

Abstract

In 2014, the UK's Offshore Renewable Energy Catapult working in partnership with The Crown Estate, the Offshore Wind Programme Board and the Offshore Wind Industry Council assessed the progress of the UK Offshore Wind sector in reducing costs.

The Cost Reduction Monitoring Framework (CRMF) was developed to support the assessment of progress towards the agreed target of £100/MWh by 2020. This framework was designed with support from key industry stakeholders and includes a quantitative and qualitative assessment of cost.

The CRMF is a significant landmark achievement for the UK offshore wind industry, made possible by unprecedented collaboration and cooperation across developer and supply chain participants, with contributors providing data and insight on progress made.

Results show that the Levelised Cost of Energy (LCoE) for offshore wind has reduced by 11% during the period 2010-2014. Furthermore the majority of indicators are on target to deliver their cost reduction potential and help achieve the £100/MWh LCoE target by 2020.

Objectives

The CRMF was designed to provide a clear assessment of the cost of offshore wind projects and evaluate the progress of the key technology, supply chain and finance developments required to achieve the cost reduction aspirations of offshore wind.

The quantitative assessment produces average project costs for a specific year or period. These averages enable a trend to be interpreted and conclusions drawn with respect to the drivers of project costs. This assessment clearly quantifies how much progress has been made to date.

The qualitative assessment delivers an evaluation of the key progress indicators across a range of factors influencing the cost of future offshore wind projects. Producing a contribution weighted qualitative evaluation of progress against agreed milestones enabling an overall conclusion to be drawn with respect to the likelihood of continuing progress in reducing costs.

These assessments combine to provide a complete picture of the cost reduction progress to date and trajectory going forward, highlighting areas which are considered behind target or at risk of falling behind target such that specific recommendations/actions/plans can be initiated.

Methods

The quantitative assessment employed an LCoE Calculator developed by Deloitte that the participants used to submit project data. The LCoE Calculator included data entry sections for all inputs required for LCoE calculations, built-in checks to identify any inputted or calculated parameters which fall outside of expected ranges and any input sections not completed. The average LCoE was weighted by the relative capacity of each project included.

A series of anonymity rules were applied to ensure that the published industry average LCoE was from a sufficient project sample size that it was impossible to infer or reverse-engineer a specific project LCoE from the average published.

To complement the analytical process, a questionnaire was developed focusing on highlighting the primary drivers of LCoE.

A qualitative indicator tracking tool was developed by DNV GL to assess the progress of technology, supply chain and finance developments required to achieve the cost reduction target. Sixty six indicators were identified and for each indicator, annual milestones were defined to enable progress to be assessed.

An extensive evidence gathering exercise was completed to ensure that each indicator evaluation was adequately substantiated. The team engaged across the offshore wind community to collate market intelligence for each indicator. This evidence was compiled and aggregated to support an assessment of each indicator with respect to the predefined progress milestones and to determine the recommended actions and support required to manage progress in the future.

Results

The quantitative assessment shows that over the period the LCoE of projects has fallen from £136/MWh to £121/MWh as shown in the figure below;

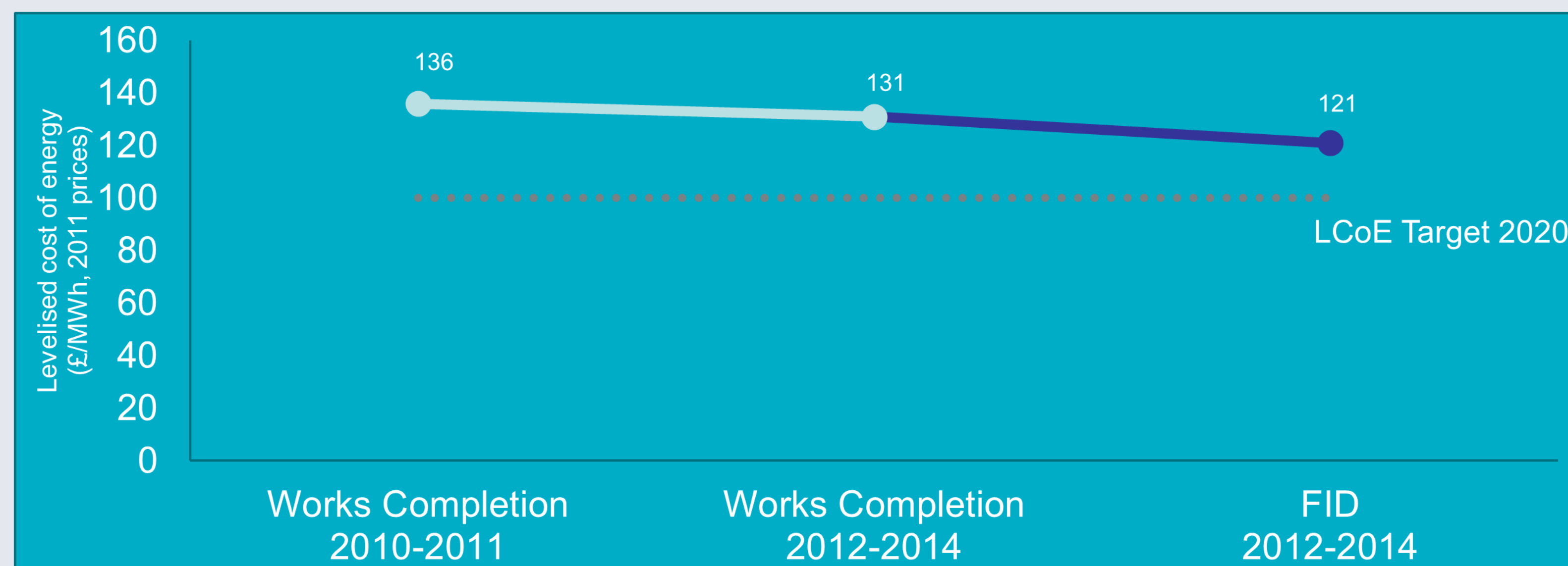


Figure 1: Quantitative Assessment Summary

This trend clearly shows that the average LCoE of UK offshore wind projects is falling, furthermore the cost has fallen sooner and further than previously predicted. What can be concluded from average figures is limited, however it is known that the projects included in the FID 2012-14 sample are predominately employing 6MW wind turbine generators (WTG) and thus demonstrates that the cost reduction potential of larger WTG's is being delivered.

The qualitative assessment has concluded that the industry is on target. Good progress to date has been achieved in the development of larger turbines, XL monopile foundations, improvements in operation & maintenance and extended design life. However not all indicators are on target, the figure below shows that whilst only *Growth and Scale* is considered behind target at level 1, there are a significant number of other low lever indicators which are behind target and require specific action and support to ensure they recover to deliver their cost reduction potential.

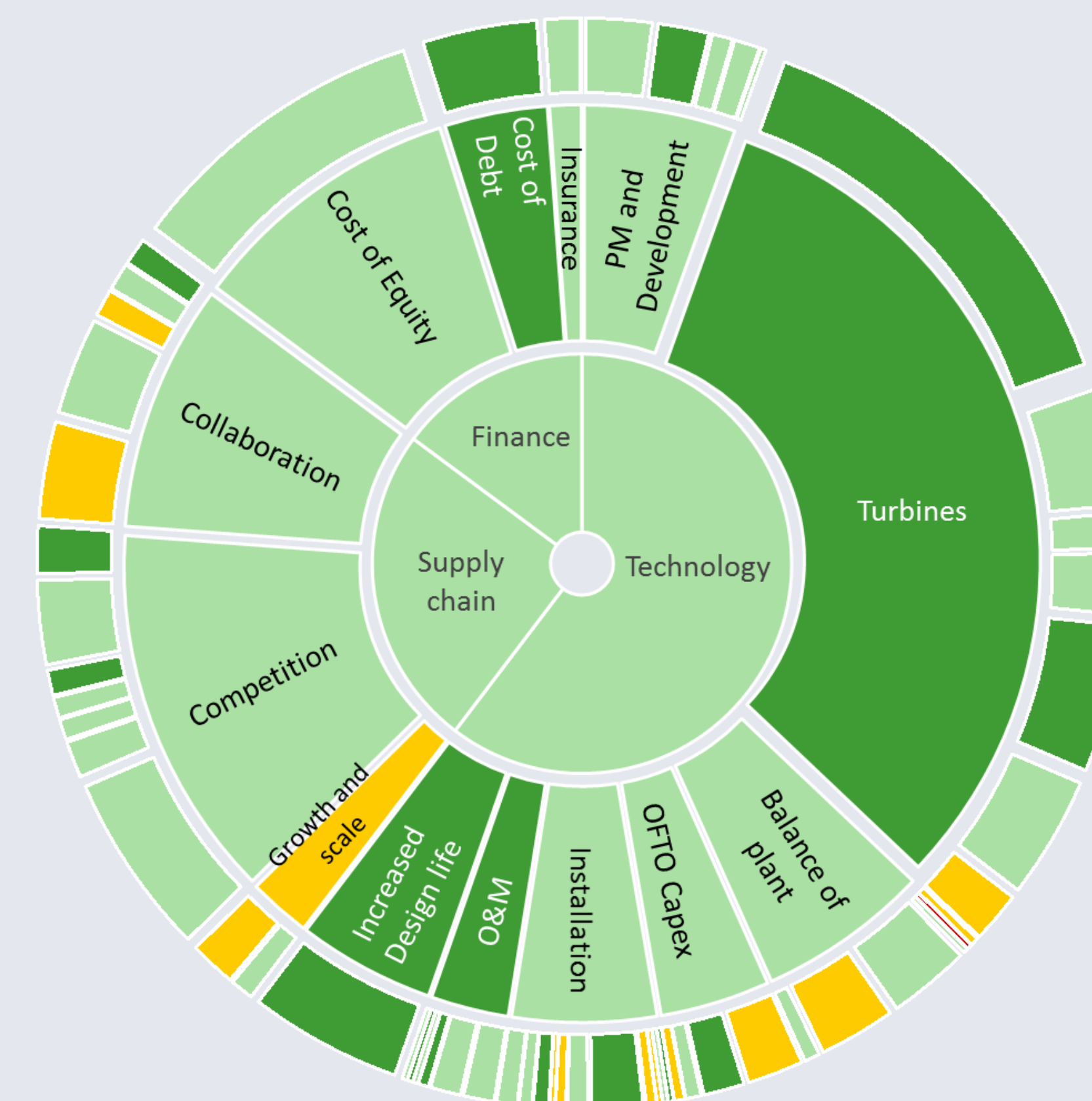


Figure 2: Qualitative assessment of key indicator progress against targets
Source: DNV

Conclusions

Whilst the CRMF concludes that good progress is being made towards the LCoE target of £100/MWh by 2020, there is still more work to be done to lock in the cost reductions delivered and ensure the momentum is maintained.

A coordinated effort is required to support underperforming indicators to recover and deliver their costs reduction potential. Following engagement with the supply chain it is unclear if there is sufficient confidence in the market size up to and beyond 2020 to justify further investments to develop the products and industrialised supply chain requirements. Further market clarity is needed to unlock these contributions to reducing cost.

Furthermore, opportunities to develop and demonstrate technological improvements need to be facilitated, specifically for innovative foundation solutions and the electrical network designs required to deliver projects in deeper water further from shore.

References / Sources

1. Cost Reduction Monitoring Framework Summary report – February 2015 – Offshore Renewable Energy Catapult
2. Qualitative Assessment Summary Report 113259-UKBR-R-08-E – January 2015 – DNV GL
3. Quantitative Assessment Summary Report – January 2014 – Deloitte
4. Offshore Wind Cost Reduction Pathways Study – May 2012 – The Crown Estate

