Looking through the Project Finance Market for European Offshore Wind to form a basis for Turkish Offshore Wind Project Finance Structures (1)

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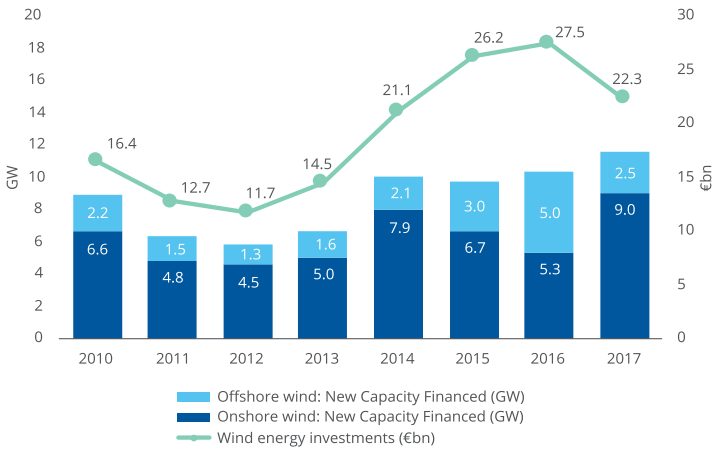
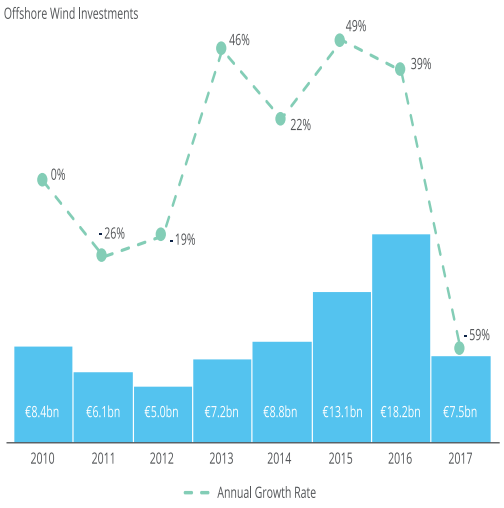
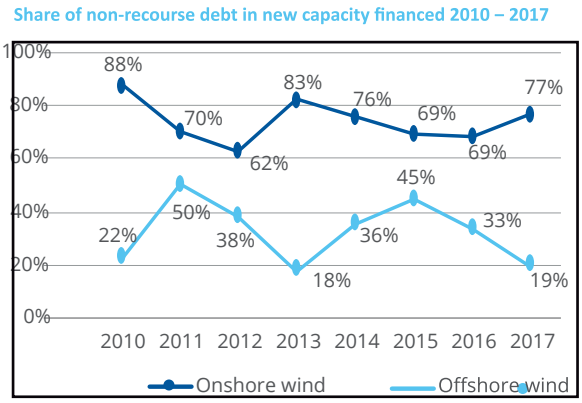
European Offshore Wind Financing Market

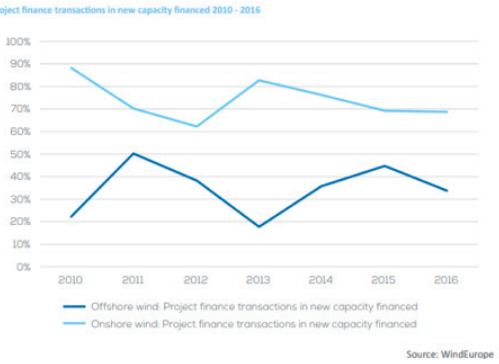
The European offshore wind financing market has developed extensively from 2006 onwards.

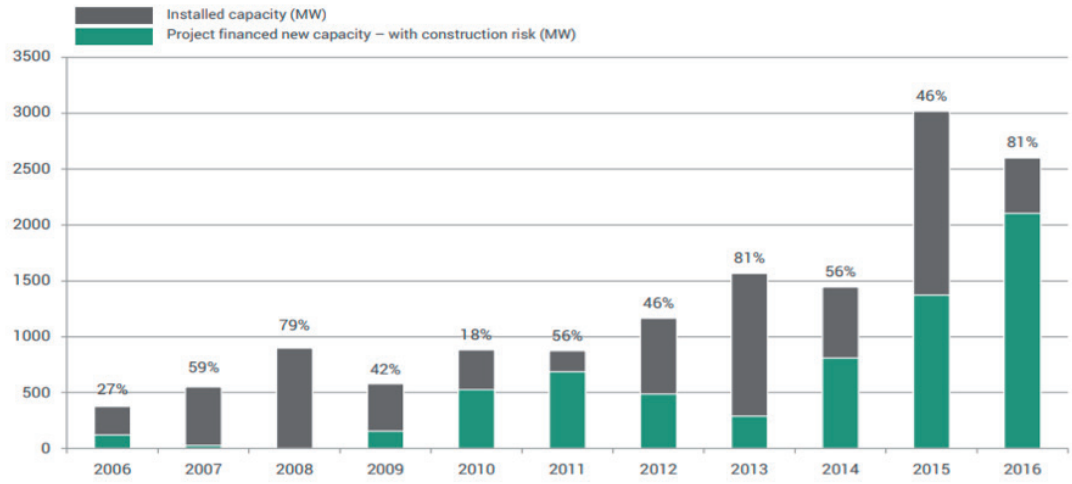




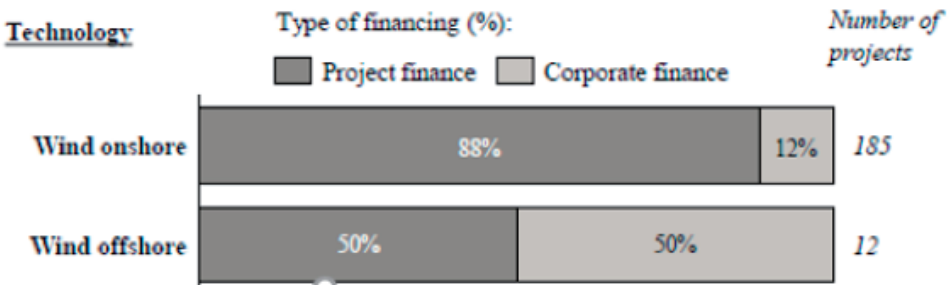
The preliminary financings have been corporate based semi financing structures, while from 2014 onwards project financing structures taking pre-construction & construction risk has evolved.







After 2010's 20-50% of new installed capacity is financed by Project Finance.



In 2016 33% new asset financing for offshore is done via non-recourse project financing amounting to 18.2 billion Euro

Today all common financing structures are being used such as:

✔ *Corporate financing: Corporate lines depending on a Producer or Contractor Balance Sheet*

✔ *Project financing: Traditional project financing structures customized for offshore wind*

✔ *Investor equity: Institutional and Financial Investor or Infrastructure Fund based structures*

✔ *Project Bond: Bond structures for offshore wind financings.*

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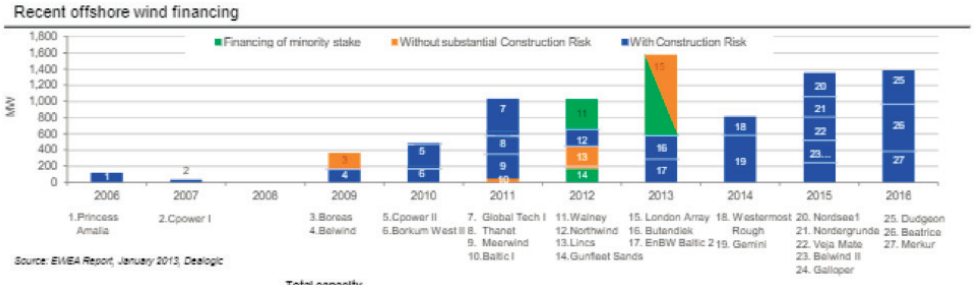
TABLE 1 OUTLINE OF FUNDING MODELS

Potential source of funding	Prominence in the sector to date	How the capital can beassesed
Power producer balance sheet	Dominated the European offshore wind sector as the source of finance for con-struction and operations. Power producers' balance sheets are becoming constrained, limiting their abil-ity to finance new projects.	Power producers could recycle equity investments available on their balance sheet by re-financing existing projects either through debt (project finance bank debt or project bonds) or by selling equity, the majority of which have been minority stakes to date. Alternatively, power producers could seek to construct more projects through joint ventures with other power producers or third party capital or better utilise project finance (see below).
Project finance	Historically project finance has been underused since power producers run the risk of damaging their credit rating and banks' due diligence process is perceived as time consuming with too much control and influence afforded to lenders . Project finance was considered too expensive and it was overly reliant on the provision of high levels of multi-lateral funding.	Cheaper debt is likely to foster greater demand – increased experience, improved understanding and enhanced appetite should increase competi-tion and lower the cost of debt. Power producers could seek to construct more projects using project finance from clubs of com-mercial banks, multi-laterals and export credit agencies, so long as they can ensure isolation of the project debt from its corporate credit rating. Power producers would need to engage with ratings agencies in order to protect their credit ratings.
Third party capital (including institutional investors)	Historically third party capital has only been prepared to accept operational risk. However, recently more institutional investors have started taking construc-tion risk under project finance deals with multi-lateral funding as well as working alongside major power producers.	Regulatory risk is the key concern for third party capital: there must be clear and stable regulation with long-term stability in the pricing. The liquidity offered by multi-laterals is a key factor in ensuring sufficient level of debt is in place for the third party capital to meet its target returns. Third party capital may be more attracted to con-struction risk if investors can accurately assess the risk and price their investment. This requires knowledge transfer from the EPCI providers and developers.
EPCI balance sheet	EPCI providers have contributed equity to the construction of offshore wind farms – Siemens has gone as far as establish-ing a dedicated Private Equity (PE) arm for such ventures. Like power producers, EPCI providers are becoming constrained.	EPCI providers can seek to recycle balance sheet equity through refinancing debt in existing pro-jects or an outright sale. EPCI providers may continue to invest equity into offshore wind projects. The most likely route is through providing a minority equity contribution under traditional project finance structures. However, the sector is looking increasingly to EPCI providers to reduce or mitigate risk through the provision of full turnkey EPCI wraps and to demonstrate strong balance sheets and success-ful track records. This will help to attract addi-tional debt and equity to projects by the sponsor. Sponsors are seeking cost reductions through multi-contracts, but lenders are averse to this since it increases contract interface risk. The more EPCI providers can do to limit contract in-terface risk through tighter definition and control, the better off the project.
Project bonds	Not played any role in European offshore wind energy generation funding to date.	Project bonds are not expected to be a source of construction finance up to 2020. However, there is an expectation in the industry that they could become a source of finance for operations and potentially act as a route for power producers to recycle their balance sheets, through issuing specific bonds for existing projects.

Looking at the Turkish market, from the development of onshore wind and financing wind energy, it is wise to conclude that the first structures, would be based mainly on project financing. Since the offshore wind sources will be auctioned to corporates, corporate financing will be in picture for developmental phases, but the continuous financing need would be covered with project finance structures, evolving from the onshore wind finance methodologies. Our aim is to explain the European offshore wind project financings, mainly focusing on the European market, which is much more developed in terms of source-MW and debt capacity. The common project financing structures would set an example on the Turkish market.

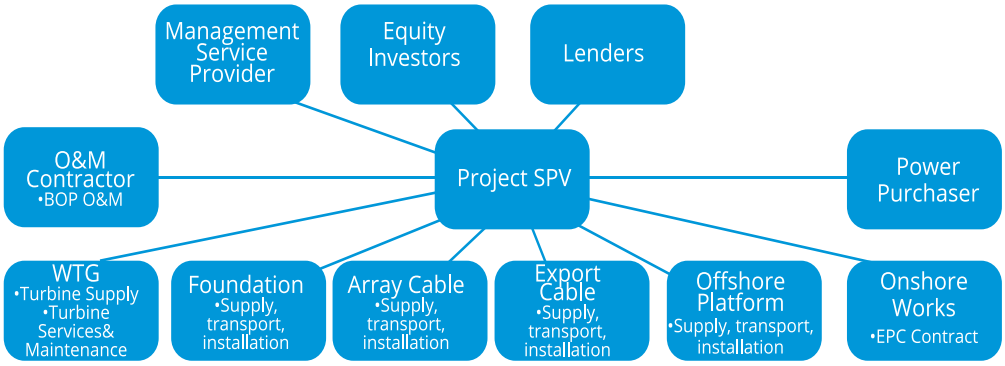


Year	Financial close	Project name	Total capacity (MW)	Sponsors	Country	Amount
2016	Aug-16	Merkur	396	Partners Group, InfraRed, DEME, GE	Germany	€1730
	May-16	Beatrice	588	SSE, CIP and SDIC	United Kingdom	£2883m
	May-16	Dudgeon	402	MASDAR, Statoil, Statkraft	United Kingdom	£1709m
2015	Oct-15	Galloper	343	RWE Innogy, SSE, Macquarie Capital, Siemens, UK Green Investment Bank	United Kingdom	£1373m
	Oct-15	Belwind II	165	Parkwind, Sumitomo Corporation, Meewind	Belgium	€655
	Jun-15	Veja Mate	402	Highland Capital, Siemens, CIP	Germany	€1900
	Jun-15	Nordergrunde	111	WPD	Germany	€334m
	Mar-15	Nordsee One	332	RWE Innogy GmbH, Northland Power Inc.	Germany	€1200m
2014	Aug-14	Westermost Rough	210	DONG Energy, GIB and Marubeni	United Kingdom	£370m
	May-14	Gemini	600	Northland Power Inc, Siemens Project Ventures, Van Oord NV, HVC	Netherlands	€2800m
2013	Sept-13	London Array	1,000	Abu Dhabi Future Energy Co – MASDAR (minority stake)	United Kingdom	£266m
	Feb-13	Butendiek	288	Marguerite, Siemens Project Ventures, Wpd, PKA, Industriens Pension	Germany	€850m
	Jan-13	EnBW Baltic 2	288	EnBW	Germany	€500m
2012	Dec-12	Walney	367	Ampere Equity Fund BV, Stichting Pensioenenfonds PGGM (minority stake)	United Kingdom	£224m
	Jul-12	Northwind	216	Colruyt, Aspiravi	Belgium	€595m
	Jun-12	Lincs	270	Centrica, Dong Energy, Siemens	United Kingdom	£425m
	Mar-12	Gunfleet Sands	173	Marubeni Corp (minority stake)	United Kingdom	£240
2011	Dec-11	EnBW Baltic 1	48	EnBW	Germany	€138m
	Nov-11	Thanet	300	Vattenfall (EIB financing)	United Kingdom	£150m
	Oct-11	Global Tech 1	400	Stadtwerke Munich, HEAG, EGL, Windreich, Esportes	Germany	€960m
	Aug-11	Meerwind	288	Blackstone, Windland	Germany	€900m

Source: Infrastructure Journal, Dealogic

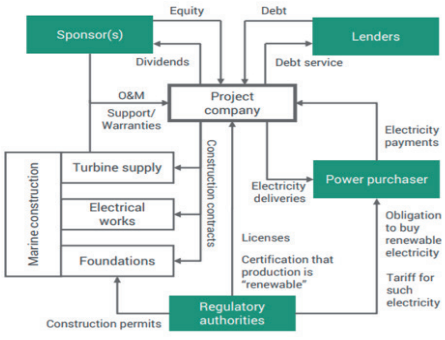
Project Finance Structures for Offshore Wind

Offshore Wind Project Financing will be analyzed in this memo, in facets of risk analysis, project contracts, loan terms & conditions, and financial covenants. Risk analysis & mapping should include technology, construction, operation & weather.



Project Risk Analysis in Offshore Wind

Looking at Offshore Wind Projects, technology, construction and operational risks are the main risk factors, although sales/price risk is also inherent in all energy financings, offshore models include a long-term feed-in-tariff or PPA agreement to offset this risk. The term of the sales agreement should be covering at least 10-20 years of operation. It should be noted that such price risk mitigation is compulsory for financing offshore wind, since it is a much more complex project financing, and bankability is widely affected by



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price risk in the models. The price risk is not mainly volume risk, but as the details suggest it is price risk, surely affected by wind measurements, wake impacts, positioning of turbines and MW of turbines to be used in the structure.

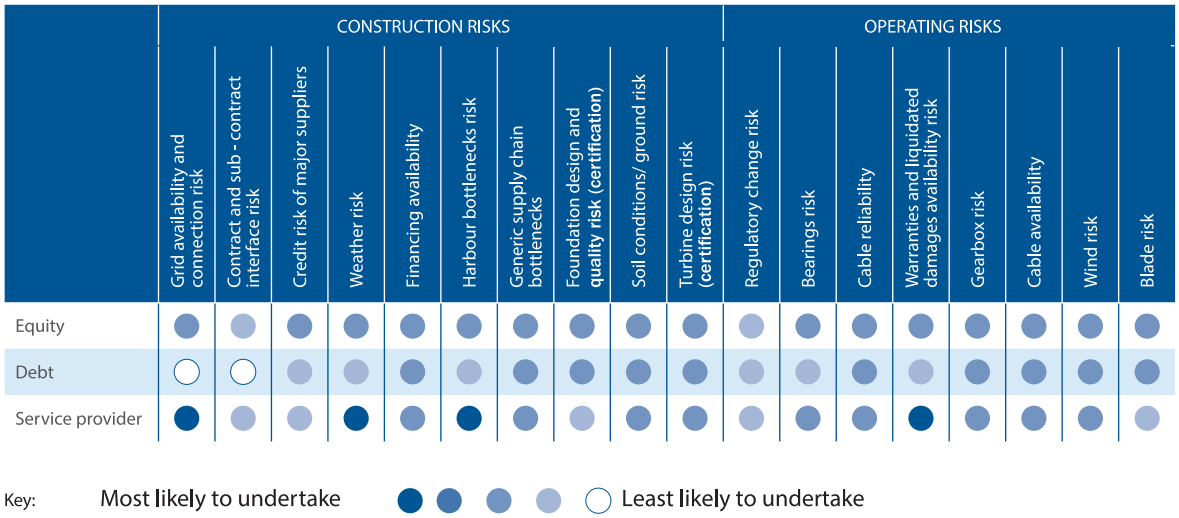
The price level to be negotiated in the bid process of the Turkish Offshore Wind Tender will set the base for financial model. As an initial price level, it would be viable not to expect levels much lower than the current upper limit of 80 USD MW

Offshore wind financing should work hand in hand with the below projects characteristics:

- *high development costs*
- *newer technologies*
- *higher operating risks*
- *longer lead times*
- *higher ratio of capital costs to operating costs*

Risk area	Mitigation approach
General approach	• Meticulous planning of the process from project to individual level; • Carry out a number of walkthrough tests with all parties involved to assess how the process will be operate in practice and identify risks as early as possible; • Seeking "lessons learnt" and other meaningful industry data in order to better understand the risks; • Set up contingency plans for a variety of likely "what if" scenarios.
Weather risk	• Systematic weather monitoring and advanced prediction techniques; • Better site investigation techniques; • Use of new build vessels that are better equipped to cope with adverse weather conditions.
Technology and components	• Use of evolutionary technology thoroughly tested on demonstration sites; • Certification and standardisation; • Guarantees and warranties backed by parent company balance sheet; • Contractual obligations such as defect liability above market level, especially if the technology is more revolutionary.
Counter party and interface risk	• Use of expert interface teams to monitor the transition and the passing of associated risks from phase to phase; • Selection of reputable contractors; • Strong contractual provisions e.g. liquidated damages for delays.
Installation and logistics	• Use of contractors with local construction experience, therefore good knowledge of local conditions; • Availability of sufficient capex contingency for unforeseen issues.
Installation and logistics	• Clear responsibilities allocated for grid development; • Project sponsor manages and works directly with offshore transmission contractor.

SUMMARY OF RISK APPETITE



Construction Risk

The construction risk is included Engineering, Procurement, Construction & Installation phases. Even though a single contract for risk mitigation is common on onshore wind models, for offshore wind, the market is not keen on presenting an extensive single wrap, because of the inflated costs and different specialization needed in the construction period.

: CAPEX associated with offshore wind is spread across 4 main elements:

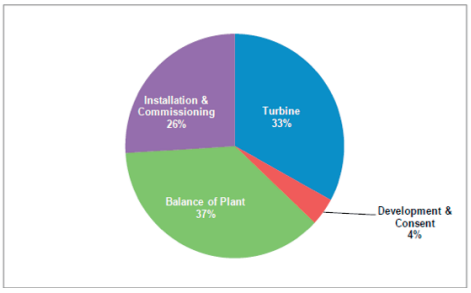
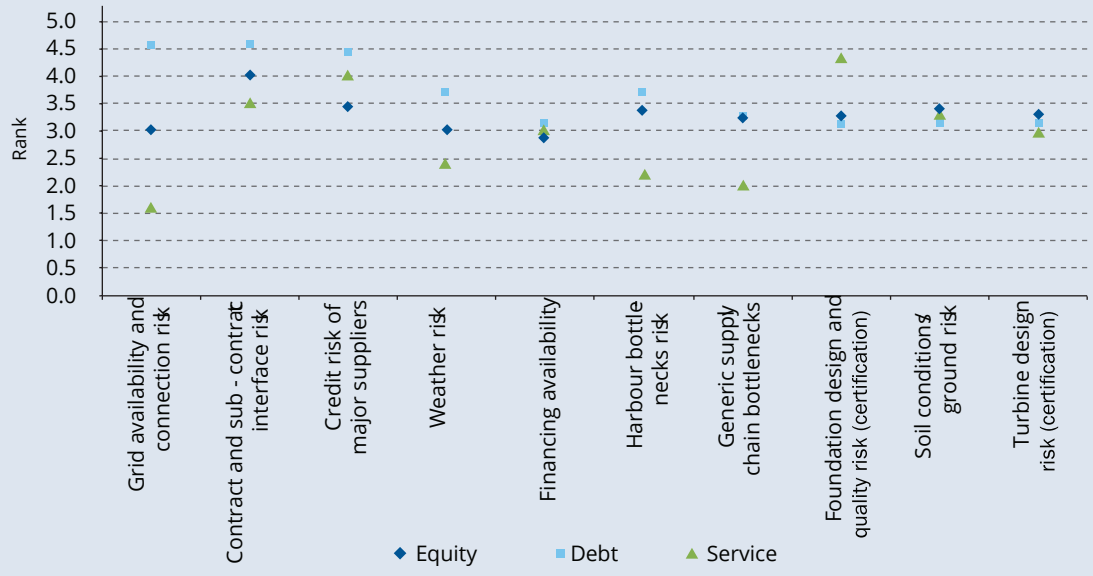


Exhibit 5: Levelized Cost of Electricity (LCOE) for various renewable technologies

£/MWh		2010 financial close	2015 financial close	2020 financial close	2025 financial close	2030 financial close
Offshore Wind	Low	149	123	95	87	81
	Medium	169	139	107	98	91
	High	191	158	121	111	104

It is common to have multi-contracting with 5-10 contracts in average for construction period works. Especially installation and logistics are more critical for offshore wind project management, along with grid availability and connection construction works. Although recent examples in the European market, have evolved, in single or dual contract structures, the initial development phase in Turkey would be also appropriate to assume a multi-contracting structure where the project finance market mainly depends on different contracts to minimize costs, even in onshore wind. The construction period can be assumed between 2-3 years, but the weather risks affect the period and budget extensively.

CONSTRUCTION RISKS



The complex construction creates a need for a contingency cost up to 10-20% in offshore wind cost budgeting, that needs to be considered in calculating financing needs. Complex construction, adverse weather, accidents all require contingency budgeting and even contingency budget insurance. Technology risk should be mainly guaranteed by parent company, through back to back arrangements with turbine manufacturers.

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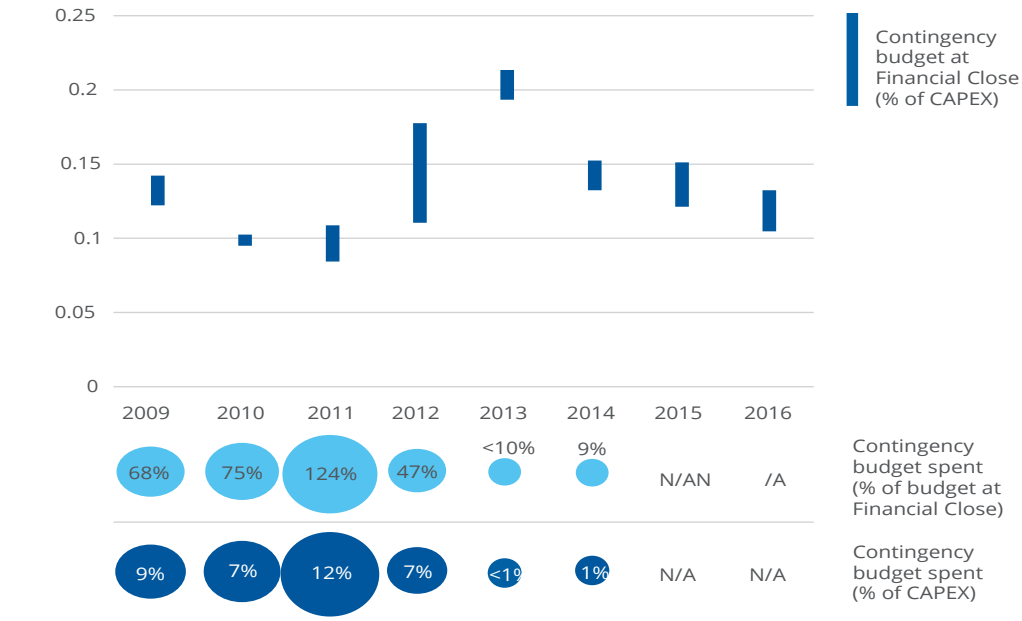
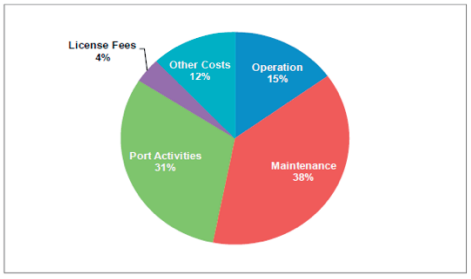
FIGURE 9
Planned and spent contingency budgets in offshore wind 2009 - 2016

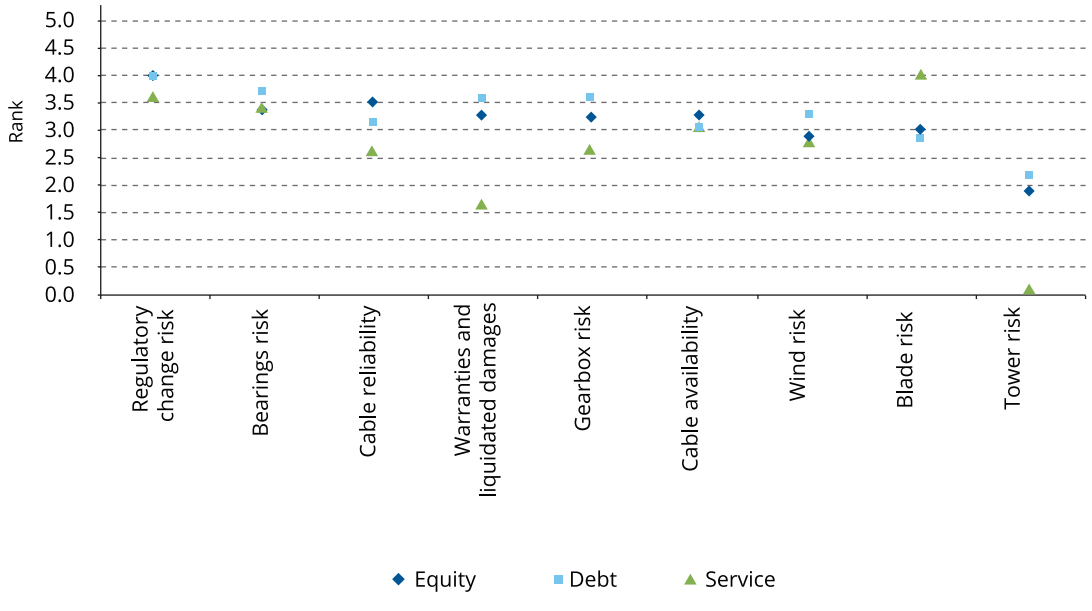


OPEX associated with offshore wind is spread across 5 main elements:



Operation Risk

In offshore wind operations main risks arise due to component risks. In addition, although the market provides loss of earnings insurance for onshore wind projects, the insurance products for offshore in not widely existent. The O&M contractor should be guaranteeing the operational efficiency through a long-term O&M service agreement.



Regulatory Risk

In Europe uncertainty in regulatory framework is currently low with the history behind the offshore wind developments. The Turkish model needs stable framework for a long term. Altough the tender is published many different regulations and certainties are needed for analyzing regulatory risk.

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(You can read the continuum of the article on specific financing details and suggestions for the Turkish Project Financing market in the next issue.)