School of Marine Science&Technology

Newcastle University

Clean North Sea Shipping
Recommendations

By: The CNSS consortium

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The European Regional Development Fund

The Interreg IVB North Sea Region Programme

CNSS
Clean North Sea Shipping

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Clean North Sea Shipping

FINAL REPORT

Key findings and Recommendations

Clea North Sea Shipping

March 2014

CNSS
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CLEAN NORTH SEA SHIPPING RECOMMENDATIONS

Clea North Sea Shipping
March 2014

The challenges ahead?

"The North Sea Commission and others have emphasised the need to support the transport sector [and stakeholders] …in facilitating an…

urgent and
demanding
change of direction."

The fundamental CNSS contribution?

Findings and recommendations of the CNSS project are regarded as an important contribution to the discussions and processes ahead of us.

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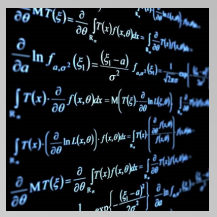
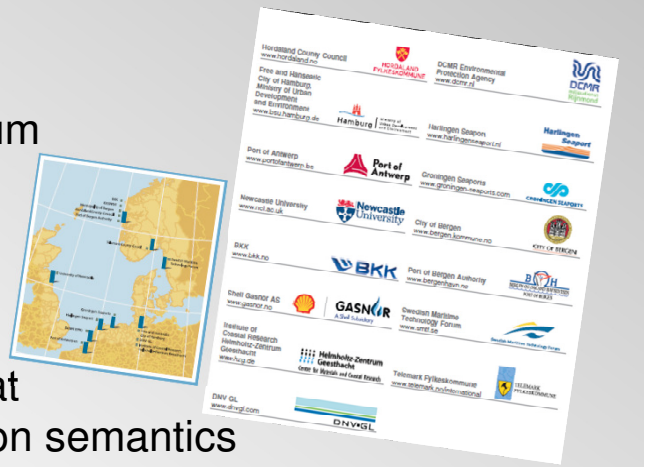
The context and process of developing the recommendations?



- **Evidence based**
  - Highly supported by scientific and technical rigour
  - Supported with peer reviewed publications throughout the scientific community

- **Involvement of a wide range of stakeholders**
  - Wide ranging stakeholder membership in the consortium
  - Many meetings and conferences over the project
  - Agreed across the consortium



- **Challenges of multiple audiences**
  - Translation of technical information into a usable format
  - Translation of multiple “terms of reference” into common semantics

- **Peer reviewed**
  - Invited experts from outside the consortium were asked to review the drafts and challenge our arguments

Headline Observations

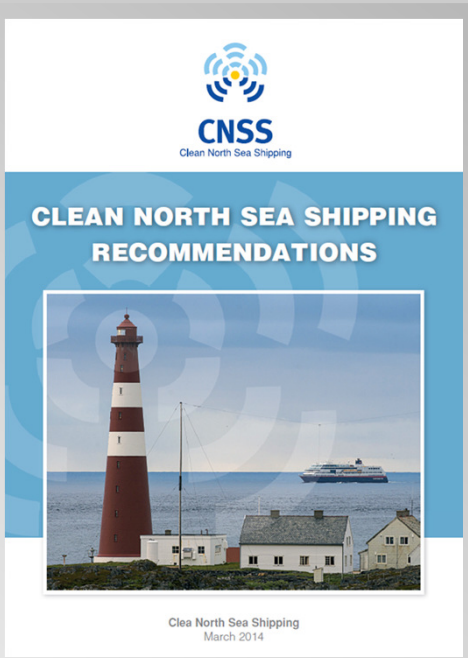
- **Postponement of the NOX limitation for new build ships from 2016 to 2021 (MARPOL)**
  - Higher concentrations of NOX in the North Sea Region of 11% to 15%

- **The development of onshore power supplies and LNG facilities**
  - Lagging behind given the increasing number of ships supporting these energy sources

- **Environmental incentive schemes to support clean harbours**
  - Not fully transparent
  - Not universal
  - Not consistently used or applied

RECOMMENDATIONS

- Air Quality
- Technology and Fuels
- Environmental Performance – Emission Indices
- Cross-thematic Policy and Regulation

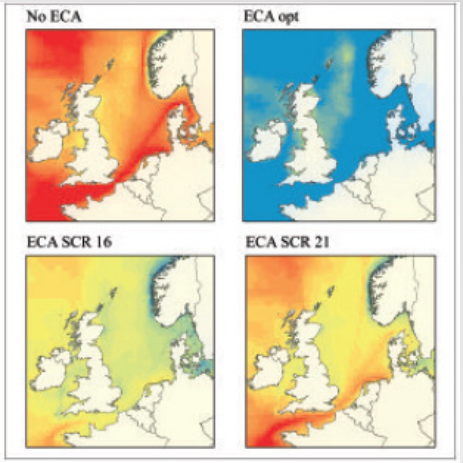


RECOMMENDATIONS

Air Quality

- CNSS Encourages the use of cutting edge scientific methods to estimate emissions

- FREE models and methods from CNSS are made available for this



RECOMMENDATIONS

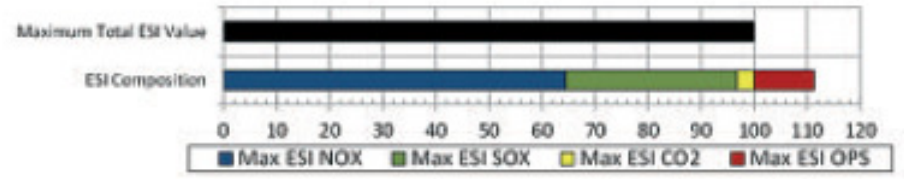
Technology and Fuels

- CNSS promotes LNG as a fuel
- CNSS promotes OPS

RECOMMENDATIONS

Environmental Performance – Emission Indices

- CNSS promotes better use of incentive and index schemes
- CNSS promotes a universal approach to incentive and index schemes
- CNSS promotes monitoring, reporting and verification (MRV) to reflect real-world assessment of emissions



RECOMMENDATIONS

Cross-thematic Policy and Regulation

- CNSS promotes the introduction of NOx Tier 3 regulations for new-build vessels ASAP

- CNSS promotes non-postponement of NOx Tier 3 regulations to 2021 from 2016

NO_x			
	Diesel engines installed on ships	Speed (n) in rpm	Max. allowable NO_x emissions (g/kWh)
Tier I	From 1 January 2000 to 1 January 2011	< 130	17
		130 ≤ n < 2000	$45*n^{-0.2}$
		n ≥ 2000	9.8
Tier II	After 1 January 2011	< 130	14.4
		130 ≤ n < 2000	$44*n^{-0.23}$
		n ≥ 2000	7.7
Tier III	After 1 January 2016 when operating in ECA	< 130	3.4
		130 ≤ n < 2000	$9*n^{-0.2}$
		n ≥ 2000	2

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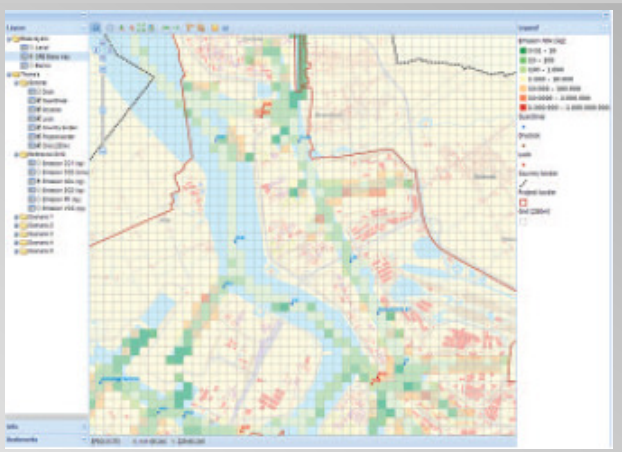
Air Quality



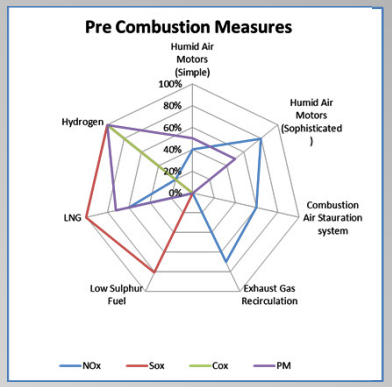
Harbours and Cities

- Size dependent fuel use functions
- Account for fuel use from boilers
- Consistent use of CNSS activity based modelling for harbour emission inventories
- Use of appropriately sophisticated models and expertise for modelling city scale impacts of emissions

North Sea

- Use of load-dependent emission factors
- Increase of on-board emissions data measurements and its distribution
- Use of AIS data for the most realistic and accurate temporal and geographical scenario modelling
- Use of advanced 3D chemistry transport models for regional modelling

Technology and Fuels



LNG

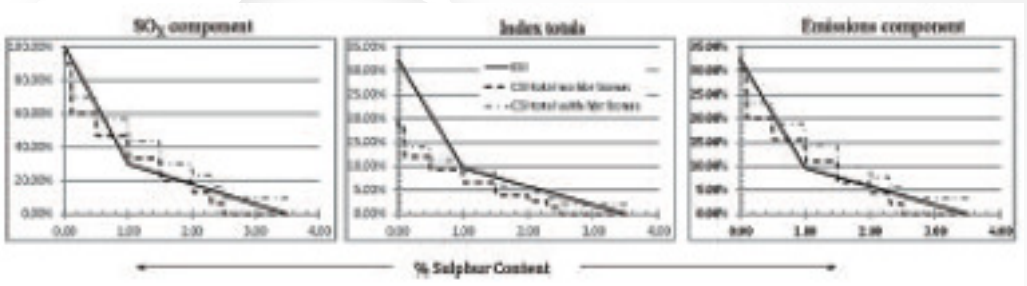
- Promotion of LNG throughout the North Sea region
- Stakeholders to promote solutions for the future LNG regulatory framework
- For LNG handling: legislators should avoid local, regional or national regulations (i.e. an international approach should be adopted)

OPS

- New ships should be fitted with OPS connections (including 50Hz on small ships)
- Increase in OPS infrastructure in ports
- Standard communications protocols for controlling ship-shore connection
- Standardisation of HVSC on ships

Environmental Performance – Emission Indices

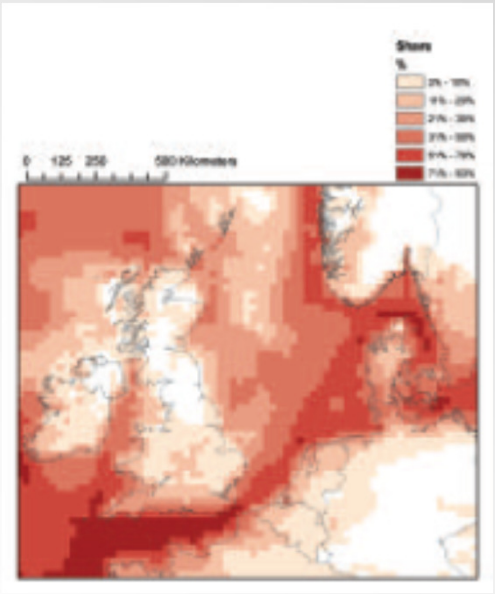
- Development of a unified approach to indexes and incentives
- Account for global effects (GHG)
- Account for local effects (poisons)
- Account for real-world emissions (actual emissions for transients, off-design operation)
- Adaptable and scalable
- Reward truly zero-emissions at-berth
- Deliver real value to the shipper/port
- Simple to administer
- Reward earlier adopters – to promote quick inception



Category	For Carriers (Fleets)	For Individual Vessels
GREEN	≥90% vessels reported and the carrier verified, ≥40% weighted total score	The vessel verified, total score ≥50%, ≥35% in all fields
YELLOW	≥20% vessels reported ≥10% weighted total score	Total score ≥20%
RED	<20% vessels reported or,<10% weighted total score	Total score <20%

Cross-thematic Policy and Regulation

- Avoid postponement of Tier 3 regulations to 2021
- Avoid postponement of sulphur cut from 2020 to 2025
- Implement standards for NOx, PM and sulphur at berth
- Implement incentive schemes for promotion of cleaner shipping
- Education, training, accreditation and certification towards the adoption of LNG



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Thank You

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http://cnss.no