

Transport for a Global Economy

The Quest of Energy Efficiency through technical Innovation

ITF2009 Workshop M4: International Shipping – Till F. Braun, Germanischer Lloyd AG



Germanischer Lloyd

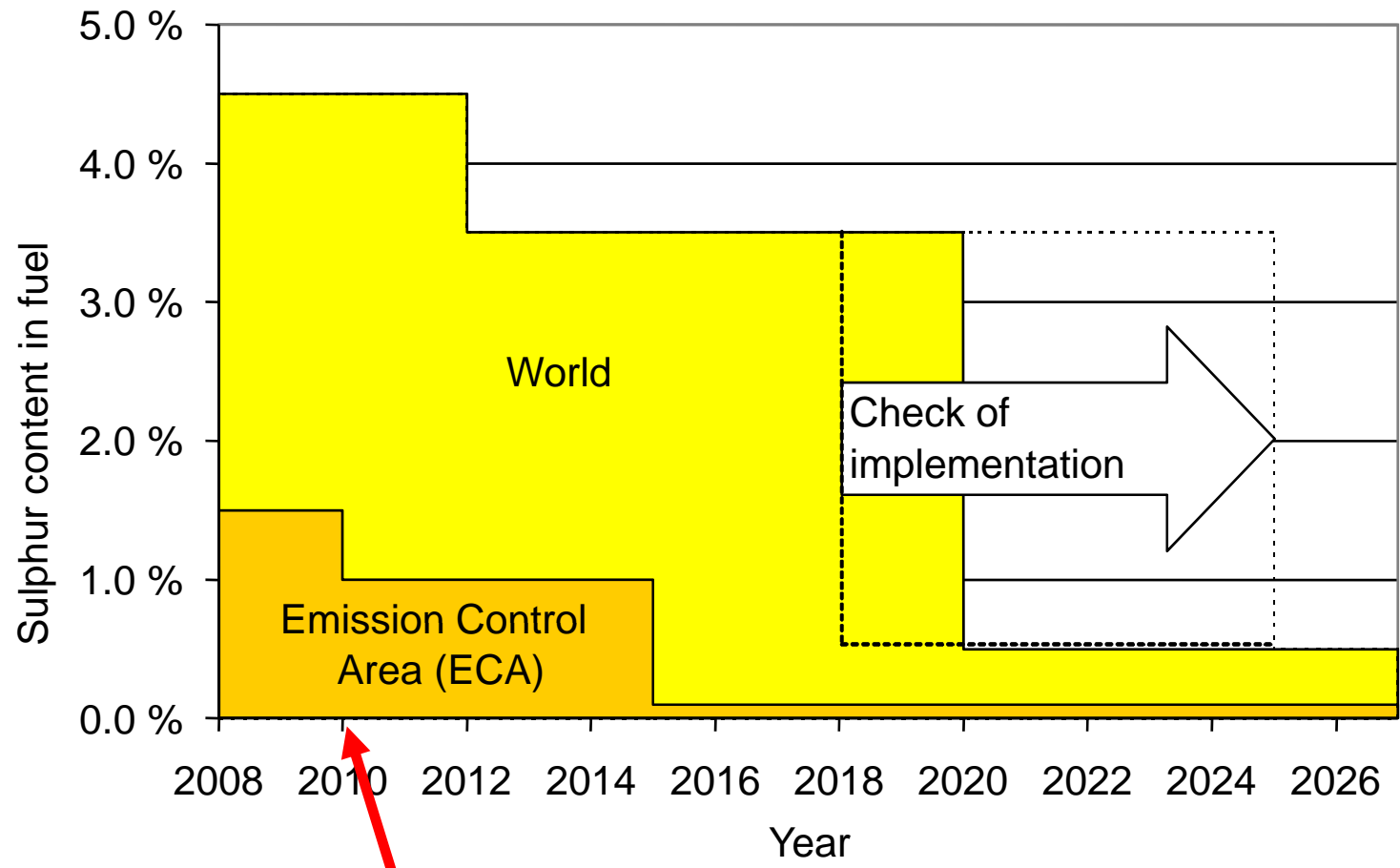
Contents

- **Why efficiency matters**
 - What happens at IMO
 - The effective fuel price in 2037
 - Which speed should be selected
 - The relative importance efficiency
- **Which options matter**
 - optimal hull dimensions
 - better hull form for new ships
 - reduced frictional resistance
 - outlook



Planned reduction of Sulphur content

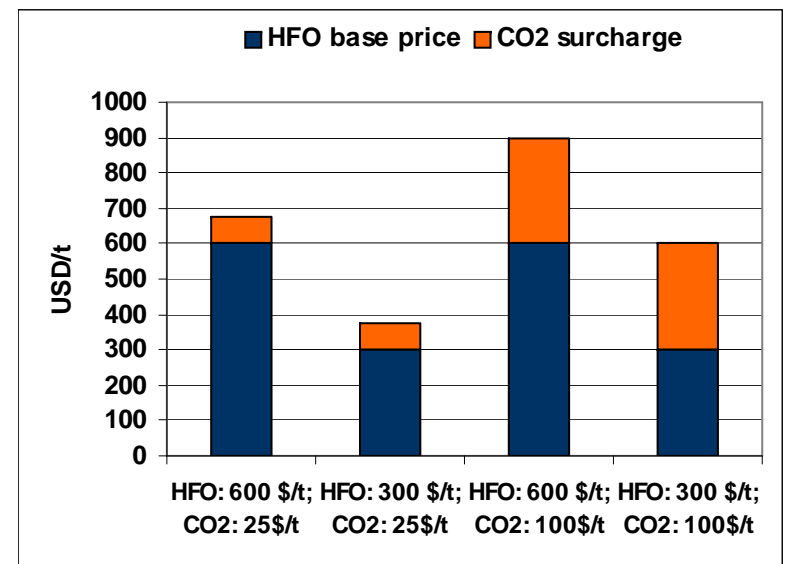
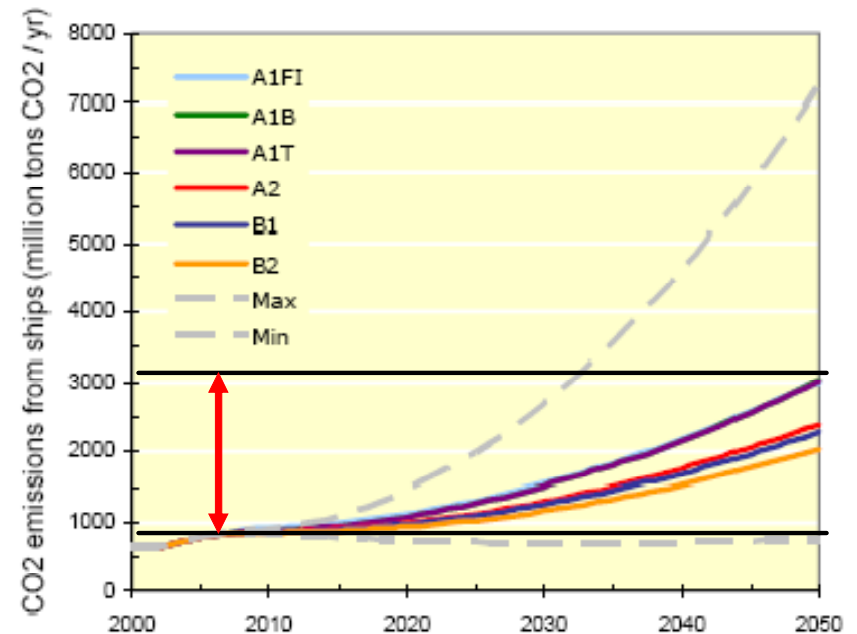
(MARPOL Annex VI 2008)



0,10% m/m Sulphur in EU ports

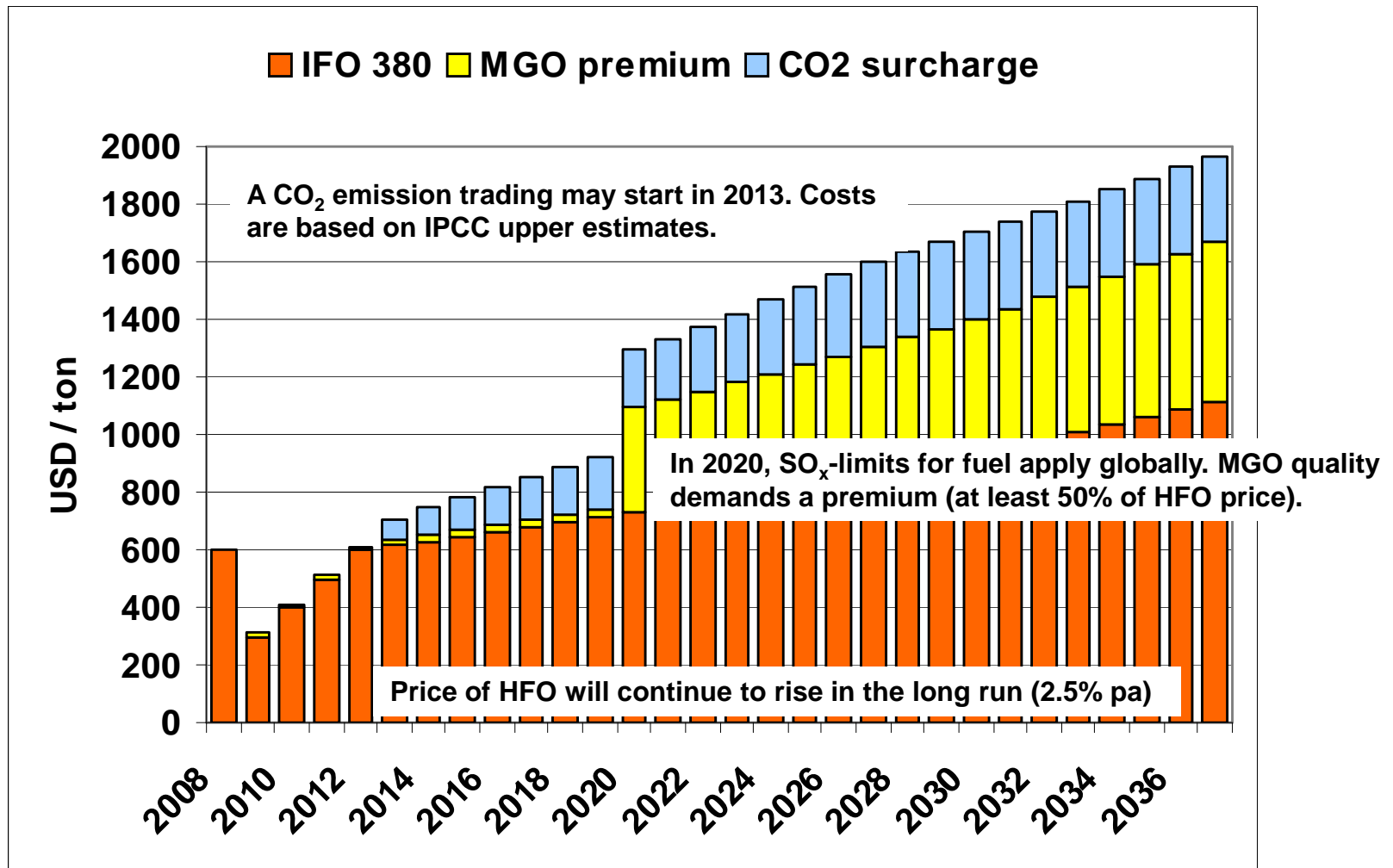
CO₂-emissions – what is expected

- With increasing transport demand, CO₂-emissions in 2050 are estimated to be three times the emissions in 2007 *
- The assumptions used in this prediction already account for novel technological and operational measures
- Political and regulatory measures are expected in addition, incl.
 - CO₂-indexing
 - emission trading
- The estimated additional costs related to CO₂-emissions range from 25\$/t to 100\$/t of CO₂. amounting to max 300\$/t surcharge for one tonne of fuel



* GHG-Inventory-Study IMO (MEPC 58/INF.6)

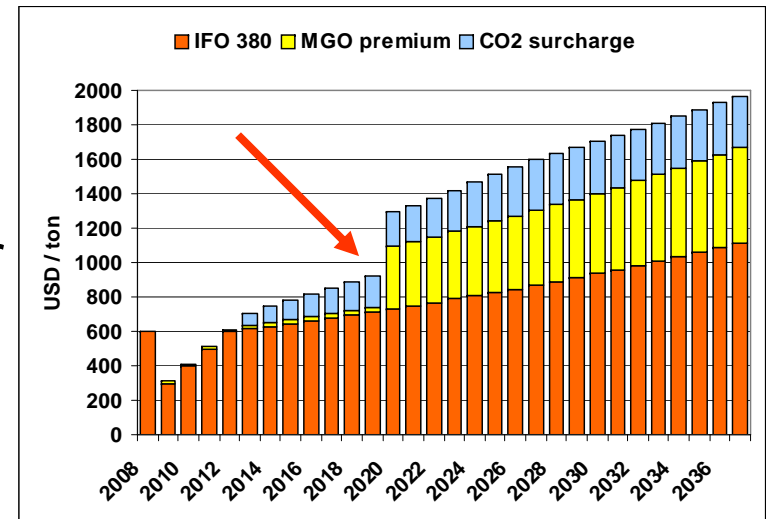
Expected effective fuel costs for shipping – a view into the future



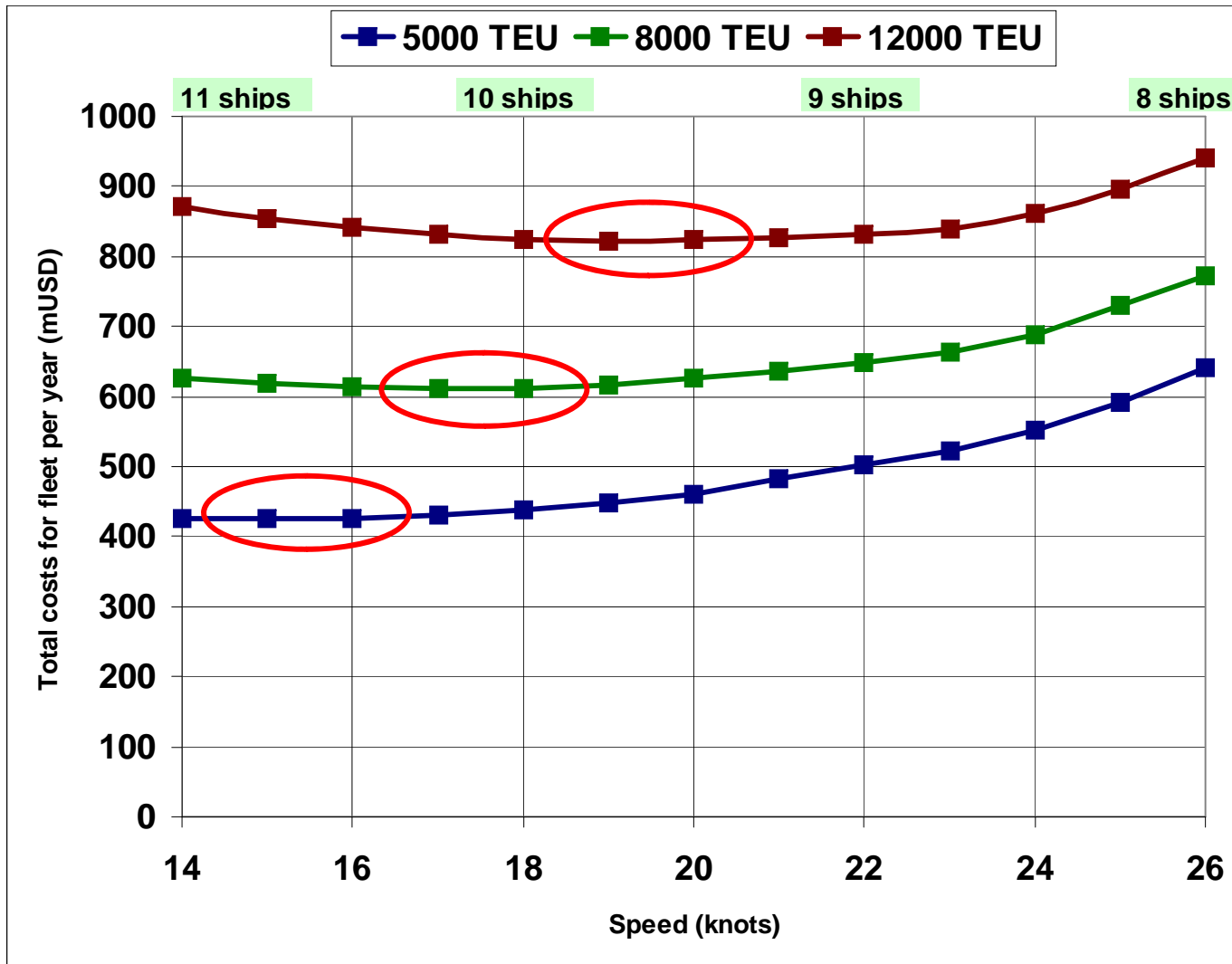
Source: GL research. The analysis excludes inflation effects.

Optimal container fleet speeds - update

- Projected optimal fleet speeds are based on fuel costs, charter rates and cargo value
- Current fuel prices are rather low, we expect fuel prices to increase in the long run. Environment-based surcharges and premiums apply
- At 2020, effective fuel cost per ton could reach 900 \$/t
- With increasing fuel cost, container vessels will transport goods with increasingly higher value



Fleet speeds –“a look into the future”



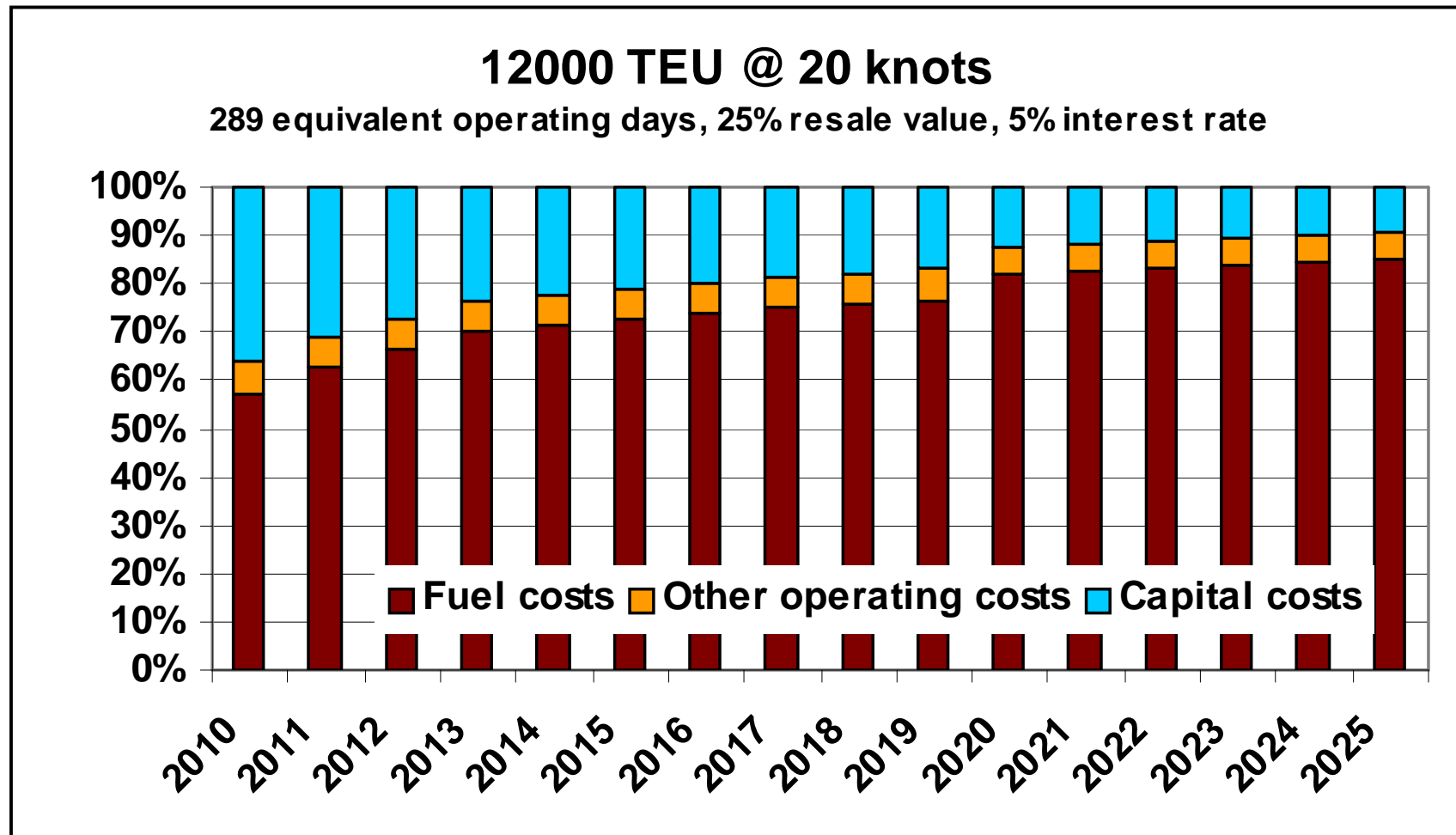
Assumptions:

Interest rate 10%

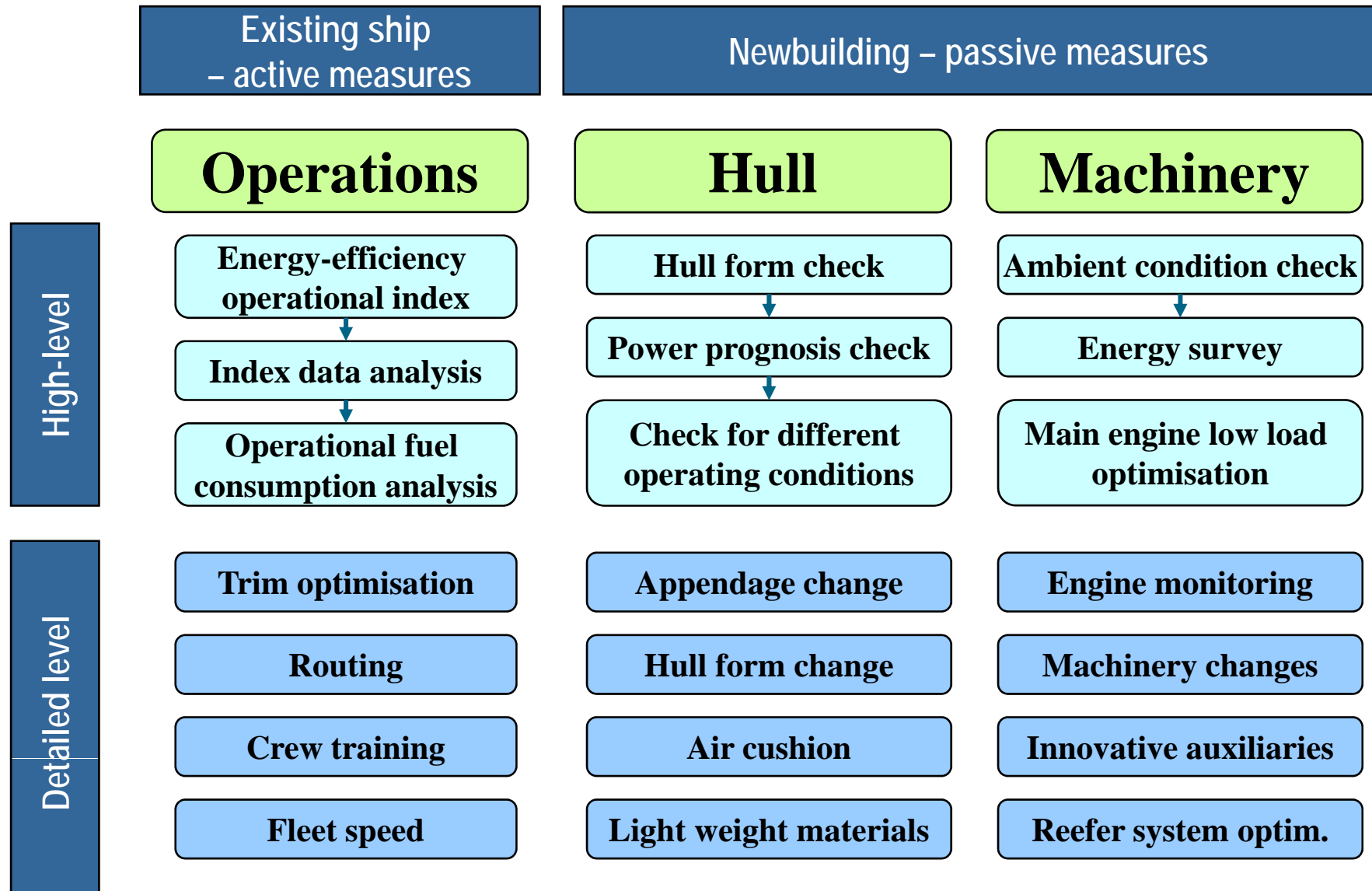
value of cargo to 120.000 USD per container

Fuel cost 900 USD/t, including environ. surcharges & premiums

The relative importance of efficiency



Overview on fuel saving options

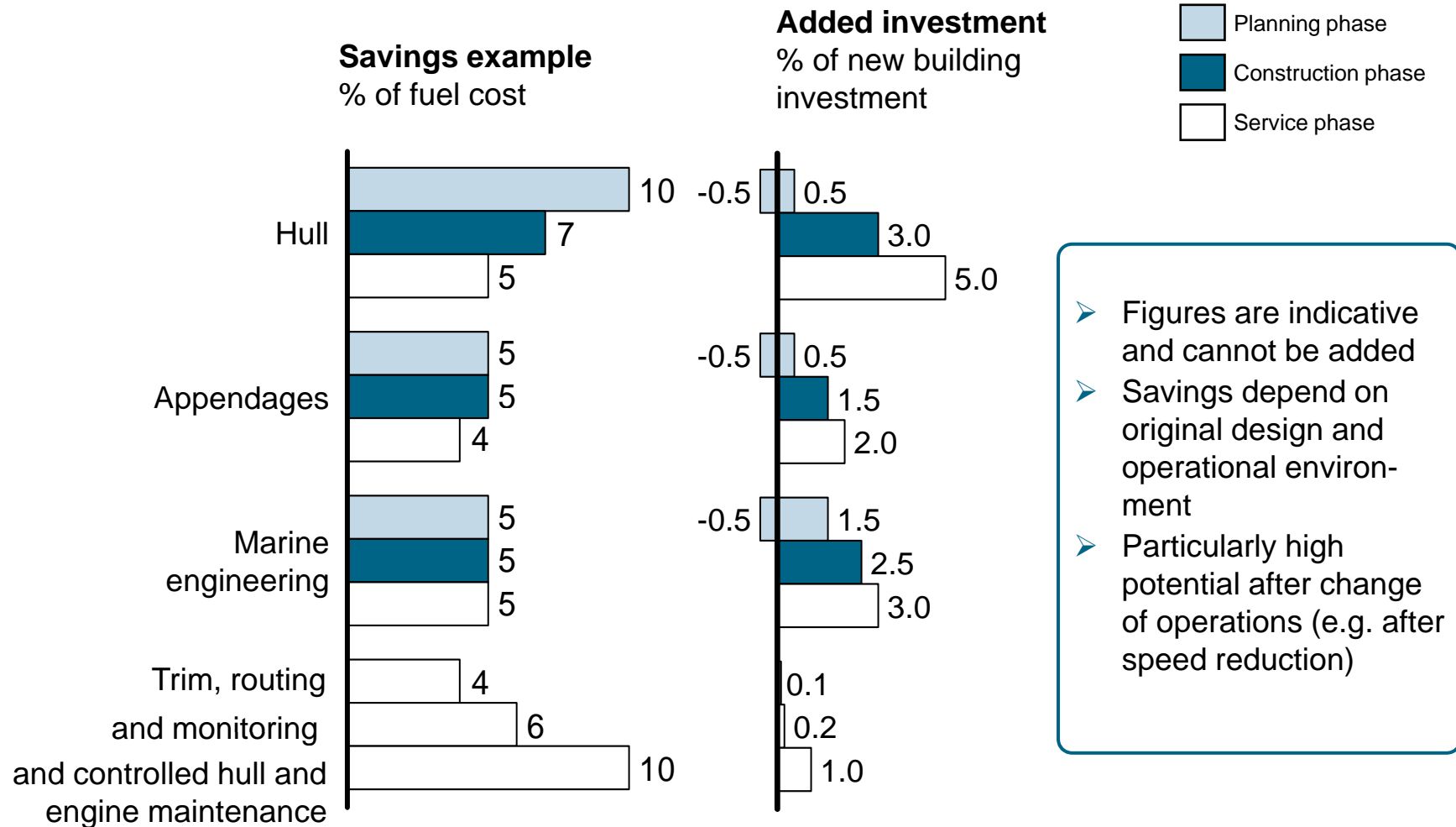


FutureShip Portfolio

The FuelSaver Family of ECO-Products – (Energy Consumption Optimization)

- 1** ECO-Patterns
Analysis of Voyage data with report
- 2** ECO-Practices
Workshop Analysis of Operations & Systems
- 3** ECO-Chances
Energy Efficiency Review (Gross Assessment)
- 4** ECO-Solutions
Energy Efficiency Review (Detailed Simulations)
- 5** ECO-Design
Fully optimized Conceptual Efficiency Design

Expected saving potential

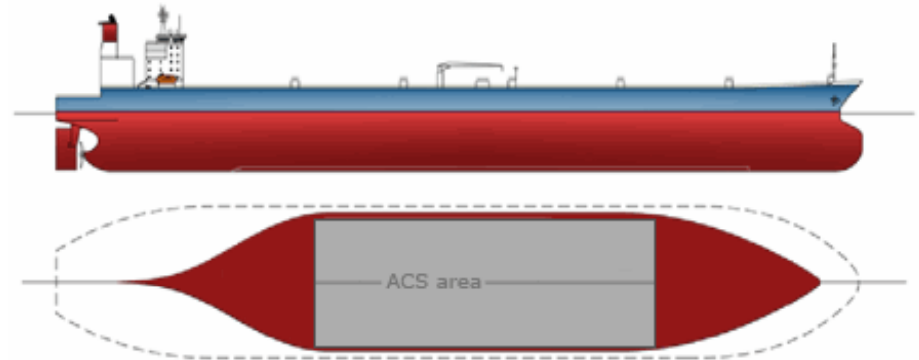


Source: GL research and GL analysis

Existing solutions:

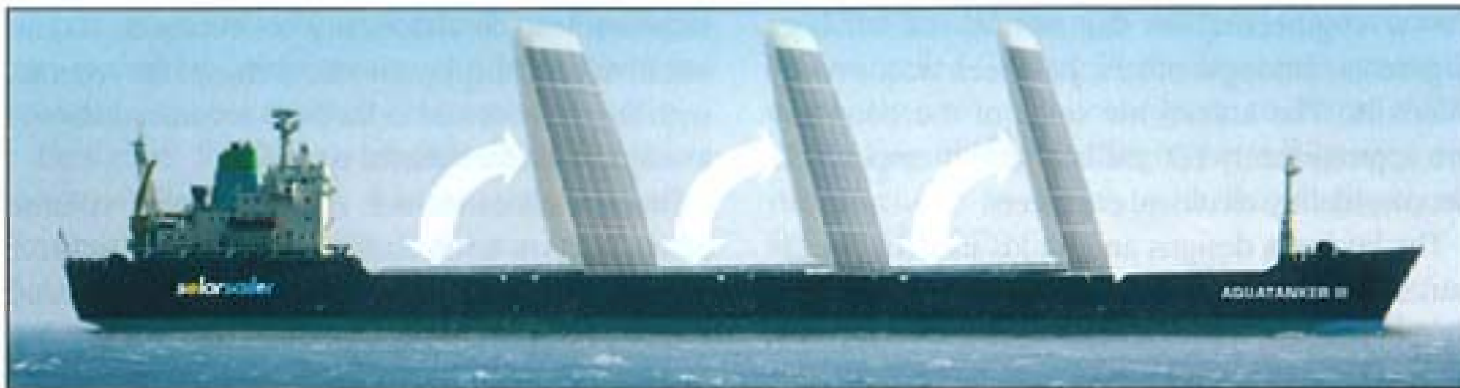
Air cushion systems for slower speeds

- Air cushion and lubrication systems (ACS) offer potentially large reductions in hull resistance
- Expected fuel cost reduction for the ACS by DK Group were recently confirmed through a full-scale demonstrator (83m MPV) and measurements by GL
- Larger savings are estimated for a dedicated design (newbuilding)
- An application of ACS requires careful consideration of the double bottom area



Outlook

- With correct speed, a hull of optimal dimensions, optimised for true operating conditions, a significant increase in efficiency can be realised.
- If fuel cells, sun and wind are used in addition, we may succeed in building energy efficient vessels for the future with CO₂-emissions at an acceptable level.



Proposal for a partly wind- and solar-powered supertanker to carry potable water from Tasmania to mainland Australia.

Source: Aquatankers

Thank you for your kind attention!

