



Rotterdam LNG Hub



Gate LNG receiving terminal



Operational since September 2011

Rotterdam initiative Small Scale LNG Extended LNG chain



1. Environmental driver

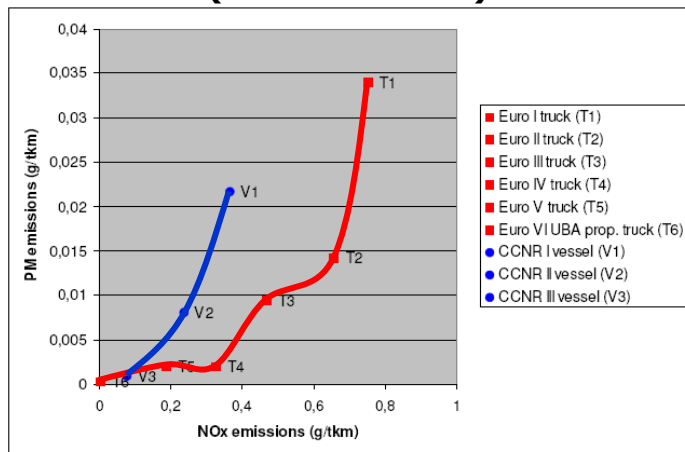
LNG the fuel to meet ECA emission standards 2015

- low sulphur

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

Tightening emission norms for trucks & ships

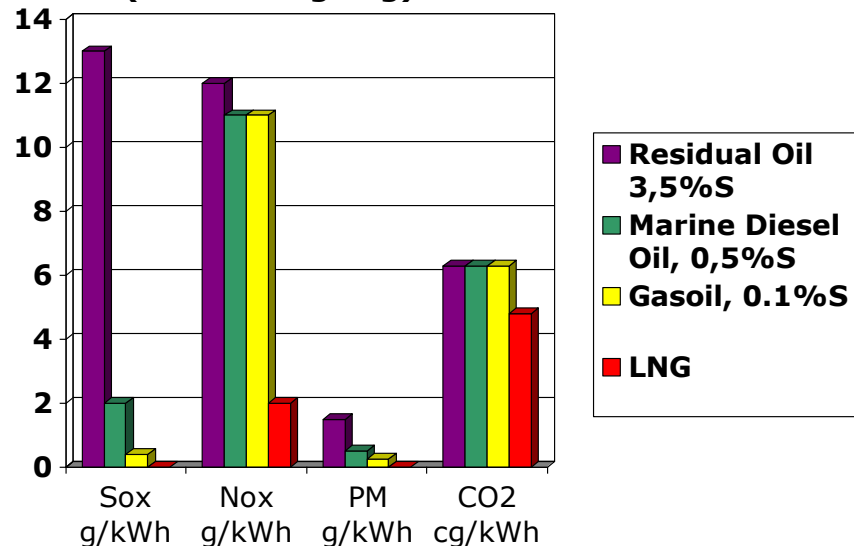
(Source: KEMA)



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

Emission comparison

(Source Magalog)



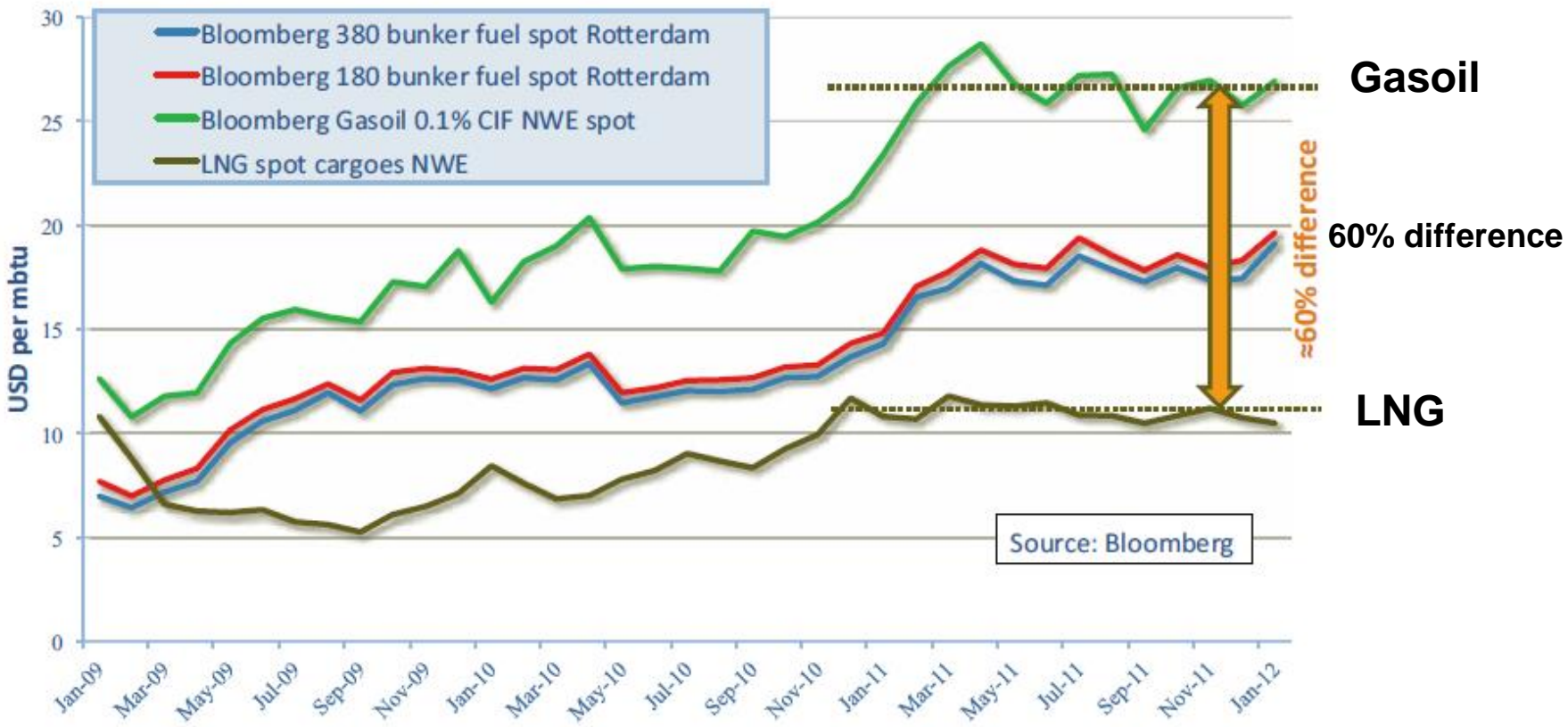
2. Regulation driver

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
 - http://ec.europa.eu/commission_2010-2014/kallas/headlines/news/2013/01/clean-fuel-startegy_en.htm

3. Market driver

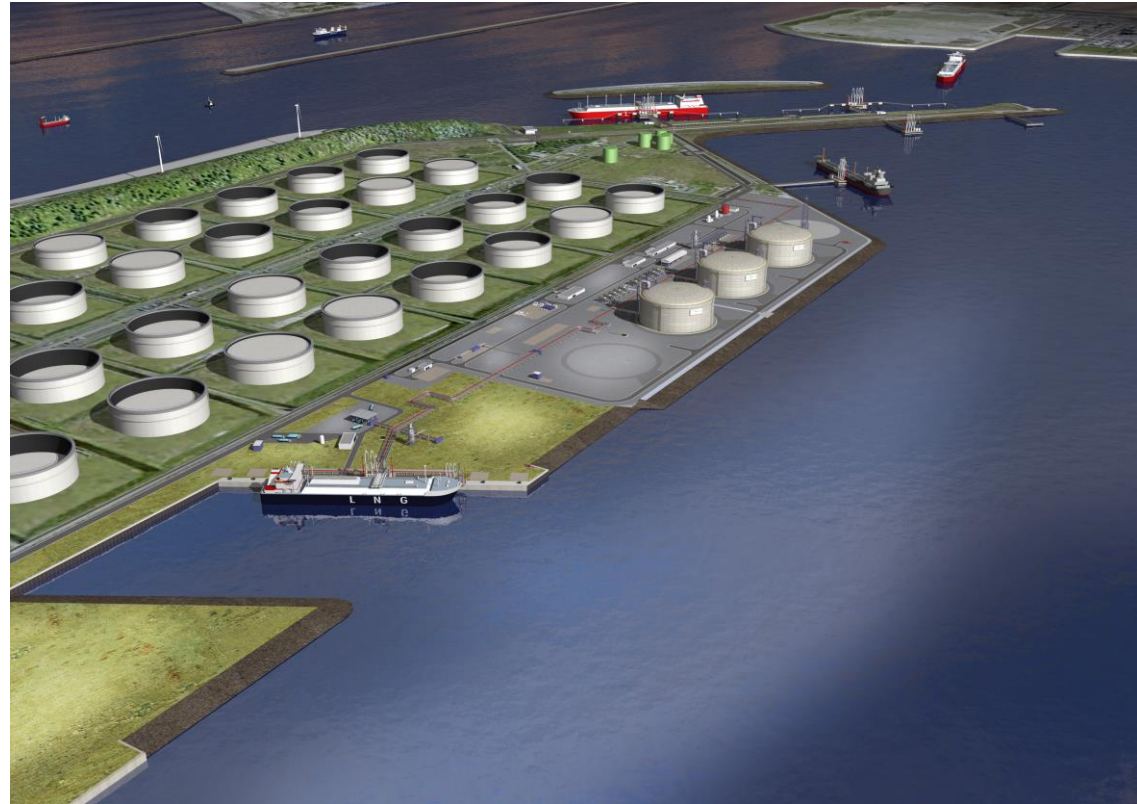
LNG Prices compared to alternative fuels



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

Phase	I - Bridging period	II – initial phase BB	III – continuation BB
Entity	Gate	R'dam BB	R'dam BB
Scope	<ul style="list-style-type: none"> • Modifications Gate Jetty • Operational requirements 	<ul style="list-style-type: none"> • 1st dedicated jetty • 2 truck loading bays • Tie-ins @ Gate 	<ul style="list-style-type: none"> • 2nd dedicated jetty • multiple truck loading bays
Ship size	> 7500 m3	1.000 – 20.000 m3	1.000 - 20.000 m3
KSF	<ul style="list-style-type: none"> • Gate jetty & operations suitable for backloading • Loading of small vessels • Customer contracts 	<ul style="list-style-type: none"> • Plot allocation • HoA & TUA (market commitment) 	<ul style="list-style-type: none"> • Market growth (adaptation LNG as fuel) • Enforcement by EU/IMO/local authorities
Others Serv.	<ul style="list-style-type: none"> • 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 60m³

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