Contribution by VTG AG to the:

“Consultation on an EU strategy for liquefied natural gas and gas storage”

Sept 30th, 2015

Contribution by VTG AG to the EU consultation

VTG AG aims to make a special contribution to the EU consultation on the **transport and storage of natural gas** and would therefore like to state its position concerning **issues 11 &. 13.**

With its **newly developed tank wagon for LNG**, VTG Aktiengesellschaft is making a **positive contribution to** the "Consultation on an EU Strategy for liquefied natural gas and gas storage“

- The wagon was granted ***authorisation to be placed into service*** by the ***German Federal Railway Authority*** in April 2015.

Possibilities for transporting natural gas

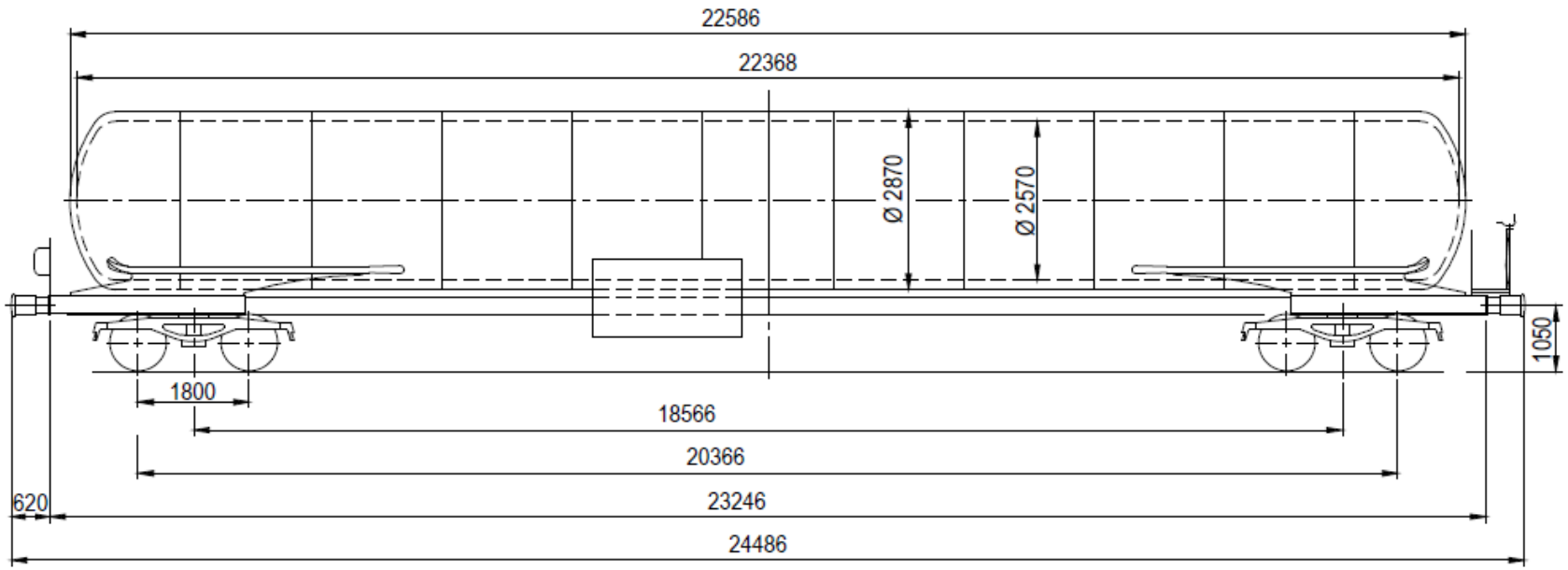
Status quo	Potentials
The distribution of natural gas is currently limited to: **Pipeline, ship, truck/tank container**	**Rail** represents the most *environmentally friendly* mode of transport here
Industrial consumers without a pipeline connection are excluded from using natural gas ▪ E.g.: Aurubis, the copper producer, is the only company with high energy consumption in Germany with its own pipeline connection	Creating new possibilities for transportation between storage facilities and customers

Possibilities for transporting natural gas

VTG AG helps to close the current gaps in coverage by developing a new wagon, which is capable of transporting natural gas in a liquid state at minus 162 degrees.

Innovation: The first European tank wagon for transporting liquefied natural gas by rail

Features of the LNG tank wagon



- Tank materials: inner tank stainless steel (1.4301), outer tank S355NL2
- Tank capacity (RID): approx. 111m³
- Tank code: R10, 4BN
- Calculation pressure (gauge pressure): 1.04 MPa = 10.4 bar
- Test pressure (gauge pressure): 1.04 MPa = 10.4 bar
- Operating pressure (inner tank): 0.7 MPa 0 7.0 bar
- Outer gauge pressure (outer tank): 0.1 MPa = 1.0 bar
- Operating temperature: -196 / +50°C
- Insulation: vacuum insulation
- Tare weight: approx. 45,7t, Holding time: 4-6 weeks

■ 22.5t axle load → max. payload line category C: ~ 36.6t → max. payload line category D: ~ 42.0t

Features of the LNG tank wagon

With an energy content of 600,000 kilowatt hours, the LNG wagon offers potential for meeting the energy demand, for instance, for:

Private households	▪ A block train consisting of 20 wagons, is capable of supplying **28,000 standard households**, consuming 5,000 kilowatt-hours of energy a year, with energy for **a month**.
Industrial enterprises	▪ The supply **of energy-intensive production facilities** in, for example, the steel, metal, chemical, paper, and mining industries can be guaranteed. ▪ Similarly, the supply of **energy producers**, such as gas and oil companies, can also be guaranteed.

Using tank containers from VTG can also extend the capacity.

Advantages of transporting LNG by rail

- **Transportation of large volumes in each transport batch at a low cost**
  - *By comparison: An LNG block train consisting of 20 wagons replaces as many as 52 trucks*
    - **Direct supply to end customers without a pipeline connection**
      - *Currently, Aurubis, the copper producer, is the only company in Germany with a pipeline connection*
        - **Can be combined with other VTG products and services**
          - *e.g: Tank containers, rail logistics*
        - **Bridges long distances**
          - **Flexible domestic supply compared to ships**
            - **LNG wagon as a temporary storage module**

LNG by rail

VTG opens up a broad range of supply options for natural gas and…

LNG by rail

… combines the environmental compatibility of rail transport with the sustainable properties of LNG as an environmentally friendly fuel and energy source for the future.

… represents a "rolling pipeline" for natural gas that promotes energy independence from Eastern Europe.

VTG: Leading European Rail Logistics and Wagon Hire Company

VTG Aktiengesellschaft

Wagon Hire

European leader for private-sector wagon hire with more than 80,000 wagons worldwide and further ambitions for growth.

Rail Logistics

Leading European rail logistics provider with tailor-made logistics solutions.

Tank Container Logistics

Global Logistics and Tank Container Hiring with fleet of approx. 7,600 tank containers.