. It is largely used domestically for cooking and heating where there is no availability of natural gas. However, the rising trend in petroleum prices over the years has encouraged its usage in the auto sector. To some extent, it is also consumed in industrial units. Region-wise, around 50% of the total consumption is in Punjab followed by Sindh, Khyber-Pakhtoonkhwa and Balochistan in order. In an effort to curb deforestation and promote the cause of environment friendly fuel, the Government of Pakistan has made it mandatory for marketing companies which are procuring LPG from Sindh to supply at least 10% LPG in Balochistan and companies receiving LPG from Punjab to supply 7% in AJK and 6% in FATA.

The local LPG prices are deregulated with a condition that they don't exceed the Saudi Aramco Contract Price (Saudi CP). OGRA may interfere in case there is an unjustified hike in prices. The local produce price of LPG is determined by the producers depending on their costing and estimated margins. Therefore, different prices are

quoted by various producers. Apart from taxes, additional margins are added by marketing companies and distributors before it can be sold to the final consumer. Most local producers are vertically integrated and own marketing companies either at the company or the group level. This provides an additional opportunity to enhance margins.

The fluctuation in price is dependant on the volatility of Saudi CP and demand & supply equation in the market. In Pakistan there is a gap in demand and supply of LPG, which varies due to the cyclical nature of the industry where sales tend to be higher in winters.

The following graph explains the consumption and supply trend in the local LPG sector:



NGL is a gaseous liquid hydrocarbon such as N Butane, I Propane, N Propane, C6+ etc processed and purified into finished by-products. NGL is more useful as raw material rather than as fuel for combustion but its extraction adds significant value to an LPG plant. The product should not be mixed with Liquefied Natural Gas (LNG) as the latter is simply a condensed natural gas liquefied for the purpose of easy transportation. In Pakistan, NGL is mainly exported with hardly any local use.

Pakistan has one of the lowest per capita LPG consumption rate in the World. On the contrary, the country is significantly dependant on oil and gas for meeting its energy demand through both indigenous and foreign sources. With around 15%-20% population having access to natural gas, there is immense potential for the LPG market to gain grounds on the basis of its affordability, efficiency and storage capacity. A sizable proportion of natural gas and crude oil is being transported/refined daily without extracting LPG from it.

Jahangir Kothari Parade (Lady Lloyd Pier)

Inspired by Her Excellency, The Honorable Lady Lloyd, this promenade pier and pavillion was constructed at a cost of 3 Lakhs and donated to the public of Karachi by Jahangir Kothari to whose genrosity and public spirit the gift is due. Foundation stone laid on January 5, 1920. Opened by Her Excellency, The Honorable Lady Lloyd on March 21, 1921.

Dome: A roof or vault, usually hemispherical in form. Until the 19th century, domes were constructed of masonry, of wood, or of combinations of the two, frequently reinforced with iron chains around the base to counteract the outward thrust of the structure.

Origins: The dome seems to have developed as roofing for circular mud-brick huts in ancient Mesopotamia about 6000 years ago. In the 14th century B.C. the Mycenaean Greeks built tombs roofed with steep corbeled domes in the shape of pointed beehives (tholos tombs).

Otherwise, the dome was not important in ancient Greek architecture. The Romans developed the masonry dome in its purest form, culminating in a temple built by the emperor Hadrian. Set on a massive circular drum the coffered dome forms a perfect hemisphere on the interior, with a large oculus (eye) in its center to admit light.



Jahangir Kothari
Parade

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