



Marine LNG gas systems

LNG and LCNG filling stations

LNG bunkering systems

LNG regasification systems for industry

Liquefaction of natural gas to LNG

Services & Parts

Turn-key small and mid-scale LNG systems



Marine LNG Fuel Systems

Cryonorm Marine LNG Fuel systems for inland and seagoing ships

LNG today's fuel for tomorrow

Cryonorm is a leading designer and supplier of tailor made cryogenic LNG systems and vaporizers.

The LNG systems are developed to meet the highest international standards as well as applicable regulations.

The Marine LNG Fuel Systems are marine class certified by the appointed third party class inspection agencies.

Cryonorm, based close to Amsterdam, The Netherlands, has engineered and manufactured LNG systems for decennia.

Besides turn-key natural gas liquefaction plants Cryonorm developed and produced cryogenic systems, vaporizers, cryogenic pipe skids, storage tanks and LNG Fuel System solutions.

The company employs in total 100 people of which +18 engineers having a long background in cryogenic LNG Systems, air separation and industrial gas installations.

Our construction facilities cover 8.000 m² and about 65 skilled production workers execute the manufacturing in direct supervision of the design engineers.

The in-house engineering and construction under direct supervision, allows us not only to deliver a high quality product, but this equally at a competitive price.

Cryonorm Marine LNG Fuel Systems for inland and seagoing ships

The use of liquefied natural gas (LNG) as a marine fuel has taken on added significance as a result of the IMO's stringent requirements concerning emissions from ships.

With the current growing demand for LNG as fuel for propulsion more and more LNG Fuel Systems are needed.

The transition to LNG in the shipping industry is fully put in motion.

Worldwide transport policy is focused to improve the efficiency and sustainability of transport. In order to achieve the new limits of emissions the shipping industry is looking for new, more sustainable fuels and technologies.

LNG is considered one of the most economical and realistic solution, LNG as a fuel offers significant environmental advantages over well-known traditional fuels for ships. LNG powered ships readily comply with the highest emission standards.

Natural gas is the cleanest fossil fuel on earth.

The main advantages of using LNG as fuel are:

- Lowering emissions
- Reduction on fuel costs and ship operational costs
- Noise reduction
- Cleaner engine rooms
- A defined volume of LNG contains 600 times more energy than the same volume of gaseous natural gas

The safe and convenient onboard storage and handling of LNG is ensured by the Cryonorm LNG Fuel System, so far Cryonorm engineered, manufactured and installed Marine LNG Fuel Systems for:

1. **Argonon of Deen Shipping**
The first dual fuel powered inland ship provided with one 40m³ LNG Fuel System
2. **Greenstream and Greenrhine of Interstream Barging**
The first two 100% gas electric powered inland ships in the world each provided with two 40m³ LNG Fuel Systems
3. **Eiger from Danser Containerline**
Retrofit of inland ship from Diesel to Dual Fuel provided with one 60m³ LNG Fuel System
4. **Coral Star and Coral Sticho of Anthony Veder**
Short sea ships with dual fuel propulsion each provided with two 100m³ LNG Fuel Systems

Cryonorm Marine LNG Fuel Systems consist of:

- Marine Class Approved systems, built according current rules and regulations such as IMO IGC / IGF, type C tanks etc.
- Technical engineering input towards classification societies for approval process, which includes for example HAZOP and HAZID meetings
- Full engineering of the complete LNG Fuel System from process engineering up to the operating and maintenance manual
- Fabrication of the complete LNG Fuel System that consist of: bunker stations, Type C Vacuum Insulated LNG Fuel tank, Tank Connection Space, LNG Vaporization, Gas processing, water-glycol, control, monitoring and ESD Systems
- Installation supervision and commissioning of the LNG system onboard the ship.
- Assistance during first Gas trial, first cool-down, first fill of LNG
- Training, after sales services and spare parts
- All sizes of Type C tanks, vertical or horizontal. MAWP 10 barg
- Reliable and steady gas pressure towards ship engine by using
 - › Conventional Tank Pressure Building System
 - › Submerged LNG pump system

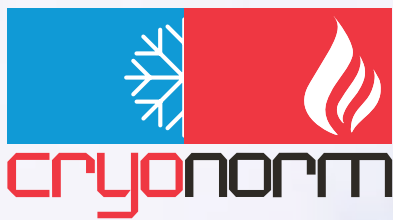
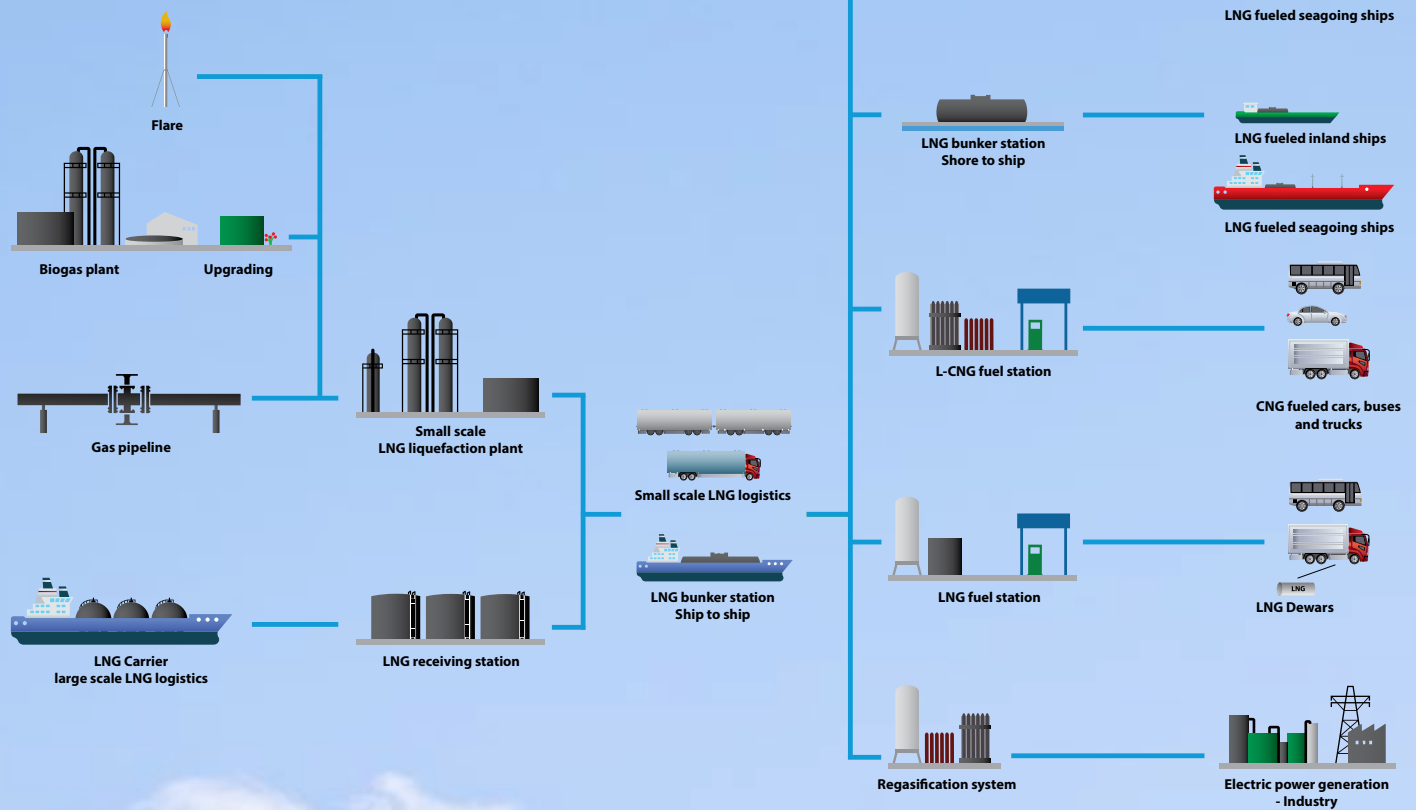
Cryonorm Marine LNG Fuel Systems are applicable for both seagoing and inland waterway, new-build or retrofit, 100% full natural gas propulsion or dual Fuel propulsion ships.

Small and mid scale LNG applications





LNG Supply chain



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■ Marine LNG fuel systems

- Inland ships
- Retrofit of existing ships
- Seagoing ships

■ LNG bunkering systems

- Land based
- Installed on ship

■ Liquefaction of natural gas to LNG

■ LNG and LCNG truck and bus filling stations

■ LNG regasification systems for industry

■ Services & Parts