Energy Security Through LNG

CHART
Cooler By Design

LNG as a primary and secondary fuel source for businesses, institutions and communities

LNG – the optimum energy solution

At a time when it is not possible to rely entirely on uninterrupted energy supplies from gas pipelines,the electricity grid or renewables, companies and institutions must address their energy independence.

Installing a Chart Compact LNG Satellite Station is the perfect solution if you're looking to replace or supplement insufficient or unreliable pipeline gas capacity, meet additional load and seasonal variations, supplement renewable resources when the sun doesn't shine or the wind doesn't blow and/or provide an emergency supply during outages.

Not only does a back-up system eliminate risk but it can also result in avoiding severe financial penalties if you're otherwise forced to curtail supply.

Using LNG as a back-up fuel instead of diesel, LPG or any other heavy fuel oil has many similarities:

- Liquid fuel is delivered by a local contractor and stored on site until it's needed
- Turning the system on seamlessly provides fuel at the point of use
- Range of local contractors to choose fuel supply from

But also some significant advantages:

- Greater efficiency; using stored natural gas to augment pipeline natural gas utilizes the same delivery system to the point of use
- Improving your credentials as a good corporate citizen by typically reducing emissions of CO_2 by 25%, NO_2 by 90 % and eliminating SO_2 and particulates

LNG helps with what is referred to as the '**energy trilemma**', finding the balance between affordability, security of supply and driving down emissions.

LNG Compact Satellite Station

Incorporates LNG storage, vaporization, pressure regulation and control systems to deliver natural gas exactly as if it were from a physical pipeline. All equipment is shop built and either supplied as a single composite unit or modules that can easily be hooked up on site.

Every back-up solution is delivered factory tested complete with CE mark and associated certification to facilitate fast and efficient on-site installation and commissioning.

Technical solution

Complete station suply includes:

- Cryogenic storage tank/tanks
- Pre-instaled product vaporizers
- Process piping
- Instrumentation
- Electric tream heater
- Control & safety system

Features:

- “Plug and Play” solution
- Variability of instantaneous output – from 1 to 5 MW per hour
- Single source solution – designed, engineered and manufactured in-house
- On-site installation and commissioning – “ready to go” solution
- Fully and easily relocatable
- Complete range of storage volume and flow capabilities
- Seamlessly compatible with BioLNG
- Design in accordance with multiple climate zones
- Continuous 24/7 operation

Technical benefits:

- Generators maintain equivalent efficiency to when they're operating with pipeline gas
- No turbine upgrade is required
- No SCR equipment on the vent stack

Solution for low to medium energy consumers

Aimed at institutions such as schools, hospitals, hotels, small factories, offices and community housing estates, particularly during higher load winter period.

Comprises a single skid mounted module incorporating storage, vaporization and control. For customers that means single truck transport, single crane lift and one day commisioning.

3 different storage size options:

- **20 000 litres** vertical tank
- **40 000 litres** horizontal tank
- **60 000 litres** horizotal tank

Benefits:

- Quick installation process
- One day commissioning
- Simple start up process
- Unmanned and fully automated operation
- Remote monitoring & control including cellular communication for servicing and process data trend analysis
- Lowest operational costs

Solution for medium to high energy consumers

Intended primarily for manufacturing companies that need gas for production processes as well as heating. Is also suited to communities, or small towns as a natural gas source for domestic heating and cooking and/or electricity generation.

Incorporates easy to install modules comprising separate skids for vaporization and storage, together with all interconnecting pipework, odoriser and controls as required.

Range of cryogenic tank options from 40 000 to 100 000 litres. Storage is modular hence capacity increases are made by incorporating multiple identical tanks.

Benefits:

- Low installation costs
- Minimal foundation work
- Wide range of storage capacities
- Coverage of instantaneous consumption up to 5 MW
- Guaranteed reliability
- Chart proven control and safety system

After-Sales & Service

Leveraging the skills and experience of the Chart family to provide a comprehensive aftermarket program with single source accountability.

Field Service

Your field service partner across Europe. Full range of services including calibrations, routine maintenance, shutdowns and turnarounds, performance optimization, repairs and emergency response.

- Multiple service locations
- Core cryogenic expertise
- Supplemental specialist knowledge of subsidiary companies
- Single source contact and accountability
- Unrivalled experience
- Largest installed equipment database

Repairs & Refurbishment

Serving the complete range of cryogenic tanks including bulk tanks and liquid cylinders (MicroBulk), ISO containers, tank trailers and other mobile units, piping systems and valves.

- All repairs and refurbishments carried out in accordance with recognized international accreditations and fully warranted
- 'As new' condition includes full vacuum leak check with mass-spectrometer, pressure test, renewal of piping systems and valves and painting

Cryo-Lease

Chart's Cryo-Lease program offers reduced capital investment and improved financial stability. Short or long-term operating leases to suit your needs. Finance lease options for additional project flexibility.
Details on request.

Frequently asked questions:

What is LNG?
LNG is natural gas that has been liquefied by refrigerating it down to −260 °F (−162 °C). Liquefaction reduces the volume to 1/600 th of its gaseous volume enabling gas to be economically stored and transported.

What is LBG?
LBG (liquid bio-gas and also known as bio-LNG) is a 100 % renewable version of LNG derived from waste organic matter. All Chart LNG equipment is fully compatible with LBG.

How is LNG transported and stored?
The Virtual Pipeline is a substitute to a physical pipeline whereby liquid natural gas is transported in cryogenic containers from its source to the point of use by sea, road, rail or a combination of one or more of these.

Chart produces all types of cryogenic distribution equipment including road trailers, ISO containers and railway wagons.

Do I need to manage a range of equipment suppliers and a project I don't really understand?
No! Chart is a complete one-stop shop and provides an end to end optimized solution; from the earliest pre-feasibility discussions right through to maintenance and service packages to ensure your equipment is always operating at peak performance.

I'm nervous about investing in a new and unproven technology.
You're not! Chart has been pioneering cryogenic technology for more than 70 years and has thousands of installations in successful operation around the world.

Capital expenditure projects can take a long time to be approved. Is there an alternative?
Yes. Contact Chart about our Cryo-Lease programme.

Please contact us

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Why choose Chart's solution:

- More than 70 years of cryogenic experience
- Single source solution
- Hundreds of reference points across Europe
- Significant engineering, manufacturing and after-sales network throughout Europe
- Chart is a public company quoted on the NYSE (GTLS) with extensive operations across the world