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Maximum efficiency and safety with LNG



NATURAL GAS: THE FASTEST GROWING MAJOR ENERGY SOURCE IN THE 21ST CENTURY



Global energy needs are growing each day and the world will need more energy to meet increasing demand over the coming decades.

Natural gas is projected to be the fastest growing major energy source in the 21st century being clean, economical and easy to transport.

Calor LNG, working with our pan-European fulfillment partners Prima LNG is ready to bring you the energy you need to run the production, vehicles, ships and everything else on which you rely.

LNG, Liquefied Natural Gas, is natural gas in liquid form. It is one of the most exciting forms of energy today because it can deliver all the benefits of natural gas to customers who do not have access to the gas grid.

LNG is the right solution for clean, economical and efficient energy.



Clean

LNG is inherently safer than its oil-based counterparts, due to its non-toxic and non-corrosive qualities. It's better for the environment too. The combustion of natural gas releases significantly less CO₂, NO_x and SO_x and virtually no ash or particulates. As it evaporates rapidly when exposed to the air, it leaves no residue on water or soil.



Economical

LNG is far simpler and more economical to produce than any other fossil fuel. Its price is more stable compared to other fuels, enabling businesses to forecast energy costs.



Easy to store and transport

Worldwide stocks of natural gas are considerably greater than those of accessible crude oil, making LNG less dependent on oil-producing nations. Moreover, liquefied natural gas is just as easy to transport as petrol or diesel because it does not depend on an underground pipeline network.

Additionally, the process of cooling natural gas into a liquid form shrinks the volume so that the fuel occupies around 600 times less space than when in its gaseous form. This also reduces the weight of the fuel in its liquid form: as its density requires limited space, it is easy to transport.

LNG in numbers

100

If spilled, LNG would not result in a slick because 100 percent of it evaporates.

99

LNG reduces particulate emission by over 99%, compared to coal.

30

By switching from heating oil or heavy oil to a gas appliance, a reduction in combustion CO₂ of over 30% can be achieved.

Natural gas, the cleanest of the fossil fuels, can be used in many ways to help reduce the emission of pollutants into the atmosphere. Burning natural gas instead of other fossil fuels emits fewer harmful pollutants, while an increased reliance on natural gas can potentially reduce the emission of many of the most harmful pollutants.

Characteristics:

- Chemical formula: CH₄
- Boiling Point: -162°C
- Liquid Density: 426 kg/m³
- Lighter than air at ambient temperatures
- Lighter than water
- Gas Density (25°C): 0.656 kg/m³
- Specific Gravity (15°C): 0.554
- Flammability Limits (in air by volume): 5.3% to 14%

LNG is categorised as a cryogenic liquid gas due to its extremely low temperatures of -160°C. Despite this, the main constituent of LNG is methane gas, which creates a flammability range of 5 to 15% by volume in air. These properties result in extremely high efficiency for the user and can be demonstrated by the fact that LNG can achieve a higher calorific value than propane and an impressive 15.2 kWh/kg output.



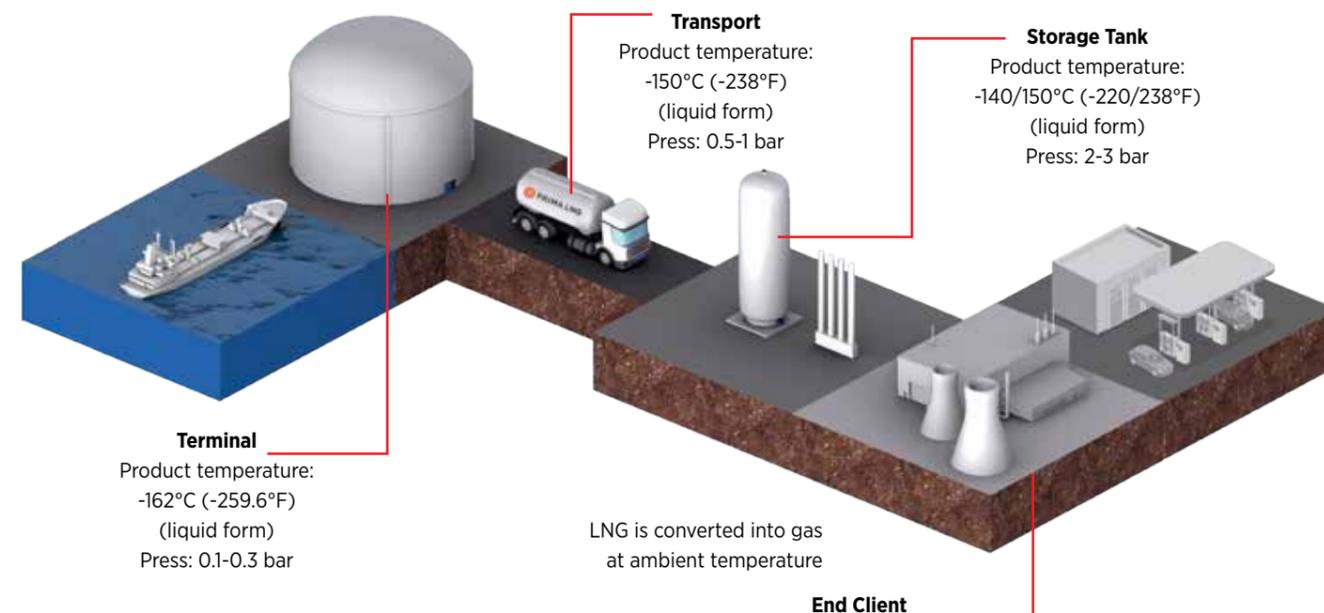
»LNG has a high calorific value and is storage- efficient: it allows you to stock large quantities of energy in a small space. It has the same benefits as methane, where methane systems are not available.«

Easy to transport, easy to use

LNG's calorific value is much higher than other fuels.

Thanks to its density (0.45 kg/l) efficient storage solutions provide large energy stocks in limited space.

In the course of its transformation to a liquid, the ambient gas undergoes a volume reduction of approximately 600 to one. It can then be easily loaded aboard specially designed tankers for transportation.



Calor LNG delivers natural gas to you

Calor LNG offer proven turnkey solutions that include feasibility analysis, engineering, equipment installation and supply. These are complemented by full maintenance and support services to keep customers' equipment in optimum condition throughout its operating lifetime.

Calor is the local business unit of SHV Energy in Ireland and the first point of contact for Calor LNG customers. Calor work in partnership with Prima LNG, our pan-European sister company and fulfilment partner, which has a wide range of experience and expertise to provide high quality and high-value equipment and LNG; whenever and wherever required.

Working with our approved cryogenic suppliers, Prima LNG can supply equipment for commissioning in all countries supported by local engineering teams providing ongoing service and maintenance. Our customers are offered

a full turnkey solution to switch to LNG and benefit from the lower cost and sustainability benefits of natural gas compared to other off grid fuels.



Prima LNG is the central supply and logistics expert within SHV Energy across Europe.



Prima LNG brands

One dedicated contact under one unified brand to serve all your branches within Europe.



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These entities provide people and businesses with decentralised, personalised energy solutions and services. Our customers often live or work in areas beyond the natural gas grid and rely on our companies for their most important energy sources. Today, SHV Energy service the needs of over 30 million customers over three continents that use our energy for hundreds of applications.

Our global story - from the terminal to your door

Prima LNG is one of Europe's leading suppliers of LNG to small-scale industrial customers, particularly those who do not have access to the gas grid. We deliver this clean, safe and cost-effective fuel to customers who recognise the advantages of using LNG in industrial processes and to road haulage and shipping companies who rely on it as an alternative transportation fuel.

Working with our approved cryogenic suppliers, we offer proven turnkey solutions that include feasibility analysis, engineering, equipment installation and supply. These are complemented by full maintenance and support services to keep customers' equipment in optimum condition throughout its operating lifetime.

Using our own specialist fleet,

Prima LNG transports LNG cost-effectively from terminals throughout Europe to our many customers in the food, asphalt and agricultural markets, shipping and road haulage industries, among others. With the capability to serve customers more than 1,500 km from the point of supply, we enable businesses to move away from oil and diesel-based products to a cleaner, quieter and more efficient fuel.

Supply of LNG always at your service!

Prima LNG's safe and competitive solutions are based on SHV Energy's more than 100 years of experience in the LPG sector, which is directly transferable to the LNG industry.

Prima LNG's access to multiple international loading points within Europe give customers more than security of supply. They also give customers the assurance of a customised, flexible and reliable service.

Customisation

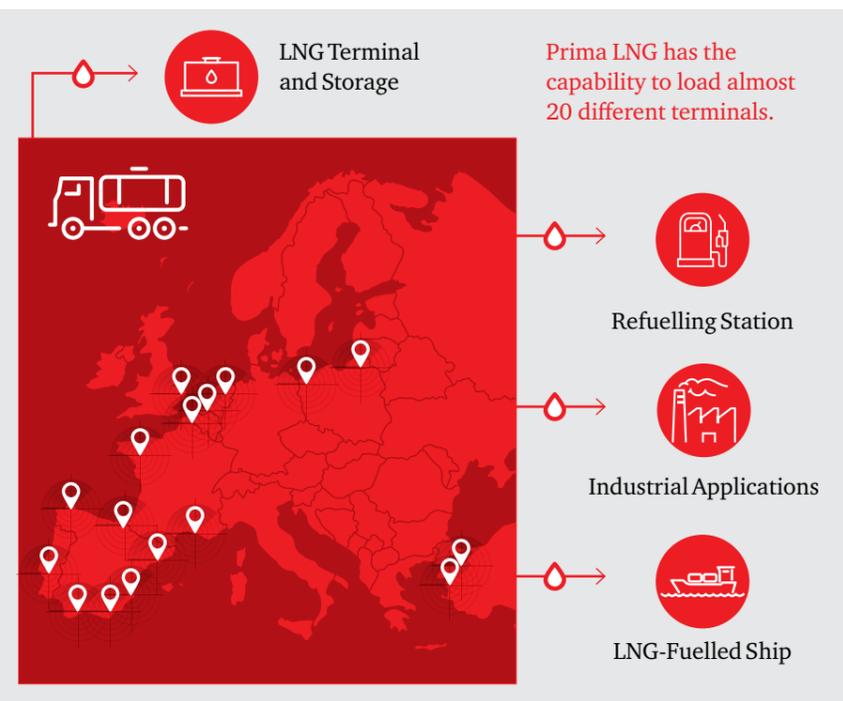
Prima LNG can tailor the supply of LNG to each client's requirements with the flexibility to customise features such as duration, indexation and price optionality. Our goal is to give each client the best experience and to be as close as possible to their particular needs and budget.

Flexibility

We supply LNG in a flexible way according to each client's individual needs. We listen to our clients' requirements and, wherever feasible, incorporate them in our models to provide better prices. We recognise that our clients' needs change over time and so are happy to dynamically adjust the terms of supply accordingly.

Reliability

Prima LNG sources LNG from virtually all terminals across Europe using own fleet of LNG trailers and is capable of delivering LNG in a cost-effective way to customers more than 1,500 km from the point of supply. We plan contingency routes so that in the event of an emergency, we maintain the uninterrupted ability to deliver anytime and anywhere.



Logistic capabilities

More than 25% of all LNG truck loadings within Europe are done by Prima LNG.



In Europe we have our own distribution fleet of LNG trailers transported by our logistics partners who specialise in transport of cryogenic gasses. These trailers are located across Europe, based at the main LNG terminals.

Prima LNG manages the supply chain through owned assets and selected partners.

- Prima LNG has proven distribution expertise. Our in-house fleet ensures that the LNG supply your business needs is simple to arrange.
- Our private fleet of trailers ensures that your supply of LNG is always there whenever you need it.
- Our large fleet enables us to serve businesses throughout Europe, offering the best possible price with motorway, waterway and railway among possible delivery routes.

Logistic partners

GCA	
Jongeneel	
Levorato	
Schenk	
SR Group	
Ncl	
Hoyer	

These cryogenic trailers are optimised for transportation of liquid natural gas with a tank capacity of almost 58,000 litres. These are some of the biggest LNG trailers on the market in Europe in order to achieve maximum payloads to minimise logistics costs. All trailers have inner and outer vessels in stainless steel with multilayer vacuum insulation. This allows us to load in every European LNG terminal and have the maximum holding time to minimise any warming of the product.



Make the switch

Our team will design a bespoke solution to help reduce energy costs and improve efficiency

Our Energy Specialists can complete a free no-obligation energy consultation. We'll review your current fuel needs and advise if you'd benefit from switching to LNG, based upon predicted cost and carbon reduction target.

When you decide to make the switch, you'll be allocated a dedicated account manager. They'll be your ongoing contact with us from your local business unit, getting to know your company's needs and recommending how best we can serve them.

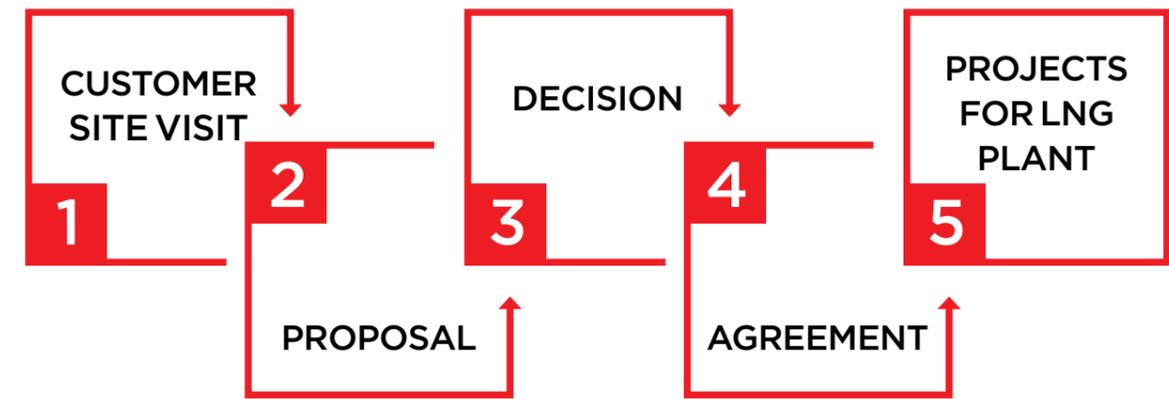
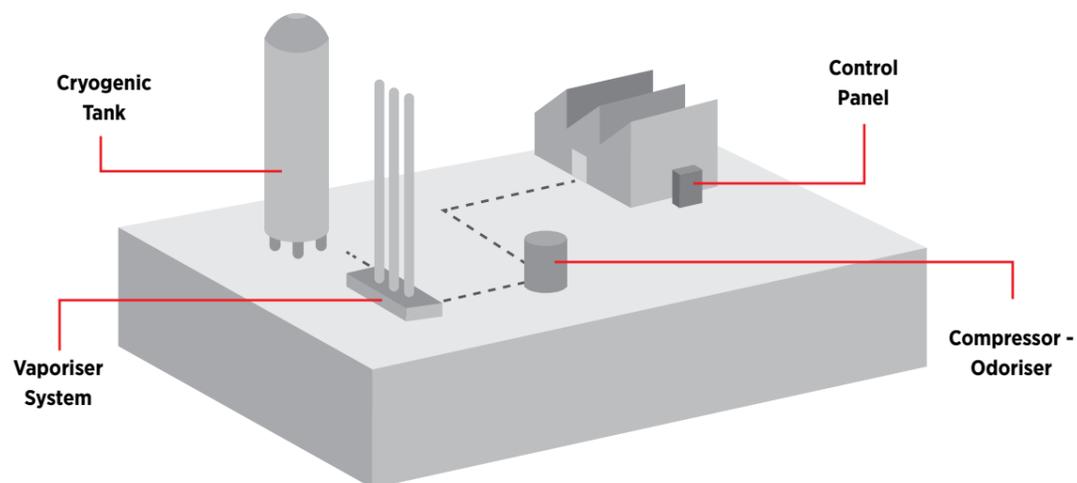
Turnkey LNG solutions

Working with approved cryogenic suppliers, Prima LNG supplies equipment for commissioning in European countries supported by local engineering teams providing ongoing service and maintenance. Calor LNG work in conjunction with Prima LNG to offer the full turnkey solution for a customer to switch to LNG and benefit from the lower cost and sustainability benefits of natural gas compared to other off-grid fuels.

LNG arrives in tanks from different terminals across Europe. LNG is transported safely to ensure a timely supply of energy for production companies that are energy-intensive, like your own.

The main components of an LNG plant include a cryogenic tank, an ambient air vaporiser, a compressor unit and an odoriser. LNG is transferred from the tank into the vaporiser; here it

evaporates through ambient heat and it is channeled into the compressor at controlled temperature and pressure. The gas is then odorised using an additive to ensure maximum safety.





System installation

Following the decision to switch to LNG, the process is very simple.

You might expect switching to be complex, but we take care of the entire project, from initial specification to testing, commissioning and ongoing maintenance support. We will ensure your installation is completed quickly and with minimal disruption to your daily business operations.

- 1 Analysing the site**
Our expert engineering team examine your site to position where the LNG System will be installed. Our engineers prepare the installation project according to the local regulations and requirements and provide a detailed specification including equipment layout, P&ID and electrical and mechanical requirements for the site.
- 2 The civil work for the tank is laid**
The construction work of the foundation for the LNG satellite plant starts under the close supervision of Prima LNG and your local business unit's experts.
- 3 The tank and other equipment is delivered and installed**
The LNG storage tank and equipment is delivered to the site, unloaded and the expert technical team supervised by Prima LNG and your local business unit carry out the assembly of the LNG satellite plant and the other system equipment.
- 4 The system safety units are installed**
While the tank is installed, the safety and security warning panels for the system are set up to ensure that the site operates in the most efficient and safe manner. Once completed, the expert technical team of Prima LNG provides training for all personnel both on the theoretical and practical nature of the installation.
- 5 The LNG System is ready for use**
The LNG System is now ready for use. The installation is commissioned and Prima LNG can provide everything from the first site review to the installation and commissioning of the system, as well as maintenance services as requested by you.



Remote monitoring

Our sophisticated telemetry system allows us to remotely monitor the contents of your tank and schedule top-ups on your behalf to ensure that you never run out.

- Our secure web service ensures a continuous process and supply.
- The system provides 24/7 monitoring of the plant. Alerts are generated and sent via text messages.
- The LNG logistics unit receives regular updates on the amount of LNG in the tank.
- Prima LNG and customers have real time overview of the plant's status.





LNG for industrial applications

Gas is used in industrial processes for energy and heat by customers who want to benefit from the lower cost and sustainability advantages of natural gas compared to other off-grid fuels.

Natural gas is the cleanest burning fossil fuel, allowing companies off-grid to switch from crude oil-based products to reduce their carbon footprint. By switching their energy source from heating oil or heavy oil to gas, companies can reduce CO₂ emissions by more than 30%.

While gas pipelines are the most common delivery method, LNG offers businesses that do not have access to the natural gas grid - or that have insufficient pressure or flow in the existing network - the opportunity to use this clean, cost-effective and efficient energy source.

LNG also gives companies that are connected to the natural gas grid the flexibility to meet peaks in demand.

Moreover LNG allows you to keep your production processes running 24/24 without having to shut off for cleaning.

LNG as a fuel

Maritime industry

LNG bunkering is the process of transferring liquefied natural gas to a ship for use as fuel and it is gathering momentum following the change to the Marpol legislation which limited Sulphur emissions from ships in northern Europe. LNG is a potential solution for meeting these requirements as it has virtually no sulphur content and its combustion produces low NOx compared to fuel oil and marine diesel oil. In addition LNG rapidly becoming more common as a cost-effective alternative due to the growth in gas production through the cost-effective access to unconventional gas reserves.

Truck Fueling

LNG as an alternative for diesel or heavy fuel oil in the truck is now becoming a reality. With new regulations promoting the use of cleaner and lower noise-emitting energy sources, combined with the high energy density of LNG, gas burning engines are now developing rapidly in the market.

Manufacturers and fleet operators are discovering that LNG as a fuel has many benefits:

- 1 Economic**
The higher purchase cost of LNG vehicles is compensated by more stable fuel prices, which are often lower than other fossil fuels.
- 2 Environmental**
LNG is the cleanest fossil fuel with CO₂ savings of 27% compared with petrol, 12%



With the Euro VI vehicle emission standards targeting a significant decrease in greenhouse gas emissions and noise reduction measures, LNG as an alternative for diesel or heavy fuel oil is fast becoming a reality.

against diesel and up to 97% when using methane from a renewable source. Following MARPOL legislation limiting sulphur emissions from ships in Northern Europe, LNG is becoming increasingly popular as a marine fuel as it has virtually no sulphur content and its combustion produces lower NOx emissions than fuel oil and marine diesel oil.

- 3 Noise reduction**
Noise and vibrations are reduced by 50% in natural gas-fuelled trucks (72dB (A) versus 82dB (A)). Furthermore, LNG trucks meet the PIEK standards that govern noise emission during loading and unloading, particularly important for

accessing the city centre and for night-time distribution.

- 4 Safety**
The physical properties of LNG make it a very safe fuel in comparison to other energy sources and natural gas fuel systems must meet the most stringent international safety standards, assuring their proper design, installation and mechanism.
- 5 Greater range**
As an LNG tank contains three times more energy than its CNG equivalent, its range is comparable to a diesel truck. Trucks can travel thousands of kilometres before needing refuelling.



»The small scale LNG market is developing quickly with opportunities to use natural gas as a lower cost and more sustainable option for mobile energy.«

Switch to LNG, reduce your costs, maximise your profit

Running a business can be a difficult venture.

Keeping an eye on costs, especially on growing energy costs for large, energy-consuming businesses, is vital to maintain profitability. To free your business from its energy dependency on oil while at the same time cutting energy bills, LNG is the right choice.

Switching fuels to LNG is a simple process.

First of all, a detailed study of the current process is undertaken by the local sales and technical team to calculate your requirements in terms of energy and peak demand. This is then translated into a specification for an LNG installation and linked to a full solution package including delivery of LNG to your facility. Once a decision is reached, the installation will be ordered, built and commissioned to your specification.

Our aim is simply to reduce your energy costs and carbon emissions substantially, backed up by great customer service.

This process takes around 3-6 months (depending on the country) and once installed, the conversion from current fuel to natural gas can be completed. Afterwards, all stock management and equipment servicing can be managed remotely to ensure a continuous process is maintained.

Why choose Calor LNG?

- 
All-in-one solution
 Distribution, equipment and supply.
- 
Quick supply
 Shorter lead times compared to our competitors.
- 
24/7 service
 Telemetry monitoring with secure web service, text messages and live parameters.
- 
Delivering as promised
 On-time deliveries with reliable centralised supply, our own fleet and logistics partners who specialise in transport and cryogenic gases.
- 
Bespoke service
 Tailor-made solutions with technical expertise based on the latest technologies.
- 
Always available stock
 Reliable centralised supply means LNG is always available at your site, even at peak times.
- 
Safety
 Our high-quality equipment is rigorously tested through Hazard & Operability (HAZOP) studies and Failure Modes & Effects Analysis (FMEA), complies with important internationally recognised health and safety certifications such as ATEX and IECEx.
- 
One dedicated contact
 One contact under one unified brand to take care of you throughout Europe.
- 
Competitive LNG price
 Our access to many terminals and loading points within Europe assures you of competitive LNG prices.
- 
We speak your language
 Our drivers speak several languages and do everything within their power to answer your questions in your preferred language.



A name you can trust

As part of the SHV Energy Group, the world's leading distributor of LPG, Calor LNG combines the purchasing power and know-how of a multinational company with the flexible, personal service that comes from dedicated local support and account management. Founded in 1896, SHV Energy serves over 30 million customers in 28 countries on three continents.

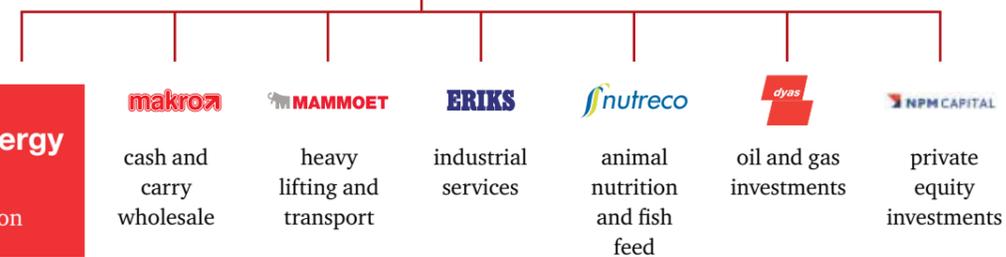
PRIMA LNG POWERED BY SHV ENERGY

SHV Holdings
60 countries,
60,000 employees,
€ 18.1 billion
turnover.

SHV Holdings Group is a multinational organisation, founded in 1896 in the Netherlands, consisting of 7 groups of specialised companies. The group operates in more than 60 countries on three continents and is backed by 60,000 employees worldwide with €18.1 billion turnover across a diverse base of activities.



▲ SHV Energy
energy distribution



Prima LNG is part of SHV Energy, the world's leading distributor of LPG. Recognising the huge market potential of liquefied natural gas (LNG), Prima LNG was established in 2013 to accelerate entry into the small-scale LNG market in Europe.

Gas solutions for all energy and fuel requirements

SHV Energy services 30 million consumers on three continents.

SHV Energy is the world's leading supplier of LPG and other portable energy sources.

Today, SHV Energy services the needs of over 30 million consumers on three continents.

SHV Energy's consumers often live or work in areas beyond the natural gas grid and rely on SHV Energy's companies for their most important energy sources.

Advancing **Energy**
 >>> Together

SHV Energy today



30
million
customers



3
continents



28
countries



15,000
employees

SHV Energy brands

Balcas	
Butan Plin	
Calor Gas	
Gaspol	
İpragaz	
Liquigas	
Liquivex Plin	
Pinnacle Propane	
Prima LNG	
Primagas	
Primagaz	
SHV Gas Supply	
Supergas	
SuperGasbras	
Xiweigaz	



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Calor complies with the International Organisation for Standardisation ISO 9001.



CALOR