Growing applications for LNG fueling development

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Čistá mobilita
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About Chart Ferox

Chart Ferox, a.s. – the European subsidiary of Chart Industries, Inc. (GTLS), a leading global manufacturer of standard and custom engineered high quality products and systems for a wide variety of cryogenic and heat transfer applications. Our equipment is used throughout the liquid gas supply chain in the production, storage and end use of natural gas and industrial gases.

CHART INDUSTRIES basic profile:

- increase of sales from $266 million in 2003 to $1,2 billion in 2014
- more than 5000 employees worldwide
- global operations with 32 principal facilities
- from a liquefaction plant down to a small liquid cylinder delivery
Small scale LNG chain

Ocean LNG carrier

Pipeline

ISO container

Receiving terminal

Rail car

Small LNG liquefier
stranded gas, biogas
or from pipeline

Vehicle fueling station
LNG Mobile fueling station

Fully function station with LNG saturation
LNG pump, up to 150 liters/min
flow meter, bill printer and fueling hose w connector
Automated flow control

20' ISO container
volume 20 m³ ... up to 8500 kg LNG

hydraulic oil drive of the LNG pump

Rental in Europe
by our partner
Flexible mobile fueling station

Pump drive from truck gear box
Fully independent
Good traceability
Truck necessary all the time

Natural gas drive
Independent of the truck
Independent of electricity
Fully flexible

Simply bring the unit to the site and serve LNG
Movable fueling station

30 up to 60 m³ LNG tank (12 000 or 24 000 kg LNG)

- 100% automated operation, 1 button process
- MID LNG dispenser
- 11 LNG buses in Olsztyn, PL

CNG option available up to 100 Nm³/h
Stationary LNG fueling station in Warsaw, Poland (2015)

LNG
- 2 tanks VT 60/18
- 3 LNG pumps
- 3 LNG dispensers

LCNG
- 2 high-pressure pumps
- 2 vaporizers
- Odorizer
- High-pressure buffer
- 2 CNG dispensers

5 min stop for LNG fueling
LNG dispenser

MID Approved

- Single or dual LNG pressures
- 35-175 LPM flow rate
- Real time density measurement
- BOG from vehicle tank management
- IFSF protocol for POS
- No moving parts
- Maintains the meter at cold temperature (no cool down period)
- 0.5% Accuracy
Scheme of the LNG fueling infrastructure development

2016

Optimal fleets:
- Mobile LNG station: 20 trucks
- Moveable LNG station: 40 trucks
- Fixed LNG station: 150 trucks

These 3 stations can serve LNG for 210 trucks

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LNG bunkering

LNG bunkering facilities
fuel tanks for ships (LNG)

- high operational savings for fleet managers
- environmental benefits
- the newest technology
- highest quality and safety level

Fuel tank with „gas tight box“

125 m3 capacity

LNG fast ferry

LNG power barge
LNG bunkering

LNG bunkering facilities + ship onboard LNG tanks

- Storage tank: 2x HT 500 m³ (total 1000 m³ gross volume)
- Cryogenic pump: 1700 liter/min
- VIP: DN150; 100 meters (under the ground)
- Refilling of the ships (e.g. BergensFjord – Norway – 2x 125 m³)
- Frequency of filling of ships – every night!

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LNG Rail Car

Why LNG on Rail?

Benefits
- Maximized payload
- Optimized for LNG and ethylene transportation
- Positive environmental effect
- Solid, reliable design
- Best thermal performance
- Safe & Easy operation
- Utilize existing rail infrastructure

Gross volume 111m³ = 2 road trailers
6 weeks holding time without vapor losses
Payload between 42.1 tons
Maximum Allowed Working Pressure 7 bar
Length 25 meters
LNG transport option to vehicle fuelling station

Initial

Medium

Advanced

6400 m³
Conclusion

- LNG fuelling technology is fully developed for initial projects and market expansion
- Rental arrangement decreases risk of investment in initial steps
- Different kinds of LNG transport bring environmental and economical benefits at each stage of market growth
- Synergy of LNG satellite regasification station and vehicle fuelling makes LNG affordable and attractive
Thank you for your kind attention

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