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**COUNCIL
WORKING PARTY ON SHIPBUILDING**

SHIPBUILDING AND THE OFFSHORE INDUSTRY

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FOREWORD

This report was prepared by the OECD Secretariat and summarizes the key points discussed during the 24 November 2014 workshop on shipbuilding and the offshore industry. This document updates some of the analyses included in the report by Douglas Westwood on offshore vessels, mobile offshore drilling units & floating production units as well as in the presentations made by other speakers, notably in the context of a lower oil price than in November 2014.

This document also proposes some issues for discussion in areas that were not extensively discussed during the workshop, in particular on government policies that have an impact on the offshore sector and may introduce distortions in the shipbuilding market.

WP6 delegates discussed the report at their meeting on 11-12 June 2015 and agreed to declassify the report, after the addition of an executive summary, so that it could be made available to a wider audience. The report will be made available on the WP6 website: www.oecd.org/sti/shipbuilding

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EXECUTIVE SUMMARY

Demand of offshore vessels and excess shipbuilding capacity

Total offshore vessel deliveries more than tripled between 2004 and 2009, driven by rising oil prices and fleet replacement. As a consequence, offshore became a key market segment for the shipbuilding industry with a **high contribution to the turnover of the global shipbuilding sector**.

The recent expansion of the offshore market was, however, **not sufficient to reduce excess capacity in the shipbuilding industry**. Indeed, according to Clarkson, the market for offshore support vessels is itself suffering from overcapacity due to the recent increase in the construction of small vessels in Asia and very large vessels for the North Sea and Brazilian markets.

However, over the medium-term, according to Douglas-Westwood, **demand for all offshore vessel types is expected to increase by 3.7% per year on average over the next ten years** driven by the developments of deep offshore fields. This might have a positive impact on reducing excess capacity through facilitating reorientation of shipbuilding companies.

Challenges and risks

Despite similarities regarding inputs used, **the reorientation of shipyards into the offshore sector involves various and elevated risks**. These are notably linked to complicated construction processes, strict regulations, high levels of investment needed and the absence of a level playing field in the market. The shift towards offshore industry represents a big challenge for employees that can be tackled through education, training and research.

After the sharp decrease of oil prices in the second half of 2014, oil companies announced reductions of their oil exploration investments. **Offshore vessel deliveries are expected to decrease by at least 10% in 2015, and further decreases are expected in 2016 and 2017**.

Upstream costs, capital and operating cost have been increasing steadily in recent years and put many projects at risk as they are vulnerable to an oil price drop below USD 80 per barrel. According to Douglas-Westwood, **cost escalation in offshore oil and gas exploration and production activities is expected to be the biggest challenge for the offshore industry**.

Other offshore sectors

Offshore renewables are promising markets, notably offshore wind installations that are expected to increase from 2 Gigawatt (GW) in 2014 to 12 GW in 2020. However, these markets, as well as that for floating plants (e.g. desalination) remain small as compared to offshore oil and gas, and **also involve big challenges** including logistics, large investment requirements and construction risks.

Several types of policies have a significant impact on the shipbuilding sector in the context of its offshore activity, in particular **local content requirements which are applied in various regions, increasing costs and uncertainty of offshore projects**.

Financing

The outstanding exposure to the offshore segment increased from 32% in January 2012 to 42% in January 2014 of total ship financing. Tightening capital requirements for banks are expected to lead to further increases of financing by Export Credit Agencies as finance is a key competitiveness factor for the shipbuilding companies constructing offshore vessels. Against this backdrop, **the increasing role of export credit agencies in offshore ship financing could be considered as an important policy issue for discussion**.

Introduction

The offshore sector is an increasingly important market segment for the shipbuilding industry. On 24 November 2014, the OECD Council Working Party on Shipbuilding (WP6) hosted a workshop on shipbuilding and the offshore industry.¹ It was attended by representatives of OECD and Partner governments, industry associations, shipbuilding and marine equipment firms, industry experts and trade union representatives. The WP6 was particularly interested in understanding the scope and limitations for shipyards reorientation towards the offshore market and the lessons learnt from recent diversification strategies.

This document summarizes the key points discussed during this workshop and updates some of the analyses included in the report by Douglas-Westwood on offshore vessel, mobile offshore drilling unit and floating production² as well as in the presentations made by other speakers, notably in the context of a lower oil price than in November 2014. This document also proposes some issues for discussion in areas that were not extensively discussed during the workshop, in particular on government policies that have an impact on the offshore sector and may introduce distortions in the shipbuilding market.

The first section of this document deals with the current situation and trends in the offshore energy market. Oil and gas supply is the major driver for demand of offshore vessels and structures. When the workshop took place, oil price was already far below its summer 2014 level. Since the oil price continued to decrease after November 2014 the following analysis of the energy market has been updated accordingly. The oil price decreased by 60% between June 2014 and January 2015, and then rebounded to reach USD 66 per barrel in May 2015, but was still 43% below its June 2014 level. This section also includes some elements on other market segments, notably offshore renewables, floating power plants and floating infrastructure such as floating desalination plants.

The second section deals with current and expected demand for offshore vessels and structures for the global fleet as well as by market segment. The third section is about the activity of the shipbuilding sector linked to the offshore market. The fourth section deals with the main policy issues related to shipbuilding and the offshore industry, notably local content requirements and export credits. Finally, the last section lists some of the main shipbuilding industry challenges to successfully enter and perform in the offshore market.

Issues for discussion

- How shipyards involved in the offshore market should adapt to the expected 10-15% reduction of future investment in oil and gas (especially for investment in exploration)?
- What are the prospect for new offshore markets, notably offshore renewables and floating plants?
- What will be the effects of cost pressure by their clients on the shipbuilding companies involved in the offshore market?
- What has worked (and not worked) regarding the reorientation of shipyards into the offshore market? What are the appropriate strategies for large and small companies?
- What is the role of government financing notably in the context of low interest rates? What role is played by export credits and R&D support for the offshore activities?
- What are the causes of market distortions in the offshore industry and what are their effects?

- What are the impacts of speculative orders on the offshore market?
- What are the burdens of local content requirements? In particular, to what extent do local content requirements restrict access to the offshore market?

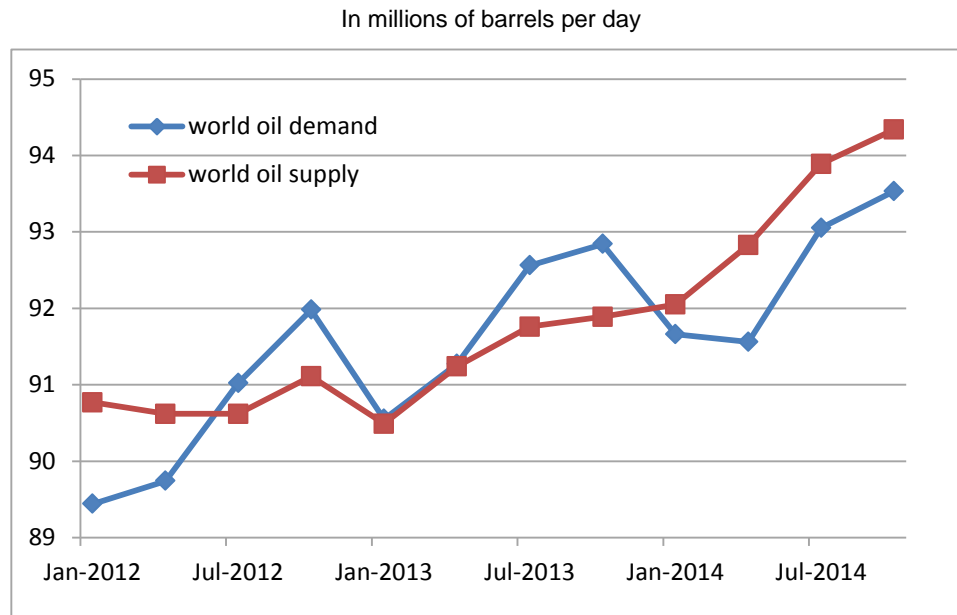
1. Current situation and trends in offshore energy

a) Oil & gas demand and supply

The macro-economic environment plays a key role in energy demand and as a consequence in offshore oil and gas exploration as well as exploitation activities, that are in turn the main markets for offshore vessels and structures. In particular, the oil price is a major driver for the demand of offshore vessels because of the relationship between oil prices, exploration, number of profitable fields and the need for offshore vessels.

According to the International Energy Agency (IEA), world oil demand amounted to 92.4 million barrels per day in 2014, corresponding to an increase by 0.7% as compared to 2013 (See Figure 1) and thereby representing the smallest annual increase in the last five years. World oil supply amounted to 93.3 million barrels per day in 2014. In the same year, world oil supply increased by 2.1% which has been mainly driven by the increase of production in countries not part of the *Organization of the Petroleum Exporting Countries (OPEC)*, notably the United States where oil supply amounted to more than 9 million barrels per day. Moreover, OPEC production was above its 30 million barrels per day agreed level of supply in 2014. In total, the oil market has been in a situation of excess supply since early 2014.

Figure 1. Oil supply demand balance



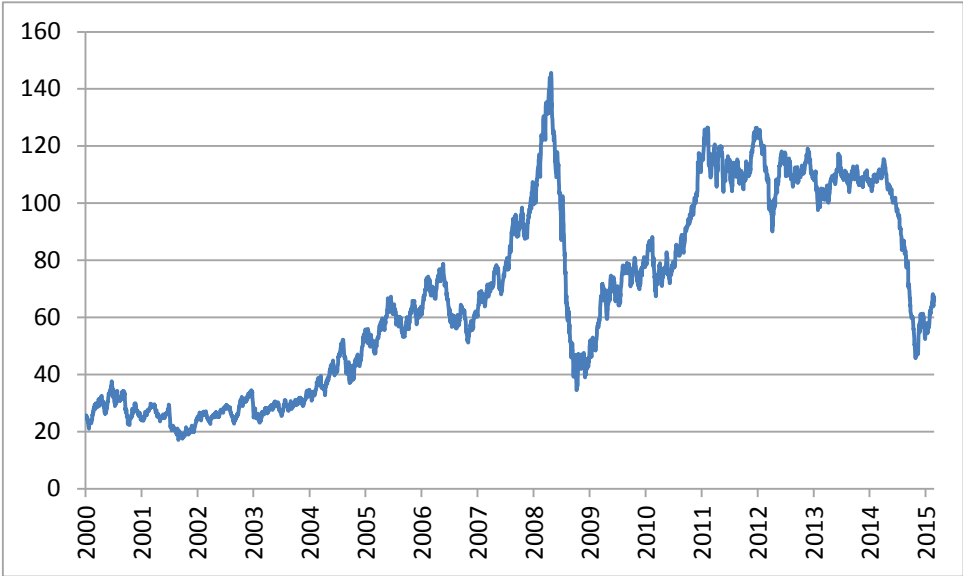
Source: International Energy Agency.

The crude oil Brent price, which is commonly used as a benchmark for the global crude oil price, strongly increased from USD 23 per barrel in January 2003 to USD 143 per barrel in July 2008 (See Figure 2). As a consequence of the financial crisis of 2008, the oil price dropped to around USD 40 per barrel, but strongly recovered after the "great recession" and remained relatively stable in a range from

USD 100 to 120 per barrel from early 2011 to mid-2014. Because of increasing supply and slowing demand in oil markets, the crude oil Brent price decreased strongly by 60% from USD 115 per barrel in June 2014 to USD 46 per barrel in January 2015. Shortly after, the oil price slightly rebounded to USD 66 per barrel in May 2015. Short-term forecast for oil prices are relatively uncertain, however, some oil company representatives expect “a period of relatively weak oil price” given the resilience of US shale oil production³.

Figure 2. Crude oil Brent price

In USD per barrel – 2000 - 2015



In USD per barrel – January 2014 - May 2015

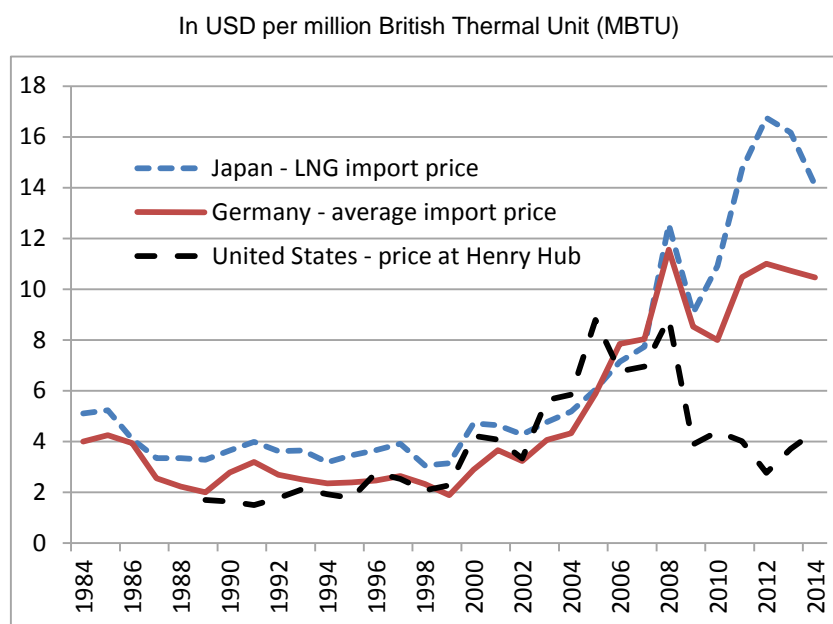


Source: Datastream.

Gas prices are substantially more regionally differentiated than oil prices. Moreover, the recent sharp increase in shale gas production in the United States has contributed to widen the gaps between the price in

North America and the price in Europe and Asia, respectively (see Figure 3). Indeed, the price gap between the Liquid Natural Gas imported in Japan and the gas price in the United States widened from USD 0.4 per MBTU in 2006 to USD 9.7 per MBTU in 2014. The price gap between the gas imported in Germany and the gas price in the United States increased from USD 1.1 per MBTU in 2006 to USD 6.1 per MBTU in 2014.

Figure 3. Natural gas prices in Japan, Germany and the United States



Source: BP Statistical Review of World Energy.

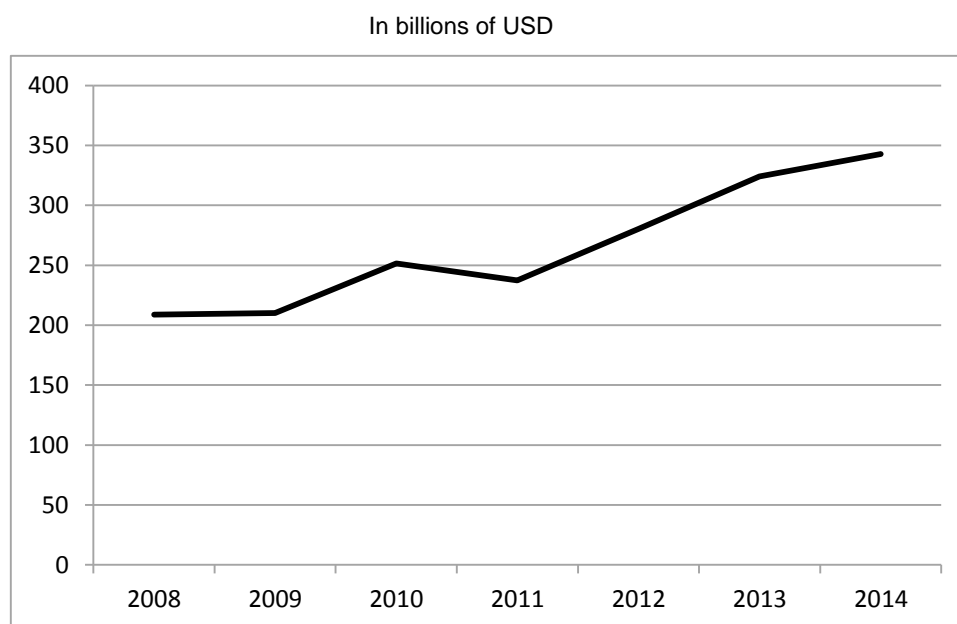
b) Oil and gas offshore exploration and production

Twenty percent of oil reserves and 45% of gas reserves are located offshore. Most of the recent large discoveries have been offshore, especially deep to ultra-deep offshore natural gas reserves. According to the French Petroleum Association (IFP EN), the most promising zones for offshore oil and gas discoveries are Brazil and West Africa continental margin (« subsalt »), East Africa, especially in Mozambique and in Tanzania. There are also many other opportunities in the Mexican Gulf, Mediterranean region, Australia and the Arctic region.

Offshore oil production amounted to 21.5 million barrels per day in 2014, representing about one quarter of world oil production. Offshore gas production amounted to 90 billion cubic feet per day (BCFD) in 2014 corresponding to approximately one quarter of world gas production. Offshore oil and gas production has been on a downward trend since 2010 driven by the decline of production in Europe, Middle East, Africa and North America.

Recent developments

According to figures from Douglas-Westwood, spending for offshore exploration and production amounted to USD 343 billion in 2014, an increase by 6% as compared to the previous year (See Figure 4). Regarding gas exploration and exploitation, high gas prices in Asia has enabled highly capital intensive Australian export projects in recent years.⁴ However, the potential to ship cheap liquefied natural gas from the United States may lead to the cancellation of some high cost export projects in other countries.

Figure 4. Offshore oil exploration and production spending

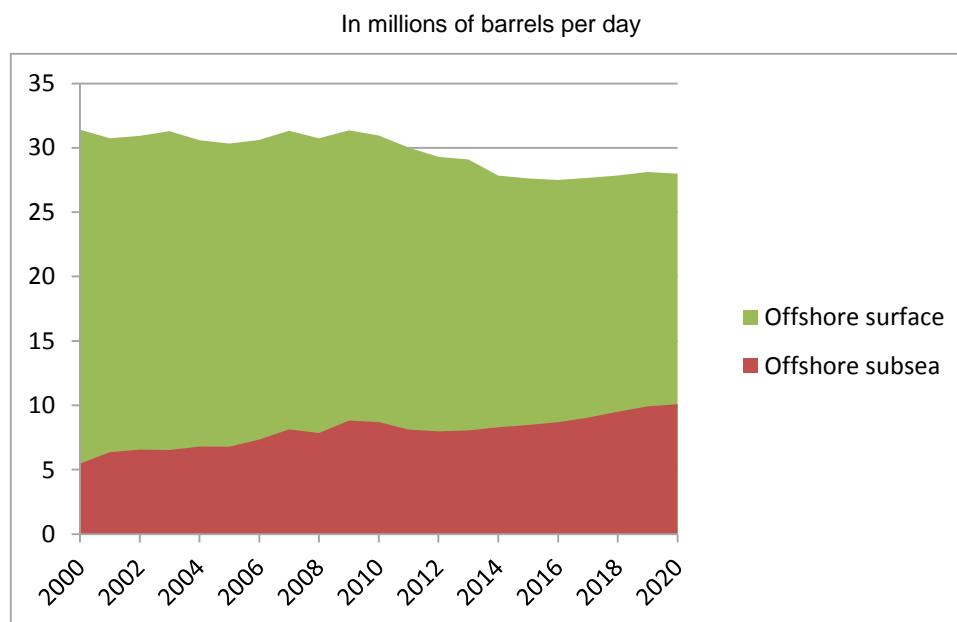
Source: Douglas-Westwood.

Offshore oil and gas supply prospects

Offshore vessels are purchased and used by oil majors and para-petroleum companies. Oil majors are expected to stabilize or even slightly decline their investments in response to lower oil prices. For instance, ExxonMobil, Chevron, British Petroleum, Royal Dutch Shell announced large cuts in capital spending for 2015; these reductions are in the range of 10 to 20%.⁵ Para-petroleum companies also suffered from the recent oil price decrease. Schlumberger, for instance, in early 2015 announced 20 000 job cuts (15% of its employees) in response to the oil price drop.⁶ At the same time the company indicated a sharp decrease of oil exploration activities notably offshore.

However, in the medium term, fossil fuels are expected to continue dominating the energy supply. Therefore, offshore would be the main beneficiary of the ongoing demand for fossil fuels in terms of capital expenditures. In the International Energy Agency (IEA) New Policies Scenario, offshore is expected to account for more than 30% of the global oil production by 2030, corresponding to an increase by five percentage points from its current level. In this scenario, the increase in the share of offshore oil would be driven by the expected 50% growth of deep water production in the next 15 years. By contrast, shallow water field production is expected to decrease in the coming years.

Douglas-Westwood expects offshore subsea production to grow significantly with its share in total oil production increasing from 8% in 2014 to 10% in 2020. Despite project delays, Douglas-Westwood expects deep water spending to reach USD 210 billion from 2015 to 2019, meaning a 69% increase over the preceding five-year period⁷. Deepwater spending would be driven by large capital expenditures in major areas of oil resources, such as in Africa, Latin America and North America.

Figure 5. Offshore crude oil production

Source: Douglas-Westwood.

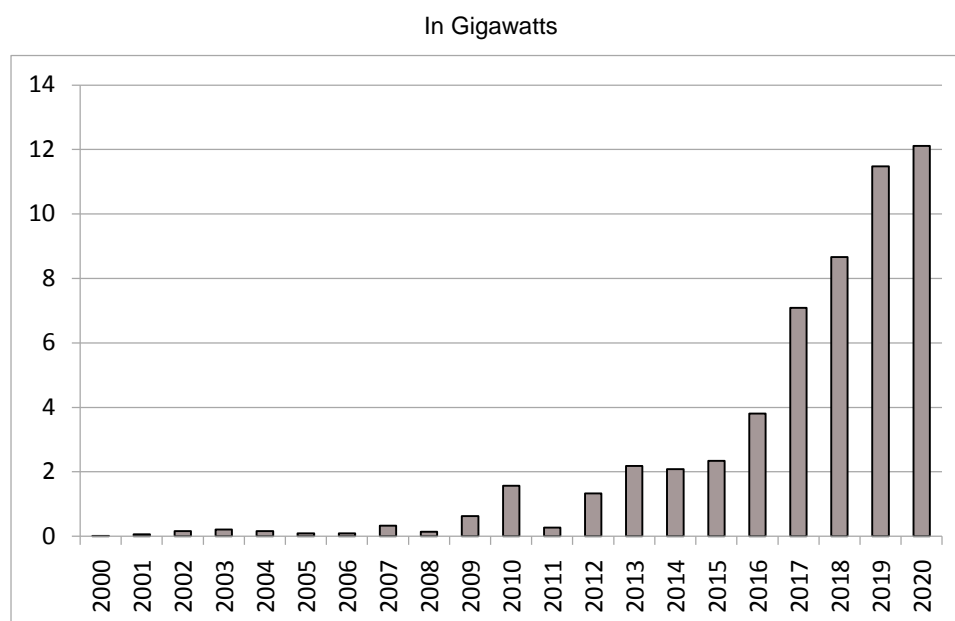
Regarding offshore natural gas production, strong growth is expected both in shallow and deep waters, driven notably by the development of East African natural gas basins. Latin America will, however, remain the largest market and North America would experience the slowest growth. In total, oil and gas offshore production is expected to grow 1.2% per year on average in the next 15 years.

c) Offshore renewables

According to Mr. Sam Anson, Head of the Marine Analytical Unit of the Scottish Government, offshore wind accounts for the largest proportion of offshore renewable energy supply and is driven by both political and economic factors. Political drivers include various global, regional and national measures aiming to reduce greenhouse gas emissions.

The offshore renewables market is reliant on government subsidies due to the high capital cost involved. However, Mr. Anson noted during his presentation at the 24 November 2014 WP6 workshop that offshore wind energy becomes more and more cost-effective as installed capacity increases and turbines become larger and more powerful.

Moreover, Mr. Anson noted that due to greater and more regular wind speeds and fewer aesthetic externalities, there is good potential for offshore wind resource located in deep water. As a consequence, floating foundations are likely to represent the long-term future for the offshore wind industry. According to Douglas-Westwood, average offshore wind installations are expected to increase from 2 Gigawatt (GW) in 2014 to 12 GW in 2020 (Figure 6). However, grid connection, logistics, large investment requirements with high technological and construction risks and financing costs remain challenging issues for the wind energy industry.

Figure 6. Prospects for offshore wind installation

Source: Douglas-Westwood.

d) New offshore markets

Floating desalination plants

According to Mr. Toshifumi Kokubun, Partner in the Global Management Institute of Deloitte, the global desalination market is already significant thanks to its sharp expansion in the last 15 years notably in North America and Middle East. He expects water shortage to be a driver for the global desalination market that would reach more than USD 14 billion in 2018.

However, the desalination industry is facing challenging issues including delays linked to environmental assessments, uncertain climate conditions during construction, and more general country risk. Mr. Kokubun indicated in his presentation that floating desalination plants will address these issues, since they can be relocated upon request and minimize the destruction of coastal ecosystems. Floating desalination plants have been used for instance in Saudi Arabia, Cyprus and Thailand. Mr. Kokubun expects the floating desalination plant market to reach between USD 1.5 billion and USD 4 billion per year until 2025.

Floating power plant and other floating structures

As Liquid Natural Gas (LNG) electric power plants located in coastal areas run the risk of being damaged by tsunamis, Mr. Kokubun mentioned that floating LNG plants could be a good alternative from a risk management perspective. Mr. Kokubun also indicated that Japan has started a new energy strategy utilizing hydrogen technologies in order to diversify energy sources and reduce CO₂ emissions. He expects that production facilities for hydrogen to be located near offshore gas fields and to generate new markets for marine industries. He also mentioned the synergies between floating LNG plants and desalination plants as the former can work as an electric power source for floating desalination plants.

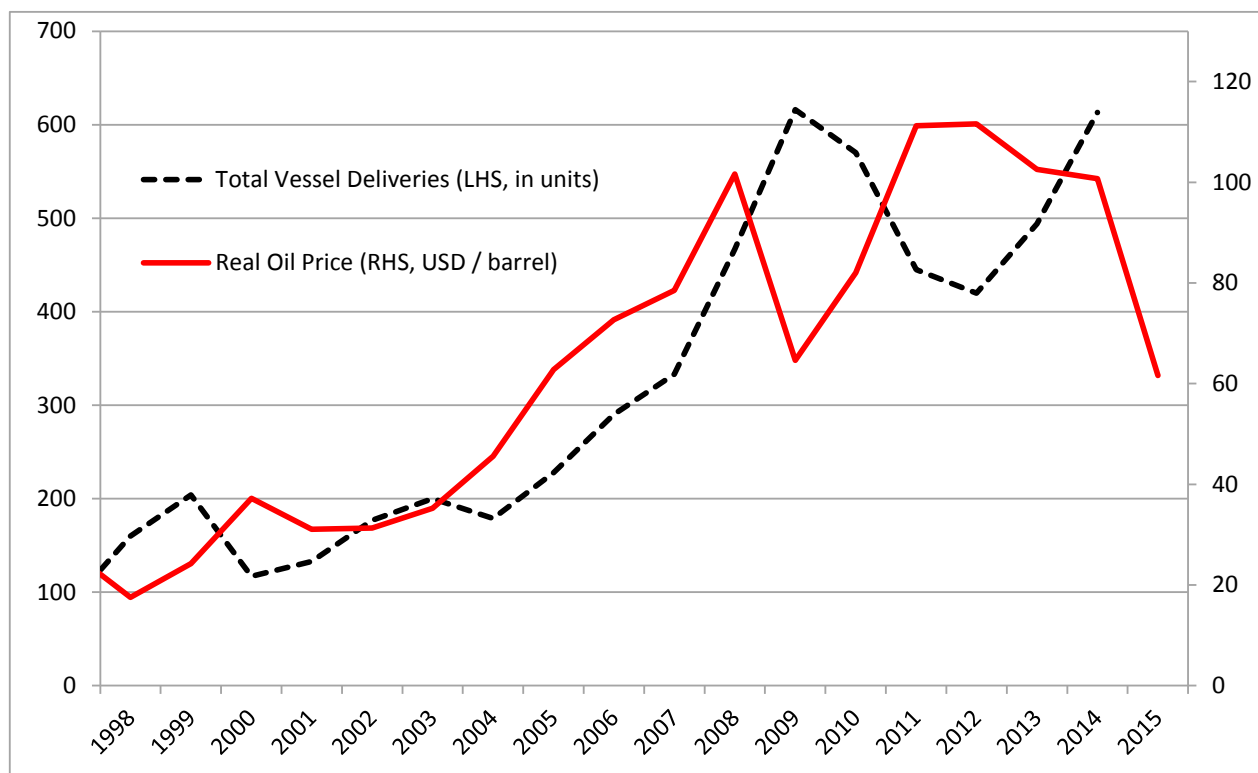
2. Demand for offshore vessels and structures market outlook

a) Total offshore vessel demand prospects

According to Douglas-Westwood, the last decade has seen high offshore vessel and building activity, driven by rising oil prices and a need for fleet replacement. The total offshore vessel deliveries more than tripled from 179 in 2004 to 616 in 2009. The great recession and lower oil prices led to a decrease of offshore vessel deliveries to 420 units in 2012. But the stabilization of the oil price around USD 110 per barrel between 2011 and mid-2014 led to a rebound of offshore vessel deliveries to 616 units in 2014.

Figure 7 below shows the high level of correlation between offshore vessel deliveries with a two-year lag and the oil price. If this correlation persists over the coming years, we can expect a decrease of offshore vessel deliveries in 2015 by at least 10%, and further decreases in 2016 and 2017. Nevertheless, over the medium-term, Douglas-Westwood is relatively confident on the offshore vessel market and expects demand for all offshore vessel types to increase by 3.7% per year on average between 2014 and 2025 driven by growing offshore oil and gas supply in the coming years notably in deep offshore fields.

Figure 7. Offshore vessel deliveries (in units) and oil price (in USD per barrel)



Source: Douglas-Westwood.

b) Offshore vessel demand by market segment

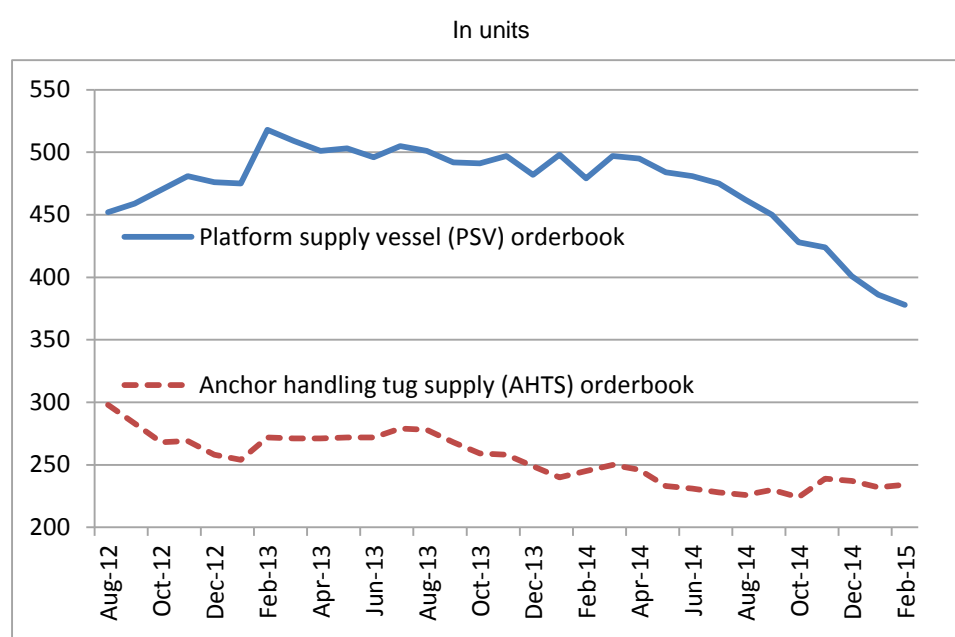
Recent developments and short-term prospects

Because of the recent fall in oil prices, drilling rig utilization decreased from 95% in late 2013 to 87% in March 2015 according to Clarkson.⁸ Due to the non-renewal of many contracts, the drilling rig

utilization is expected to decrease even further. As a consequence, the rates for offshore vessels that are frequently rented on a daily basis are expected to continue decreasing.

Moreover, according to Clarkson, the market for offshore support vessels is suffering from overcapacity due to the recent increase in the construction of small vessels in Asia and very large vessels for the North Sea and Brazilian markets. The large orderbook for platform support vessels (PSVs) that has been driven by speculative orders and represents around 40% of the fleet may lead to cancellations. As a consequence, Clarkson expects a slowdown of the offshore fleet growth to 4% in 2015 as shown by the decreasing trends of the orderbook for platform support vessels and anchor handling tug supply (AHTS) vessels (See Figure 8). However, supply of offshore support vessels would still grow faster than demand.

Figure 8. Recent developments of the orderbook for platform support vessels (PSV) and anchor handling tug supply (AHTS) vessels



Source: Clarkson.

Medium to long-term forecasts

According to Douglas-Westwood, robust growth forecasts for both the offshore support vessel (OSV) and mobile offshore drilling Unit (MODU) market is expected over the next decade, supported by increasing offshore drilling activities. This growth is largely attributed to the increased activity in Latin America, Africa and Asia.

Douglas-Westwood also expects growth in the floating production unit market given the increase in offshore production activity. Besides Subsea, Umbilicals, Risers, Flowlines (SURF) vessels, the requirement for construction vessels will be driven by replacement demand. The vessel market for wind energy construction is expected to grow rapidly with continued government subsidies. The expectations by Douglas-Westwood of market demand for offshore vessels by market segment are detailed in Box 1 below.

Box 1. Detailed offshore vessel demand medium to long-term forecasts by market segment (2014-2025)

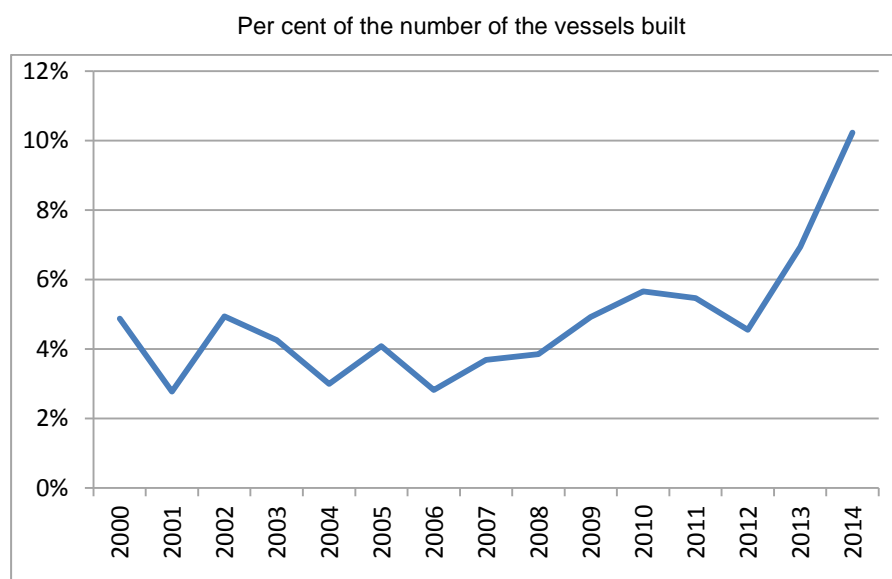
- **Offshore support vessel (OSV).** The anchor handling tug supply (AHTS) market is driven by a combination of large assets supporting deep water drilling and smaller multi-purpose service vessels. The *Platform supply vessel* (PSV) market is expected to see the strongest growth out of all offshore support vessel types as a result of increased demand for floating production systems and drillships. The Emergency Response and Rescue Vessel (ERRV) market is less subjected to industry cyclicity given the greater exposure to longer term life of field contracts and a relatively consolidated supply chain.
- **Mobile Offshore Drilling Unit (MODU).** Significant growth is expected in the shallow water jackup drilling market before stabilization between 2020 and 2025. Demand for drillships is expected to see robust growth, driven by the deepwater triangle – West Africa, Latin America and North America.
- **Floating production unit (FPU).** The floating production, storage and offloading (FPSO) market is project-driven. Asian yards are expected to continue supplying floating storage and offloading (FSO)s.
- **Construction vessel demand.** The increasing volume of subsea installations and of Inspection, Repair & Maintenance (IRM) activities is expected to drive demand for subsea vessels particularly from Latin America and Africa. Subsea, Umbilicals, Risers, Flowlines (SURF) vessels are expected to benefit from the increasing volume of subsea installations, particularly in Africa and Latin America. Increasing water depth and size of wind turbines is expected to drive higher requirements for larger cranes and deeper operational capabilities.

Source: Douglas-Westwood.

3. Shipbuilding activity linked to the offshore sector

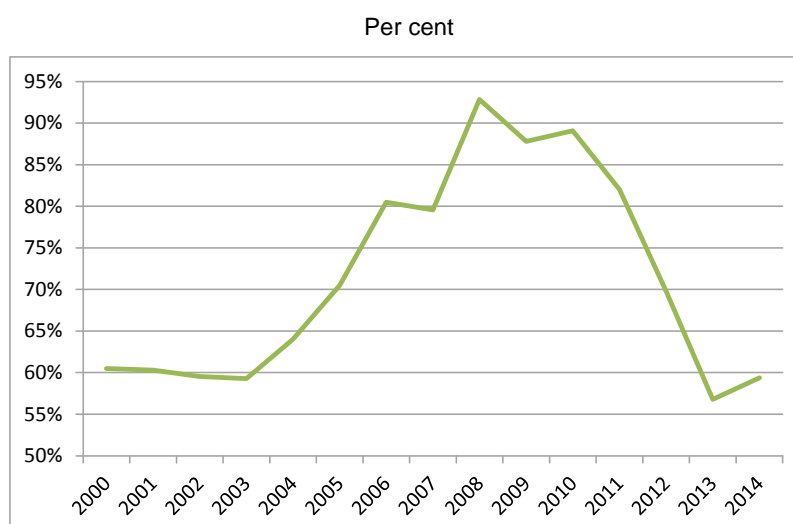
a) Yard capability to build offshore vessels

According to Douglas-Westwood, offshore vessels accounted for around 10% of the total number of vessels completed in 2014, increasing strongly from its share of 4.5% in 2012 (See Figure 9). The growing share of offshore vessels in the global shipbuilding activity can be explained simultaneously by the weakness of the cargo ship market and the massive orders for offshore vessels in the last three years driven by high oil prices. In terms of investment by vessel types, the offshore segment represented in 2012 more than half of investments in vessels and not less than 20% of total investment each year between 2008 and 2014 (Clarkson database).

Figure 9. Share of offshore in total (marine + offshore) vessel completions

Source: Douglas-Westwood.

According to IHS Fairplay, the offshore segment represented in previous years a significant share of global new orders. In value, Korea accounted for 42% of the global offshore orderbook as of January 2014, followed by Brazil (21%), China (16%) and the European Union (11%). Despite stronger activity in the offshore market, the shipbuilding capacity utilisation ratio in OECD countries remained below 60% in 2014 (See Figure 10) and was only slightly above this level in the global shipbuilding industry, showing that growing offshore activity didn't significantly help to resolve the excess capacity situation in the global shipbuilding industry.

Figure 10. Capacity utilization ratio in the shipbuilding industry in OECD countries

Note: Capacity utilization ratio is calculated using the following formula: vessel completions in CGT divided by shipbuilding capacity in CGT.

Source: Douglas-Westwood.

According to calculations by Douglas-Westwood, which are based on the maximum tonnage of each yard, 34% of OECD yards are able to construct production units such as floating production, storage and offloading (FPSO) and 48% are able to produce drill ships. By contrast, 96% of yards are able to produce smaller and less complicated vessels such as offshore support vessels. However, not all yards have the engineering, procurement and construction capabilities to produce offshore ships.

b) Competitiveness factors

Despite some similarities regarding raw materials and equipment used, the reorientation of shipyards into the offshore sector involves various risks, which are notably linked to customization requirements, complicated construction processes, strict safety regulations, and stringent environmental standards. Involvement in the offshore segment also involves close cooperation with designers and equipment manufacturers. Moreover, high levels of investment are needed in the short term, and the playing field is not always levelled when taking into account potential public support measures.

Mr. Raimon Strunck, Vice-President Sales, Flensburger Schiffbau-Gesellschaft (FSG) highlighted in his presentation on the offshore sector the challenges and opportunities for European high-tech shipyards. Series in the offshore segment are small which implies essential structural change. For FSG, contract volume for offshore vessels are around twice the average contract for other vessels and amount to about EUR 100 to 150 million per vessel on average, involving higher financial risks for each contract.

Moreover, offshore means more design and production flexibility, new planning processes, high level of coordination, less internal added value by ship but higher project volume. Offshore projects involve complex after-sales support service and sophisticated project financing, improved planning and design engineering processes, and method planning supported by simulation. For a successful transformation process to enter the offshore market, shipyards need both highly skilled experts who are difficult to find in the job market, as well as continuous investment in R&D.

4. Policies issues related to shipbuilding and the offshore industry

Several types of policies have a big impact on the shipbuilding sector in the context of its offshore activity. This section presents some elements regarding local content requirements and export credits.

a) Local Content requirements

Local content requirements are applied in various regions, increasing costs and uncertainty of offshore projects. Douglas-Westwood described local content requirements in selected regions, as depicted in Box 2.

Box 2. Local content requirements by region

- **North Sea** – in this region, local content requirements are not imposed, although there has been an added emphasis on environmental and safety issues.
- **North America** – Several regulations govern offshore vessels that can be operated within the US: US Coast Guard (USCG), Mineral Management Service (MMS), Jones Act.
- **Africa** - The shipbuilding industry in Africa is currently going through major changes in the field of local content requirement policies with a focus on production units. South Africa implemented Revised Preferential Procurement Policy Framework Act (PPPFA) regulations for Shipbuilding.
- **Latin America** – Brazil has introduced several local content requirements in an attempt to strengthen the local industry. While local content policies are in place, the local industry struggles to meet Petrobras' ambitious Exploration & Production plans.
- **Middle East** – There is no explicit regulations regarding the construction of offshore vessels.
- **Asia** - There are no explicit construction local content requirements governing Asian countries, however, local content policies on vessel contracting exists. Indonesia requires all drilling vessels to be Indonesian-flagged. Malaysia through the Petroleum Development Act and Petroleum regulations require supplies and service providers to have a valid license produced by Petronas (National oil company of Malaysia).

Source: Douglas-Westwood.

Local content requirements distort trade by forcing companies to purchase local inputs even if alternative foreign supply would be less costly. Regarding the specific case of the offshore vessel sector, they increase the constraints on the value chains that are already very complicated in the offshore industry. In addition to that, they may also inhibit innovation by reducing artificially competition. Some economic studies⁹ have tried to measure quantitatively the impact of local content requirements.

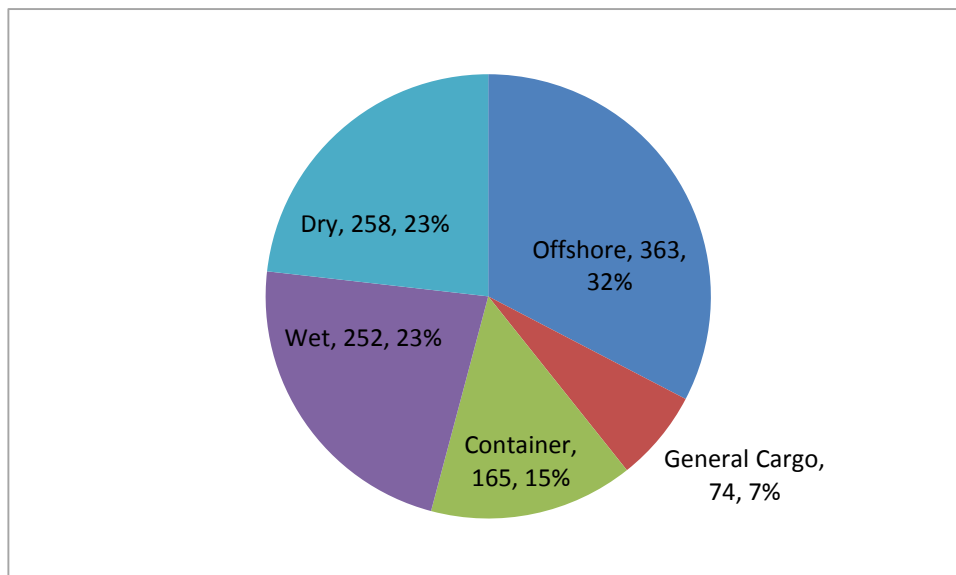
b) Export credits

In his presentation at the 24 November 2014 WP6 workshop, Mr. Mowinckel, Assistant Managing Director, Market Analysis and International Relations at the Norwegian Export Credit Agency (GIEK) showed that the outstanding exposure to the offshore segment increased from 32% in January 2012 to 42% in January 2014 of total ship financing (See Figure 11).

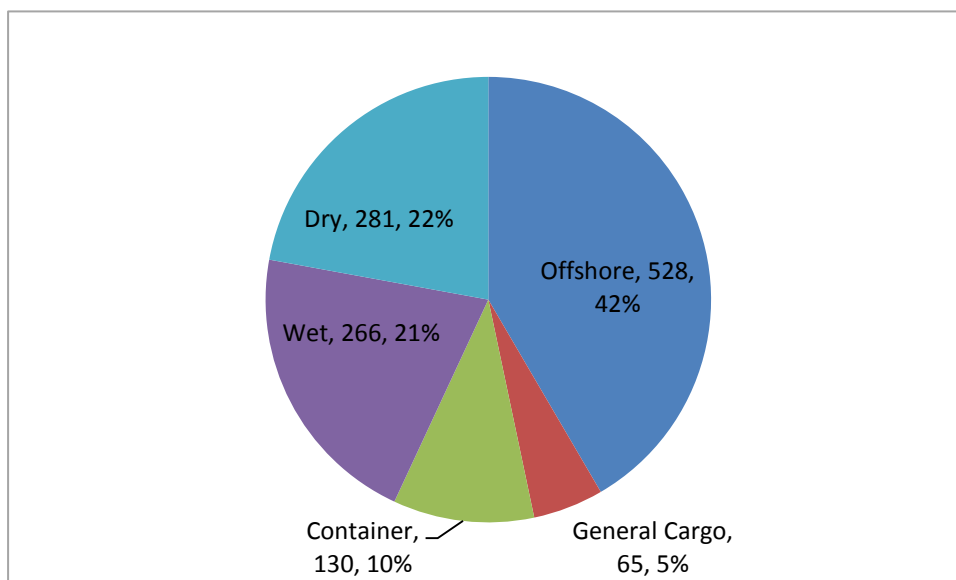
Figure 11. Outstanding world exposure by shiptypes for all sources of funding

In billions USD

January 2012



January 2014



Source: Tufton Oceanic.

Mr. Mowinckel mentioned that there are more similarities than differences between financing for shipping and offshore activities. However, he mentioned that country risk is less relevant in offshore ship financing. Moreover, he indicated some special characteristics related to offshore finance, in particular the role of secured lending notably mortgage over asset, the assignment of charter parties and wide variation of credit risk and the more specialized assets required for offshore vessels.

Mr. Mowinckel also highlighted the falling share of financing by banks as compared notably to export credit agencies that is due to the tightening of banking regulation in recent years. Discussions with markets participants in the offshore sector provide anecdotal evidence that finance is a key competitiveness factor for the shipbuilding companies constructing offshore vessels. The role of finance, both in terms of volume and structure of the institutions financing the offshore sector, will be studied in the context of the WP6 project on the new forms of finance for the shipbuilding industry.

New sources for credit risk capacity and new funding tools would probably be required, with increased importance of bonds as a funding source. Tightening capital requirements for banks are expected to lead to a further increase of financing by ECAs. Against this backdrop, the increasing role of export credit agencies could be considered as an important policy issue for discussion. According to Mr. Mowinckel, a good way to limit export subsidising through ECA financing is to encourage co-finance on equal terms, *i.e.* sharing of risk between commercial lenders and ECAs.

5. Main industry challenges

a) Technical issues

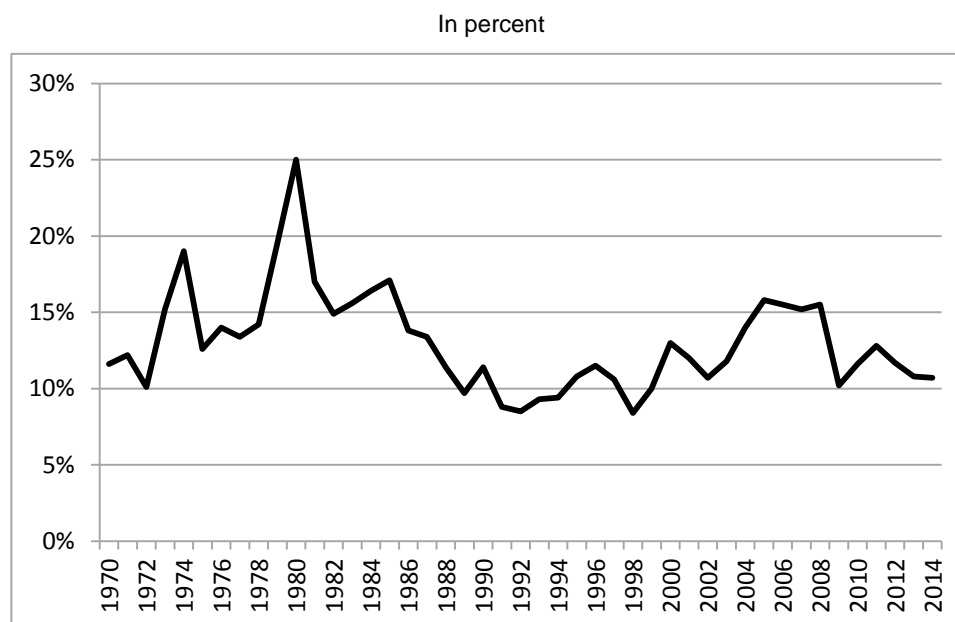
According to Mr. Borelli, managing director of D2M, the exploitation of offshore oil and gas fields will require an increased recovery rate from the reservoir of 35-40% on average to a future objective of 60%. The increasing share of ultra-deep offshore oil production will involve tailor-made projects, adapted to the site conditions and characteristics of the reservoir. The industrialization and the lowering of costs in deep water are big technical challenges. For production vessels and other marine supports, the development of all subsea processing is expected to be more complex. Moreover, lots of work to qualify equipment and materials will be required to manage ecological risk.

There are vast underexplored areas in the Arctic Region with potentially 20% of globally available hydrocarbons. In this region, several fields are already producing in difficult environments, such as Alaska, Eastern Canada, Russia and Khazakstan where the industry has gathered significant experience relevant to Arctic developments, often at a high price. The exploitation of new fields in the Arctic region will involve even greater technical challenges as new fields are expected to be located in more hostile areas.

b) Cost increase

Higher oil and gas prices in recent years have increased the viability of complex oil and gas projects. In parallel, since 2000, industry costs have increased dramatically; impacting project profitability despite higher oil prices and leading to reduced cash returns (See Figure 12). Reasons for rising costs include supply chain constraints, increased project complexity and a lack of standardisation.

In the past few years, the rapid increase in upstream costs, capital and operating cost put many projects at risk as they are vulnerable to an oil price drop below USD 80 per barrel. Cost escalation has been one of the key reasons for project deferments by Chevron, Statoil and Shell in recent years. Around one-third of these new projects, amounting to about 3.5 million barrel per day in 2020, could be at risk. According to Douglas-Westwood, this is an optimistic view, as it assumes the offshore hydrocarbons that will be produced will remain competitive, and this is uncertain.

Figure 12. Cash return on cash invested in the oil industry

Source: Douglas-Westwood.

c) Labour issues

Mr. Kan Matsuzaki, Director for Shipbuilding and Shipbreaking at IndustriALL, mentioned during the workshop that the shifting of the shipbuilding industry towards offshore industry represents a big issue for employees. Mr. Matsuzaki highlighted the role of education, skills, training and research to tackle this challenge. He mentioned that shipbuilding companies involved in the offshore sector must create quality employment, minimize negative environmental impacts and advance the interests of society as a whole.

He also highlighted the issue of promoting equity that can be addressed with comprehensive industrial policies and social programs. It would allow workers benefiting from change and would be essential for sharing the costs and benefits of change.

NOTES

- ¹ Presentations delivered at the 24 November 2014 WP6 workshop on shipbuilding and the offshore industry can be found at the following Internet address:
<http://www.oecd.org/sti/ind/workshoponshipbuildingandtheoffshoreindustry.htm>.
- ² The declassified report by Douglas-Westwood Ltd. on offshore vessel, mobile offshore drilling unit & floating production unit market review can be found at the following Internet address:
<http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=c/wp6%282014%2913/final&doclanguage=en>.
- ³ Comments by Rex Tillerson, Chief Executive of ExxonMobil, the world's largest listed energy company quoted in *Exxon CEO says oil prices will stay low*, Financial Times, 4 March 2015
- ⁴ According to the Australian Petroleum Production & Exploration Association (APPEA), Australia has four operating LNG developments and six more under construction. Other projects are also being considered. <http://www.appea.com.au/oil-gas-explained/operation/australian-lng-projects/>.
- ⁵ Source: *Exxon CEO says oil prices will stay low*, Financial Times, 4 March 2015.
- ⁶ Source: Schlumberger, *First-Quarter 2015 Results*, 16 April 2015.
- ⁷ Source: *World Deepwater Market Forecast 2015-2019*, Douglas-Westwood, April 2015.
- ⁸ Source: Clarkson Research services, *Shipping Review & Outlook*, Spring 2015.
- ⁹ For instance: Stone, S., D. Flaig and F. Van Tongeren (2014), "*Modelling Local Content Requirements: Quantitative Restrictions in a CGE Model*", 2014 GTAP Conference, Dakar, Senegal. The authors used a Computable general equilibrium (CGE) model to assess the impact of local content requirements.