Conditions for making business in Danish maritime sectors will change over the next decade. The Danish Government recently announced a new growth plan for the Danish maritime sectors, and international market conditions are expected to drive structural changes in the Danish maritime business environment.

Companies will need to adapt to the changing environment to capture growth opportunities in the Danish maritime sectors over the next decade.

In light of the development of the new Danish Maritime Special Plan and the expected change in the maritime landscape over the next decade, Ramboll has developed an outlook of the current status towards 2030, including drivers and projected growth of the Danish maritime sectors, as well as an assessment of trends, conditions and other aspects that have a significant impact on companies operating in the different maritime sectors, primarily infrastructure developments.

“The outlook shows, that the Danish ports are an important gateway for future growth in the maritime sector and general growth in Danish industries and society. It also shows a need for the ports to be much more specialized in the future and focused on their specific markets and services.”

Leif Laszlo Haaning
Business Manager
The Danish political agenda for maritime sectors is changing

On January 22, 2018, the Danish minister of Industry, Business and Financial Affairs announced the Danish Government’s new growth plan for the Danish maritime sectors. The aim is to make Denmark a global maritime powerhouse by 2025 by making framework conditions more attractive for companies operating in maritime sectors. The growth plan, which includes 36 specific initiatives, focuses on making Denmark a hub for new maritime technologies, for example autonomous ships and digitalisation of maritime sectors. Moreover, the growth plan creates a supporting basis for the new Danish maritime spatial plan (MSP), which is currently being developed by the Danish Maritime Authority and is expected to enter into force in 2021. The Danish MSP is, unlike to other European nations, expected to be growth-based. This new political focus is expected to influence conditions for maritime companies in the future - and to understand what drives growth in the maritime sectors will be vital for all maritime actors.

Maritime markets are changing

Over the past decades, the maritime sectors have undergone significant changes. The financial crisis of 2008 sent the economy spiralling downwards, and consequently, Danish maritime sectors suffered - characterised by e.g. declining volumes and lack of new investments.

In more recent years, global growth has picked up, and the maritime sectors, both internationally and in Denmark, are expected to undergo significant changes over the next decade. Specifically, four global megatrends influence the Danish maritime sectors:

1. **A world economy in recovery.** The world’s largest economies are displaying solid growth again, which has an impact on several factors of relevance to the maritime sectors.

2. **Green agenda.** Regulatory initiatives and customer demand in especially Western Europe have created an increased focus on sustainability in a range of sectors, including maritime sectors. This translates into a change from fossil fuels to more sustainable energy sources, as well as a change in the energy mix, which is extracted offshore.

3. **Demographic changes.** The industrialised economies experience changes in the composition of their populations. Falling birth rates and an increase in the proportion of elderly people are likely to change consumption patterns.

4. **Digitalisation and technological development.** The maritime sectors are in the process of becoming digitalised and automated, which will entail autonomous ships and development of more efficient equipment for maritime industries.
Development of the Danish ports is a precondition for maritime growth

The Danish ports are the gateways to the ocean, from which all maritime sector players operate. Consequently, the capacity of the ports to manage increased traffic from offshore wind, shipping, fishing and other maritime companies is vital for growth to materialise over the next decade.

Many ports are currently exploring development opportunities …

The Danish ports are currently investing heavily to increase capacity and maintaining competitiveness. Several Danish ports are expanding rapidly, including the ports of Esbjerg, Aarhus and Copenhagen. Ports are becoming increasingly specialised. For example, the Port of Esbjerg is specialising in offshore oil, gas and wind energy. Moreover, ports are expanding their service offerings.

… and several other relevant infrastructural projects are planned

Several other significant infrastructural projects are currently on the way, including cable, wire, pipeline and construction developments. These will improve the conditions of maritime sectors and increase connectivity between the different sectors.

Examples include a new Viking electricity cable connection between Denmark and Great Britain, a doubling of gas pipeline capacity between Denmark and Germany and the new Femern connection. On aggregate level, currently planned projects towards 2020 are estimated at 200 billion DKK.
Energy production, offshore wind power, Denmark

- Forecast using CAGR of 2007-2021 of 14.0%

![Graph showing offshore wind power production in Denmark with forecast using CAGR of 2007-2021 of 14.0%.]

- **RØNLAND**: 17 MW
- **VESTERHAV NORTH**: 80 MW
- **VESTERHAV SOUTH**: 170 MW
- **HORNS REV III**: 400 MW
- **HORNS REV II**: 209 MW
- **HORNS REV I**: 160 MW
- **NYSTAD**: 165 MW
- **FREDERIKSHAVN**: 7 MW
- **ANHOLT**: 400 MW
- **TUNØ KNOB**: 5 MW
- **SAMSØ**: 33 MW
- **SPROGØ**: 21 MW
- **MIDDELRUNDEN**: 40 MW
- **AVEDØRE HOLME**: 11 MW
- **VINDEBY**: 5 MW
- **KRIEGERS FLAK**: 600 MW
- **RØDSAND II**: 207 MW

Oil- & gas production, MDKK

- Forecast of 0.0 % from 2018

![Graph showing oil and gas production in Denmark with forecast of 0.0 % from 2018.]

- **Oil market, MDKK**: Dark blue bars
- **Oil market, forecast**: Light blue bars
- **Gas market, MDKK**: Green bars
- **Gas market, forecast**: Light green bars
WIND POWER
The growth in offshore wind energy is expected to continue towards 2030, representing a continuation of the growth, which the sector has displayed since 2007.

DRIVERS: Wind power is driven primarily by area allotment, which relies on political decision-making. Projects are already planned until 2021, where the large offshore park Kriegers Flak is expected to be operational. Cost levels also drive volume: Offshore wind energy production is still far more expensive than onshore, but increasingly large parks and digitalisation help reduce the costs. Available infrastructure (e.g. transmission cables) is another key driver for growth, as it has an impact on the utilisation of capacity. Lastly, regulation plays a key role, as offshore wind energy production is state subsidised. Conditions are approaching market terms, which will make the market price for electricity a main driver.

OIL & GAS
The production of oil and gas is hard to predict, as several drivers are characterised by a high level of uncertainty. It is uncertain at which pace the fields currently closed due to maintenance will be fully operational again, as delays in development of new fields are common and extraction is dependent on the volatile oil price.

DRIVERS: The cost level is a key driver. New fields are, on average, more expensive to extract from, as the most accessible extraction fields are explored first. In this context, a low oil price can make certain fields unprofitable – as some fields have been over the last five years. However, Danish fields are on shallow waters and are thus relatively cheap to extract from. Supply and demand are one of the main drivers: The Danish market is embedded in international markets, where large actors, e.g. OPEC, can influence market prices by controlling supply, as they have demonstrated previously. This constitutes an element of uncertainty. Focus on green energy is similarly expected to have an impact on the sector, as it can influence the oil price. Lastly, reserve sizes drive the sector’s total market value. New reserves are continuously found, and new extraction techniques are invented. Shale has increased global reserves, but many reserves remain unprofitable. Most Danish reserves are on relatively shallow water, which eases extraction.

WAVE ENERGY
Wave energy needs further state financing before it can become a commercialised energy source

Currently, the technology is in the testing phase. While Danish wave energy concepts are among the world’s best, they have not yet been commercialised due to uncompetitive energy unit prices. Many producers, however, are moving abroad, as especially Ireland has better conditions for development.

Public support in the form of subsidies is a precondition for the technology to become an established part of the Danish energy mix in the future.
While shipping on a global level is expected to grow at a 3.5% yearly rate until 2021, Danish shipping growth is likely to be dampened by a decline in the need for transportation of oil in Danish waters, caused by the expected lower oil extraction. However, while tonnage only shows very slow growth towards 2030, the value of the goods is increasing.

**DRIVERS:** Oil production is a key driver for Danish shipping, as liquid bulk has accounted for 15-30% of total tonnage in Danish ports from 2004 and onwards. Danish oil production has fallen since 2004. Similarly, the oil price drives shipping volume, as oil constitutes one of the largest costs for cargo transportation, why a low oil price increases the volume of goods transported due to lower tonnage prices. However, in the Danish shipping sector, this effect has not materialised, possibly caused by a substitution to land-based transportation. The demand for physical goods is also a key driver: The composition of the Danish population, like much of Western Europe, is changing - with an increasing proportion of elderly and lower birth rates, which creates relatively more demand for service goods and less demand for physical goods. Inter- vs. intraregional trade is also expected to drive volume in the next decade: Goods are increasingly being moved intra-regionally rather than between regions, which is in line with the European Commission’s initiative “Sustainable Blue Growth Agenda for the Baltic Sea Region”, in which there is a focus on short sea shipping. Another driver is capacity: Cargo shipping is characterised by overcapacity, as there were massive investments in fleet capacity until 2008, and declining demand hereafter - leading to excess supply. Due to a large backlog of new orders and larger ships, overcapacity remains an issue. Lastly, global trade also remains a key driver: The world economy is growing, which has a positive effect on global shipping. However, this trend does not trickle down to the Danish market, as growth rates here are less than the global growth in shipping.
**Fishing, value of landings, bil. DKK**

Forecast using historical growth of 6%

**Aquaculture (ocean), quantity, th. tons**

Corresponding to the Danish Government’s growth plan for aquaculture

Based on expected growth of 5-7%

Based on historical growth of 0%

Sand and stones: expected growth rate of 3%

Average growth rate best case: sand and stones: 5%
FISHING & AQUACULTURE

FISHING
The outlook for the Danish fishing sector is positive. The fish stock is growing, and some observers believe that a 30-40% increase in landings towards 2020 could be sustained by the fish stock levels. However, landing sizes are determined politically through the quota system, which is currently undergoing changes.

DRIVERS: The primary driver is quotas, which are determined by the EU. Quotas define the allowed sizes of landings in EU countries. Recently, a new quota system has been introduced (Maximum Sustainable yield, MSY), which is expected to have a positive effect on the allowed landing sizes. The size of quotas is primarily driven by the fish stock: Fish stocks in Danish waters have become larger and healthier in recent years, which, however, has not yet had a positive influence on the sizes of quotas. Another key driver is the price on fish: Prices directly influence the value of total landings. Prices are driven by a range of factors, including demand, quality and supply within the EU. Danish prices have, on aggregate level, increased in recent years. As supply is determined by quotas, value-adding activities in other parts of the value chain (e.g. processing) is also a driver in the fishing sector. Lastly, fishing zones are to be considered, as less restriction on the sea makes it easier to catch landings, i.e. lower costs. Brexit can have a negative effect in this regard, as 31-45% of Danish landings are caught in the British part of the North Sea.

AQUACULTURE
While the Danish Government has a declared ambition to grow aquaculture by 20% towards 2020, the base case reflects an estimated growth of 5-7% in demand for European ocean aquaculture. However, it is not unlikely that the sector will continue to be characterised by stagnation, which has been the case in recent years.

DRIVERS: The main driver for aquaculture is the framework conditions. The general administrative and political conditions for aquaculture have been identified as the main obstacle to growth. Several requirements must be fulfilled by aquaculture producers to be compliant. Demand and export drive new investments and thus production, as new investments require stable increasing demand in the EU marketplace. For example, Danish consumers spent 2.6% more on fish in 2016 than the year before. Location of the aquaculture farm influences the operating costs. The higher the distance from shore to aquaculture farm, the higher the operating costs. Depending on future legislative decisions on area allotments and potential changes in operating costs, production output can be influenced. Lastly, the increasing focus on organic produce may become a driver for further growth. Currently, only 1.5% of consumer fish production in the EU is organic.
Nordhavn in Copenhagen is an example of how extraction is used in the construction sector.
RAW MATERIAL EXTRACTION

Raw material extraction from the ocean is expected to show stable growth until 2030, driven primarily by the construction sector, i.e. public projects such as ‘Super Sygehus’ and infrastructure, as well as an increase in the proportion of raw material being extracted from the seabed rather than from land.

DRIVERS: Construction sector: The extraction sector follows the movements of the construction sector, which is showing steady growth. Moreover, placement of future construction projects also plays a role, as transportation costs are high, why local extraction is exhausted first - and ocean-based extraction can be substituted by land-based extraction. Therefore, another key driver is land capacity: Areas for land-based raw material extraction are scarce, which is why ocean-based extraction is increasing as a proportion of total extraction. Fleet capacity: There have been few investments in the Danish dredging fleet, and as it takes approximately five years from commission to completed construction, fleet capacity can inhibit future growth. Another volume driver for raw material extraction is allotted areas. Currently, extraction can only be done from auction areas, common areas or construction client areas (in Danish ‘bygherreområder’), administered by the Danish Environmental Protection Agency.
Danish national Tourism Strategy projects a 3% growth rate.
Average growth of 2% based on historical development.
Global growth of 4%.

Note: The figure only depicts the development of overnights. Non-commercial tourism, such as visits to friends and family, also plays a role in the economy – and is expected to grow steadily towards 2030 (this part of the sector grew by an estimated 1.4% between 2014-2015). Moreover, outdoor physical activities are in demand (e.g. surfing, kayaking), also influencing growth positively.

Cruise calls, total number

Other ports Port of Rønne Port of Aarhus Port of Copenhagen
TOURISM

Coastal and nature tourism makes up the bulk of tourism-related revenue and is the largest maritime sector in the EU. Danish Tourism is expected to grow with at least 2% towards 2030.

DRIVERS: A key driver is demographics: Northern European demographics are changing – i.e. a growing elderly population. This influences travel and tourism patterns and results in a higher level of consumption per tourist. Another important driver is airfare prices: Lower airfare prices (partly caused by lower fuel costs) have a negative impact on the Danish tourism sector. Generally, people take more but shorter vacations. Nature conditions are another important aspect: The clean beaches, high water quality and low pollution levels are key drivers for Danish tourism. Income levels and globalisation: An increased level of globalisation and increasing average income levels have a positive effect on Danish coastal tourism. As with some other maritime sectors, the increased focus on sustainability also plays a role: Focus on sustainability is expected to have a positive effect on Danish coastal tourism, as it is perceived as very nature-based and “sustainable”. Lastly, digitalisation: New digital marketing platforms, distribution networks and information services all influence Danish tourism positively.

CRUISES:

The cruise sector is expected to grow, primarily fuelled by the ports of Copenhagen and Aarhus. Yearly growth rates could be as high as 4-5% towards 2030. Specifically, the Danish turnaround market (defined as the market for passengers that both embark and disembark in the same port) has the highest growth potential. However, the growth potential is expected to be slightly smaller than global growth (due to higher demand in other markets and lower fees).

DRIVERS: Demographics: Northern European demographics are changing – i.e. a growing elderly population. This influences travel and tourism patterns and can drive growth in the cruise sector. Another important driver, as with tourism in general, is airfare prices: Lower airfare prices are expected to have a positive effect on the Danish cruise sector, as this can increase the number of international travellers boarding cruise ships in Denmark. Moreover, the development of the European cruise market plays a significant role, as The Danish market is deeply embedded in the European cruise market, especially adjacent markets. These markets are, as stated, expected to drive growth in the coming decade, which will likely have a spill-over effect on the Danish market. Focus on sustainability: The increased focus on sustainability is expected to have a positive effect on Danish coastal tourism – and consequently also the cruise sector. Lastly, investments in land infrastructure are identified as a driver for cruise volume: As the average size of cruise ships is increasing, land infrastructure (e.g. port infrastructure) will determine where the bulk of future growth will be placed – i.e. a well-developed land infrastructure is a precondition for cruise sector growth.
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