Large-scale and small-scale LNG infrastructure in Europe: Status and Outlook

Wim Groenendijk, GLE President

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Who we are

- GLE is one of the three columns of GIE (Gas Infrastructure Europe), the European association of the Transmission, Storage and LNG Terminal Operators

- GLE membership:
  - 16 member companies
  - 9 countries
  - 2 observers

GLE represents ca. 90% of regasification capacity in the EU
LNG terminals in Europe (large scale)

- **EXISTING**
  - 22 LNG Terminals (197 bcm/a)

- **UNDER CONSTRUCTION / COMMITTED**
  - 6 LNG Terminals (32 bcm/a)

- **UNDER STUDY / PLANNED**
  - 24 LNG Terminals (> 146 bcm/a)


Source: GLE LNG Map, June 2014
Regasification capacity development

Regasification Capacity in Europe
in bcm/y

Total LNG capacity incl. proposed projects
LNG capacity existing and under construction

Source: GLE LNG Investment Database, September 2014
LNG storage capacity development

LNG Terminals' Storage Capacity in Europe
in mcm LNG

Total LNG capacity incl. proposed projects

LNG capacity existing and under construction

Source: GLE LNG Investment Database, September 2014
Low terminal utilisation, but ...

- LNG terminals are ready to run at full capacity on short notice if the need arises.
- LNG can arrive rapidly to LNG terminals, to mitigate any disruption of deliveries from other sources.

**LNG send out (mcm NG/day)**

- Total available: 537

Source: ALSI
Development of “new” LNG services continues

Reloading

- Transfer of LNG from the LNG tanks at the terminal into a vessel
- 10 LNG terminals have reloaded cargoes
- 12% of gross imports have been re-exported (6% in 2012) including to other EU countries

Transhipment

- Transfer of LNG from one vessel to another
- Offered in France, Spain and from 2015 in Belgium
Contributing to a low-carbon economy

• Natural gas is the **cleanest fossil fuel**. Substituting gas for more carbon rich fuels can substantially **reduce CO2 emissions** on the short term and contribute to the EU’s long term decarbonisation policy objectives.

• Gas infrastructure operators share the EU policy objectives to reduce harmful emissions and continuously pursue **technologically advanced solutions** to achieve them with the highest safety and efficiency.

• One such solution is the development of LNG and CNG (infrastructure) for **maritime and road transport**.
Liquified natural gas (LNG) is the alternative shipping fuel, reducing emissions by up to:

- SO$_x$: -100%
- NO$_x$: -90%
- CO$_2$: -25%

... and emits few particulates.

Adding renewable sources of gas to natural gas can even increase the attractiveness

Source: GasNaturally, Air quality and natural gas
On 15 April 2014, the European Parliament approved new rules to ensure the build-up of infrastructure for alternative fuels across Europe and the development of common technological specifications, including CNG and LNG refueling points:

- **2020 target CNG**: adequate refueling in urban agglomerations and densely populated areas
- **2025 target CNG/LNG (road)**: minimum number of filling stations along the TEN-T core network (150 km for CNG and 400 km for LNG mentioned as indicative maximum distances)
- **2025 target LNG (shipping)**: refueling in a sufficient number of TEN-T seaports
- **2030 target LNG (shipping)**: refueling in a sufficient number of TEN-T inland ports
- Common technical standards for CNG and LNG refueling points by 2015
Gas demand for transport is likely to increase substantially

- Natural gas volumes in transport are currently modest (0.4% of total gas demand), but the volumes delivered increased by 6% from 2011 to 2012

Loading of bunkering ships

• LNG is loaded on bunkering ships which supply to LNG-fuelled ships or LNG bunkering facilities for vessels

Truck loading

• LNG is loaded on tank trucks which transport LNG in smaller quantities

Rail loading

• LNG is loaded on rail tanks which transport LNG in smaller quantities

Source: World Maritime News
Source: IIP Digital
Source: GLE Services Inventory, March 2014
GLE Small-Scale LNG Map

Small Scale LNG Infrastructure

- LNG import terminal offering new LNG services
- LNG liquefaction plant
- LNG bunker facility for vessels
- LNG bunker ship
- LNG refuelling station for trucks
- LNG satellite storages (not included in map)

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Print versions of the maps (format: A0) can be ordered at gie@gie.eu
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## Back-up: Small-Scale LNG in Europe per type of Installation

<table>
<thead>
<tr>
<th>Installation</th>
<th>Status</th>
<th></th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>In operation</td>
<td>Under construction</td>
<td>Planned or announced</td>
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<tr>
<td>LNG terminals (large + small):</td>
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<td></td>
<td></td>
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<tr>
<td>Reloading</td>
<td>9</td>
<td>3</td>
<td>4</td>
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<td>Transhipment</td>
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<tr>
<td>Loading of bunker ships</td>
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<td>2</td>
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<tr>
<td>Truck loading</td>
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<td>7</td>
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<tr>
<td>Rail loading</td>
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<td>-</td>
<td>3</td>
<td></td>
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<tr>
<td>Liquefaction plants</td>
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<td>3</td>
<td></td>
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<tr>
<td>Bunkering facilities for vessels</td>
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<td>1</td>
<td>15</td>
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<tr>
<td>Bunker ships</td>
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<td></td>
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<tr>
<td>Refuelling stations for trucks</td>
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<tr>
<td>Satellite Storages</td>
<td>&gt;1000</td>
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### Back-up: Small-Scale LNG Installations per Country (Top 10)

<table>
<thead>
<tr>
<th>Country</th>
<th>Number of Installations*</th>
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<tbody>
<tr>
<td></td>
<td>In operation</td>
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<tr>
<td>Spain</td>
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<td>Portugal</td>
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<td>Belgium</td>
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<tr>
<td>Germany</td>
<td>3</td>
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<tr>
<td>Italy, Slovenia</td>
<td>2</td>
</tr>
</tbody>
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* excl. LNG Satellite Storages