SHIP EFFICIENCY 2015

by STG 5th International Conference

Hamburg, 28 – 29 September 2015

The German Society for
Maritime Technology
Schiffbautechnische Gesellschaft e.V.

Overview on Eight Years

SHIP EFFICIENCY Conferences

2007 – 2015

5th International Conference Ship Efficiency
Dr. Hermann J. Klein, President STG

History

2005 The Board of STG decided to establish an international Conference
„SHIP EFFICIENCY“

2007 1. Conference SHIP EFFICIENCY

2009 2. Conference SHIP EFFICIENCY

2011 3. Conference SHIP EFFICIENCY

2013 4. Conference SHIP EFFICIENCY

2015 5. Conference SHIP EFFICIENCY

≈ abt. 100 Presentations
≈ abt. 1000 Participants

Volatility of HPO-Price: 185 – 820 US$/ton (100 – 440 %)
Volatility of Charter Rates: 5.000 – 160.000 US$ / day * (100 – 3.000 %)

* Cape Size Bulk Carrier

2007

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Announcement

1st International Conference

Hamburg, October 8 – 9 2007

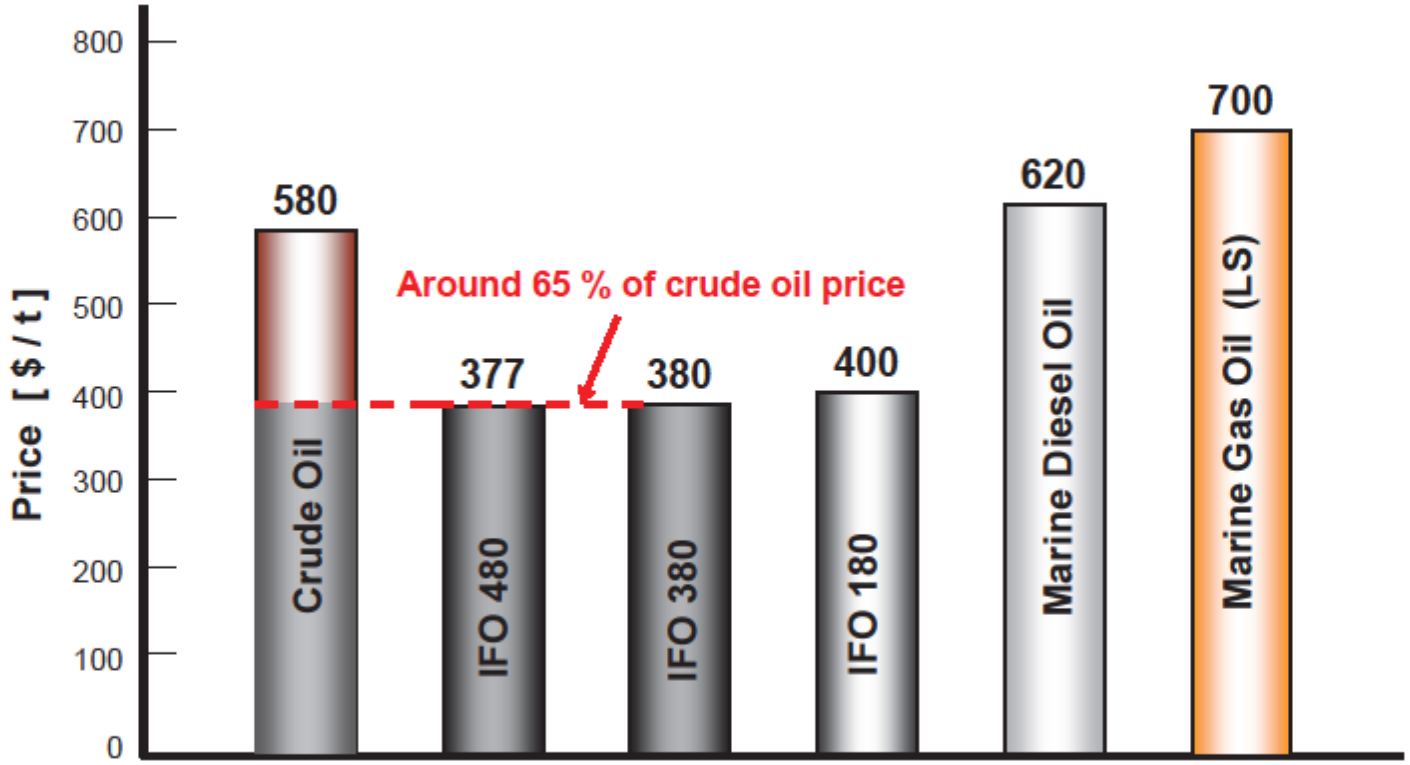
Efficient Hull Forms – What can be gained?

Ship Efficiency
1st International Conference

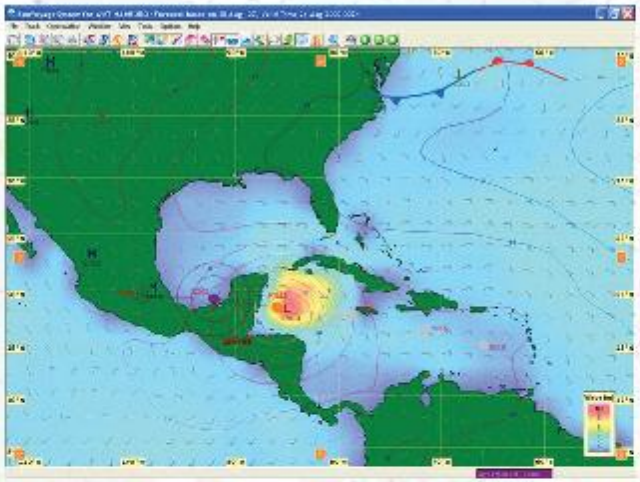
Hamburg,
October 8 – 9 2007

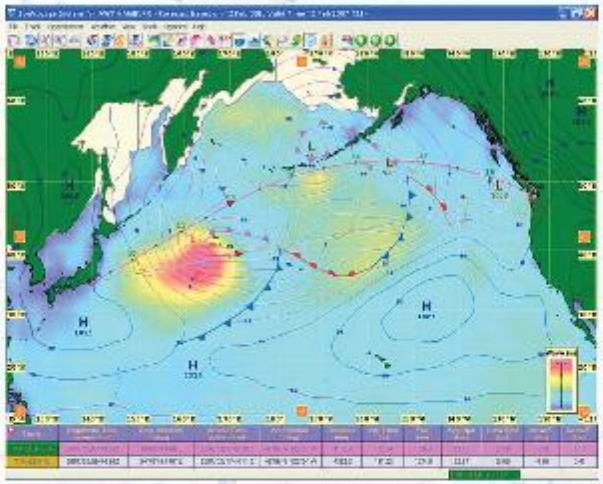
Dipl.-Ing. Jürgen Friesch
Dr.-Ing. Uwe Hollenbach

Bunker Prices in Rotterdam (September 2007)



Onboard Solution





BON VOYAGE SYSTEM

Onboard weather display and route optimisation software

- Data requests and forecasts provided through e-mail
- Weather parameter: Surface pressure, 500 mb heights, surface winds, sig. wave, swell, tropical storms, ice, current, sea surface temperature
- Route input & comparison
- Route optimisation with weather constraints and nogo areas
- Voyage simulation

Optimized Propeller-Rudder Interaction

Study to find a more efficient propulsive installation

- Pre-study to define/evaluate:
  - Efficiency gain
  - Possibility to retrofit existing vessels
- Next step would be a test program to validate the pre-study before final decision

2009

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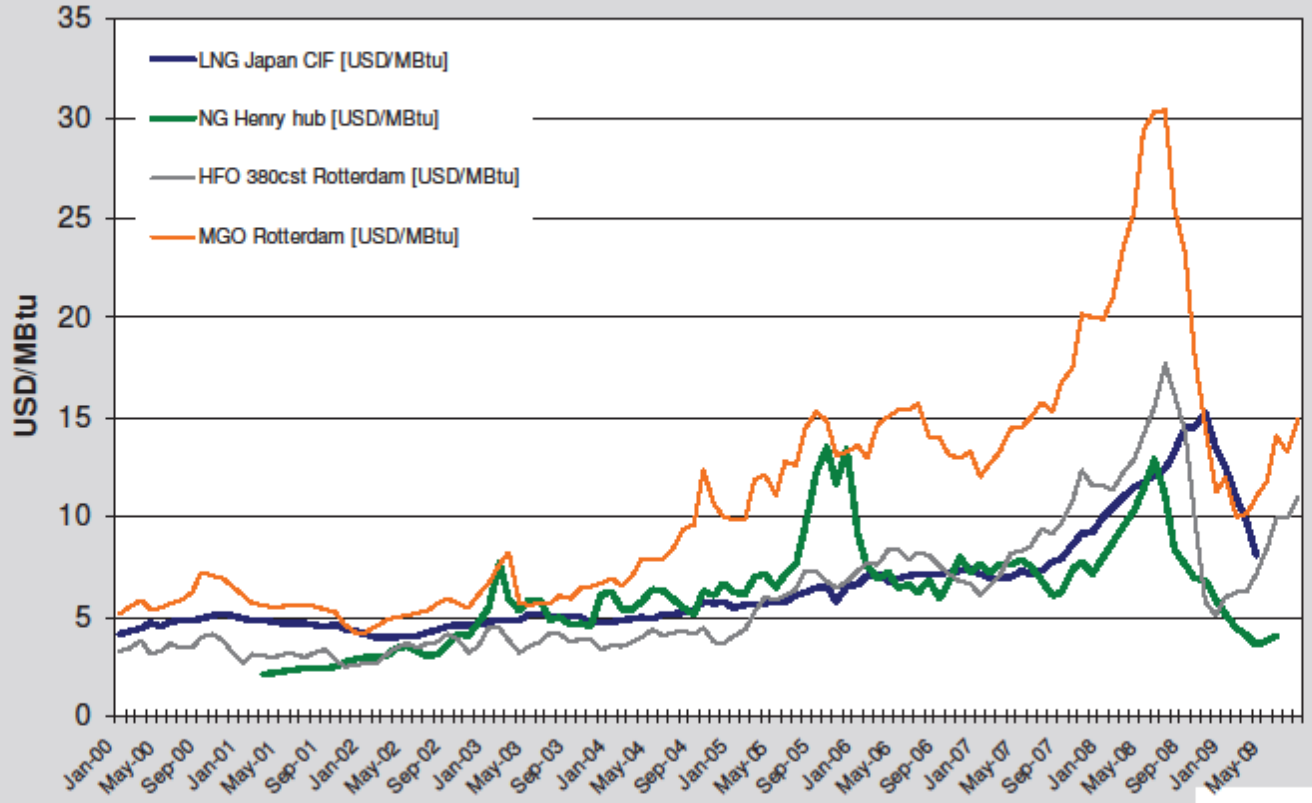
2nd International Conference

Hamburg, 28 – 29 September 2009

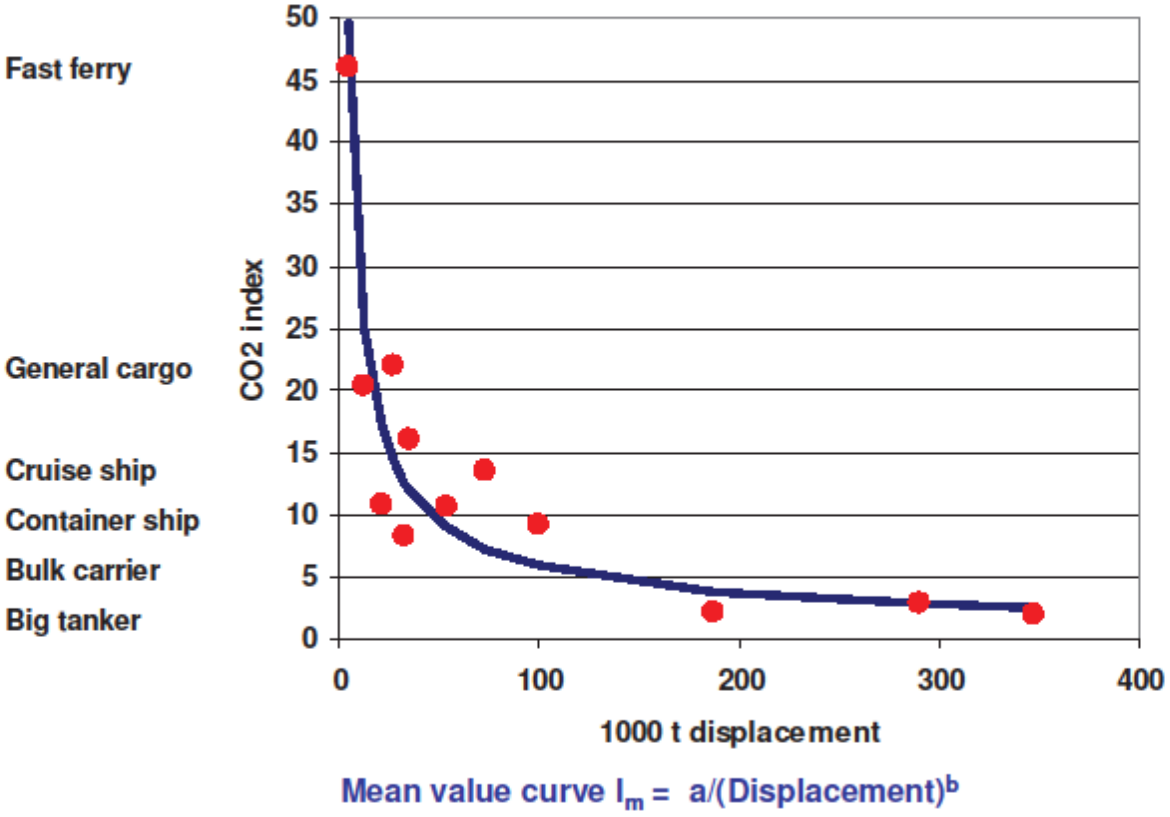
Fuel prices



Sources: www.lngoneworld.com, www.bunkerworld.com, LR Fairplay

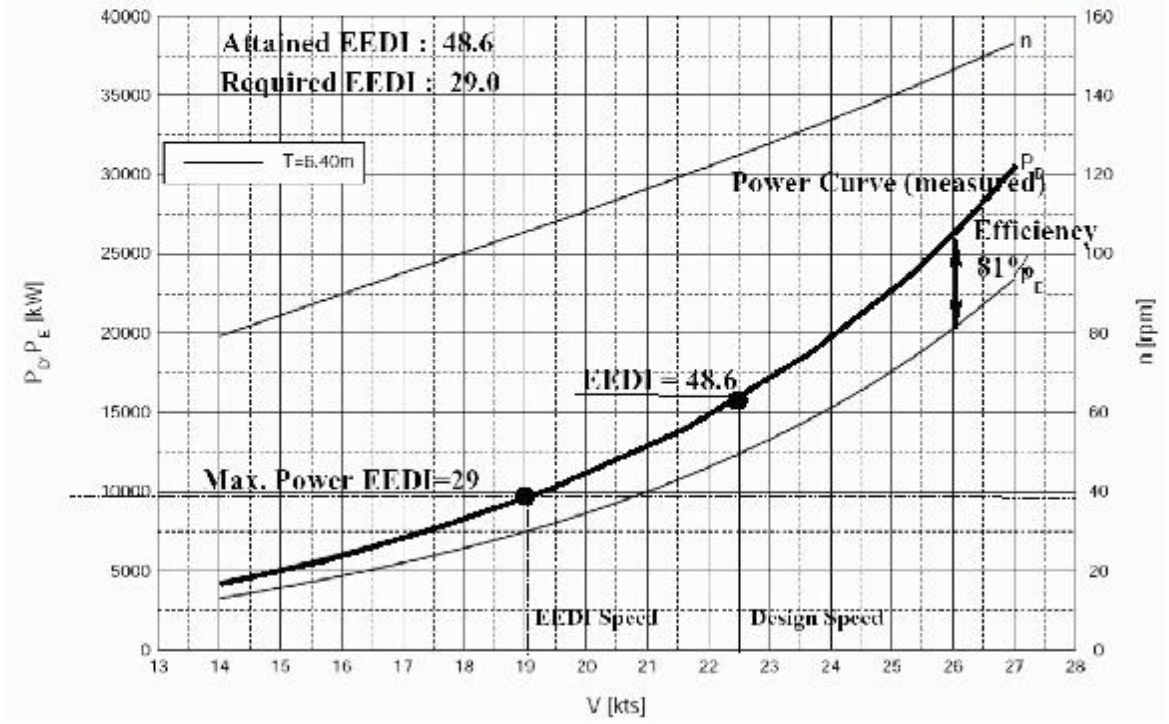
WÄRTSILÄ

Examples of Index values for different ships



Mean value curve $I_m = a/(\text{Displacement})^b$

Application: Most efficient RoRo in TUHH DB

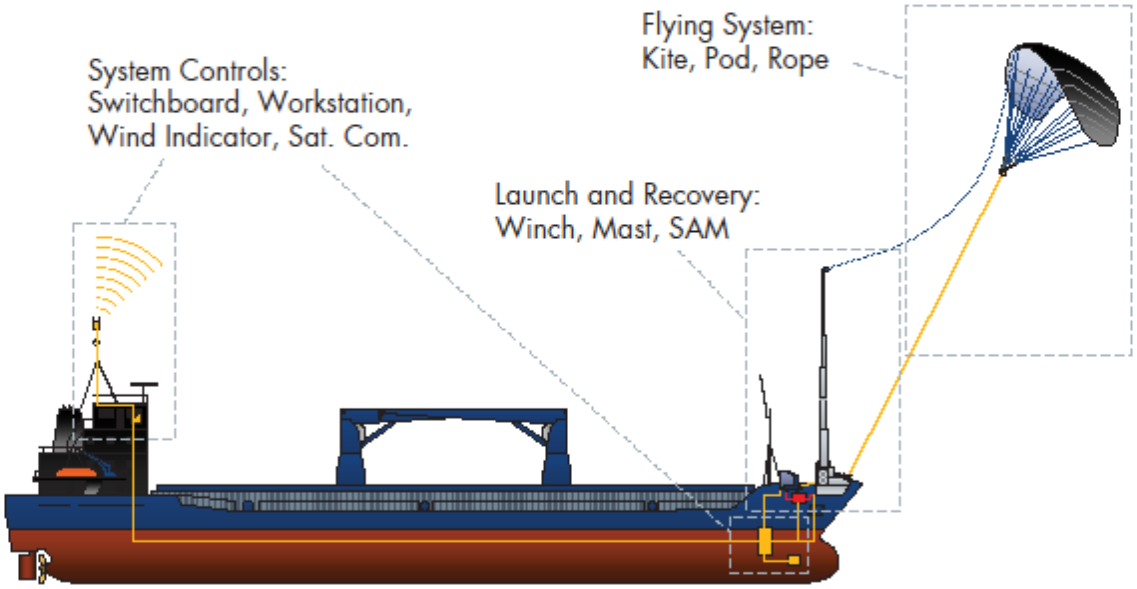


Consequence: Speed loss of 3.5 knots or design optimization !

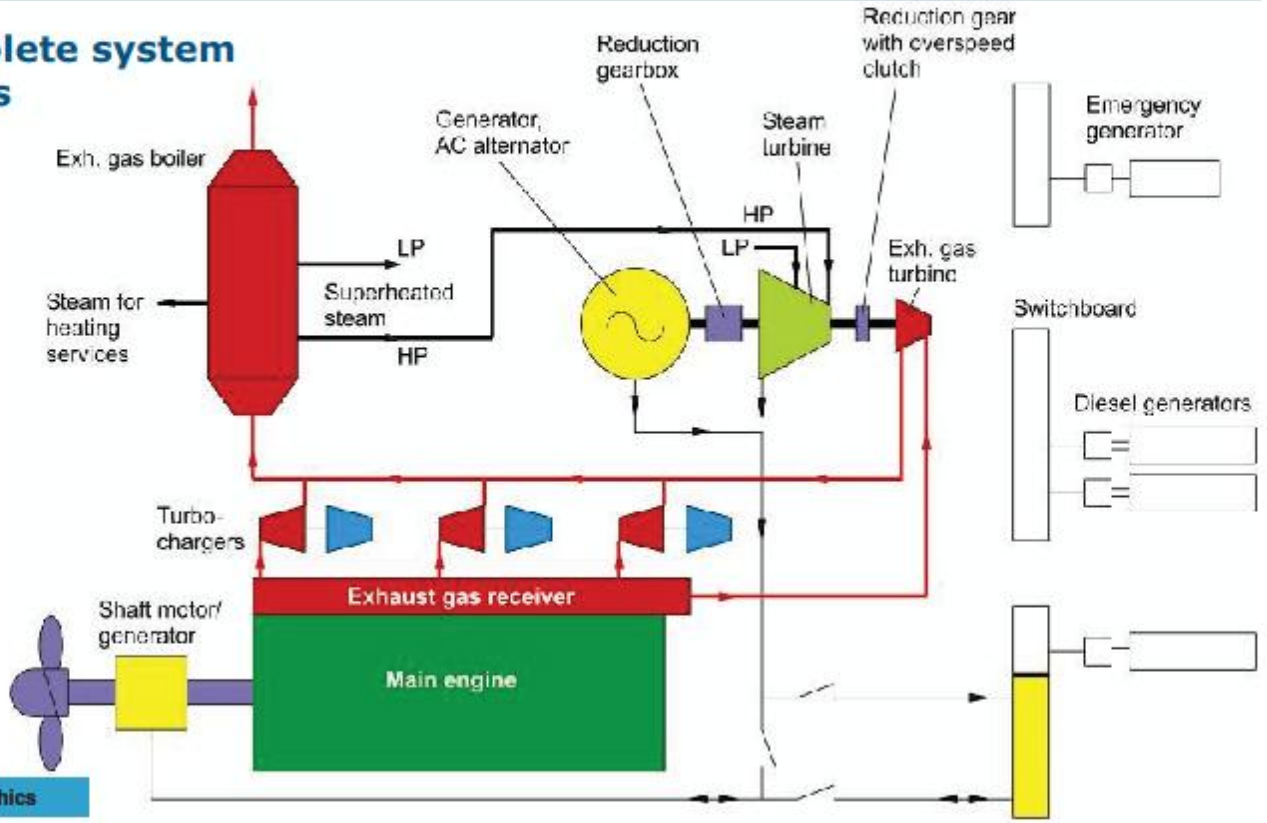
SkySails

TURN WIND INTO PROFIT

System Components



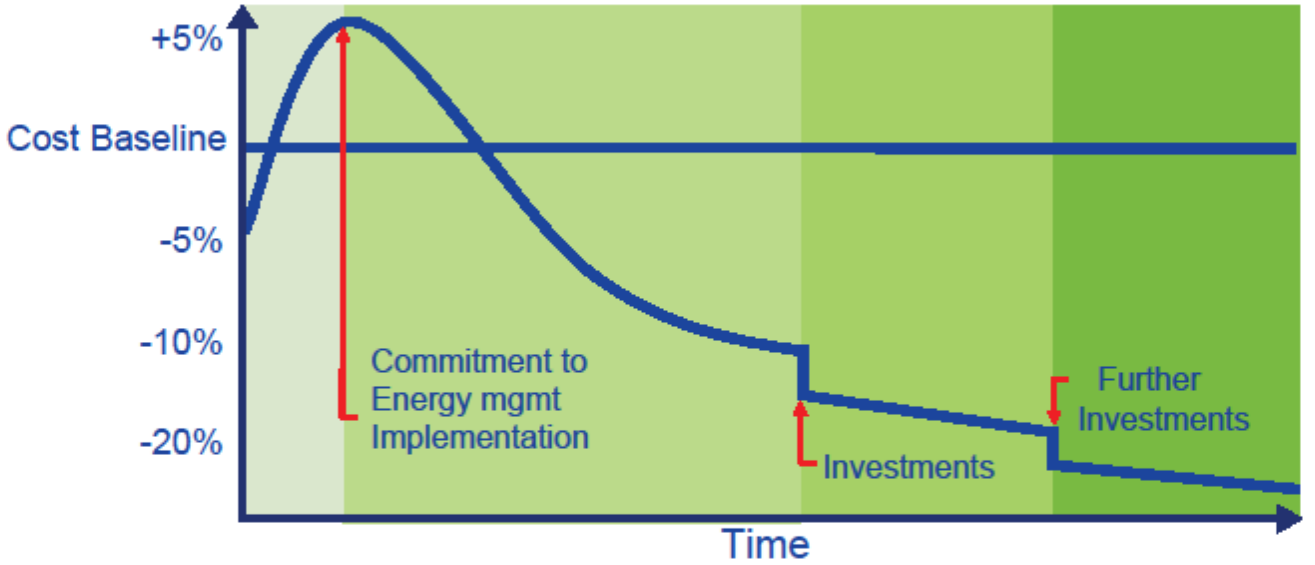
WHR complete system Schematics



MAN Diesel Graphics

Hull condition – at what cost?

Structured: Continuous effort are the only route to sustainable energy efficiency improvements



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2011

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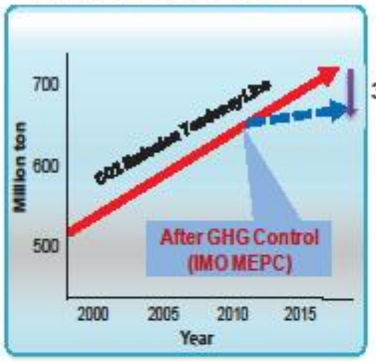
3rd International Conference

Hamburg, 26 – 27 September 2011

❖ Carbon Reduction

- Carbon Gas Control



30% Reduction

- Results of IMO MEPC 61
  - Not Fixed for Approval and Adoption.
  - But it still has a Possibility for Approval and Adoption at MEPC62 (Effectuation from '13.1.1)

- Trends of Operation Cost & Oil Price

stx Offshore & Shipbuilding

DSME Econology Plan

FEEL 389

30% CO_2 reduction

80% NO_x reduction

90% SO_x reduction

by 2015

ECONOLOGY EFFECT

by 2020

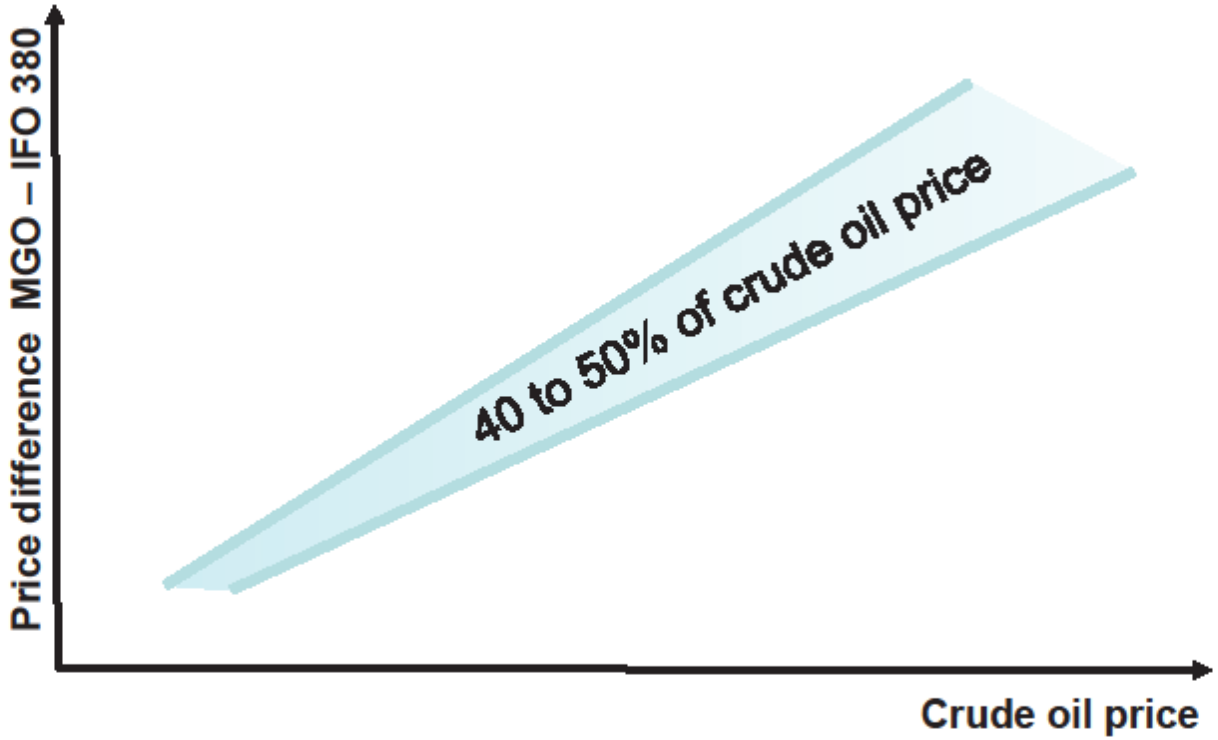
FEEL 599

CO_2 reduction 50%

NO_x reduction 90%

SO_x reduction 90%

Additional Costs for LS MGO Operation



2013

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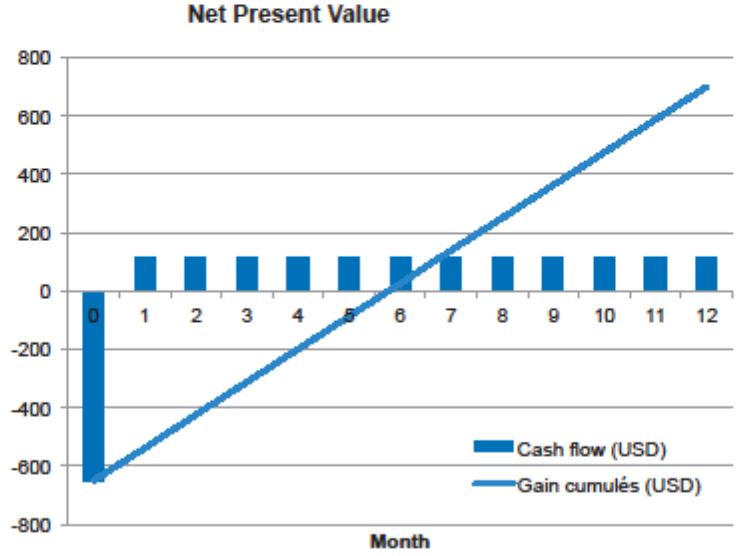
4th International Conference

Hamburg, 23 – 24 September 2013

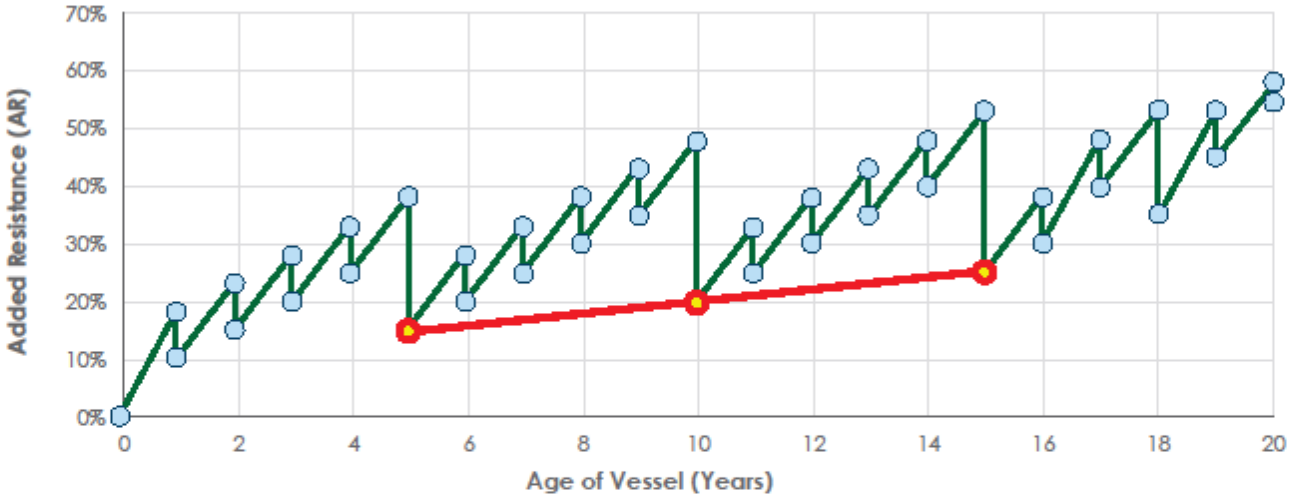
Business Case

- Mean Consumption: 25,000 T/Year/vessel
- Optimized Bulb: -9% in mean HFO Consumption
- Savings : 2,250 T/Year/vessel (1,350,000 USD/Year/vessel)
- Retrofit Cost
  - 600,000 USD
- ROI: 5-6 months

GO



3. Blasting of hulls



Example shown is a ship with yearly prop polish and 5 yr docking.

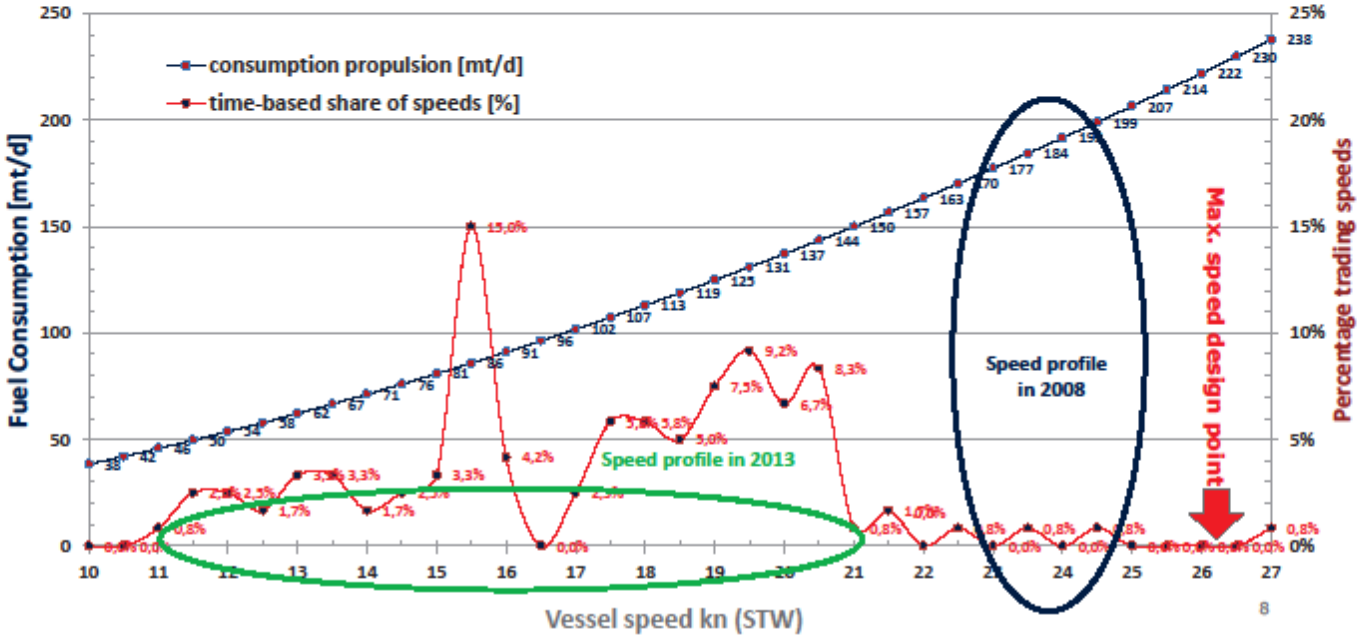
5 yr.=0.50 kn. | 10 yr.=0.73 kn. | 15 yr.=0.85 kn. | 20 yr.=1.7 kn.

Speed loss increases over docking intervals (when only spotblasted)

E.R. SCHIFFAHRT

Operational profile trends leading to fuel saving
Efficiency adjustments vs. operational requirements
Weighted mean speed 16,5 kn / weighted mean consumption 98 mt/day

Consumption [mt/d] acc. to 7.500 -8.500 TEU fleet in 2013 vs. speed range in 2008



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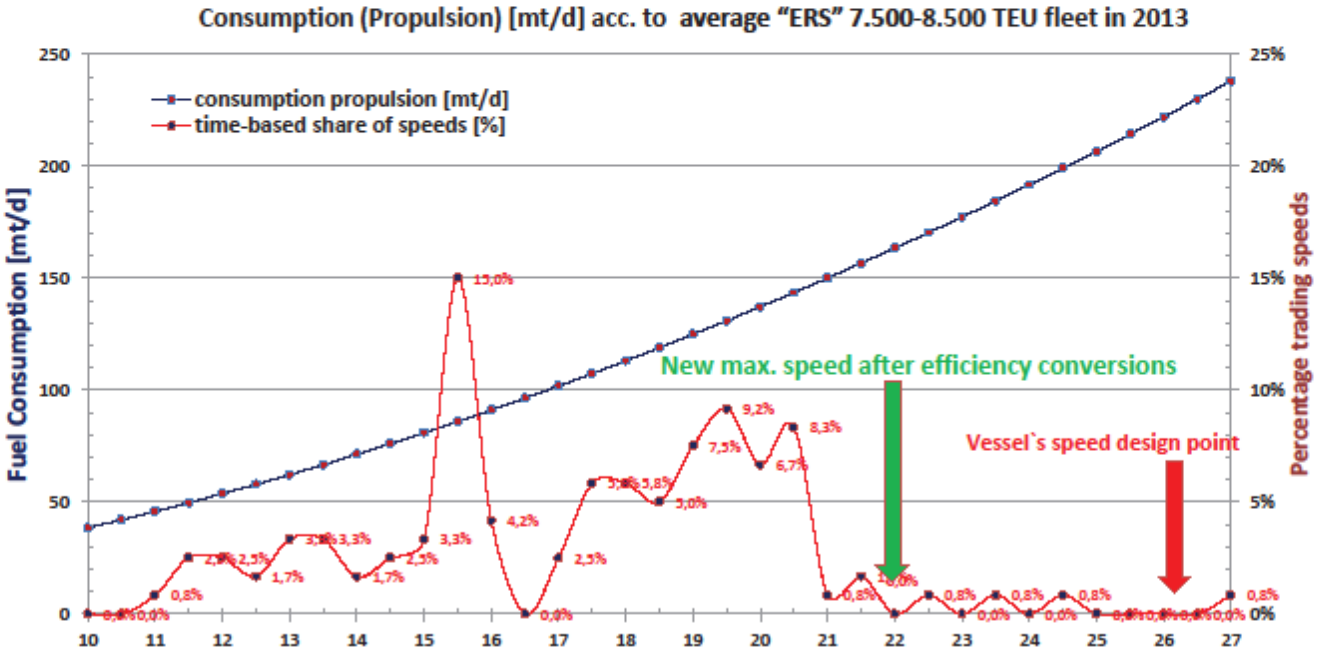
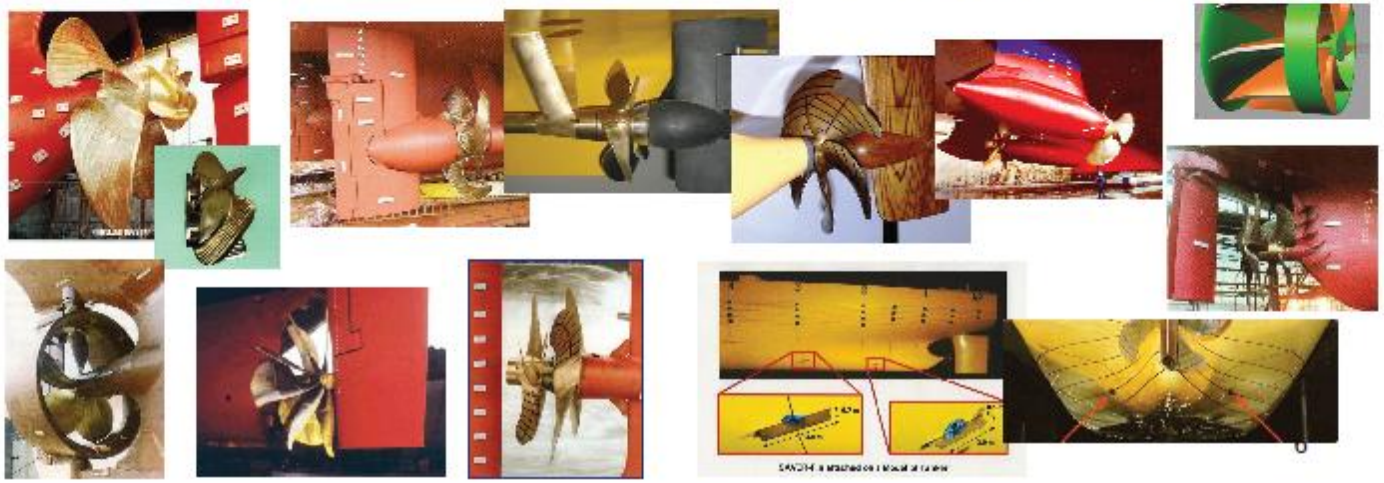


Energy Saving Devices, Overview

Hydrodynamic Energy Saving Devices



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5th International Conference

Hamburg, 28 – 29 September 2015

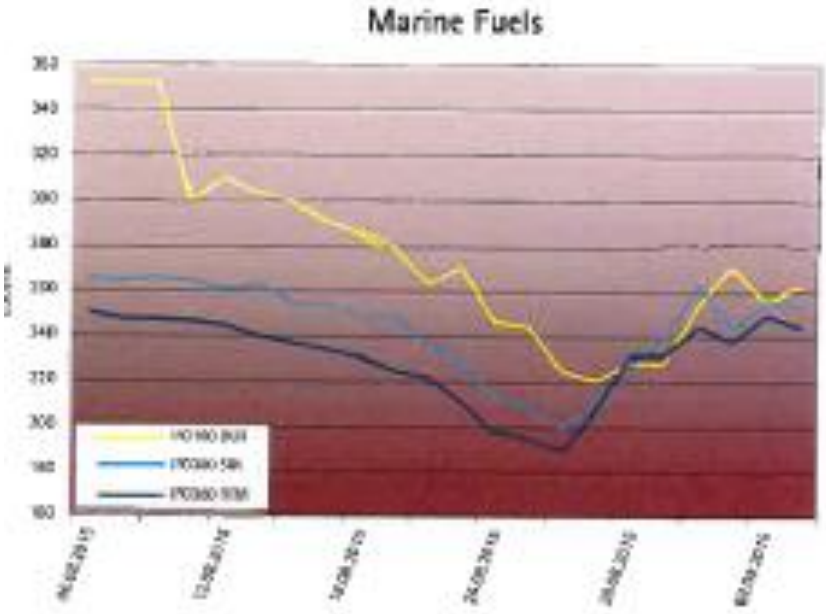
Challenges today

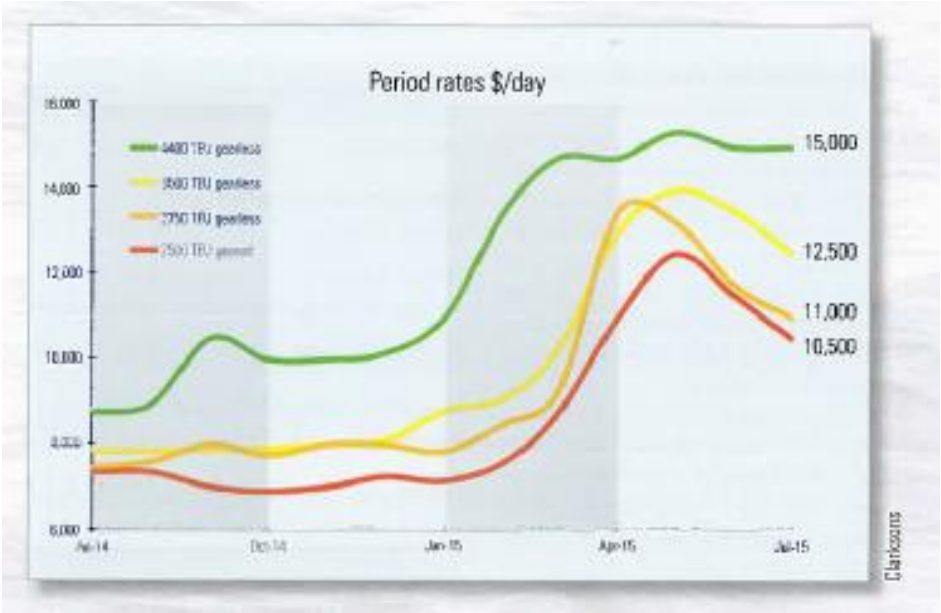
How to design vessels for a highly volatile market?

How to operate vessels in such a highly volatile market?

- Fuel Price 100 – 500 %
- Charter Rate 100 – 1.000 %

How to modify vessels for such a highly volatile market?





Volatile markets ask for maximum flexibility

Actual trends

Today‘s situation: low fuel price, low charter and freight rates,
low newbuilding prices

→Newbuildings: Flexibility in fuel type and ship speed

→ Existing Vessels:
- longer payback time for modifications (only projects with low capex)
- still slow steaming
- crew still focussed on fuel saving

Happy to answer your questions