DNV·GL



Decarbonisation through data-driven retrofitting

Dr Imran Ibrahim Principal Consultant, Head of Research and Development DNV GL Maritime Advisory

Table of Contents





GLOBAL SHARED SERVICES



DNV GL, Maritime Advisory - Overview



Structure Advisory

Assess response of hull structures Verify yield, fatigue and buckling towards class rules and international standards. Help ensure reliable and cost-effective structural design.



Noise & Vibration

Enhance comfort for crew & passengers, improve crew performance, passenger satisfaction, the reliability of structures, machinery and equipment. Comply with all international regulations – noise expertise (underwater, external)



<u>Hydrodynamics & Stability</u> Predict and assess motions and loads for ships and ocean structures. Evaluate and improve performance of hull and propeller - CFD expertise.



Mechanical & Systems Engineering

Trouble-shooting, analysis, optimization and verification of mechanical systems. Minimize the risk for failure during installation and in operation. Preparing vessels for condition based maintenance - hybrids and battery knowledge



Safety, Risk & Reliability

Technical decision support and risk assessments for efficient, reliable and safe ship operations. Remote and autonomous operations are new challenges currently being assessed



<u>Life cycle management</u>

Help customers ensure cost-efficient operations for ships and offshore units with a life-cycle perspective.



Shipping Advisory

Support customers in taking the right management decisions. Work closely with the management throughout the maritime value chain. Offer a holistic and independent perspective.



Control systems and cybernetics Support customers in making control systems reliable, by modelling and testing for newbuilds and fleet in operation.

Plight of seafarers



Mission to Seafarers Sea Sunday celebrations to be broadcast ... Seatrade Maritime News - 6 Jul 2020 The Revd Canon Andrew Wright, secretary general, The Mission to Seafarers, said:

This Sea Sunday is special. We are enabling all seafarers, and those ...



Call Attention to Seafarers by Sounding Your Horn on July 8 The Maritime Executive - 1 Jul 2020 "Globally there are now 400,000 seafarers who are either stranded at sea and have overrun their contracts or are at shore waiting to start their tours of duty.". Seafarers still stranded at sea — and more test positive

FreightWaves - 1 Jul 2020 View all

250k Seafarers Stranded in Ships and Shores For Months ...

SchengenVisaInfo.com - 6 hours ago

About 250,000 seafarers have been stranded on their ships on international shores for months now after the Coronavirus pandemic halted air travel.



Maersk: Authorities have declined to help our seafarers

ShippingWatch UK - 6 Jul 2020 Maersk is experiencing more openings to replace its exhausted seafarers, but it is still far from the norm, says Niels Bruus, head of Marine HR, to ShippingWatch.



How the Covid-19 crisis has left seafarers in a desperate plight New Statesman - 6 Jul 2020

Across the seas, ship crews were finding themselves trapped on board. Seafarers can work a maximum of 11 months at sea, according to international law. In ...



"Seafarers are at the heart of everything IMO does. **In the darkest hours of the pandemic, they have been selflessly delivering the goods we all need.** But their own health and wellbeing are as important as that of anyone else. Now is time for governments around the world to deliver for seafarers, by ensuring they can access medical care without delay, whenever they need it."

-- IMO Secretary-General Kitack Lim

Global market status

- Covid-19 pandemic has led to **disruption across almost every sector** of the shipping industry
- Annual decline in seaborne trade expected at 5.6% in full year 2020
- Order book represents around **10% of the fleet** (In 2009 order book was >50% of fleet)
- Supply/Demand very well balanced in shipping
- **Owner** in general have **better financial liquidity** (stronger earnings across the board in 2018 and 2019, less debt and fewer NB commitments)
- Scrubber retrofitting declined sharply, HSFO/LSFO spread is only 1/6 compared to the start of 2020. **Energy efficiency** still in focus
- Delay in annual, renewal survey or retrofitting (save cost now, survive then plan for later) may lead to rebound in activity later in 2020 (and potentially increasing off-hire time for the world fleet?) – competitive yard pricing could provide an incentive to undertake retrofits if earnings remain under pressure
- Further reduction in competence among our client, cost and competence new skills is on the agenda
- Accelerated "Green Transition" anticipate fuel conversions, installation of wide range of new technologies to reduce emissions. Focus on decarbonization at increased pace, alternative fuels on the agenda!
- **Digitalization to accelerate**, including increased willingness to cooperate between Maritime stakeholders

Source: DNV GL analysis

DNV GL's Energy Transition Outlook – COVID-19 update: effect on energy demand and emissions



Energy demand:

- A **drop-off energy demand** related to V-shaped economic impact (following the IMF's forecast of a -6% fall in world GDP in 2020)
- A **lasting behavioural changes** induced by the pandemic, e.g. virtual working, lower transport needs and less active office space.

World energy-related CO₂ emissions - with and without COVID-19



Emissions:

- A **similar fall in emissions** due to COVID-19, with 75 GtCO₂ avoided due to the pandemic.
- From a global warming perspective this 'buys' the world just an additional year before the 1.5°C carbon budget is exhausted (in 2029).
- This illustrates the dimensions of the climate crisis challenge: **to stay within the Paris Agreement ambitions, the world would have to avoid this amount of emissions every year from now to 2050**. It underlines the importance of tackling hard-to-abate demand sectors.

Note: DNV GL will release its full 2020 Energy Transition Outlook in early September 2020, along with supplementary reports on the energy transition impact on Maritime, Oil & Gas and Power & Renewables.

Market overview

Where are the possibility for emission reduction – what is the potential?



Source: DNV GL, this study

Barriers are Cost, Availability, Infrastructure and Onboard Storage

ECO Retrofit identifies and implements the most effective fuel saving measures for your individual ship

- ECO Retrofit is an independent turnkey solution offering guidance throughout the entire retrofit project
- Uniquely ECO Retrofit provides high end computation results for the specific vessel and its specific operational targets in a well established, transparent process.





Prediction accuracy – Selected projects



Prediction accuracy – Specific project @ medium draught

ship manager

organisations

manager

Data from

manager

outside ship

organisations

Data from ship

Accessing the data – connectivity and asset centricity – client example

VERACITY by DNV GL

 *Example of customer utilizing Veracity

Track and monitor total fleet emissions

• **Features described do not include all the available datapoints and filters*

Fleet benchmarking of CO2 emissions per day

Comparison of Speed Profile vs CO2 Emissions

- Accelerated "Green Transition" anticipate fuel conversions, installation of wide range of new technologies to reduce emissions. Focus on decarbonization at increased pace, alternative fuels on the agenda
- Digitalization to accelerate, including increased willingness to cooperate between Maritime stakeholders
- Data-driven solutions enables Trust and Transparency of shipping operations / management

Thank You

www.dnvgl.com

SAFER, SMARTER, GREENER

The trademarks DNV GL[®], DNV[®], the Horizon Graphic and Det Norske Veritas[®] are the properties of companies in the Det Norske Veritas group. All rights reserved.

