

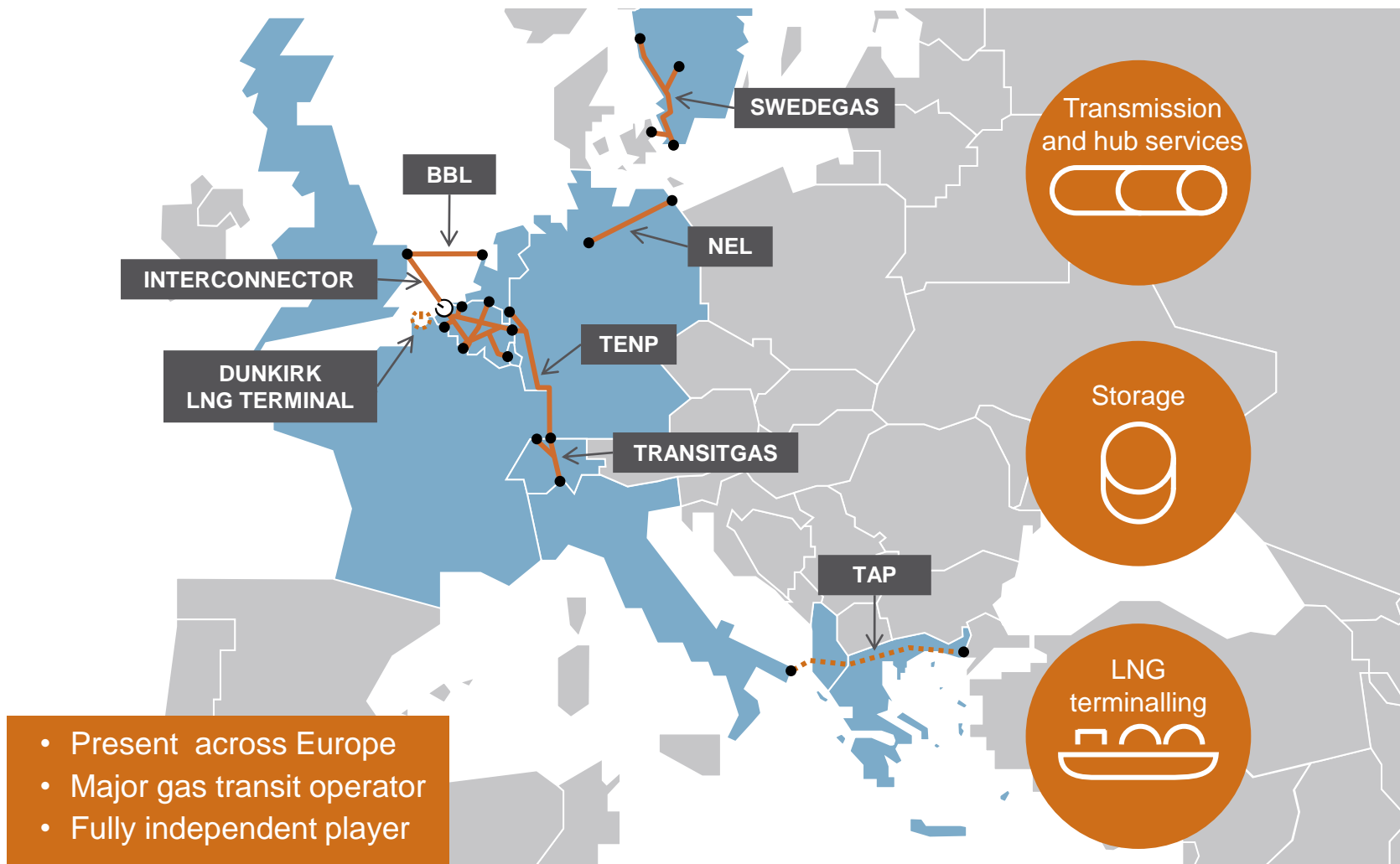


**SMALL-SCALE LNG:
THE FUTURE OF LNG
IN EUROPE?**

Laurent Remy, Spokesman & Social Media Manager
10th ICIS Conference – 19th October 2016

1. Fluxys Belgium in a nutshell
2. Drivers for the small-scale LNG market
3. Fluxys' small-scale LNG activity
4. Future developments

FLUXYS: GAS INFRASTRUCTURE COMPANY



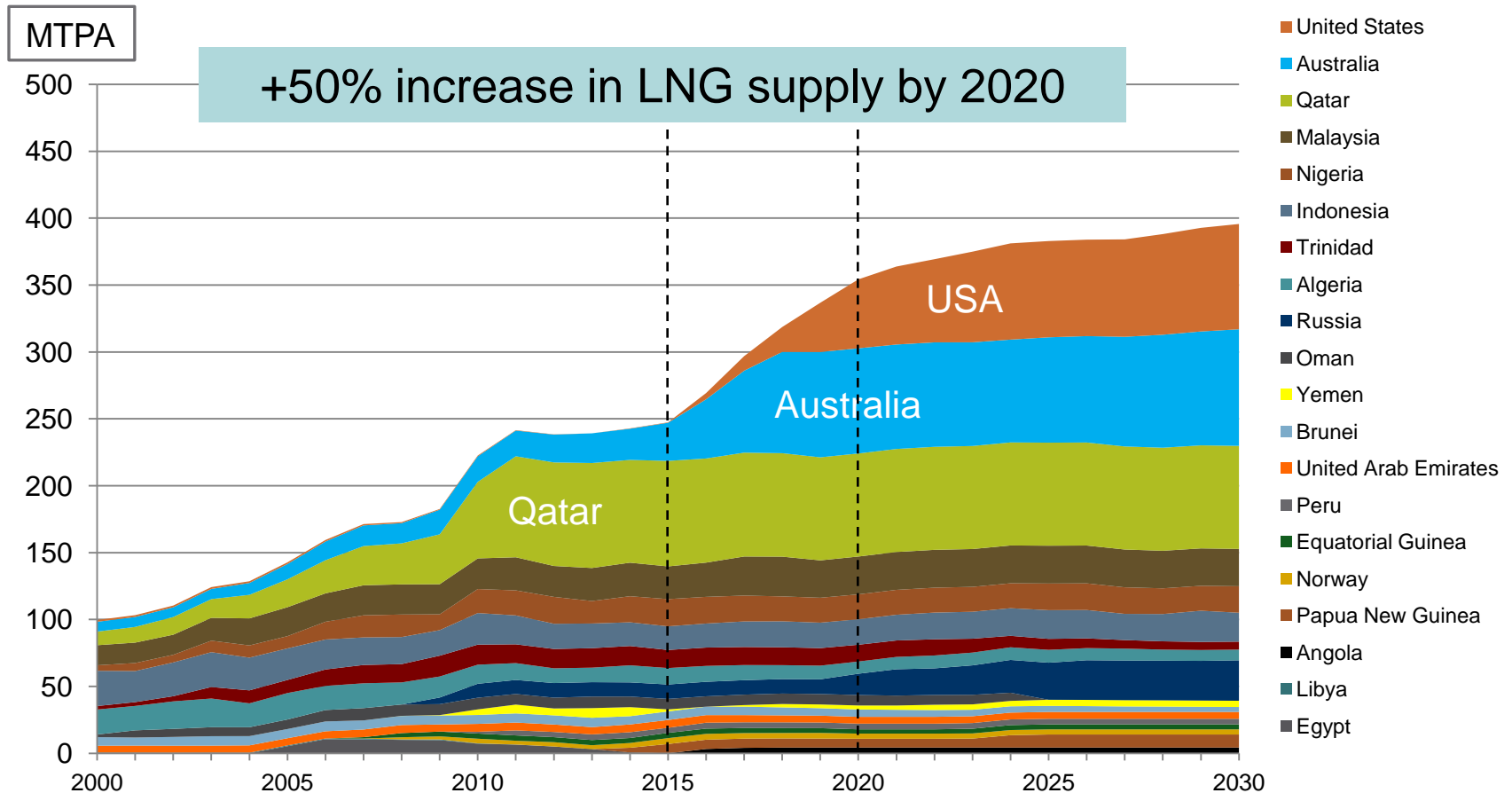
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WHAT DOES SSLNG MEAN CONCRETELY?

- **Conventional use of LNG:** LNG is delivered on a large scale, stored and regasified for injection into the natural gas grid
- **Small-scale LNG** applications cover the use of LNG
 - as a sustainable alternative fuel for ships and long-haulage trucks
 - as an attractive energy source for industries in areas that are not connected to the natural gas grid.



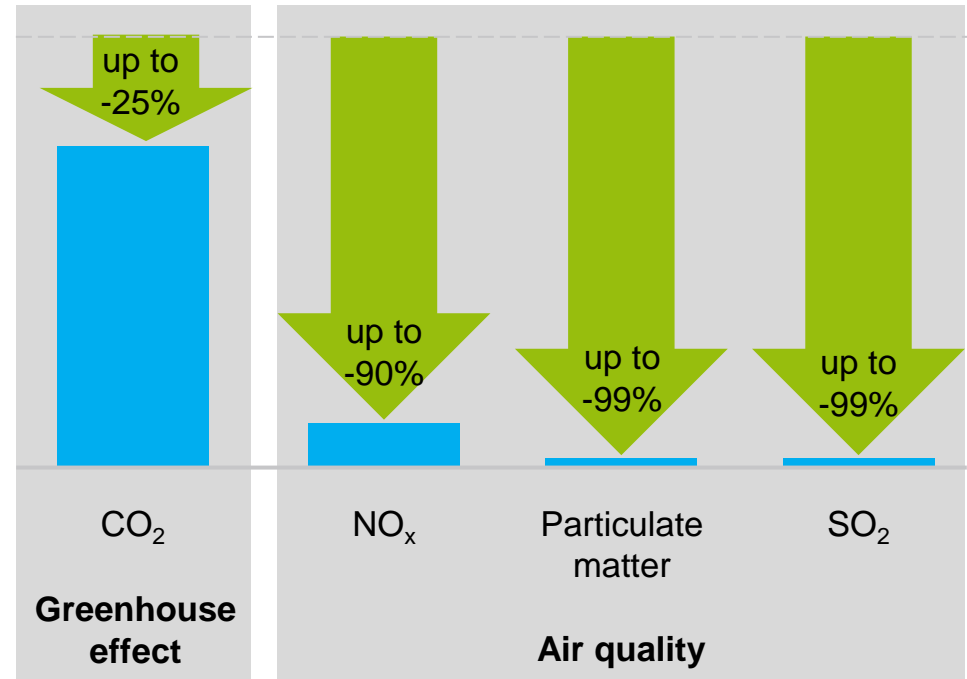
LNG IS AVAILABLE: 240 → 360 MILLION TON /Y IN 2020



[IHS – exports operational terminals & terminals under construction]

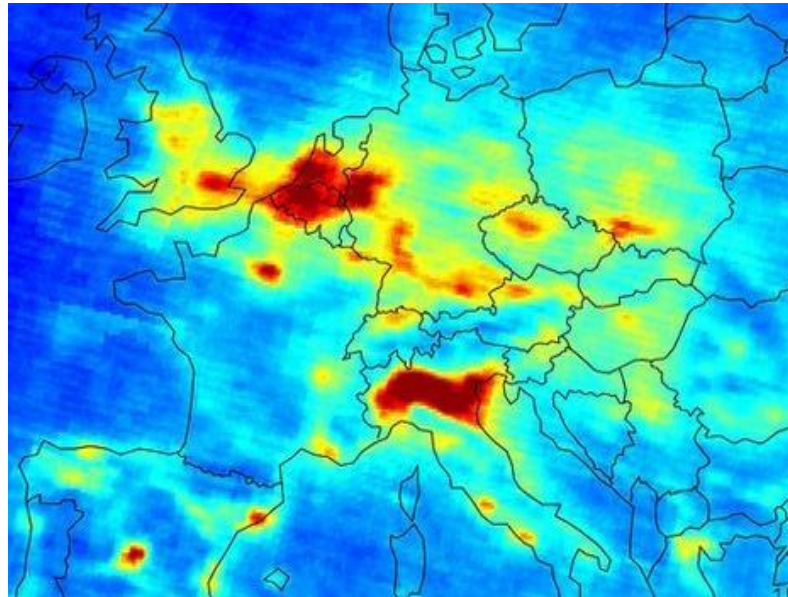
NATURAL GAS TICKS ALL THE BOXES AS ALTERNATIVE FUEL IN TRANSPORT

- Switching to natural gas: immediate and significant reduction of carbon and emissions impacting health
- Proven technology & excellent safety record
- CNG & LNG as alternative fuels in transport supported by EU Directive



Challenge = availability of filling infrastructure

LNG AS A FUEL BETTER FOR THE ENVIRONMENT



Envisat, ESA

NO₂ tropospheric column density [10^{15} molec./cm²]



Attack the invisible killer: premature deaths from air pollution estimated at 491,000 for the year 2012 in EU-28

European Environment Agency



HEAVY FUEL OIL
3.5% Sulphur



MARINE GAS OIL
0.1% Sulphur

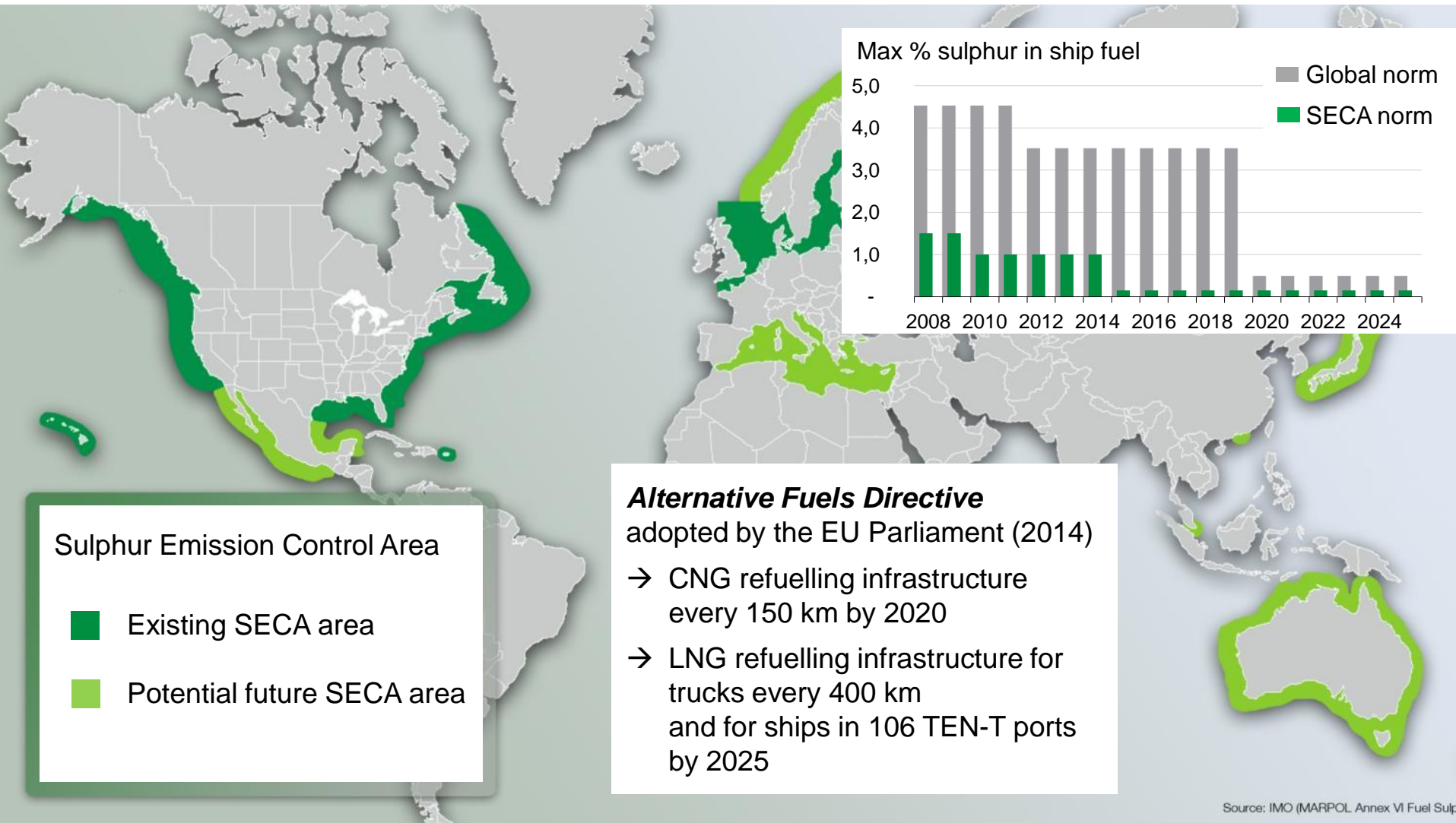


LNG

- 0% Sulphur
- Particulate matter: negligible
- Up to 90% less Nox
- Up to 25% less CO₂

[European Commission SWD 2013 4]

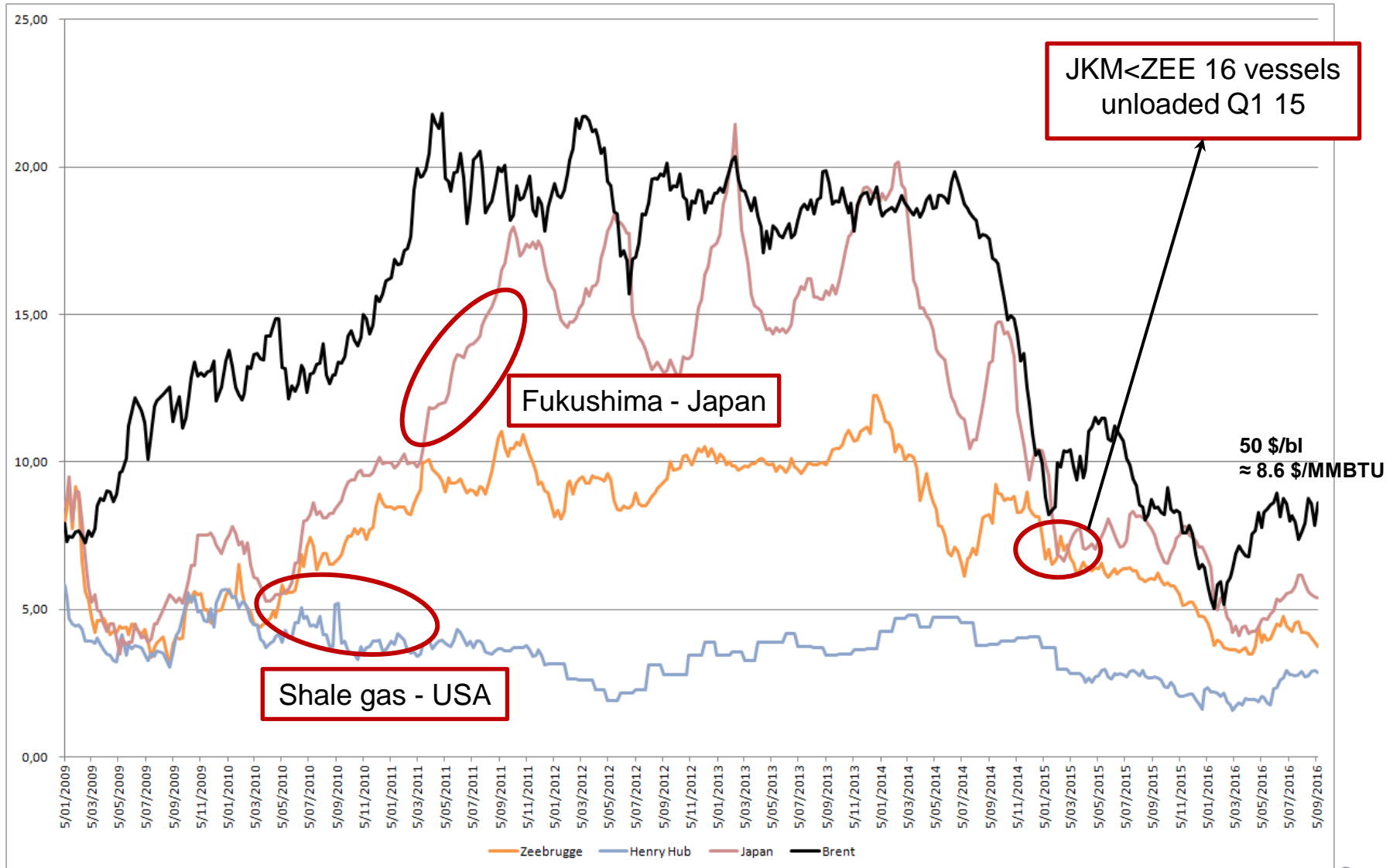
WORLD-WIDE REGULATION FAVOURS LNG



PRICE DIFFERENTIAL ASIA – EUROPE ERODES

➔ LNG COMES BACK TO EU

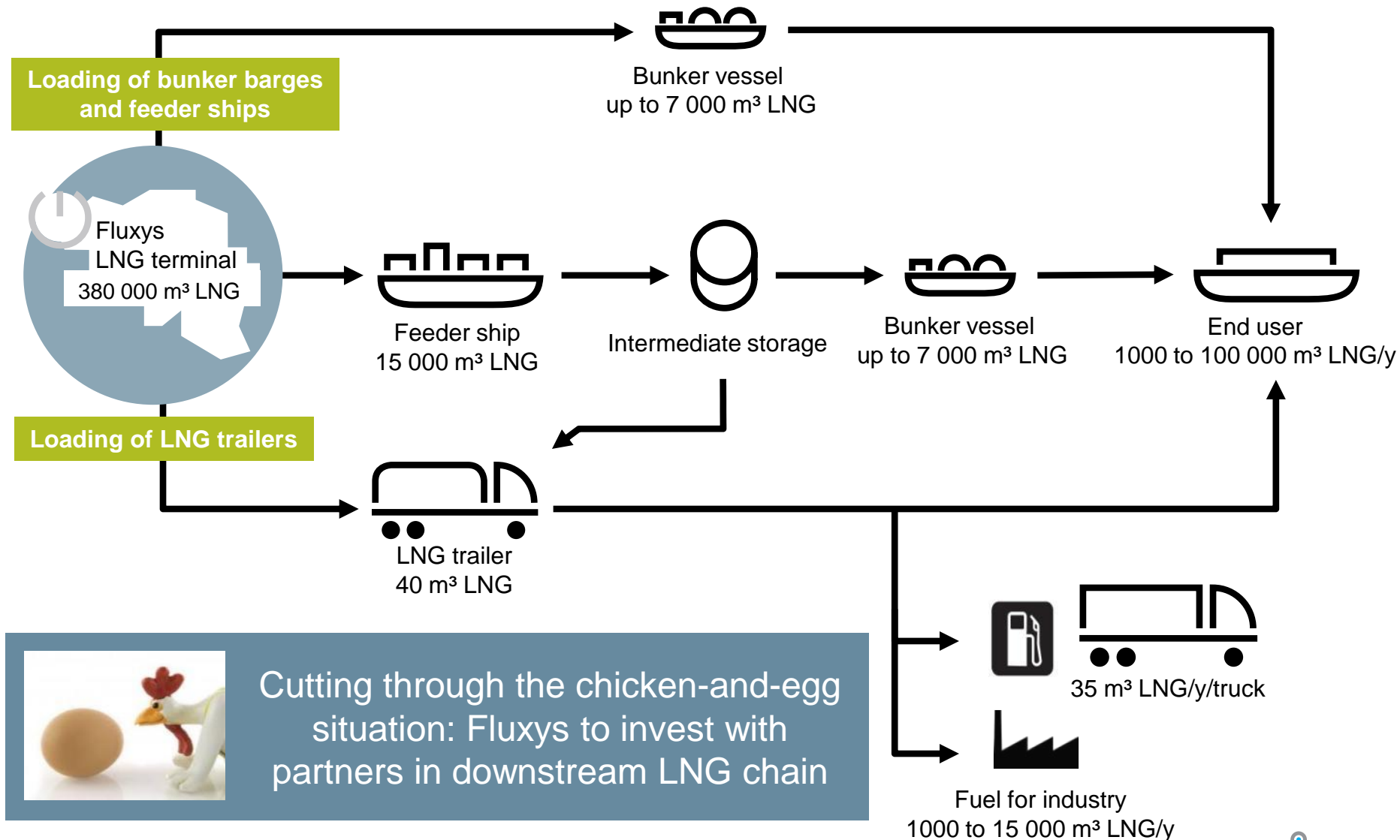
\$ /MMBTU (*)



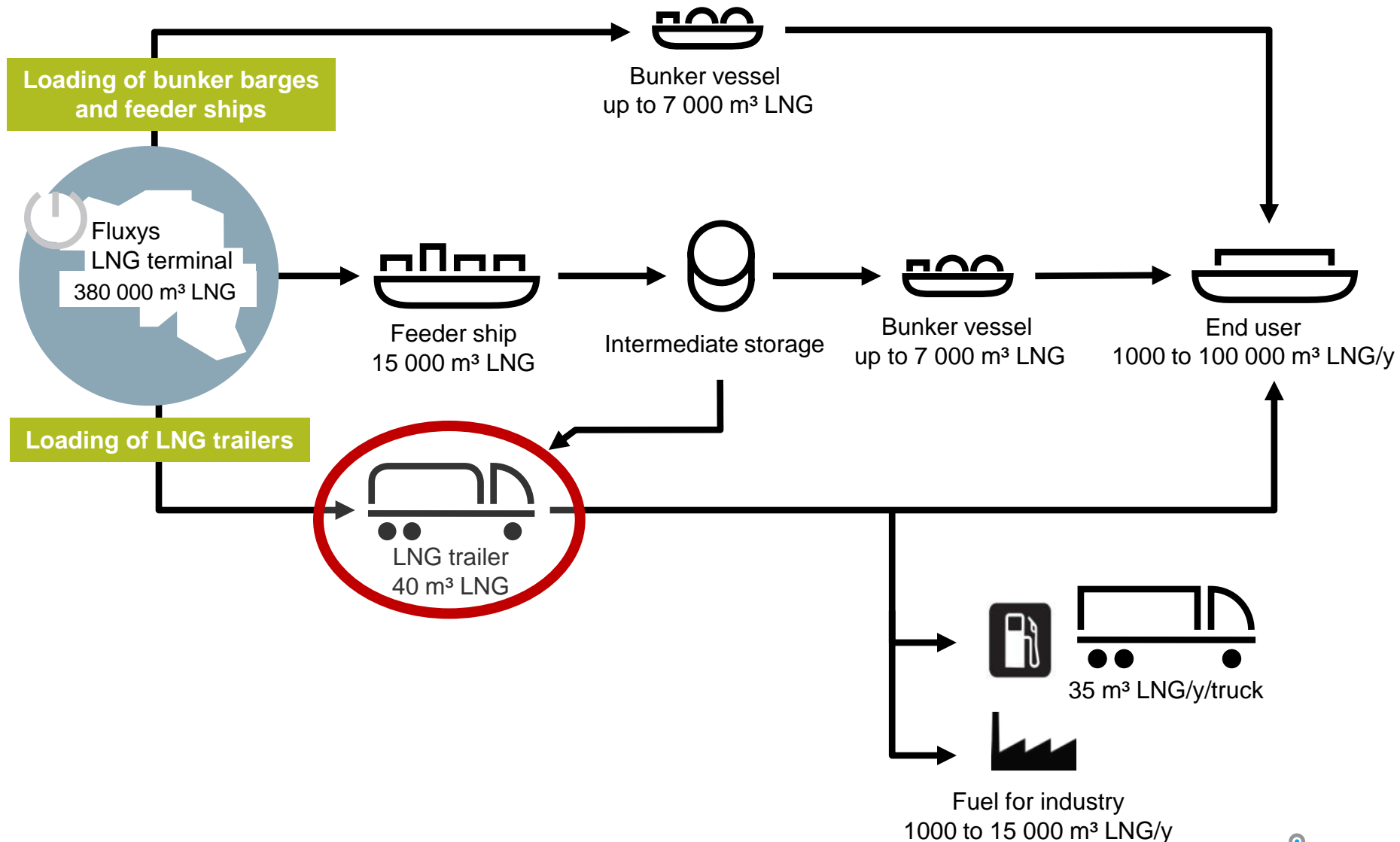
(*) 5 \$/MMBTU ≈ 15 EUR/MWh

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DOWNSTREAM SMALL SCALE LNG SUPPLY : A CLOSER LOOK



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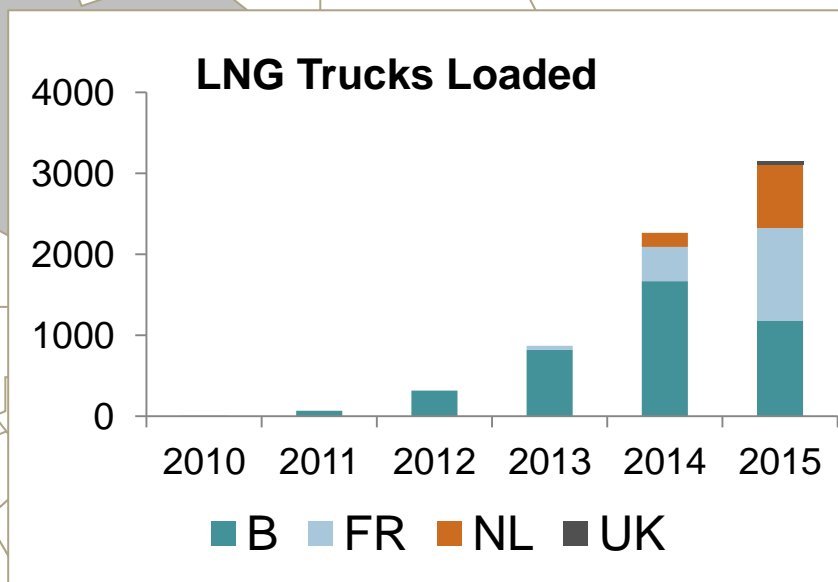


LNG TRUCK LOADING

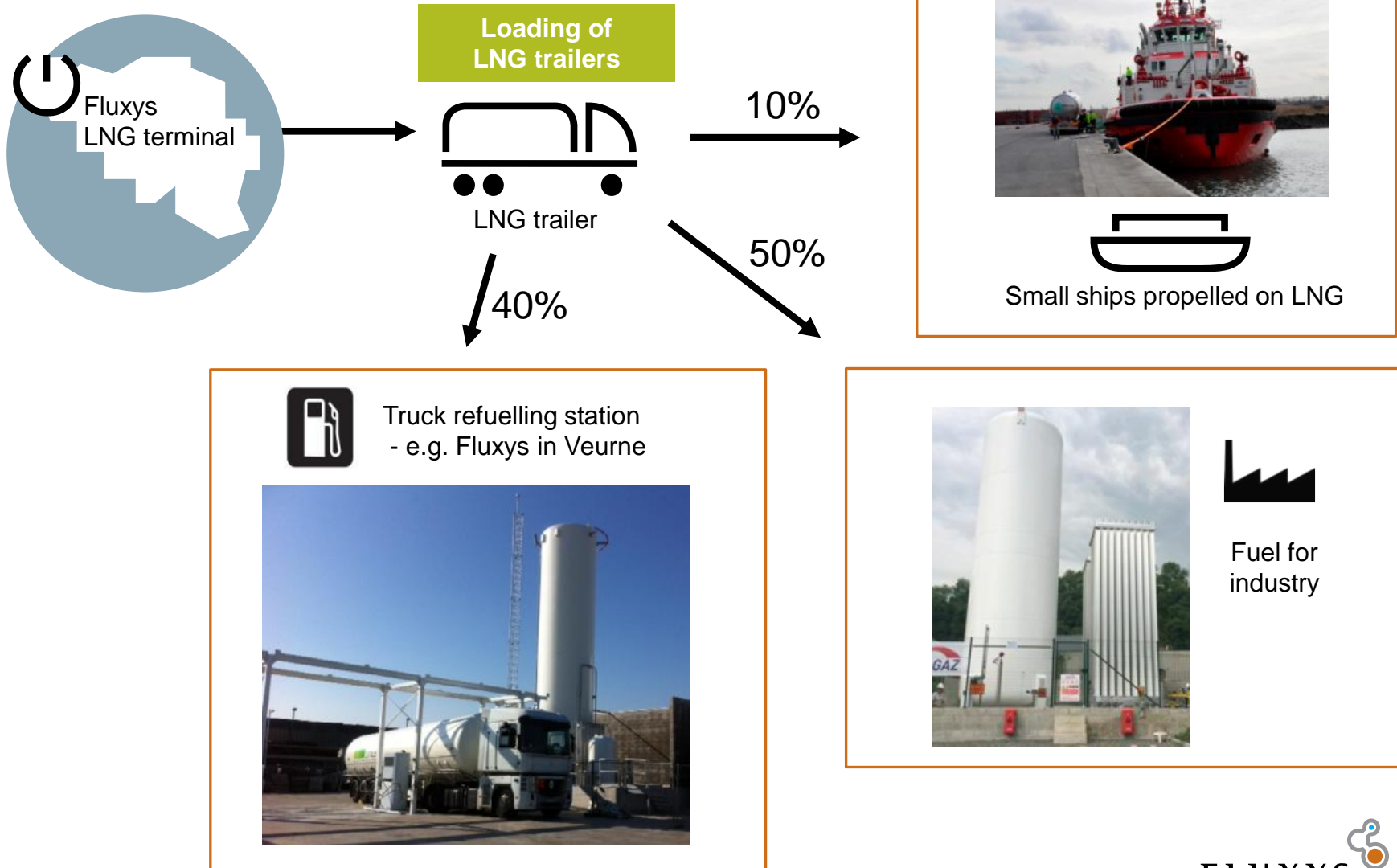
2010 2011 2012 2013 2014 2015 ...



- 19 active truck loading companies
- Capacity of 4 000 loadings/year
- 24/7, online day-ahead scheduling
- Destinations: Belgium, UK, France, Germany, the Netherlands, Poland, Switzerland, Sweden, Norway, Italy
- FID for a second truck loading bay
→ Operational H2 2017



LNG AS A FUEL FOR INDUSTRY, SHIPS AND TRUCKS



2014: FIRST LNG FUELLING STATION FOR FLUXYS IN BELGIUM

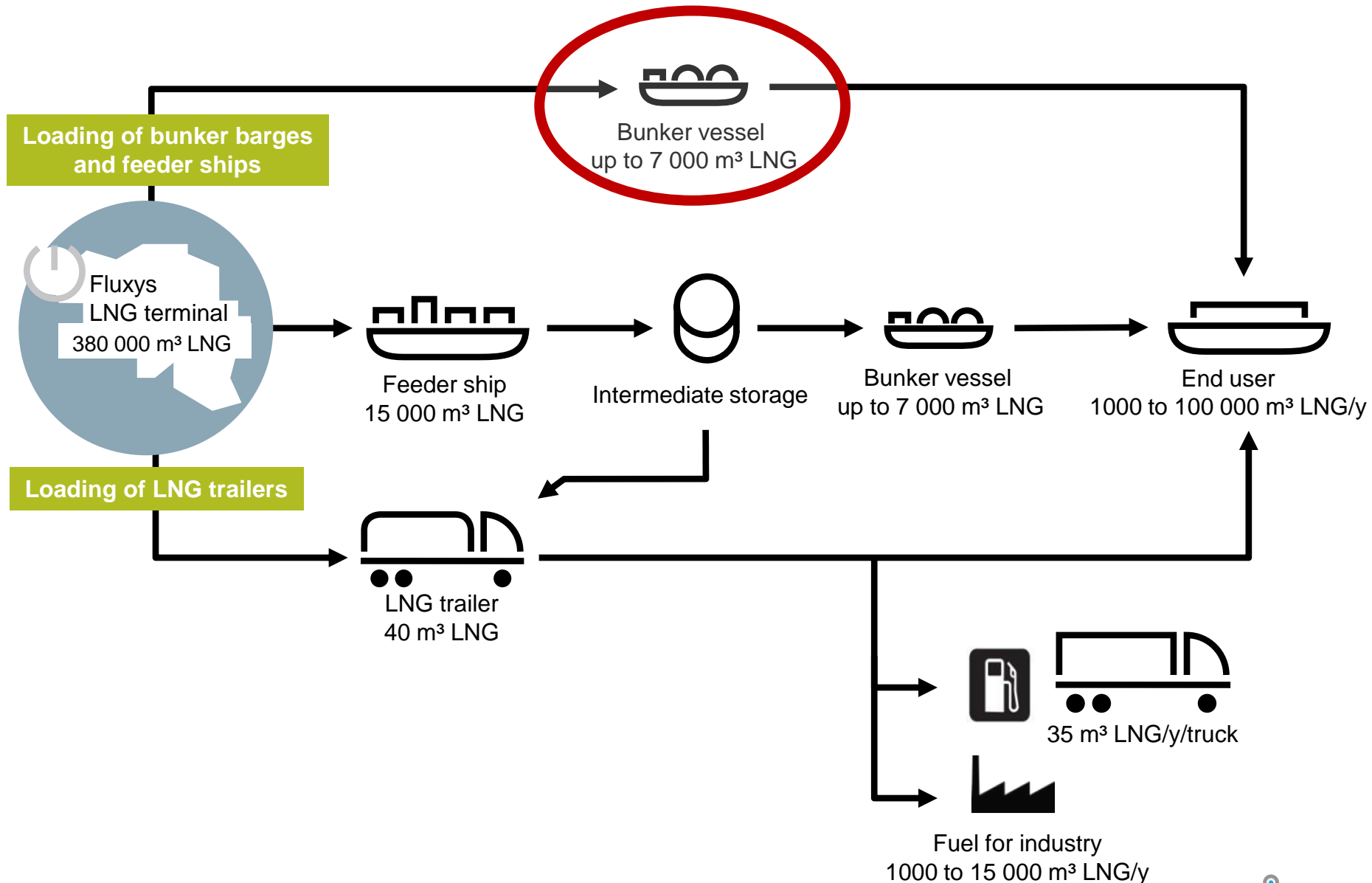


- Fluxys: investment in LNG fuelling station
- Haulage company Matheeuws: investment in LNG-fuelled fleet and operation of LNG fuelling station
- Pilot project: roll-out of best practices to other LNG fuelling stations

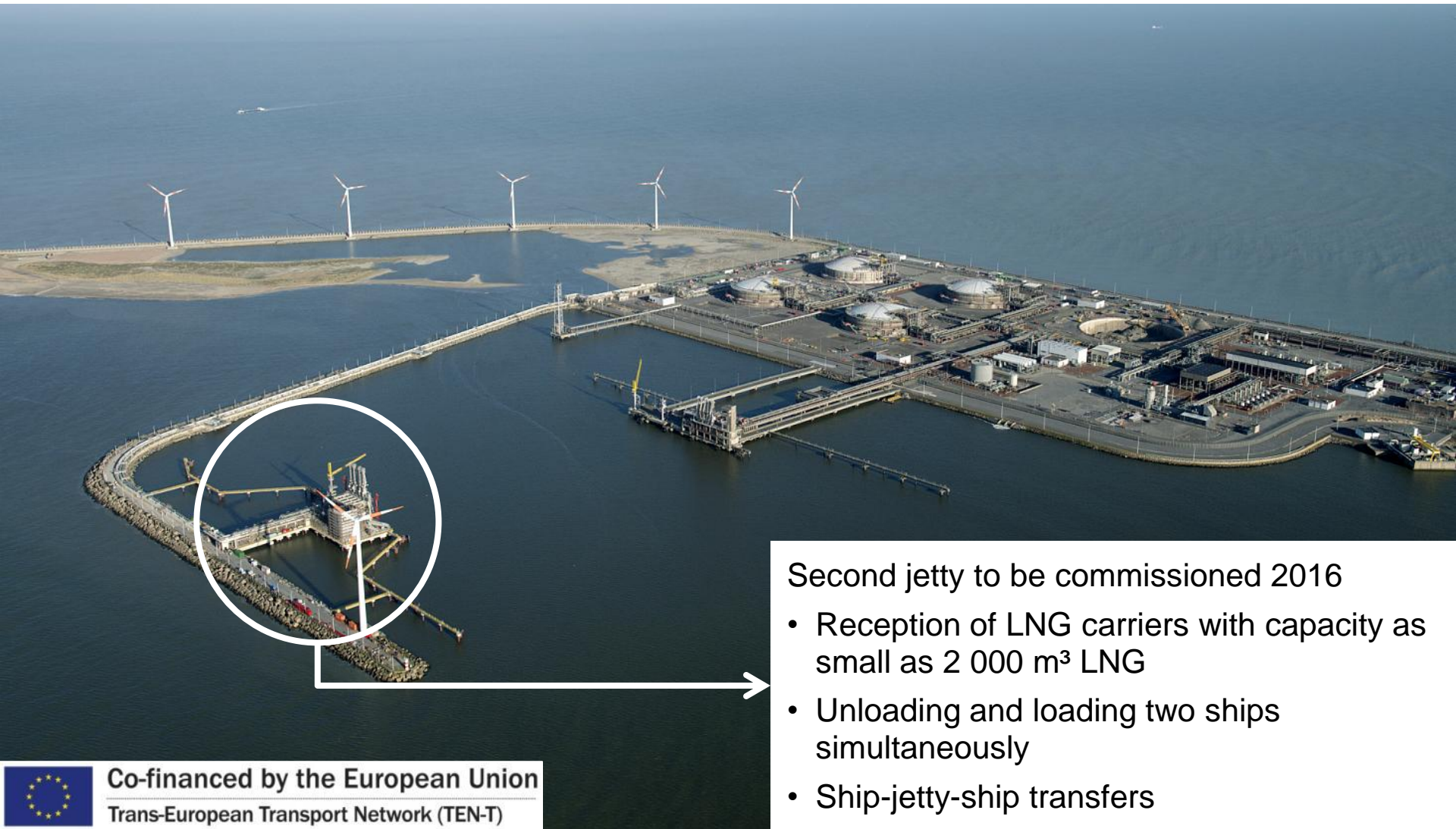


Co-financed by the European Union
Trans-European Transport Network (TEN-T)

DOWNSTREAM SMALL SCALE LNG SUPPLY : A CLOSER LOOK



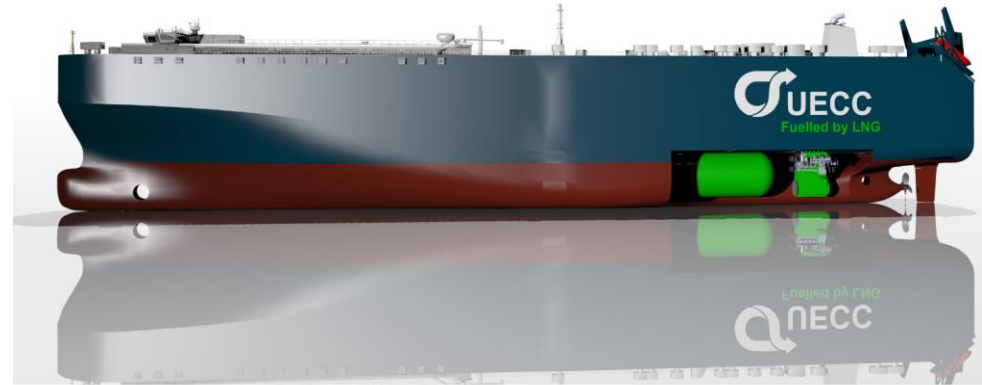
2ND JETTY ABLE TO LOAD SMALL LNG BUNKER BARGES



Second jetty to be commissioned 2016

- Reception of LNG carriers with capacity as small as 2 000 m³ LNG
- Unloading and loading two ships simultaneously
- Ship-jetty-ship transfers

LNG BUNKERING VESSEL WITH HOME PORT ZEEBRUGGE

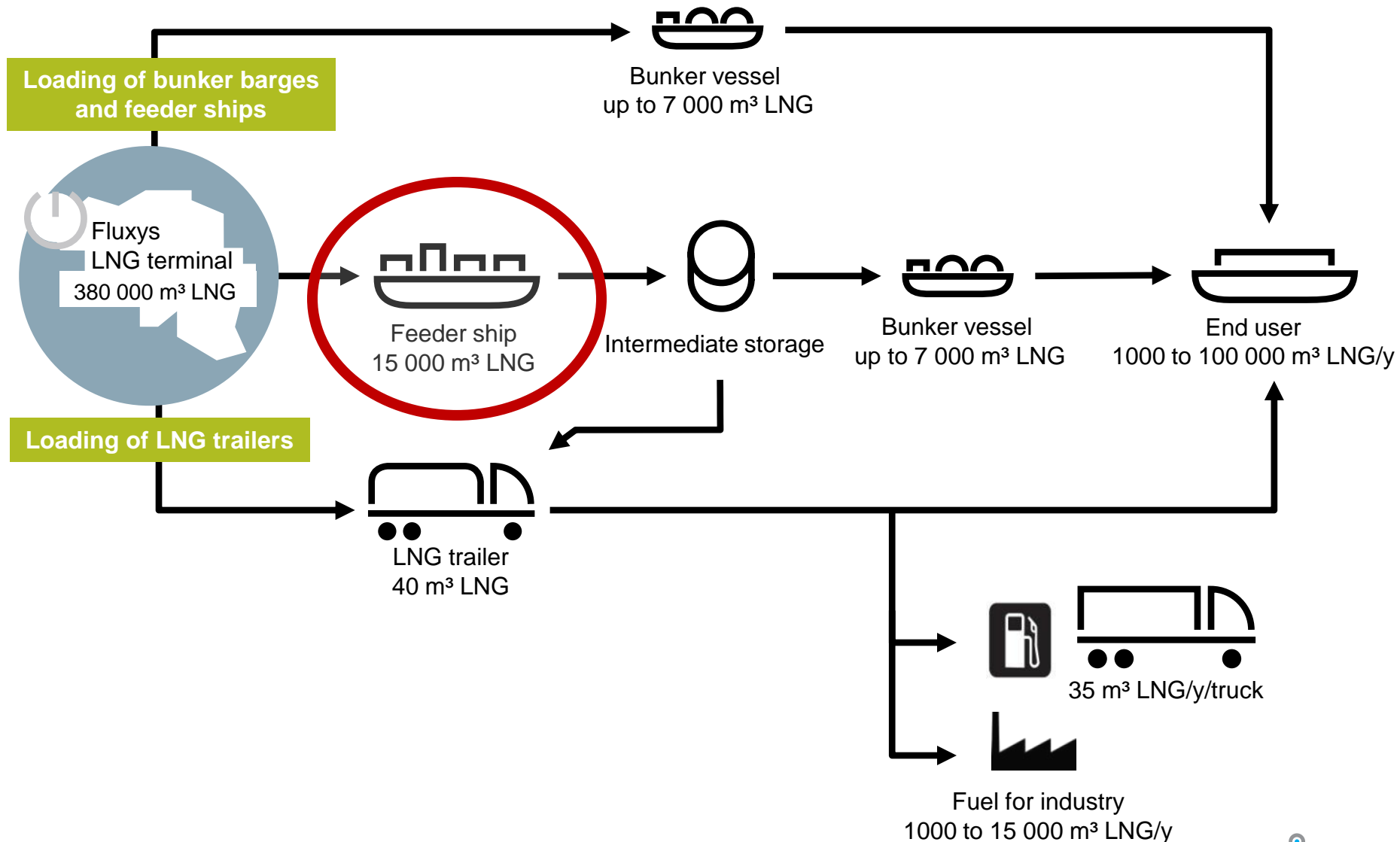


Engie, NYK, Mitsubishi and Fluxys are building a new LNG bunkering vessel:

- 5 100 m³ LNG
- Delivery forthcoming
- LNG bunkering contract signed between engie and United European Car Carriers (UECC), a leading short-sea operator

- Capacity of 3 800 standard-sized vehicles per carrier over 10 decks
- Dual fuel: MGO, LNG or HFO
- Left shipyard (China) on September 29th
- Round voyage ZB → Baltic Sea → ZB = 14 days (first of its kind to be fitted with an LNG fuel propulsion system, can complete a 14 day round voyage in the Baltic using solely LNG fuel, including main engine and auxiliary power generation)

DOWNSTREAM SMALL SCALE LNG SUPPLY : A CLOSER LOOK



LOADING OF FEEDER SHIPS: 15 600 M³ LNG



11/2014: agreement signed between Eni and Skangas to load 2 small scale LNG ships per month in 2015 and 2016



LNG AS A FUEL FOR INDUSTRY IN 2015: 1.5 MTPA

0.5 MTPA LNG

is delivered to industry via
small LNG carriers and
trucks

0.8 MTPA

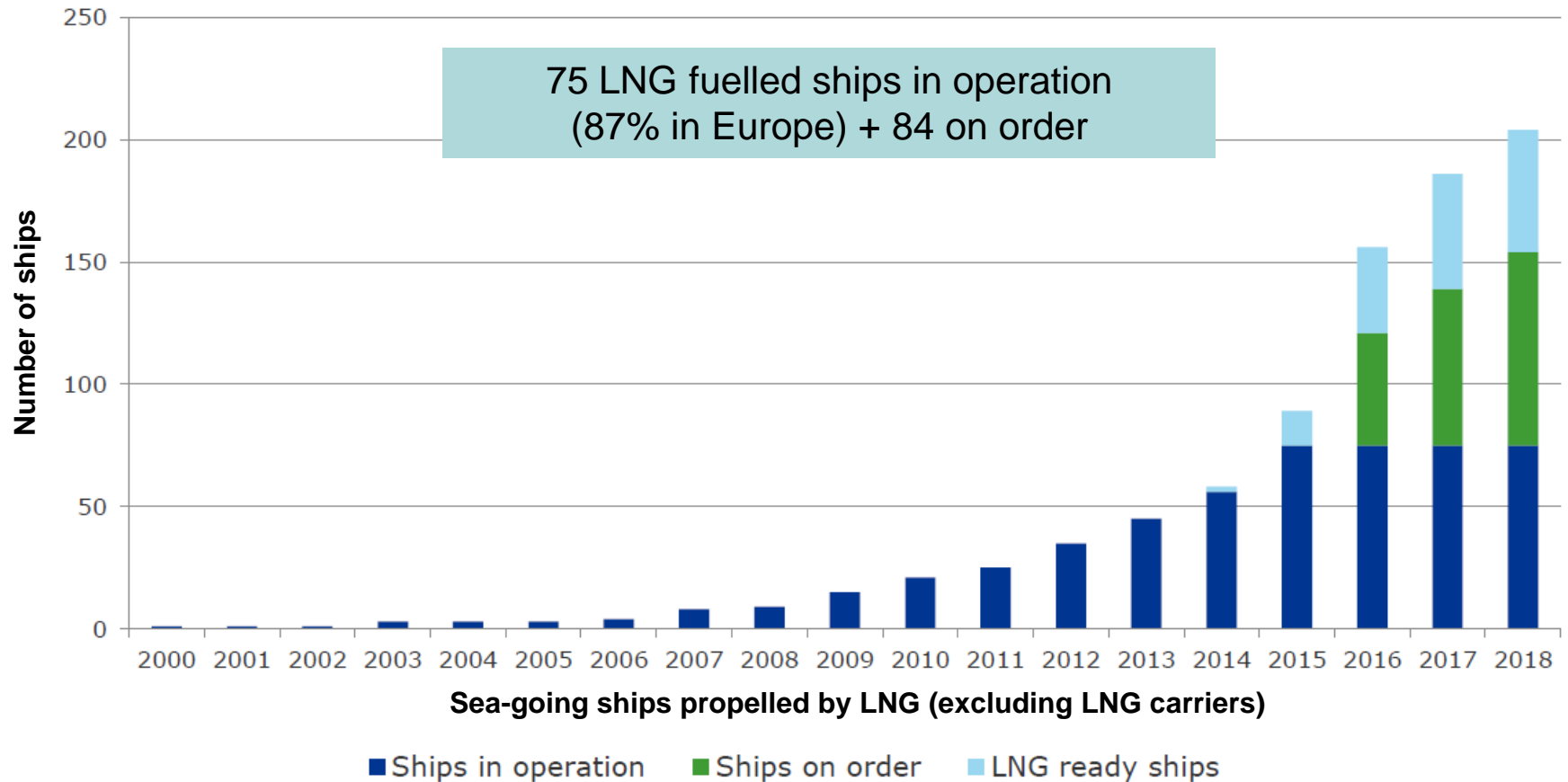
is delivered via LNG trucks
to remote gas grids, which
supply industry, power
plants and households

0.2 MTPA LNG

is delivered to
industry via trucks



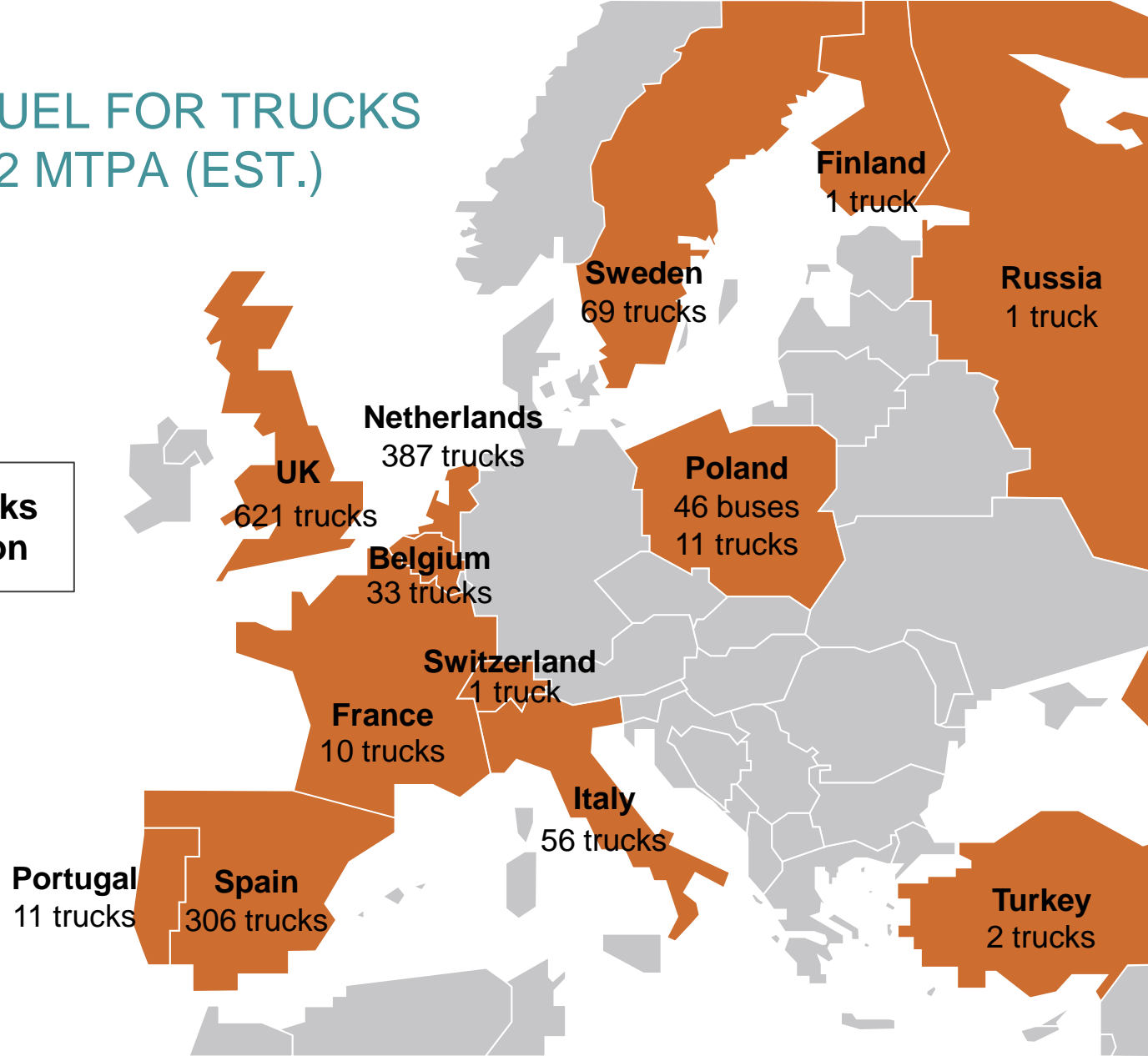
LNG AS A FUEL FOR SHIPS IN 2015: 0.2 MTPA





LNG AS A FUEL FOR TRUCKS IN 2015: 0.02 MTPA (EST.)

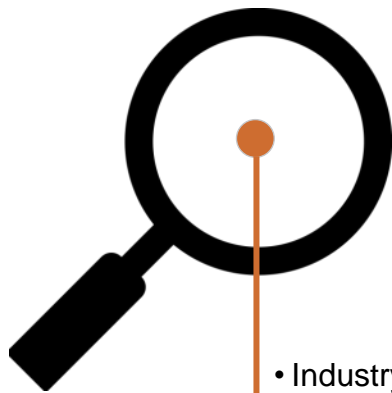
**1509 LNG fuelled trucks
+ 46 buses in operation**



[NGVA Europe Jan 2015]

A NICHE MARKET TODAY, BUT WE ARE FISHING IN A SEA WITH LARGE POTENTIAL

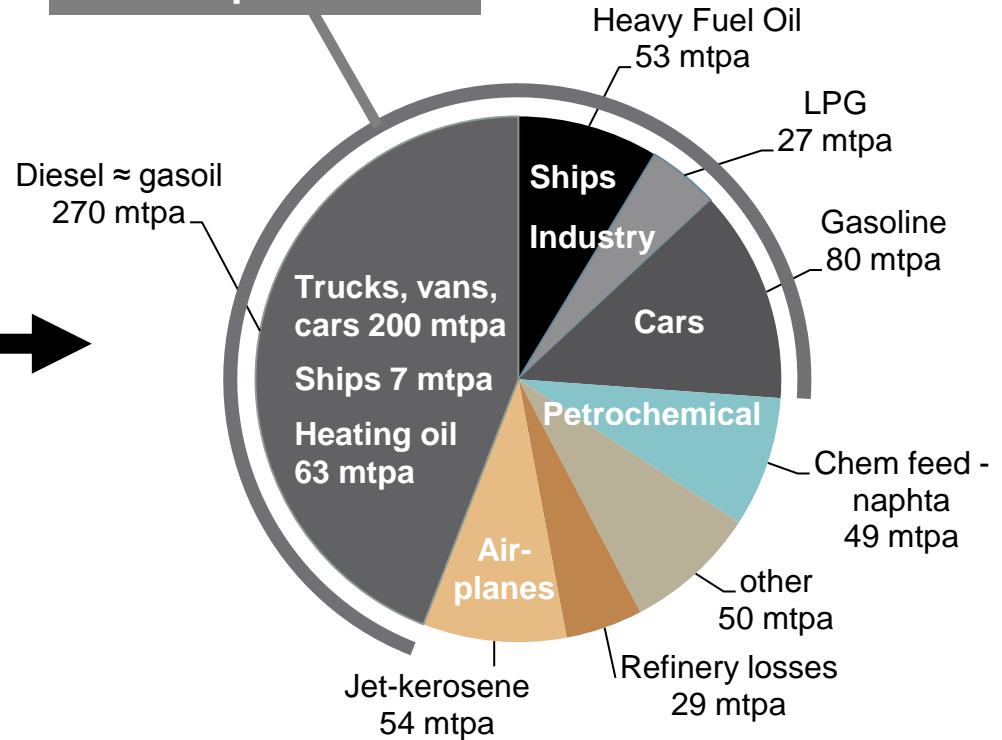
Small-scale LNG: 1.7 mtpa



- Industry: 1.5 mtpa
- Ships: 0.2 mtpa
- Trucks: 0.02 mtpa



430 mtpa market



CONCLUSION: SSLNG HAS THE WIND IN ITS SAILS

SWEGEGAS

Open Season Information Memorandum

- LNG bunkering installation on Jetty 519/521 in the Port of Gothenburg

BINDING OPEN SEASON



ENGIE

Port of Antwerp



Press Release
28 April 2016

**First Alternative Energy Hub with LNG
for inland navigation
and road transport in Belgium**

Port of Antwerp and ENGIE sign 30-year concession agreement for construction and operation of sustainable infrastructure powered by LNG, CNG and electricity



08 Gas4Sea: a new brand for LNG bunkering
SEP 2016

Liquefied Natural Gas (LNG) is an extremely promising fuel to reduce the future environmental impact of sea and river transport. For this reason, ENGIE and its partners Mitsubishi Corporation and NYK Line, by launching their common Gas4Sea brand, are committed to developing LNG as a marine fuel supply offer through LNG bunkering vessels.

Finland's first LNG terminal starts commercial ops



Gasum said the first LNG import terminal in Finland began commercial operations in Pori on Monday.

Deliveries of liquefied natural gas to customers began on the same day, the company said in its statement.

The terminal has enabled LNG deliveries to industrial, maritime and heavy-duty road transport customers outside the gas pipeline network.

Image courtesy of Gasum

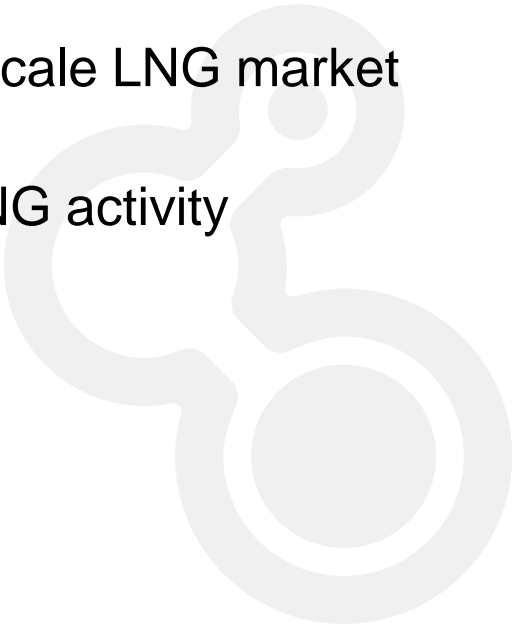
LNG is a leading alternative maritime fuel. One advantage it offers is a reduction of up to 25% in CO₂ emissions compared to diesel, as well as enhancing the quality of life in port, marine, and waterway environments..

> Watch the video



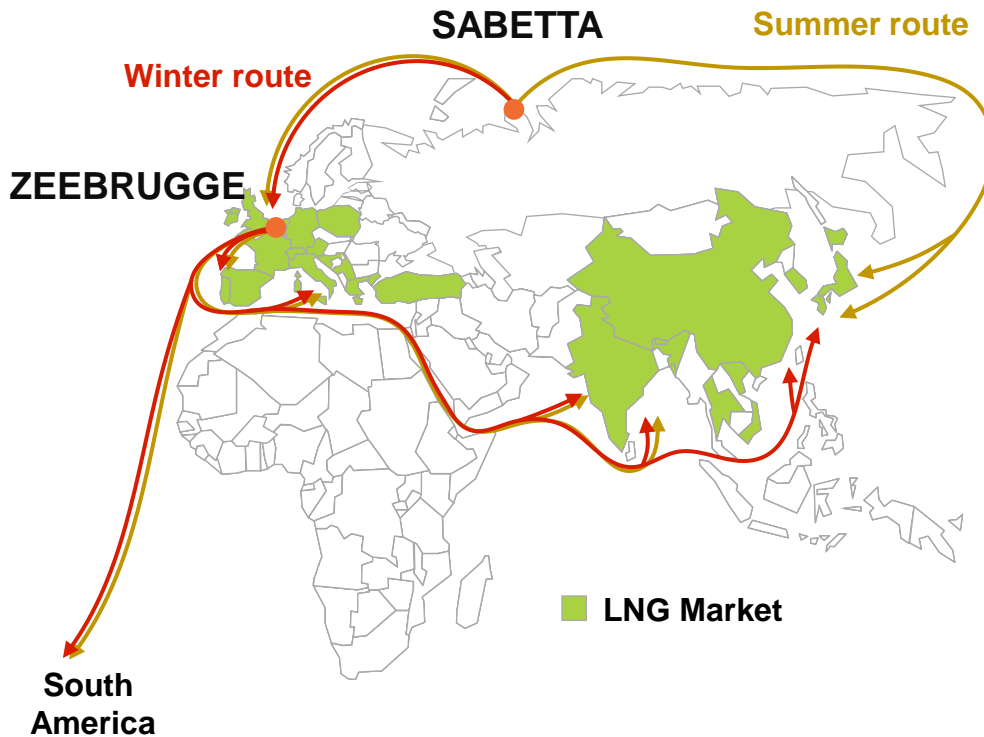
6 September 2016 – ENGIE, Mitsubishi Corporation and NYK Line launch Gas4Sea, a new international brand to deliver liquefied natural gas (LNG) as marine fuel from bunkering vessels.

Gas4Sea is a global brand for LNG bunkering which aims to provide the shipping sector with LNG through purpose-built bunkering vessels. Launched by ENGIE together with Mitsubishi Corporation and NYK Line, Gas4Sea promotes an innovative service in an increasingly buoyant market.

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ZEEBRUGGE LT-CONTRACT: TRANSSHIPMENTS FOR YAMAL LNG

- Port of Sabetta, Yamal Peninsula:
Yamal LNG to produce 16.5 mt/y of LNG
- Yamal Trade - Fluxys LNG:
20y capacity agreement for up to 8 mt/y LNG
transshipment services at LNG terminal in
Zeebrugge.



TRANSSHIPMENT CONTRACT: INVESTMENT IN 5TH STORAGE TANK AND PROCESS INSTALLATIONS

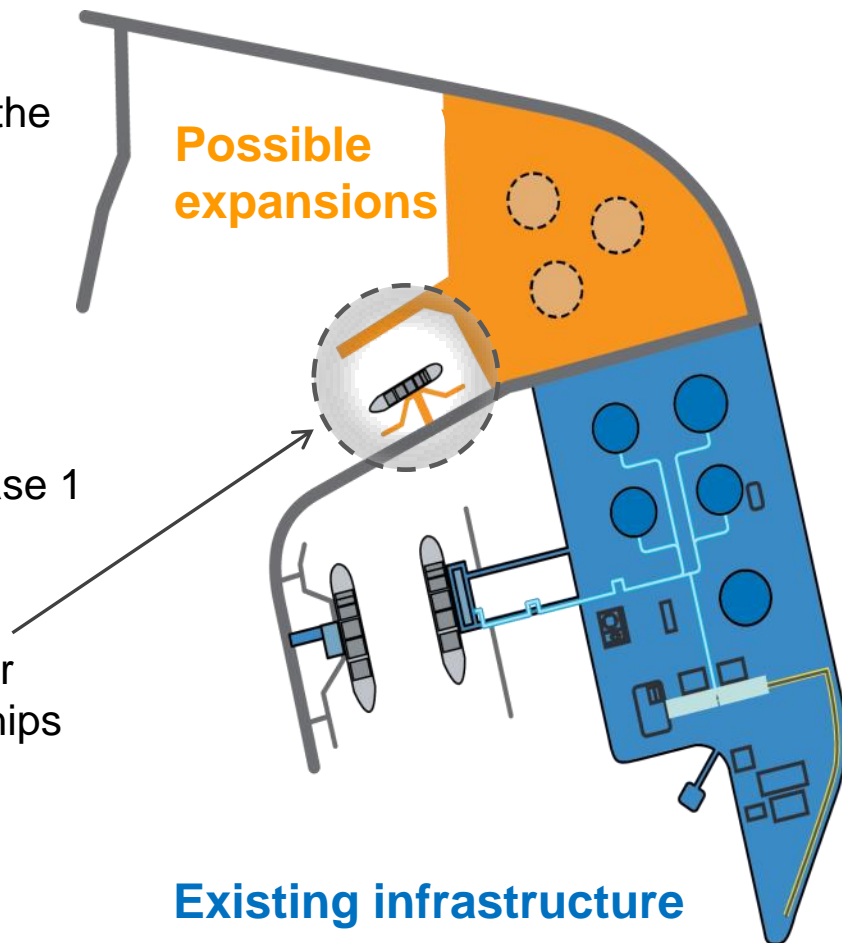
Investment in 5th storage tank and process installations:

- ship-to-ship transshipments in 2018
- ship-storage-ship transshipments 2019



ADDITIONAL SMALL-SCALE PROJECTS BEING ANALYZED

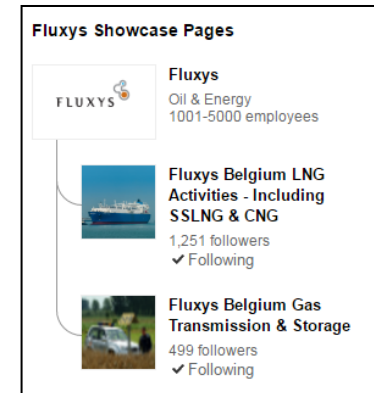
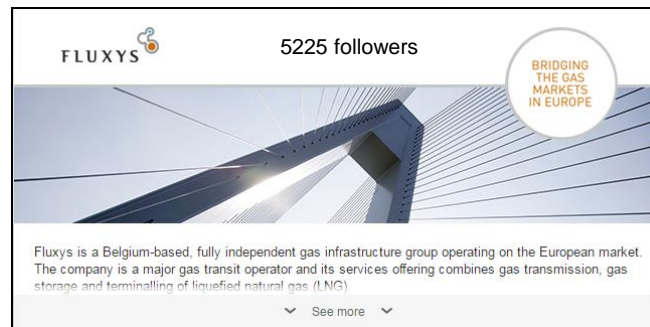
- 2015: market test for additional capacities at the Zeebrugge terminal
 - **Phase 1: jetty for small-scale vessels**
 - **Phase 2: additional jetty / storage / send-out for large scale**
- 11 participants expressed interest in both phase 1 and phase 2
- Possible expansion phase 1 is currently under investigation: additional jetty for small LNG ships



YOU WANT TO KEEP IN TOUCH WITH US? WE ARE ACTIVE ON SOCIAL MEDIA

- LinkedIn

- Fluxys page: <https://www.linkedin.com/company/fluxys>
- Showcase pages
 - » (SS)LNG & CNG
 - » Transmission and storage



- Twitter

- Fluxys Group: <https://twitter.com/fluxysgroup>
- Fluxys Belgium:

<https://twitter.com/fluxysbelgiumnl> & <https://twitter.com/fluxysbelgiumfr>



QUESTION TIME



