Emission reduction potential in shipping

ECCP - WG Ships Meeting 3

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November 16, 2011

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Emission reduction potential: comparison of studies

Impact of EEDI and SEEMP: IMO study

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Comparison of studies

	Target year	Fuel price $/t	Baseline Mt	Cost-effective potential	Total potential*
DNV	2030	380	~1500	~30%	~55%
CE Delft	2030	700	~1900	~40%	~45%
SNAME	2030	900	~2000	~45%	~45%

*Highest reported potential – scenarios vary

The studies agree on a potential of 45%-55%, where most are cost-effective at the current fuel price. What will drive the implementation?

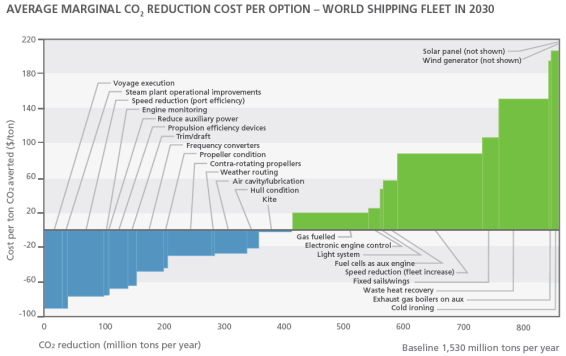
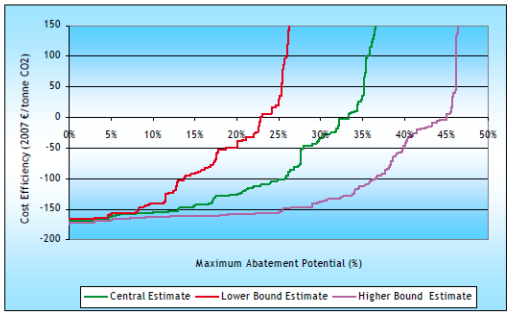


Figure 18 Marginal CO_2 Abatement Costs for the Maritime Transport Sector in 2030 relative to frozen-technology scenario, Range of Estimates, US$ 700/ tonne fuel, 9% Interest Rate



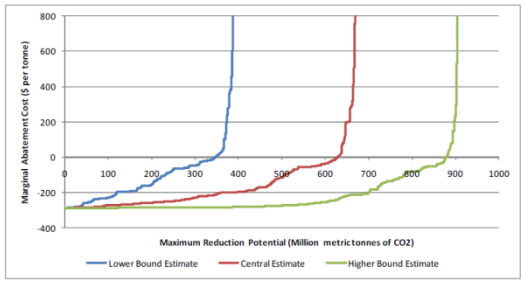


Figure 6-3 Aggregated MACC in 2030 with $900 per ton fuel price and 10% discount rate for all ship types

- Sources:
  - DNV (2009): Pathways to low carbon shipping
  - CE Delft (2009): Technical support for European action to reducing Greenhouse Gas Emissions from international maritime transport
  - SNAME/IMarEST (2011): Marginal Abatement Costs and Cost Effectiveness of Energy-Efficiency Measures
  - Comparison study by CE Delft (2011): Analysis of GHG Marginal Abatement Cost Curves

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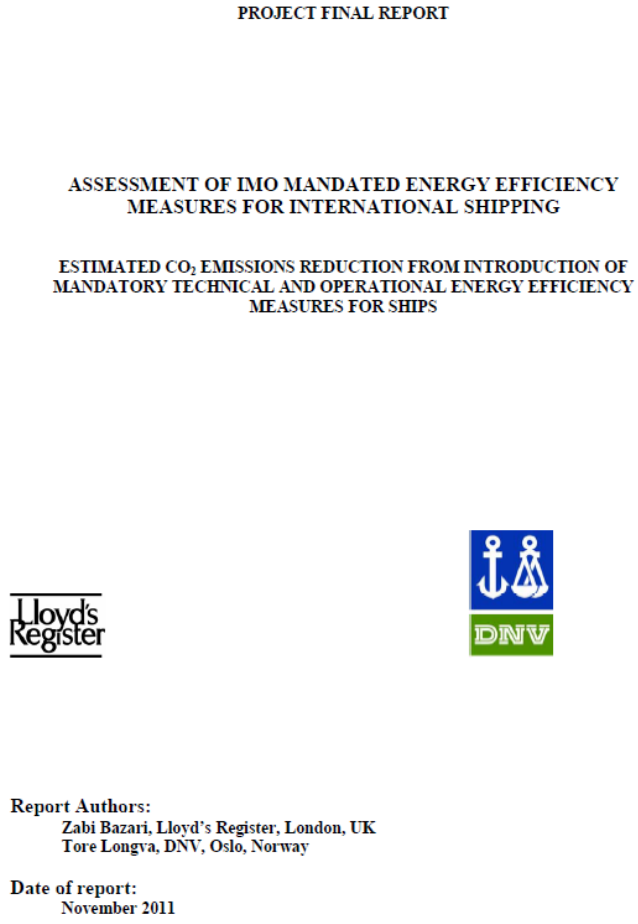
Study on effect of EEDI and SEEMP (Novemeber 2011)

- Purpose: Analyse the potential reduction resulting from the mandated energy efficiency regulations on EEDI and SEEMP
- Commisioned by IMO and undertaken by Lloyds Register and DNV



PROJECT FINAL REPORT

ASSESSMENT OF IMO MANDATED ENERGY EFFICIENCY MEASURES FOR INTERNATIONAL SHIPPING

ESTIMATED CO_2 EMISSIONS REDUCTION FROM INTRODUCTION OF MANDATORY TECHNICAL AND OPERATIONAL ENERGY EFFICIENCY MEASURES FOR SHIPS

Lloyd's Register

DNV

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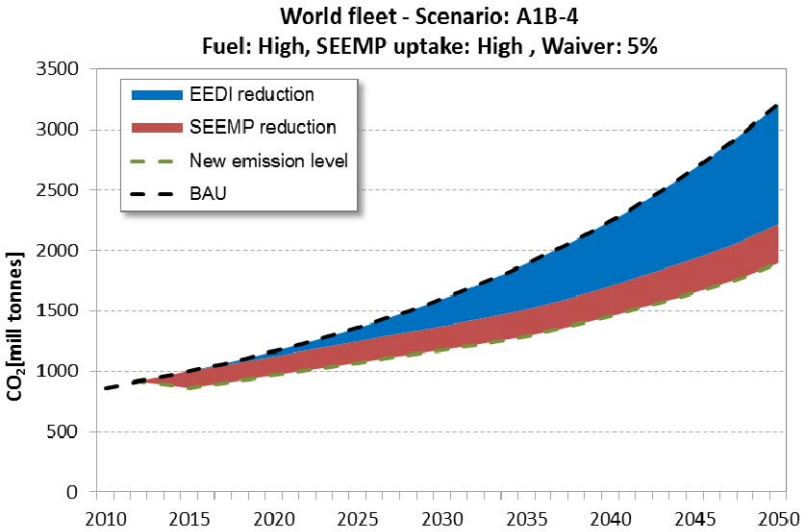
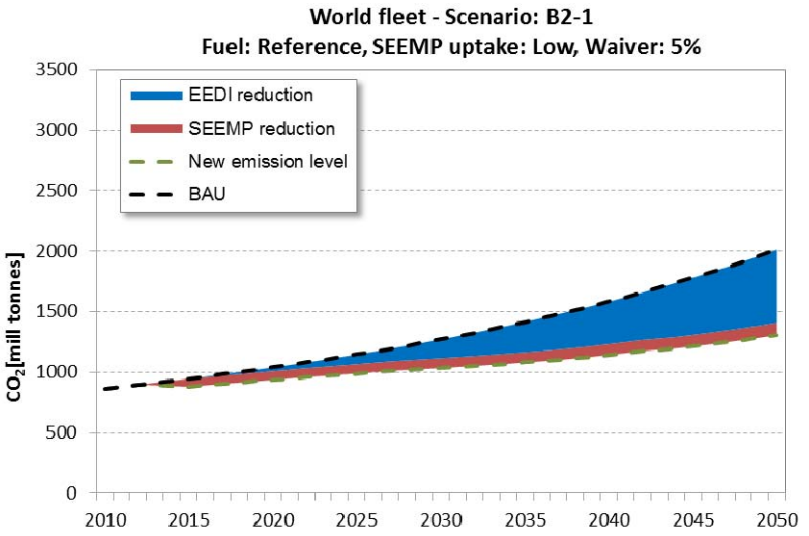
World fleet effects

- Business-as-usual CO_2 emissions expected to reach 2-3 billion tonnes in 2050

	Average of A1B-4 and B2-1			
Year	BAU Mt	Reduction Mt	Reduction %	New level Mt
2020	1103	152	14%	951
2030	1435	330	23%	1105
2040	1913	615	32%	1299
2050	2615	1013	39%	1602

SEEMP reduction will be more significant in the short run, while the effect of EEDI will have a large effect in the long term.





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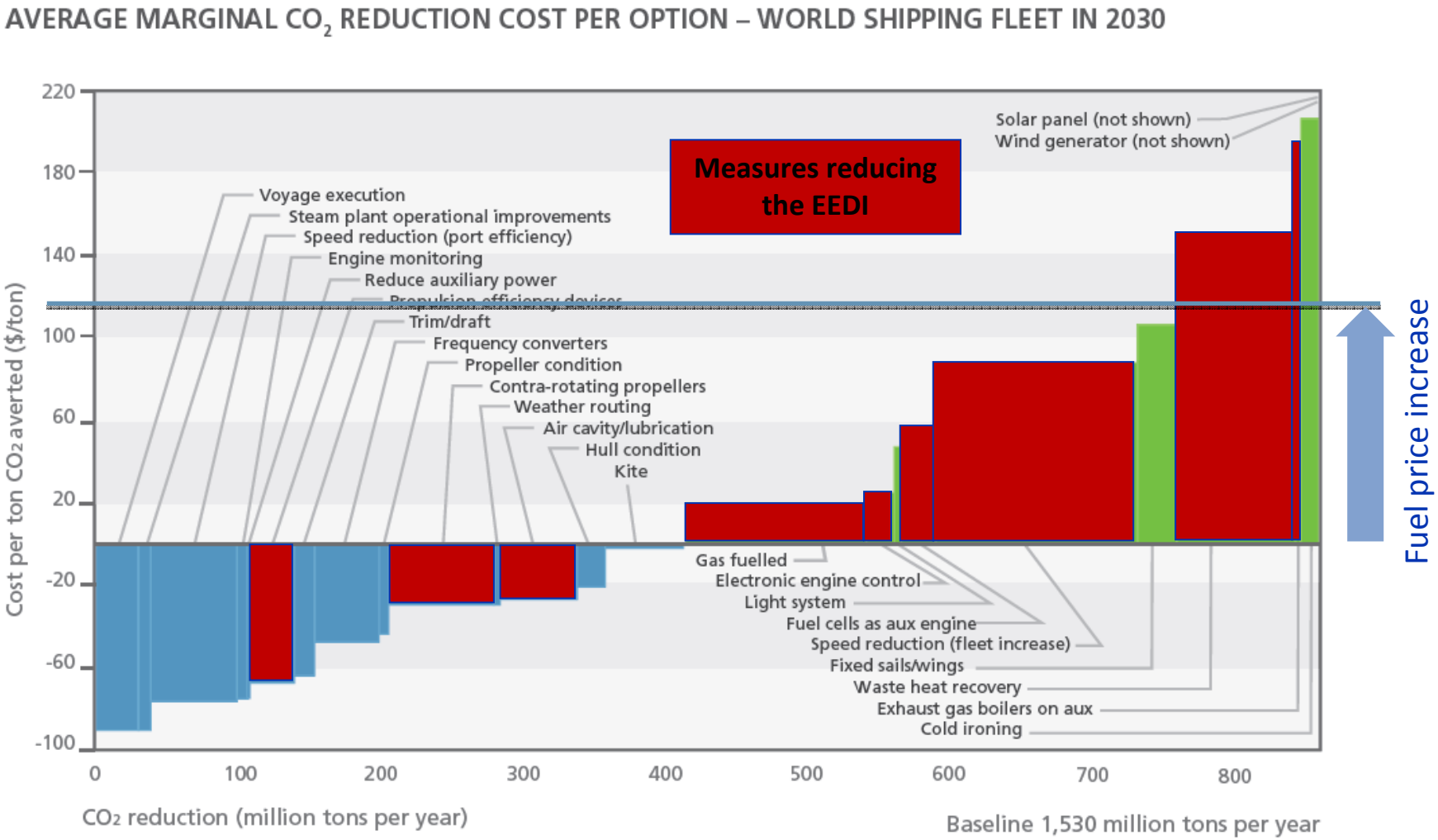
Marginal abatement cost curve



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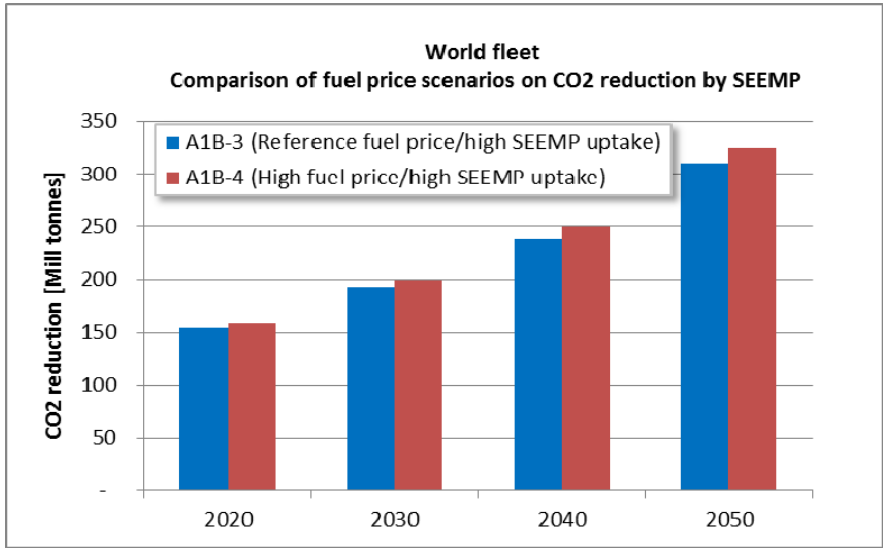
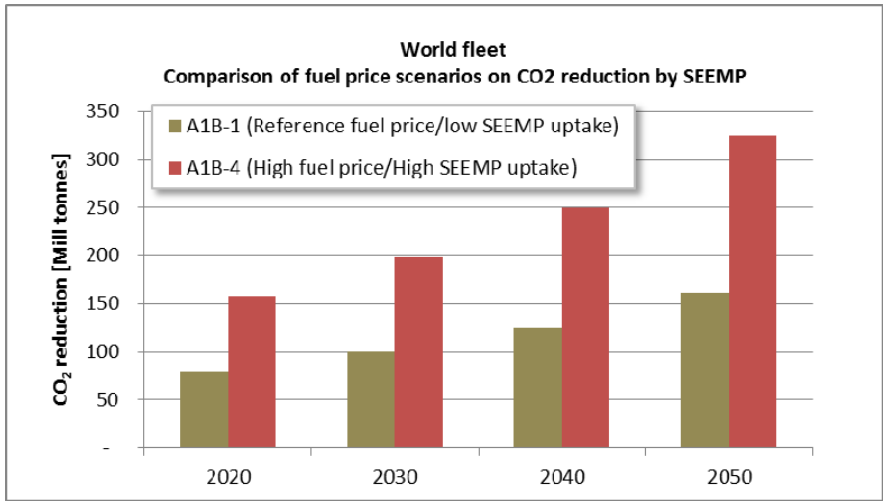
Impact of fuel prices on operational reductions

- Most operational measures are cost-effective even under the reference fuel price scenario
  - The measures have a relatively low cost
  - High fuel prices will not directly increase the uptake
- Non-financial barriers will play a more significant role
  - Lack of capital
  - Lack of competent personnel
  - Cooperation between actors
  - Split incentives (implementer may not benefit)

SEEMP will increase the awareness of the potential of energy efficiency measures

Non-financial barriers preventing implementation of cost-effective measures





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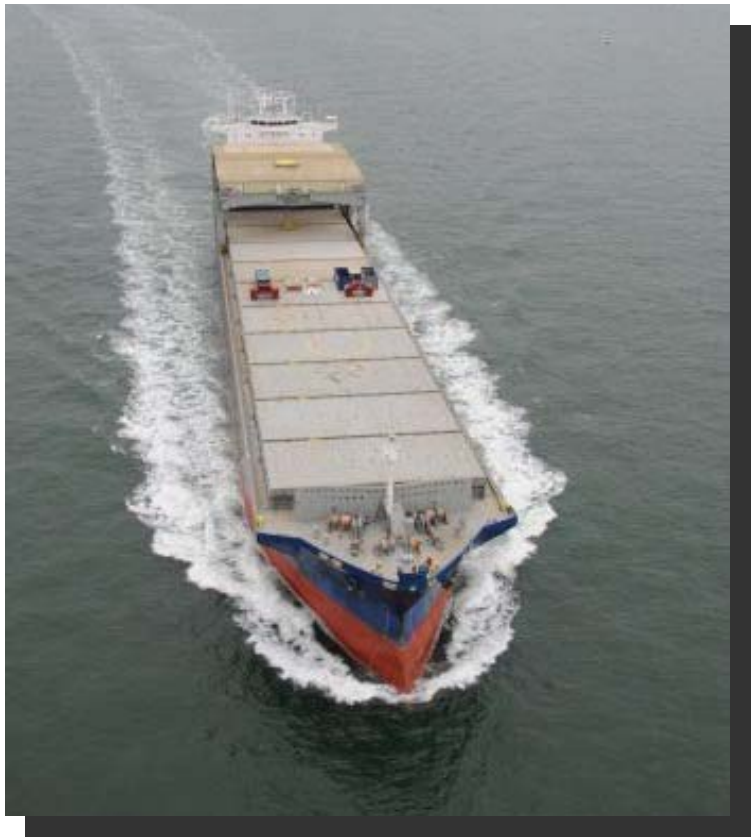
Concluding remarks

- Several published studies show that there is a high potential for reduction – around 50%
- EEDI and SEEMP mandated with amendments to MARPOL Annex VI
  - Impact study shows that over time the EEDI will reduce emissions by 13% and SEEMP by 9 % in 2030 and by 55%/14% in 2050
  - New technologies needed to reach this level. Potential technologies in 2050 are not identified
  - SEEMP does not directly require reductions but will increase the awareness of the potential of energy efficiency measures
- Most operational measures are cost-effective but many are not implemented
  - Non-financial barriers hinders the implementation



High fuel prices will drive technology development, but non-financial barriers may need others incentives to overcome.

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