





# A vision of 2020

Given the cyclic nature of the shipping industry, its ever-present uncertainty about the future is hardly surprising. However, no shipowner or executive would say no to a sneak preview of what's to come.

**F**oresight into future economic developments, business drivers, market fluctuations and legislative changes can make or break the best corporate strategies. The question is where to look for your insight. The would-be futurists and media pundits, and their predictions, are many and varied.

Classification societies, inherently sober and cautious as they are, do not make qualitative prophecies without doing their homework. So when the Norwegian classification society and risk assurance group Det Norske Veritas (DNV) unveiled the preliminary findings from its *Shipping 2020* research project at the international shipping exhibition Posidonia, in June 2012, the international press corps was all ears.

One of the first classification societies to establish a dedicated research unit in 1954, DNV has been identifying emerging trends and technologies in its *Technology Outlook* reports since 1995. *Shipping Outlook 2020* is part of an ongoing, in-depth analysis that drills down from DNV's *Technology Outlook 2020*,



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## Technology Outlook 2020

Aims to share DNV's views and to stimulate discussion about future technologies towards 2020. It gives an overview of the challenges and megatrends in four main areas: shipping, fossil energy, renewable and nuclear energy and power systems. The report covers 27 technologies that DNV believes will affect the future development of shipping. Made by DNV Research & Innovation, it is available at:

[http://www.dnv.com/moreondnv/research\\_innovation/foresight/outlook/index.asp](http://www.dnv.com/moreondnv/research_innovation/foresight/outlook/index.asp)

More insight from the Shipping 2020 report here:

[http://www.dnv.com/press\\_area/press\\_releases/2012/dnv\\_reveals\\_technology\\_uptake\\_towards\\_2020.asp](http://www.dnv.com/press_area/press_releases/2012/dnv_reveals_technology_uptake_towards_2020.asp)

which highlights technologies likely to have major impact on the maritime and energy sectors.

### Key Insights

Commenting on the reports findings, DNV president Tor Svensen said that incorrect investment decisions could be devastating for individual shipowners and collectively they could impact negatively on the environment as well. He suggested that the *Shipping 2020* analysis could give shipowners a clear technology and market context to work in, with the opportunity for targeted analysis of individual ship profiles.

To get a clearer fix on the key insights from *Shipping 2020*, *Generations* decided to quiz Tore Longva, DNV's business development manager.

#### **Q: What key insights does it reveal on energy efficiency on board vessels?**

A: The market will demand more energy efficient ships in 2020. High fuel costs will accelerate this development ahead of the EEDI (Energy Efficiency Design Index) regulatory timeframe. We expect new tankers, bulkers and container vessels to be up to 30 percent more energy efficient than today's newbuildings. Fuel choices up to 2020 will be driven by the time spent in Emissions Control Areas (ECAs), but distillate is a more likely option than scrubbers for most ships.

We foresee major innovations based on new concepts, such as ballast-free ships and hybrid propulsion systems. Hybrid propulsion using marine fuel cells, batteries or solar panels integrated in a diesel-electric system might also be a reality in commercial shipping in 2020, in particular for ships with variable power demands. In addition, there is a wide range of mature technologies, which are expected to increase energy efficiency: from propulsion efficiency devices to frequency converters.

#### **Q: What key insights does it reveal about shore-side/port power?**

A: We anticipate a standardization of plug-in connections for converting land-based electricity to appropriate voltage and frequency for vessels. The main challenge for this "cold ironing" will be power availability and sufficient grid capacity, especially in smaller ports.

#### **Q: What were the major findings on electrification on board vessels?**

A: We expect an increase in the use of electric propulsion, particularly in specialized segments, such as offshore, cruise and ferries. This will be done through hybrid systems taking power from a wide range of sources, such as solar, wind, fuel cells and batteries. This will increase the onboard complexity, but will also increase efficiency through better power production and management.

**Q: Were there any findings on the cruise ship industry and energy efficiency?**

A: The cruise industry will be a forerunner for many new technologies that increase efficiency, especially power production, renewables and hybrid systems. We also expect increased efficiency through the combination and integration of onboard systems, such as waste heat recovery, HVAC (heating, ventilation and air conditioning) and power production. In addition, new types of fuel, such as natural gas and biofuel, will come into play.

Advanced modeling tools for developing and assessing hull designs, propulsors and complex machinery systems are expected to be increasingly used towards 2020, and large-scale demonstrator projects would be the next step required in order to accelerate innovation and technology adoption, while sharing investments and risks among the major stakeholders.

**Q: Does it predict any future game-changing factors and technologies in the maritime and energy sectors?**

A: Technological evolution is more likely than technological revolution, but we can expect the technology to be used in new areas. We see new fuels coming into play and this may change the demand for shipping, especially in the tanker segment.

The LNG (liquefied natural gas) price is very low at the moment and this will increase its usage, if a distribution chain can be established at an attractive price. But without a stricter CO<sub>2</sub> regime combined with carbon capture and storage, LNG will not achieve its potential as a bridge towards a low carbon energy future.

An analysis of fuel choices reveals that between 10 and 15 percent of the newbuildings delivered up to 2020 will have the capacity for burning LNG as fuel. This equates to about 1,000 ships. Larger vessels will benefit more from using LNG, compared with smaller

vessels. Furthermore, a gas-fuelled engine can be justified if a ship spends about 30 percent of its sailing time in the ECAs.

**Q: Does it indicate what will be the greatest challenges and opportunities that the maritime industry will face in the future?**

A: The main challenge, but also an opportunity, will be the multitude of environmental regulations coming into play in the next decade. Compliance will have to be met with new technology that is still not mature. This requires many investments and creates uncertainty, and many shipowners sit on the fence. However, it also presents an opportunity for those that design innovative solutions and energy efficient ships. The market will be difficult with overcapacity that does not induce high investment, but may also create a competitive edge for energy efficient ships. This is a true dilemma for shipowners.

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Climate change will result in increased Arctic vessel traffic, speeding up development of Arctic-specific technologies, such as ice routing optimization software, hull load monitoring and new icebreaking concepts. E-Navigation including ECDIS, weather routing, piracy detection and ship-port synchronization technologies are expected to be widely used, preventing accidents and optimizing performance.

This is a decade of transition, and we have the opportunity to prepare for a more sustainable future by driving new technologies from idea and test stages to full-scale cost competitive solutions.