



**EUROPEAN SEA PORTS ORGANISATION** ASBL / VZW  
**ORGANISATION DES PORTS MARITIMES EUROPEENS** ASBL / VZW

# Liquefied Natural Gas

## ESPO view on LNG and selected ongoing projects in North European ports



**Port & Shipping TECH, Genoa, 19-20 September**

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# Content



- 1. ESPO view on LNG**
2. Selected projects in North European ports
3. Conclusions



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# European Sea Ports Organisation

- ★ Founded in 1993
- ★ Represents European seaport authorities
- ★ Members from EU and neighbouring countries
- ★ Secretariat in Brussels
- ★ Recognised counterpart of EU institutions
- ★ A lobby and a knowledge network





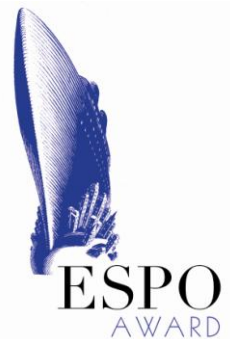
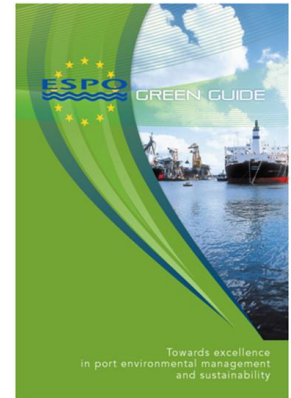


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# ESPO & the Environment

Encouraging ports to be **proactive in protecting the environment** by:

- ★ Providing guidance and preparing recommendations on environmental management (Green Guide)
- ★ Drafting guidelines on specific issues (e.g. nature protection)
- ★ Developing and promoting tools and methodologies for port environmental management (EcoPorts tools)
- ★ Providing the platform for port cooperation and sharing of environmental experience (EcoPorts network)
- ★ Visibility and credit to frontrunners (ESPO Award, EcoPorts labeling and certification)





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## Why LNG?

### ★ New regulations:

- SOx, 0.1% by 2015, 0.5% globally by 2020
- NOx, Tier III limitations for all ships built after January 2016
- CO2 emissions
- European S-Directive
- Proposal for Directive Clean Power for Transport

### ★ LNG as a ship fuel would comply with all new regulations

- NOx: 85-90%
- SOx: 100%
- Soot/particles: 100%
- CO2 reduction (20-25%)

### ★ Proven technology

- Approx. 30 LNG fuelled vessels in operation
- Boil-off used on LNG carriers



***LNG appears to be the most complete medium term viable solution***

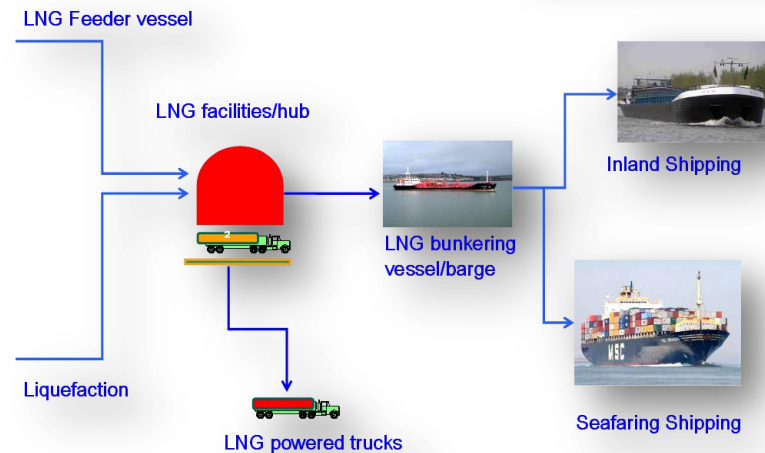
## Port perspective

- ★ Maintaining / restoring the green image of shipping
- ★ While maintaining its competitiveness
- ★ Reducing impact on local air quality (SO<sub>x</sub>, NO<sub>x</sub>, PM) – Top priority 2013!
- ★ Maintaining good environmental conditions in the port area to ensure license to operate and to grow
- ★ LNG appears to be a very promising medium term solution

	2013
1	Air quality
2	Garbage/ Port waste
3	Energy Consumption
4	Noise
5	Ship waste
6	Relationship with local community
7	Dredging: operations
8	Dust
9	Port development (land)
10	Water quality

# Main challenges for LNG

- ★ Safety concerns
  - On-board vessels and in relation to port operations
- ★ LNG bunkering
  - Port regulations and impact on operations
- ★ Infrastructure
  - Development of supply chain
  - Chicken-and-egg cycle
- ★ Vessel application
  - Added costs for a new build
- ★ LNG price



**What can be done by ports?**





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# WPCI LNG – focus safety and awareness

***Harmonization of the approach of ports towards developing rules and regulations regarding LNG as fuel and creating LNG awareness.***



★ 3 main areas of focus:

- ☐ WP 1: Bunker checklists and accreditation
- ☐ WP 2: Risk perimeters
- ☐ WP 3: LNG Awareness



## WPCI LNG Fuelled Vessels Working Group

2013				2014			
Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4

SWG 1: Draft bunker checklists

SWG 1: Draft accreditation guideline

Industry reference group meeting 8th of October in Antwerp

SWG 3: Launching LNG website

SWG 2: Report LNG risk perimeters

IMO 0,1% Sulfur Regulation within SECA



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# WPCI LNG – open to all interested ports

ACTIVE
Amsterdam
Antwerp
Bremen
Brunsbüttel
Fujairah
Gijón
Gothenburg
Hamburg
Le Havre
Long Beach
Los Angeles
Rotterdam
Stockholm
Wilhelmshaven
Zeebrugge

Peel Ports Medway
San Francisco
Marseille
Oslo
Frederikstadt
Gent
Broome
Dover
Gibraltar
Peel Ports Liverpool
Tacoma
Dublin
Barcelona
Valencia
Everglades
Jacksonville
Nelson

Nagoya
Busan
Tanzania
Longview
Indonesia
Denmark
Valencia
Jeddah
Johor
Australia
Mauritius
Cork
Oakland
Tacoma
Finland



Supported by:



For questions/comments or to join the project contact:  
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# Baltic ports LNG TEN-T project

- ★ 7 ports around the Baltic Sea plus supporting ports; supported by BPO, ESPO and many industry organizations (ship-owners, national ports organizations)

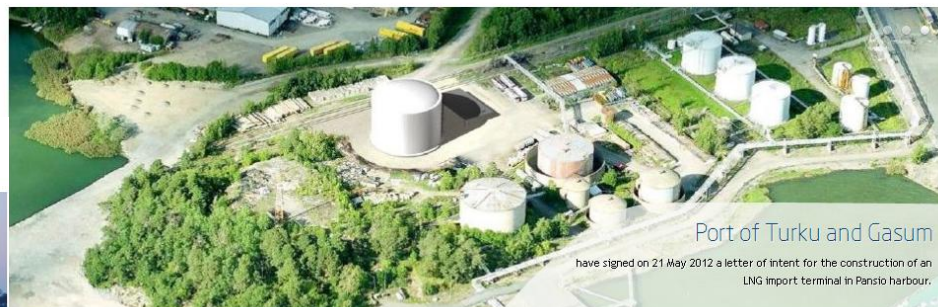
LNG   
in Baltic Sea Ports

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Co-financed by the European Union  
Trans-European Transport Network (TEN-T)

[www.Inginbalticseaports.com](http://www.Inginbalticseaports.com)



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# Baltic ports LNG project

LNG   
in Baltic Sea Ports



- Focus on pre-investment studies such as environmental impact assessments, feasibility analyses for LNG terminals or bunkering vessels, project designs, regional market studies, safety manuals, etc.
- Project works include a 'stakeholder platform' which will facilitate a discussion among various actors, such as port authorities, shipowners, gas infrastructure providers, energy traders and bunkering companies.
- Project Budget - Around 4 mln. Euro;  
Jan. 2012 – Dec. 2014



Co-financed by the European Union  
Trans-European Transport Network (TEN-T)





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# Stockholm – actual LNG bunkering!

- ★ Viking Grace – daily service from Stockholm to Turku
- ★ Daily bunkering in Stockholm





# Stockholm - LNG bunkering chain

LNG terminal  
Nynäshamn



3 trucks with  
trailer



Loudden  
Energy Port

Bunker vessel  
SEAGAS

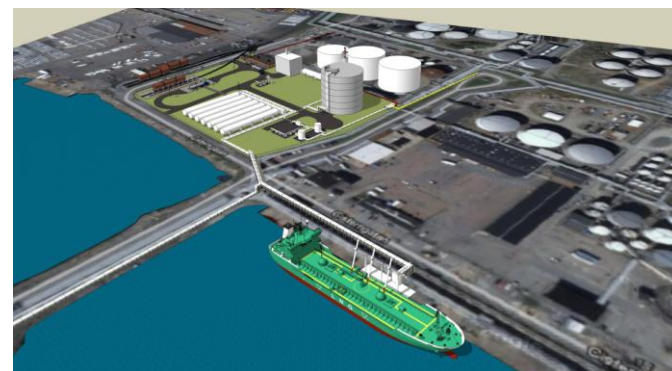
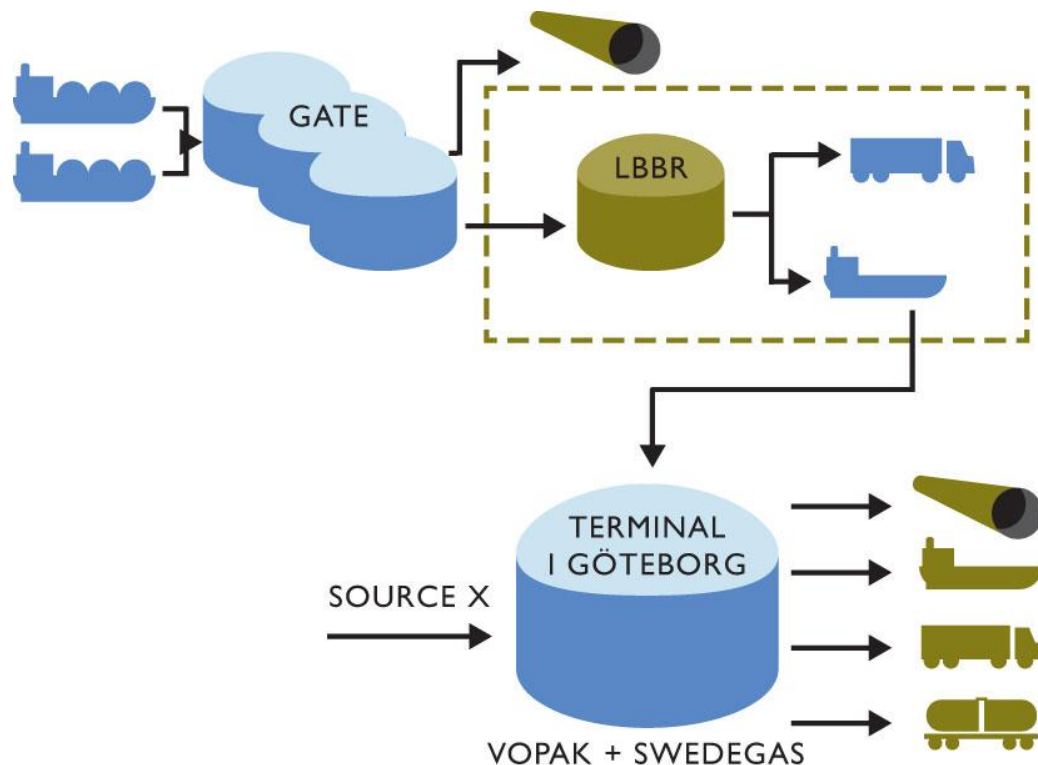
Stadsgården





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# Gothenburg – New LNG terminal



★ Construction 2014

swede  
gas

Vopak

I SAMARBETE MED

GÖTEBORGS  
HAMN



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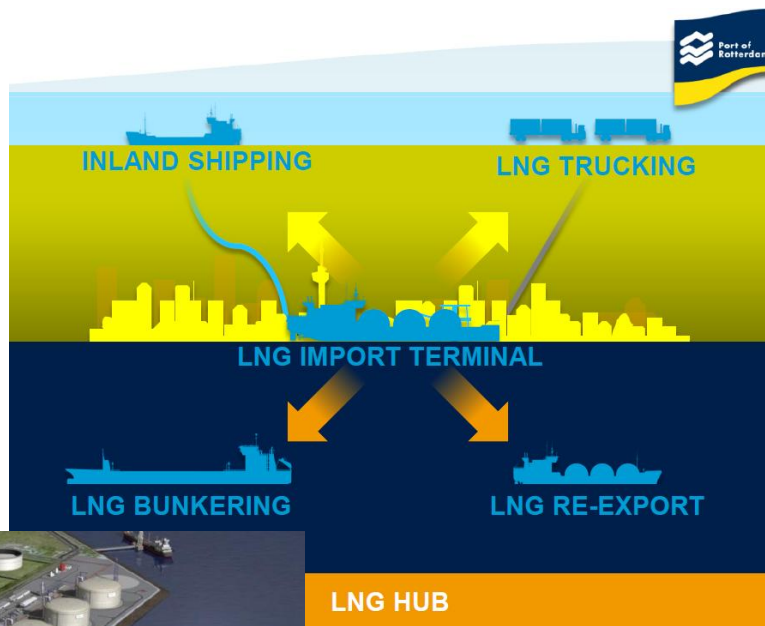
## Planned services to be offered

Product/services	Description
(Un) loading slots for ships	Unloading and loading of all LNG vessels at the coastal quay's will be possible up to 16 400 m <sup>3</sup> vessels. If needs grow the Jetty 519 can take ships up to 75.000 m <sup>3</sup> (max draft 12,5 meters)
Storage capacity	Firm and temporary storage entitlements 7,000 – 30,000 m <sup>3</sup>
Ship bunkering	Loading of bunkering vessels, minimum size 300 m <sup>3</sup> . It will also be possible to load within the Energy harbour at quay from truck.
Regasification	Injection to grid up to 90,000 Nm <sup>3</sup> /hour
Truck loading	Loading of trucks up to 14,000 trucks/year
Railcar loading	Loading of rail cars up to 1,850 per year





# Rotterdam – LNG hub



ARTIST IMPRESSION BREAKBULK TERMINAL

## Gate terminal:

- 2013: Export facility

## Breakbulk terminal:

- 2014: Start up truckfilling station
- 2015: Start-up LNG BB terminal

## Bunkering Seinehaven:

- 2011: Argonon: 1st inland vessel on LNG
- 2013: Greenstream: 1st single fuel vessel

## LNG small scale infrastructure:

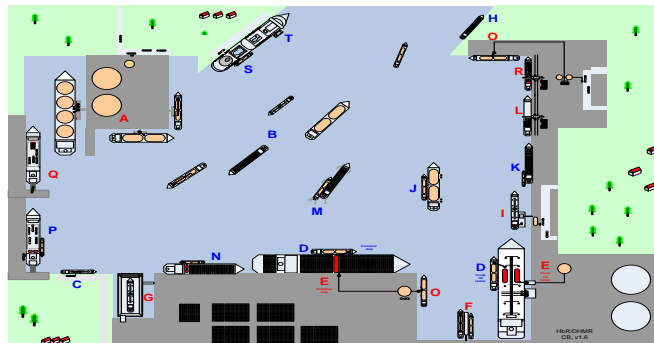
- 2014: Commercial LNG Bunker station for inland vessels
- 2014: 3 LNG tankstations for trucks
- **Ambition:**
  - 2015: LNG bunkerbarge operational in Rotterdam



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# Rotterdam – LNG safety assumptions

- ★ LNG carrier/bunker vessel = normal tanker carrying dangerous goods
- ★ LNG fuelled ship = normal ship, no extra port regulations
- ★ LNG bunker company: accreditation
- ★ Port Bye Laws in Rotterdam:
  - Shore- to- Ship bunkering: 1st July 2013
  - Ship-to Ship bunkering: 2014

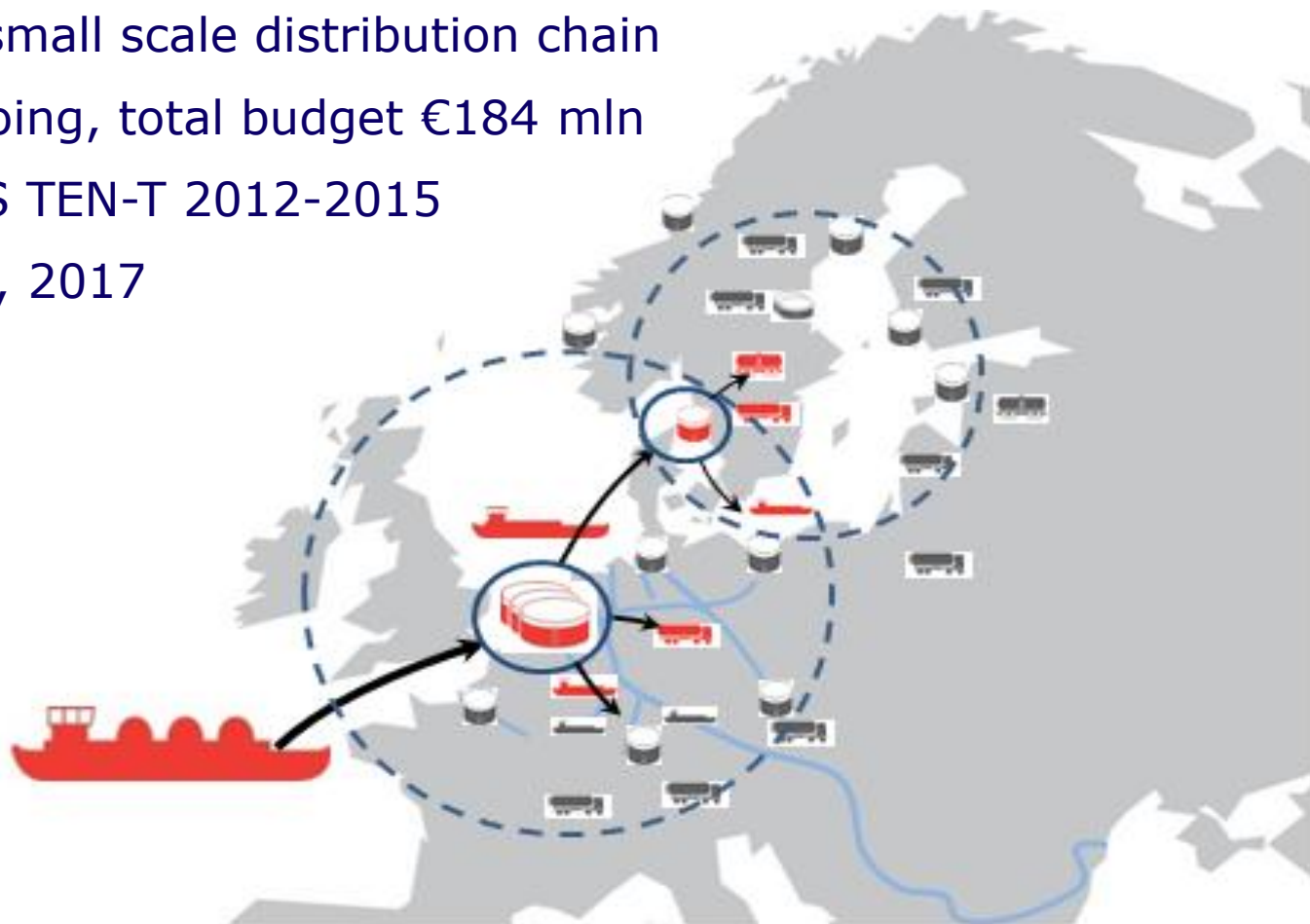




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# Rotterdam – Gothenburg TEN-T project

- ★ Market catalyst, small scale distribution chain
- ★ Preparations ongoing, total budget €184 mln
- ★ Submitted to MoS TEN-T 2012-2015
- ★ Operational 2015, 2017





# Zeebrugge – existing LNG terminal

- ★ Operational since 1986
- ★ Bunker vessel (port, FLUXYS, private parties) 2015
- ★ Second jetty construction 2015





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# Port of Antwerp

***"In 2015 pioneer shipping owners should be able to bunker LNG as a fuel for their vessels in the same way as conventional fuels are being bunkered today."***

★ Phased approach:

- Develop bunkering procedures and assess the safety aspects of LNG in the port environment (2013)
- Develop required supply chain and needed infrastructure
- Influence public awareness (WPCI LNG Leader)
- Support LNG pioneers





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# Port of Antwerp – LNG bunker vessel

- ★ Kick-start market development
  - ❑ Share the risks
  - ❑ Break the chicken-and-egg cycle
  - ❑ Non-discriminatory exploitation
  
- ★ Call for tender
  - ❑ Conceptualizing, build and operation of an LNG bunker vessel
  - ❑ WITH participation of the Port of Antwerp
  - ❑ Negotiations with 3 selected parties commenced in January 2013
  - ❑ Partner by Q3 2013 - EXMAR





# Port of Hamburg

- ★ Ongoing assessments for LNG storage facility, berth for a bunker barge and bunkering locations
- ★ LNG barges for providing electricity to vessels
- ★ LNG trucks (pilot 2013)



Berth's for Feederships



LNG Storage possible



Possible Service Berth for a Bunker Barge





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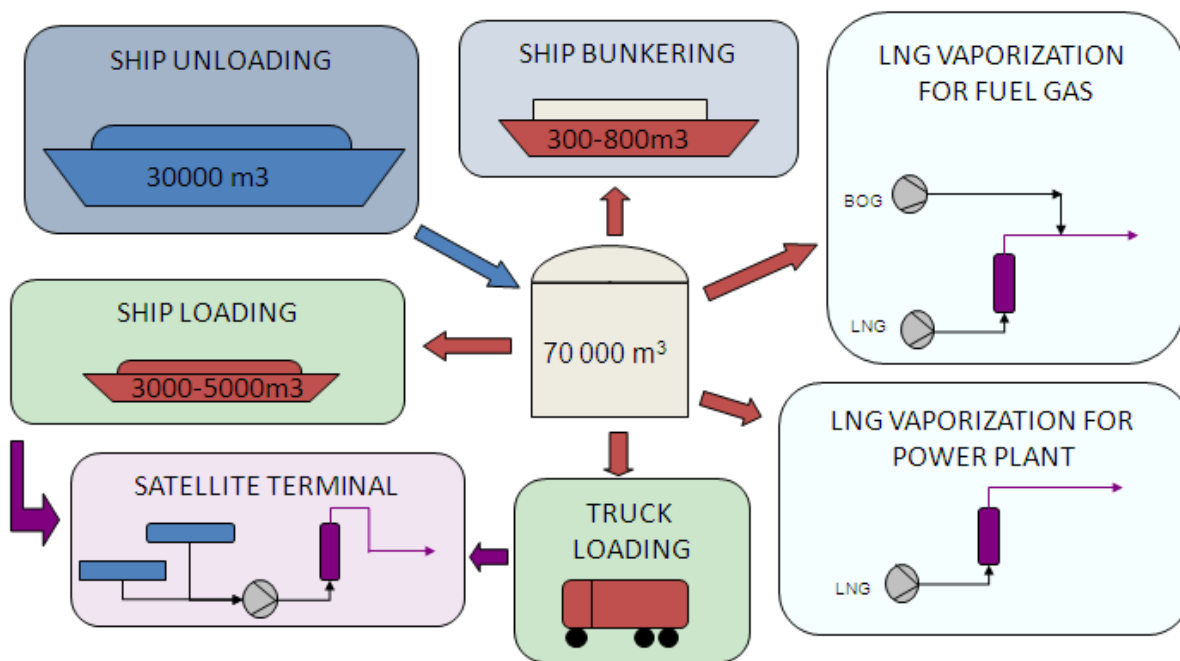
# Tallinn – LNG terminal

- ★ Full third party access
- ★ Re-gas capacity (regional consumption)
- ★ LNG bunkering, truck loading facilities
- ★ Approval pending (TEN-T Energy),  
Estonia or Finland
- ★ 2016-2020





# Finland – Bay of Bothnia project



Tornio Manga LNG project







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# Finnish ministry of transport

## LNG Action Plan for shipping 2013 – 2017

This Action Plan, prepared under the leadership of the Finnish Ministry of Transport and Communications, is aimed at promoting the use of liquefied natural gas (LNG) in shipping on the basis of the following guidelines:

- **focus resources on providing LNG bunkering in Finland**, taking into consideration synergies with domestic industry and heavy vehicles, and the need for an EU-wide LNG infrastructure;
- **examine the use of financial incentives**, such as investment aid and guarantees for ship acquisitions, in the construction of LNG infrastructure and procurement of LNG-powered ships; and
- **work actively at international level** (IMO, EU and HELCOM) to promote the use of LNG as ship fuel, including efforts to establish LNG infrastructure and draft the associated regulations and guidelines, particularly for LNG bunkering.



Ministry of Transport  
and Communications

# Danish ports – ongoing projects

## 5 ports:

Port of Skagen

Port of Hirtshals

Port of Aarhus

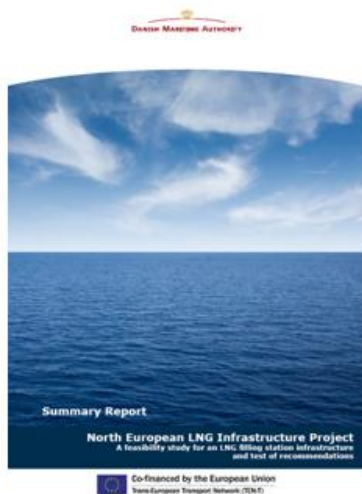
Samsø Island ferry

Copenhagen Malmö Port





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May 2012  
 National project with  
 EU funding on the need  
 for LNG infrastructure



LNG bunkering for  
 cruise vessels April 2015



**LNG**   
 in Baltic Sea Ports

Denmark's first LNG fuelled  
 Domestic ferry  
 October 2014



TEN-T project 2010 – Dec 2014  
 Ports in Copenhagen-Malmö,  
 Helsingborg, Stockholm,  
 Helsinki, Turku and Tallinn  
 Feasibility studies are finalised.  
 Next step: Operators



May 2013 LNG ferry  
 Bunkering in Norway







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## Conclusions

- ★ LNG is at the present the most complete medium term viable solution – still not a “silver bullet”
- ★ Significant remaining challenges
- ★ Several ongoing port projects in North Europe
- ★ Ongoing EC, EMSA initiatives
- ★ Pressing timetables, complementarity of compliance strategies and solutions
- ★ An opportunity for South European ports



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# Thank you for your attention!



## Port & Shipping TECH, Genoa, 19-20 September

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