LPG
A wholesale and retail view

OW Poole

Rockgas Limited, PO Box 38-721, Wellington, New Zealand. Telephone 64-4-576-6200, Email owen.poole@rockgas.co.nz

Introduction

Most of us think of LPG as being a relatively recent energy source in the New Zealand market. This is not so for in 1934, some 70 years ago, Propane was imported from the United States of America in 100 lb cylinders and decanted into smaller camping-sized cylinders and so was born the LPG wholesale and retail market. The originator of this market was Bottle Gas Distributors, later to become Rockgas Limited

Much has happened in the industry since that humble beginning 70 years ago. There is now:

Local supply of LPG
Supply and delivery in bulk
Supply by reticulation
A forklift cylinder market
Nationwide supply
National Service Station Network
Widespread industrial and domestic use
A market of in excess of 150,000 tonne

From 1934 and through to today, there are three industry characteristics:

The market is growing
New uses are continually being developed for LPG
Safety is paramount

LPG is an exciting product and one which offers a great deal of advantages over other energy sources and the most exciting part of the industry is the wholesale and retail sectors which concentrate on promoting this fuel nationwide and presenting cost effective solutions to a diverse customer base.

To understand the industry some explanation of the industry structure is necessary.

There are four basic production facilities:

Maui
Natural Gas Corp / Kapuni
Waihapa
Rimu

The next step in the industry is Liquigas, which was originally formed as part of the Think Big strategy to provide a national storage and distribution network.

Liquigas has a contract to purchase LPG from Maui for the life of the field dating back to 1980. Liquigas has over the intervening years shrunk from being a total monopoly controlling all LPG supply.

Today Liquigas coordinates supply, shipping and storage of product for the South Island with seafed terminals at Christchurch and Dunedin. In the North Island Liquigas supplies some product, shipping, and storage facilities to service the Auckland/Northland market; the balance of the market being supplied by producers such as Kapuni and Swift's at Waihapa and Rimu.

Wholesalers purchase product from Liquigas, Maui, Kapuni, Natural Gas or Swift's. Their sourcing depends on price, ownership links or contractual relationships.

This product is picked up in tankers ranging from 3 tonne through to 18 tonne.

Critical Issues

Supply

I am happy to be able to say: "There is no shortage of LPG, neither currently nor in the foreseeable future".

Let me repeat that. "There is no shortage of LPG, neither currently nor in the foreseeable future".

Any reduction of LPG supply from Maui can be substituted by imports from Australia. Imports are used to eliminate any demand/supply imbalance. LPG is transported in pressurized ships from New Plymouth and Australia to seafed terminals owned and operated by Liquigas in Christchurch, Dunedin and Auckland.

Last year in excess of 10,000 tonnes of product was imported into New Zealand to meet winter peak demand. The industry forecasts that imports will continue until such time as Pohokura and/or Kupe produce LPG.

Price

The price of LPG is extremely important as there is a correlation between the differential in the price between LPG and competing fuels and industry demand. Going forward with the move towards importing and new field development, international pricing is becoming more of a reality. Like natural gas, LPG pricing in New Zealand has been sheltered from international pricing trends because of long-term supply contracts with Maui.

Over time LPG will move to some relativity to international pricing. The benchmark pricing internationally is Saudi contract price or CP price.

Having said that, I strongly caution the production side of the industry that the very best they should expect to achieve over time is export parity pricing, ie their net back equivalent they could achieve selling on the international market, definitely not import parity, being the CP price plus freight to New Zealand.

Storage

LPG is stored as a liquid under pressure in bulk tanks similar to those shown.

These particular tanks are being installed at Rockgas Christchurch and will hold 660,000 litres of product to service the Christchurch market and to provide back-up storage to support the fast growing reticulation system.

Adequate storage must also be provided at customer sites and at cylinder filling depots and franchises to meet both average and peak demand.

Service

LPG does not have the luxury of continuous supply lines and therefore adequate storage either in cylinders or bulk tanks must be provided at the customers' premises. This must then be supported by a robust and proactive distribution network with high levels of service. With LPG it is distribution and service which provide continuity of supply. A variety of methods are used to schedule including telemetry, milk runs and previous usage. Deliveries range from 35 litre cylinders to 35,000 litre tanker loads.

Capital/Labour Intense

By its very nature the wholesale and retail sectors of the business are capital intensive. Unlike other industries every new customer and increased demand from existing customers, requires additional capital expenditure, be it for cylinders, bulk tanks, vaporization or reticulation pipe work. LPG wholesaling and retailing is therefore a rich man's business due to its insatiable demand for new capital.

The industry is also labour intensive at the cylinder end. Each cylinder must be manhandled on at least five occasions in its business cycle, which can be as often as daily. Cylinders must be filled by weight, labelled, leak tested, delivered and connected to the customer's supply point. This all makes for a high cost labour intensive operation. Empty cylinders weigh from 10 kg to 50 kg and from 20 kg to 140 kg when full.

Regulation/Safety

The industry, due to its hazardous nature, is subject to an onerous and costly regime of regulation, legislation and Codes of Practice. Of prime importance is the need for safe practices and safe operation. Having said that since 1980 the industry has moved 1.7 million tonnes of product within New Zealand without any serious safety incidents.

Distribution Systems

There are three main systems of delivering LPG to customers:

Reticulation

Bulk

Cylinders

Each has its specific challenges.

Reticulation

There are a number of LPG reticulation sites operating throughout New Zealand. These range from small domestic reticulations, which in the main are uneconomic, through to major ones such as the Rockgas reticulations at Queenstown where effectively the whole town out to and past the airport is serviced by mains, and in Christchurch where the Rockgas reticulation runs from Sydenham to the airport via the CBD.

Reticulation of LPG is expensive when done correctly and supported by safety systems. It is more complex than reticulating natural gas as it involves two products, Propane and Butane, both with differing Dew points and therefore network sizing expertise and vaporization expertise are essential.

From a customer point of view they have surety of supply, metered billing, no requirement for large isolation distances as is the case for a bulk tank and reduced town planning and resource consent issues.

Bulk

Where there is no reticulation available, large users of LPG can be supplied bulk LPG.

Bulk product is transported in road tankers of various sizes up to a capacity of 18 tonne of LPG into bulk tanks owned by the wholesaler at service stations and industrial sites.

Storage on customer sites range from 1-40 tonne. Many industrial sites include complex vaporization equipment to meet peak volume demand. Once again a complex set of

regulations, safety requirements and resource consents cover the installation of bulk tanks.

Cylinders

A considerable volume of LPG is supplied in cylinders for both commercial and domestic use. LPG is a portable fuel source and is available throughout New Zealand.

Cylinders range in size from 1kg to 200 kg, but the most popular sizes are:

4.5kg and 9kg	barbecues and cabinet heaters
18kg – 20 kg	forklifts
18kg, 45kg and 90kg	commercial and domestic

Cylinders are effective but labour intensive and therefore a costly method of providing energy of choice to a wide range of domestic, commercial and forklift customers.

Business Sectors

There are four major business sectors:

Automotive
Industrial/Commercial
Forklift
Domestic

Looking at these sectors they have both common and quite different drivers.

Automotive

In 1980 the Government offered incentives for vehicle owners to convert to either CNG or LPG and as a result of that and the quest for self sufficiency in energy, autogas accounted for 90% of all LPG used.

During the intervening period subsidies were removed which the public perceived was lack of support by Government for alternative fuels. Excise tax was imposed on LPG, increased and in more recent times LPG was exempted from special increases. Excise tax was removed from diesel and this was reflected in pump prices. There was a move away from six cylinder vehicles to cheap four cylinder Japanese used imports. All these factors combined, impacted severely on LPG demand.

Today, assisted by the availability of quality OEM vehicles with LPG options available from manufacturers as standard and fully warranted, automotive LPG has managed to hold the decline at 20% of total volume.

LPG is a viable and economic automotive fuel for medium to high mileage vehicles.

Government continues to support automotive LPG with a favourable excise tax regime in order to maximize environmental benefits that LPG delivers to the economy.

New Zealand is committed to Kyoto, which targets large reductions in CO_2 emissions. LPG has a huge role to play in this.

100,000 cars on LPG would deliver a 300,000 tonne per annum reduction in CO_2 emissions or 16% of New Zealand's Kyoto target for the transport sector.

In addition LPG particulate emissions are typically an order of magnitude lower than diesel. When compared with petrol LPG contains:

- approx 15% less in greenhouse gas emissions
- 20% less carbon dioxide emissions
- up to 80% less emissions of air toxics

LPG is a 'here and now' solution and should be grasped and championed by Government AND Local Government in the interim until new hybrids are available commercially at an affordable price.

If Auckland is to address its particulate problem, which the Ministry of Transport estimate causes around 399 premature deaths from cancer each year, then immediate consideration should be given by the Regional Council and Central Government to promoting automotive LPG as a clean fuel which is not only beneficial to the environment but also to occupational health.

Industrial/Commercial

This sector is supplied either via the reticulation, bulk or cylinders.

Typically installations on commercial sites are as follows:

Reticulation
Bulk
Cylinders

No energy requirement is too large or too small for LPG. Selling to this sector requires expertise in LPG, vaporization, thermal dynamics and boiler operation. To be effective it is necessary to work closely with the customer to determine their exact requirements and match equipment and supply to meet their demands.

Lead times for large industrial sites vary from 3-12 months depending on the site development.

Domestic

Domestic demand is growing rapidly but it is a labour intensive and costly sector to service with demand increasing

500%-600% winter over summer. As this is in the main weather driven, it is difficult to service.

Typically a domestic customer may have all the following:

Instant water heating

Gas hob

Flame effect fire

and in an increasing number of cases, central heating.

Such installations are serviced by a Cylinder HomePack comprising 2 x 45 kg cylinders with either manual or automatic changeover between cylinders.

Another sector of the domestic market is serviced by 9kg and 4.5kg cylinders.

In summer the use is BBQs and in winter cabinet heaters. 9kg cylinders are used to fuel the 500,000+ cabinet heaters which are in the market.

This market is serviced by service stations and specialist cylinder fillers as 7 day a week extended operating hours are necessary to meet customer buying pattern.

Forklifts

Due to low emissions from LPG and the need for robustness in operation, many forklifts are powered by preference on LPG. Cylinders are mounted on the rear of the forklift and can either be exchanged or filled insitu on the forklift from a bulk tank through an automotive type pump.

There is little seasonality in forklift demand.

Why are we so enthusiastic about LPG?

Basically it is because it offers so many advantages. It is portable. It is versatile and each year that passes sees more and more innovative uses for LPG.

As the Minister of Energy said in discussing the life cycle of individual fuels –

"LPG is coming into the sunshine".

What makes LPG so attractive?

Portability

LPG is portable and is available in every corner of New Zealand.

Efficiency

Burnt at source rather than for power generation, therefore no generation on line losses.

Clean burning ensures boilers operate efficiently.

Price

LPG is priced competitively with other fuels and is not subject to peak load pricing tariffs which apply in the electricity industry.

Control

LPG provides chefs with instantaneous control of heat and as such is a preferred cooking fuel over electricity.

Infrastructure

In the main LPG storage and infrastructure equipment is provided by the supplying wholesaler.

Innovative/unusual uses for LPG:

Weed control

Jet boat fuel

Kiln drying of timber

Powering turbine buses

Frost protection

Horticulture

Plastic moulding

Hot air balloon

These special uses together with all other drying, cooking, water heating, boiler firing, space heating, across a wide spectrum of industry make LPG an exciting and vibrant sector of the energy business, with a bright future going forward. There will be challenges ahead on pricing, but unlike natural gas there is no shortage of supply and other than price and capital for infrastructure, there is little impediment to future growth.

I am confident of the future for LPG and urge Government and producers to get behind the wholesalers and encourage further growth for the betterment of New Zealand and for the betterment of the environment.