

Sustainable Barge Transport

An overview of current initiatives

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Expertise and InnovationCentre Barging

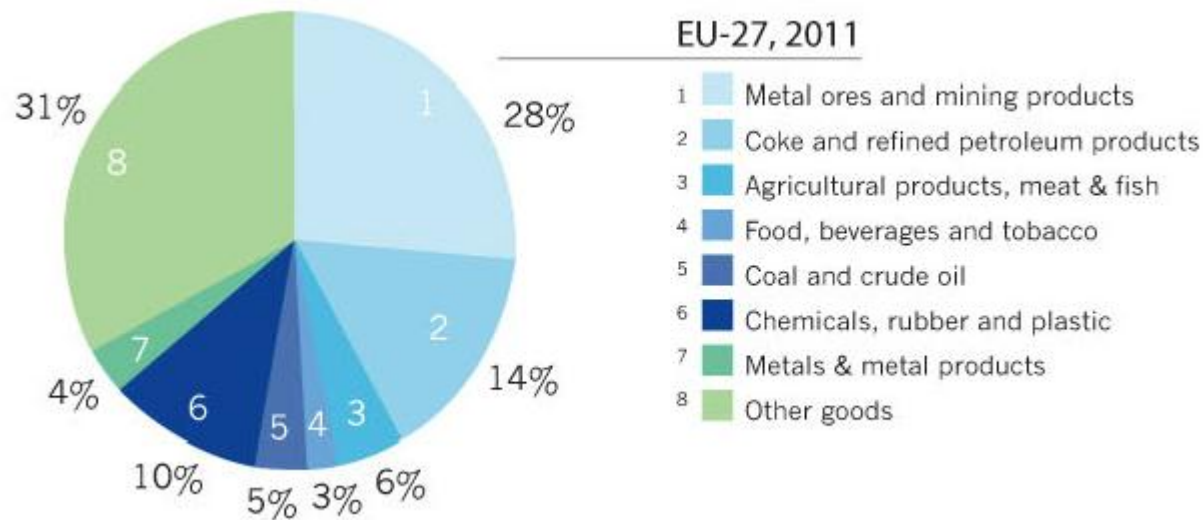
Antwerp, November 26th 2014

Topics

- Short introduction
- Expertise and Innovation Centre Barging
- Our challenge: fighting emissions
- Current initiatives
 - Innovation Lab (NOx, pm)
 - Smart Steaming (CO₂)
 - LNG Centre

Some words on barging in Europe

- 13.500 vessels, 15,2 mio tonnes cargo capacity
- 6,5% share in tonne kilometres vs. road and rail
- 521 million tonnes, 5,7 mio TEU (EU-27, 2011)



Some words on tankers

- 2000 tankers in Europe
- 50% over 2500 tonnes
- Modern tankers can carry over 5000 m³
- Considered safest transporter of chemical products
- Safety acts as an enabler for continuous investments
 - For instance regulation on double hulls



Standard tank vessel
Length 110 m - width 11.40 m -
draught 3.50 m - cargo capacity 3,000 t



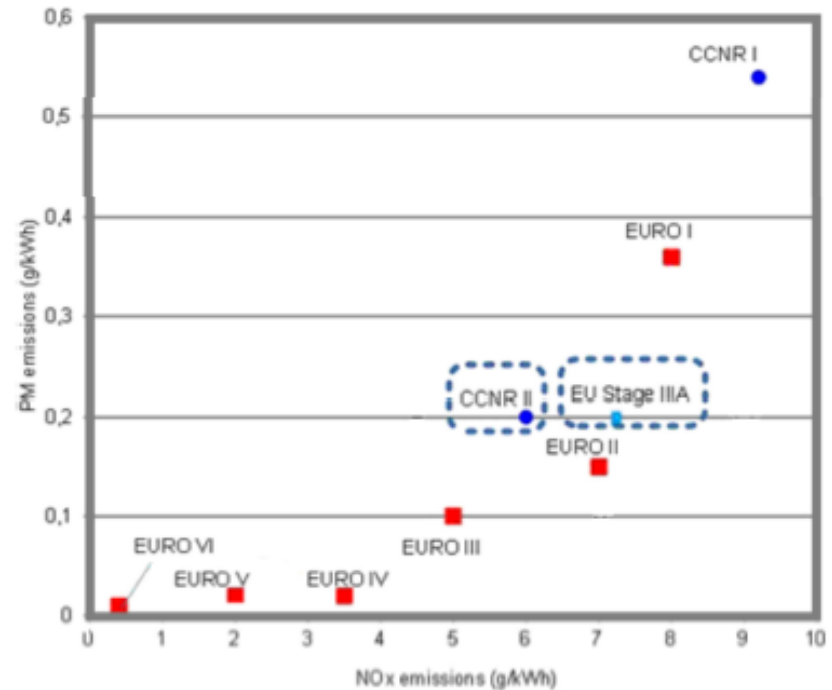
Large tank vessel
Length 135 m - width 21.80 m -
draught 4.40 m - cargo capacity 9,500 t

Some words on EICB

- Expertise and Innovation Centre Barging
- 5 fte.
- Dutch Foundation, based in Rotterdam
 - Associations in the Board
 - Independent
- Aim: to make the inland waterway transportation sector innovative and future proof
 - Focus on greening technologies

Our Challenge

- Comparison with road transportation
- Working towards future Non Road Mobile Machinery Stage V (2020, expected):
 - 0,02 g/kWh for pm
 - 1,2 g/kWh for NOx



Our Solution

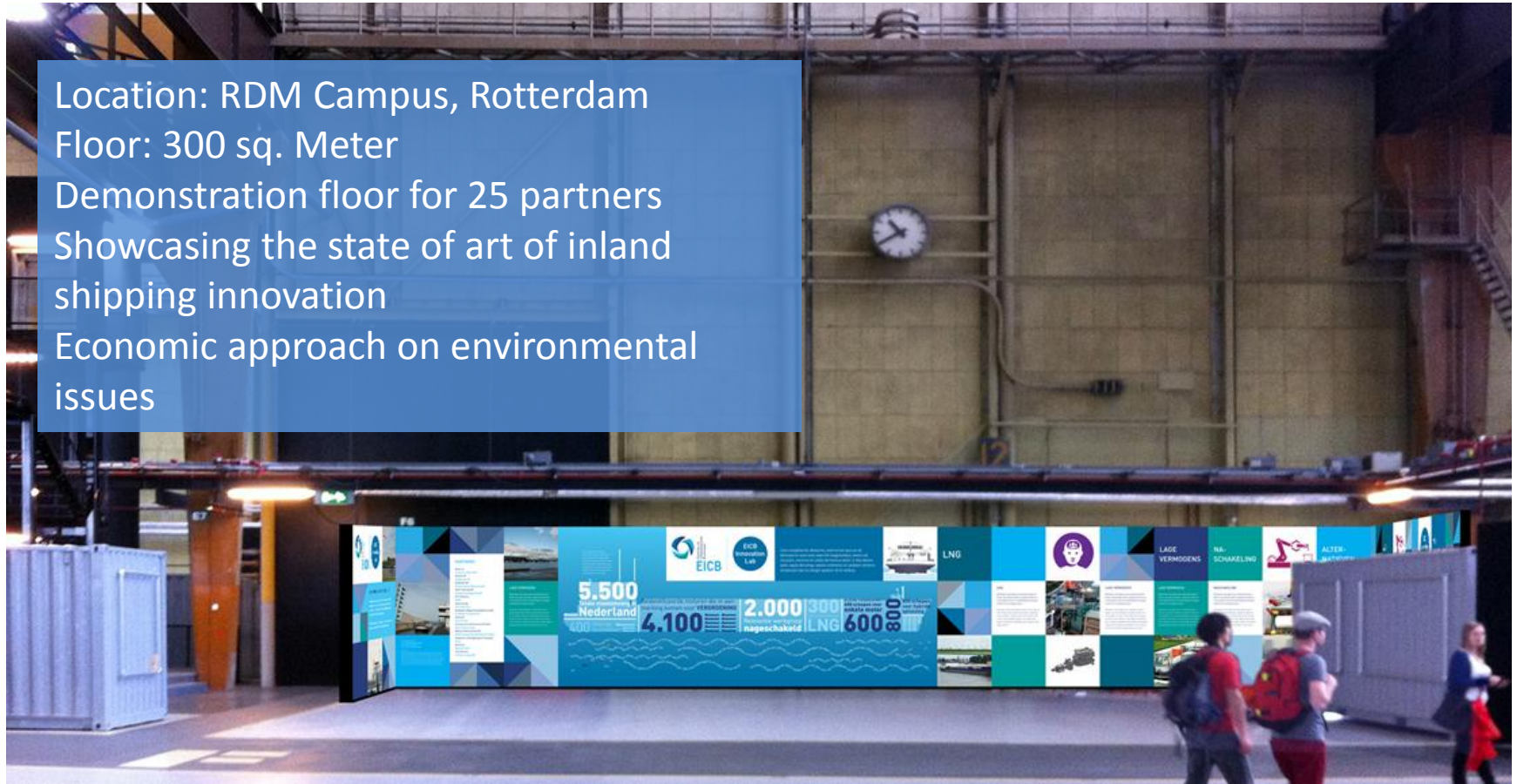
- Fighting emissions: NOx, pm set the agenda
 - ... while the carbon footprint issue is never far away
- Modernization is necessary
- But..., only 35 ships newly built (Netherlands)
 - Compared to over 250 in 2009
- Solution: upgrading the current fleet by **retrofitting**

Our Approach

- Project oriented, e.g.:
 - EICB Innovation Lab
 - Econaut/Smart Steaming
 - LNG Centre

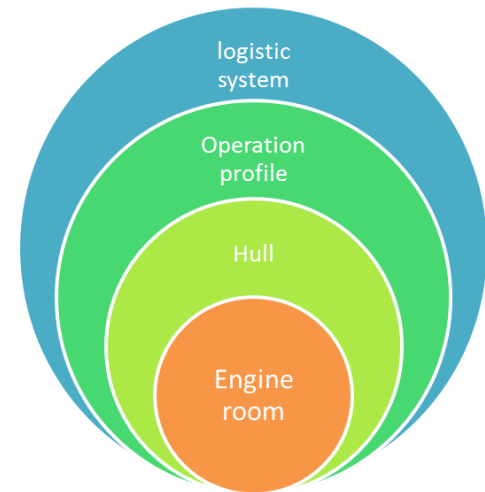
EICB Innovation Lab

Location: RDM Campus, Rotterdam
Floor: 300 sq. Meter
Demonstration floor for 25 partners
Showcasing the state of art of inland shipping innovation
Economic approach on environmental issues



EICB Innovation Lab

- Targeting 4100 engines
- Identifying greening options
- Retrofit!
- 4 solutions:
 - LNG
 - After treatment (SCR/DPF)
 - Hybrid propulsion
 - Alternative solutions, like Waterfuel Emulsion and GTL fuel

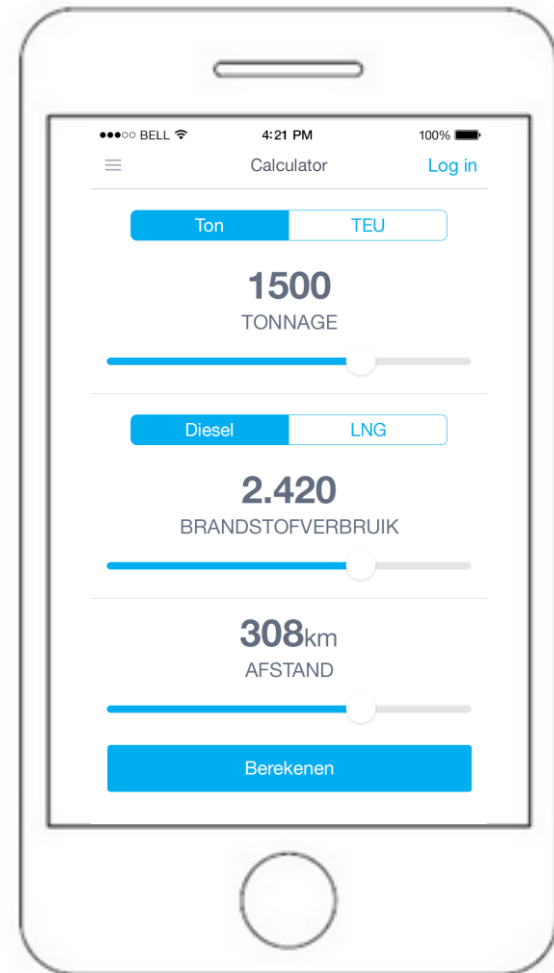


EICB Innovation Lab

- Strategic partnership with industry is key
- Identify and quantify the problem
 - Industrial stakeholders and end users working together
 - Projects supported by regional and national (port) authorities
- Goal: bring 20% of 4100 engines towards CCR 2 emission target (Dutch fleet)
- Designed for Nox and pm
- European upscale potential

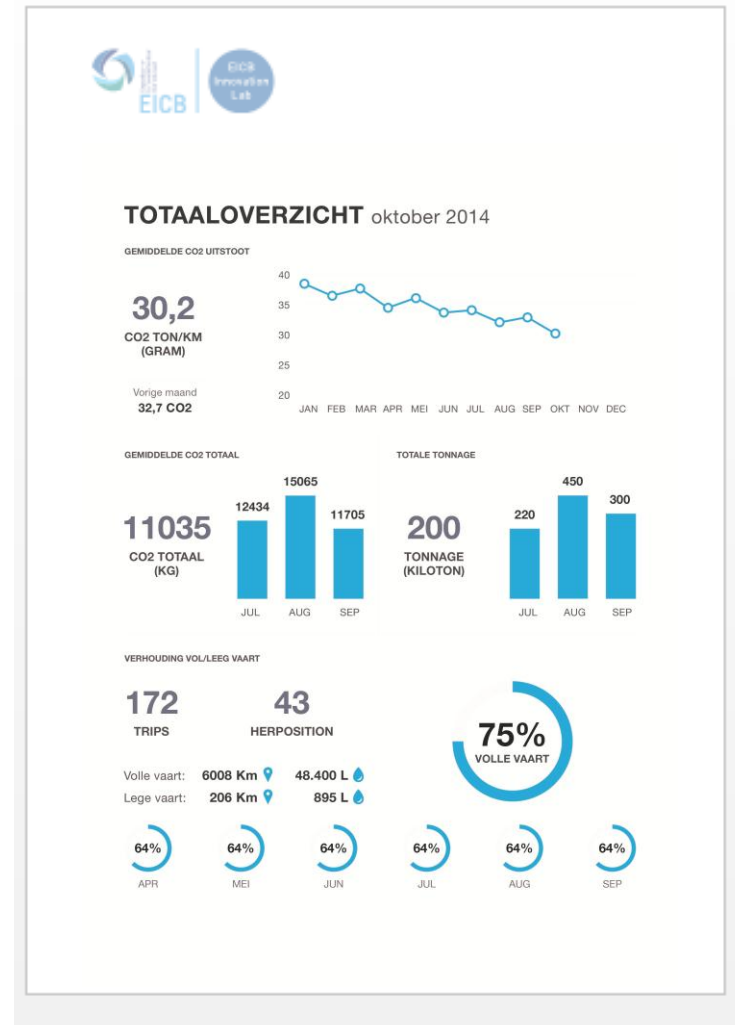
EICB Econaut

- CO₂ footprint calculator
- Setting a standard
 - Supported by associations
 - Agreement on methodology and defaults
- Free of use
 - for rapid uptake



EICB Econaut

- Smart reporting function
 - Use of GPS
- Cumulative effects



EICB Econaut

- Monthly reporting
- PDF by e-mail
- Online sharing options to encourage good behavior
 - by social media
 - towards clients
- International version scheduled for 2015

DOCUMENTATIE week 48-49

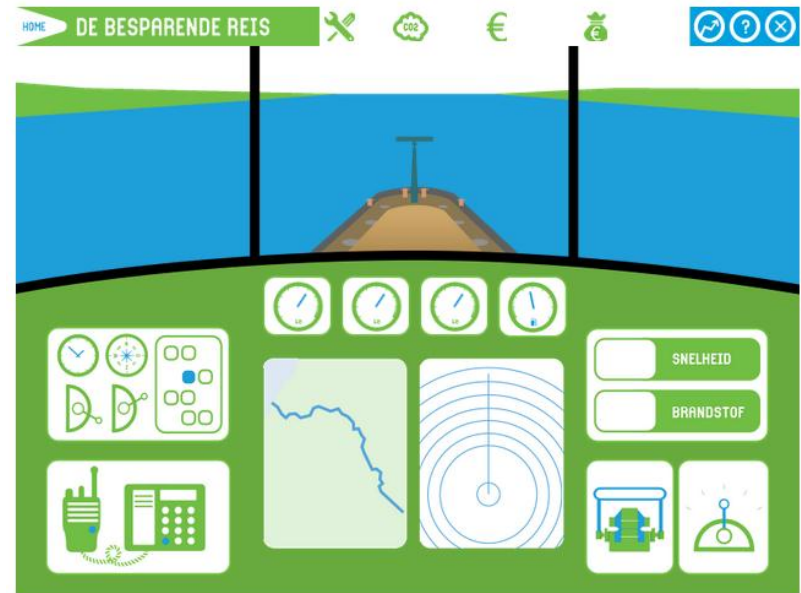
17 t/m 21 oktober		17 okt	18 & 19 okt	20 okt	21 okt
Tonnage	Ton	800	1500	800	1500
Km vol	Km	308	308	308	308
Km leeg	Km	46	46	291	291
Herpositionering	Liters	200	200	1350	1350
Brandstof	Liters	1780	2420	1780	2420
Overig gebruik	Liters	642	712	1050	1160
Aantal ton/km	Ton/km	246,400	462,000	246,400	462,000
Co2 verbruik totaal	Co2/kg	6922,08	8.796,45	11035,2	13.015,2
Co2 verbruik ton/km	Co2/g	28,09	19,04	44,79	28,17

23 t/m 27 oktober		23 okt	24 okt	25 & 26 okt	27 okt
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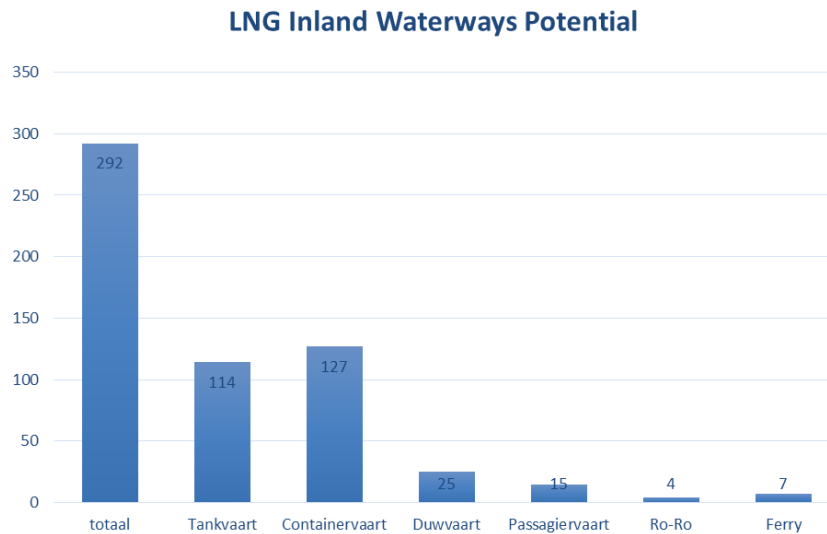
EICB Smart Steaming e-course

- 4% reduction is possible by altering behavior
- Stimulating life long learning-principle



EICB LNG Centre

- Potential: 300 ships identified
- 114 tankers
- > 500 m³ bunker fuel makes a solid business case

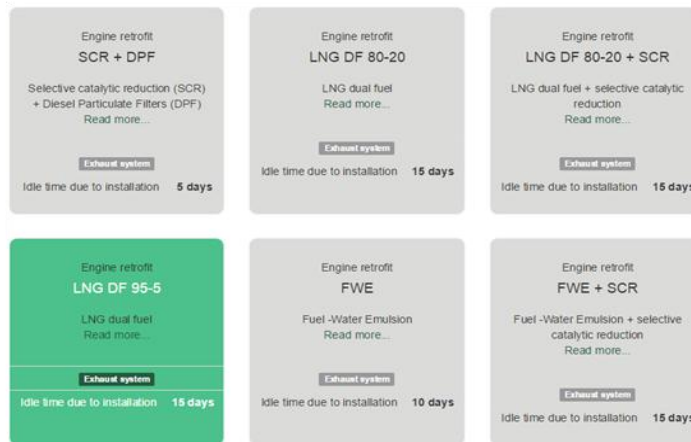


EICB LNG Centre, current issues

- High investment
 - Only pilot/demo projects
- Technology readiness
 - Not standardized, not regulated (yet)
- Limited financial resources
- Uncertainty
 - emission regulations
 - fuel price development
- Lack of awareness and knowledge
- Reduction of hardware costs by using industrial products
 - LNG tank
 - Coolbox
 - cryogenic components
 - engines
- Reduction installation costs
 - developing standard designs
 - realistic safety requirements
 - upscaling pilot projects to deployments projects

EICB: towards a holistic approach

- Accumulating *all* knowledge into one Greening Tool
- Informing skippers/shipowners about *their* options



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THANK YOU!