Rotterdam LNG Hub
Gate LNG receiving terminal

Operational since September 2011
Rotterdam initiative Small Scale LNG
Extended LNG chain

LNG carrier

LNG receiving terminal & break bulk

vaporizer

Transit pipeline

Road trailer

LNG carrier for break bulk

Satellite plant

bunkering

Rotterdam
1. Environmental driver
LNG the fuel to meet ECA emission standards 2015
- low sulphur

Emission limits for transport by truck and ship are tightened and converging. LNG as transport fuel can meet these requirements

Truck: Euro V has been implemented in 2009, Euro VI will come into force in 2014.
Ships: CCNR v3 will have similar emission levels in 2014.
2. Regulation driver
EU support LNG as Transportation Fuel

• EC has published its alternative fuels strategy on January 24th.

  – The commission is proposing that LNG refueling stations be installed in all 139 maritime and inland ports on the Trans European Core Network by 2020 and respectively 2025

  – The Commission is proposing that by 2020 refueling stations are installed every 400 km along the roads of the Trans European Core Network.

  – CNG The commission proposal will ensure that publically accessible refueling points, with common standards, are available Europe-wide with maximum distance of 150 km by 2020

3. Market driver
LNG Prices compared to alternative fuels

Source: Bloomberg
LNG break bulk Rotterdam

The project:

• LNG supply via Gate terminal
• Reloading of LNG to smaller vessels and barges
• LNG Truck loading
• LNG loading of trains and containers under discussion
## Project outline

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<td><strong>Entity</strong></td>
<td>Gate</td>
<td>R’dam BB</td>
<td>R’dam BB</td>
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| **Scope**         | • Modifications Gate Jetty  
                   • Operational requirements | • 1\textsuperscript{st} dedicated jetty  
                   • 2 truck loading bays  
                   • Tie-ins @ Gate | • 2\textsuperscript{nd} dedicated jetty  
                   • multiple truck loading bays |
| **Ship size**     | > 7500 m\textsuperscript{3} | 1.000 – 20.000 m\textsuperscript{3} | 1.000 - 20.000 m\textsuperscript{3} |
| **KSF**           | • Gate jetty & operations suitable for backloading  
                   • Loading of small vessels  
                   • Customer contracts | • Plot allocation  
                   • HoA & TUA (market commitment) | • Market growth  
                   (adaptation LNG as fuel)  
                   • Enforcement by EU/IMO/local authorities |
| **Others Serv.**  | • Backloading small and regular LNG vessels | (Dedicated) storage | e.g. Quality upgrading |
| **Time**          | 2013 – 20.. | Q3 2014 - 2035 | 2020 - 2040 |
LNG loading in Rotterdam

- Sea going vessels: 5,000-40,000 m³
- Harbour barges for bunkering deep sea vessels:
  1,000-10,000 m³
- Inland bunkering barges
- Road Trucks: 40 to 60 m³

Capacity: 280 Ships per year per jetty
          1 truck per hour per loading bay

1 Jetty + 2 Bays is a capacity approx. 2 BCM/a = 1.3 Mtonnes
Current status Rotterdam LNG

- Heads of Agreements signed to use the dedicated small scale facilities

- Discussions on final binding contracts are ongoing

- Permit application 5 september 2012, outcome expected late March

- Government support “Green Deal” 5 july 2012

- EU subsidy application being prepared by Gasunie/Vopak/Port of Rotterdam as part of international consortium