

# A Path to £75/MWh UK Offshore Wind

Inès TUNGA, Dr Stuart Bradley, Prof Lars Johanning, Dr Harry Van Der Weijde, Dr Iraklis Lazakis  
ENERGY TECHNOLOGIES INSTITUTE

## Introduction

Currently producing over 5GW in UK waters and with an expected installed capacity in the order of 56GW by 2050, Offshore Wind is expected to be one of the largest contributors to the UK electricity generation mix; however long-term deployment is only possible if sustainable and competitive.

Significant reduction in costs have been observed over the last decade, mainly from technology innovation, supply chain and transmission risk-sharing, positive impact of buying power (Weighted Average cost of capital- WACC) and Operation and Maintenance strategies.

## Motivation

This research looks to answer the following:

“Given a target cost-of-energy from offshore wind of £75/MWh, where in UK waters could current turbine/foundation designs and operational practices meet that cost and how, and where would you require alternative designs and practices or even more advanced designs using new technologies?”

Levelised Cost of Energy (LCoE) is used here as a metric to estimate the most cost-effective wind sites in the UK waters. A Geographical Information System (GIS) is used to estimate the wind energy resources in UK waters (Energy Act 2004).

## Approach

### Technologies & Operations review

- Operation & Practices
- Economic Assessment
- Resource assessment (GIS)

### Baseline model

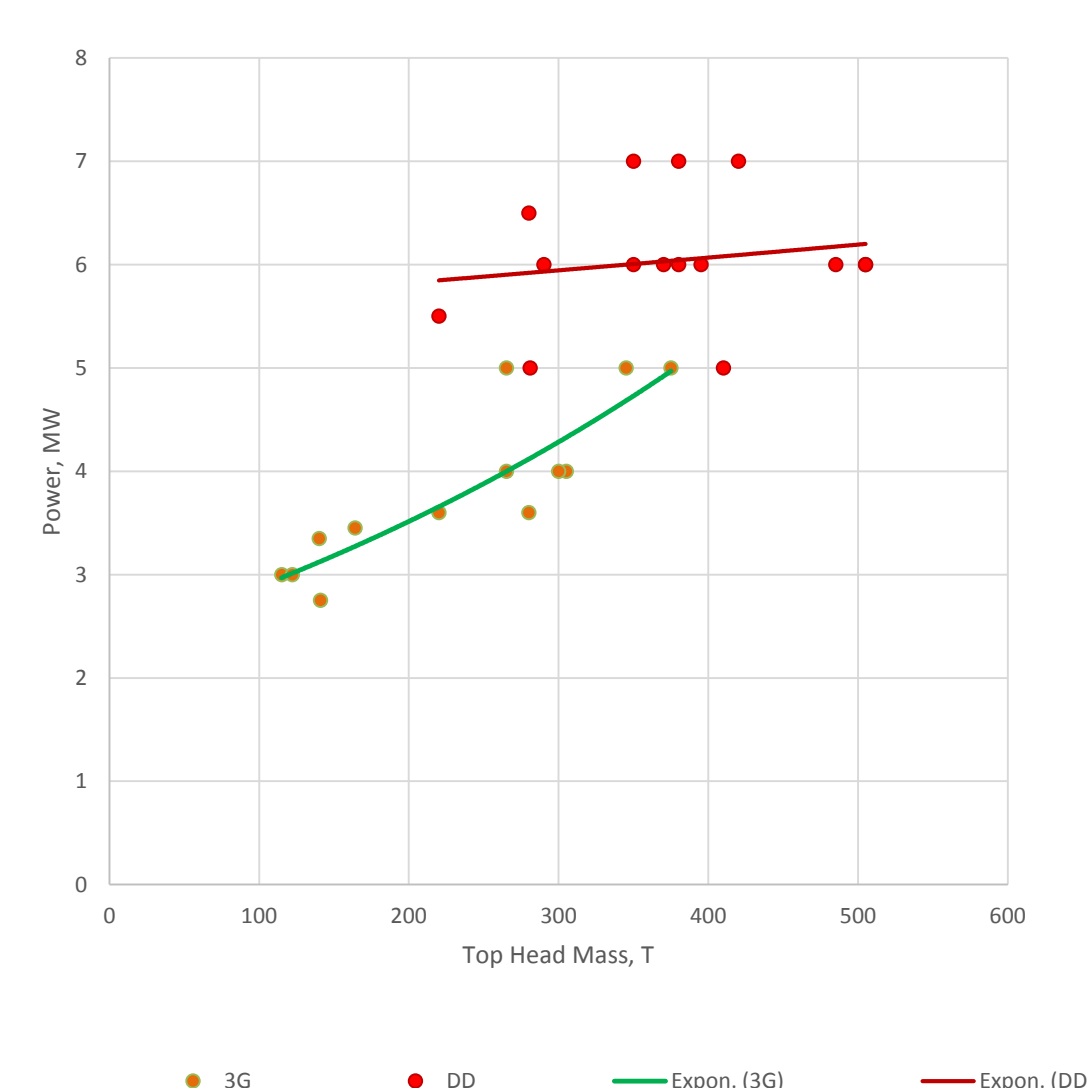
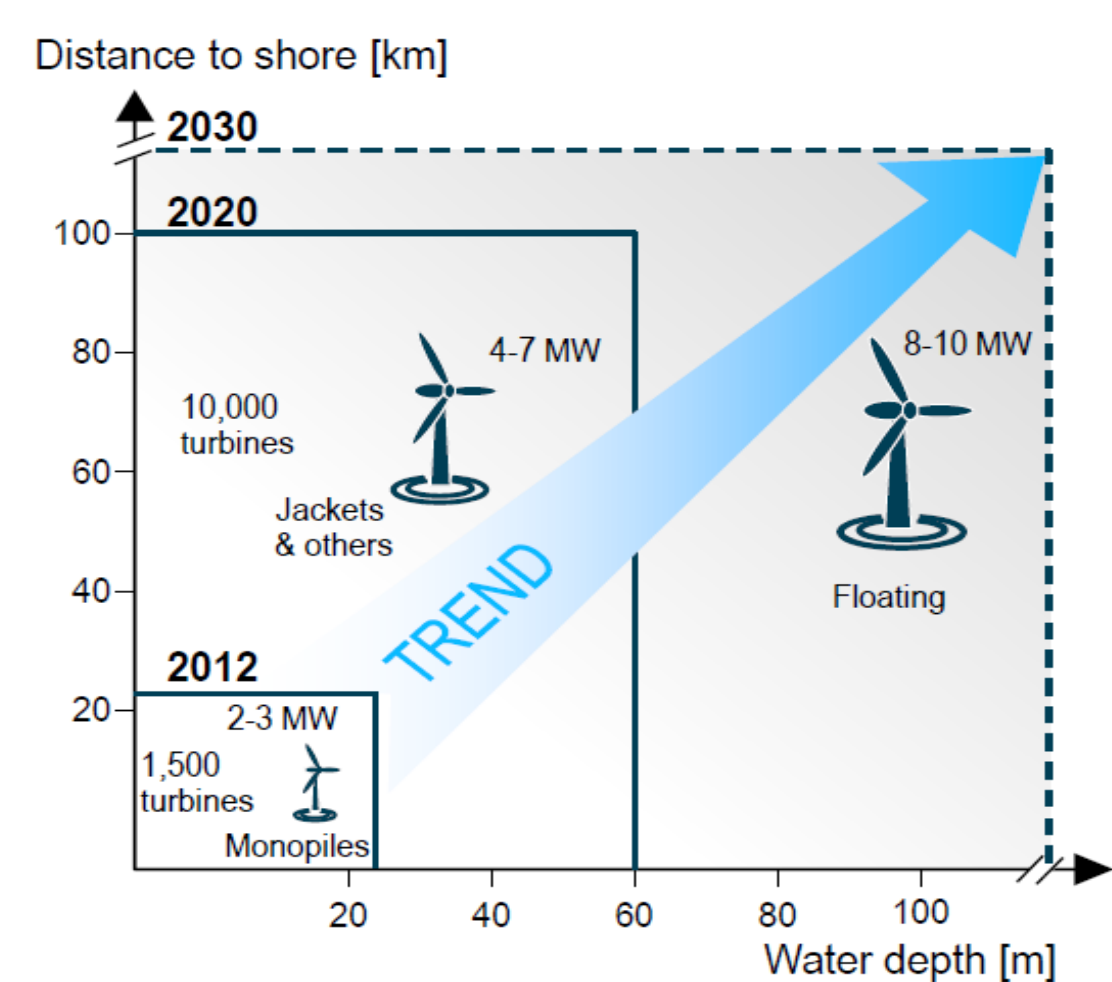
- Exemplar Model
- Operation data/ Mass Vs Cost
- ESME Analysis

### Innovation Analysis

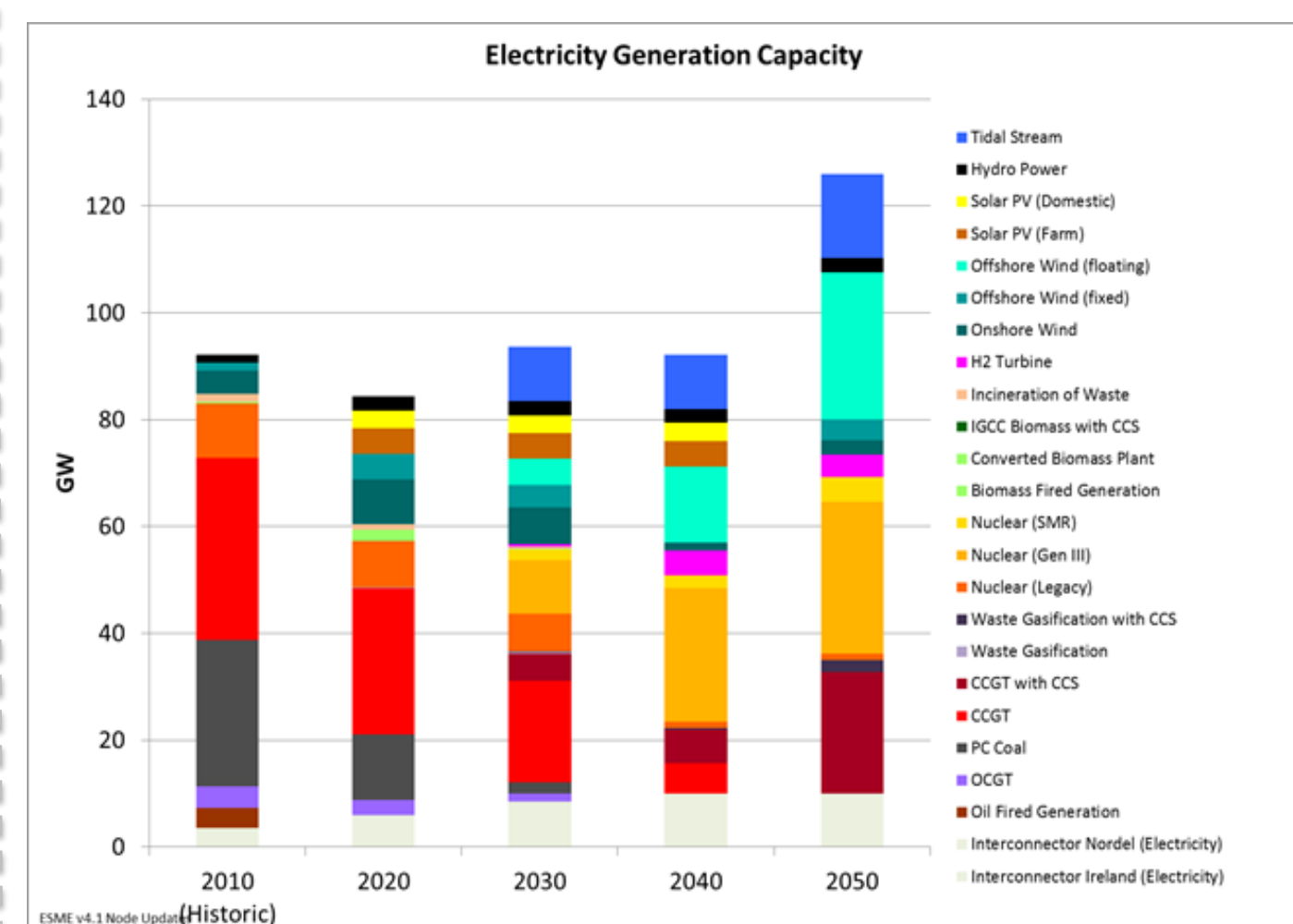
- QFD/TRIZ Analysis
- Optimisation Tool- Economic Impact

### Cost modelling

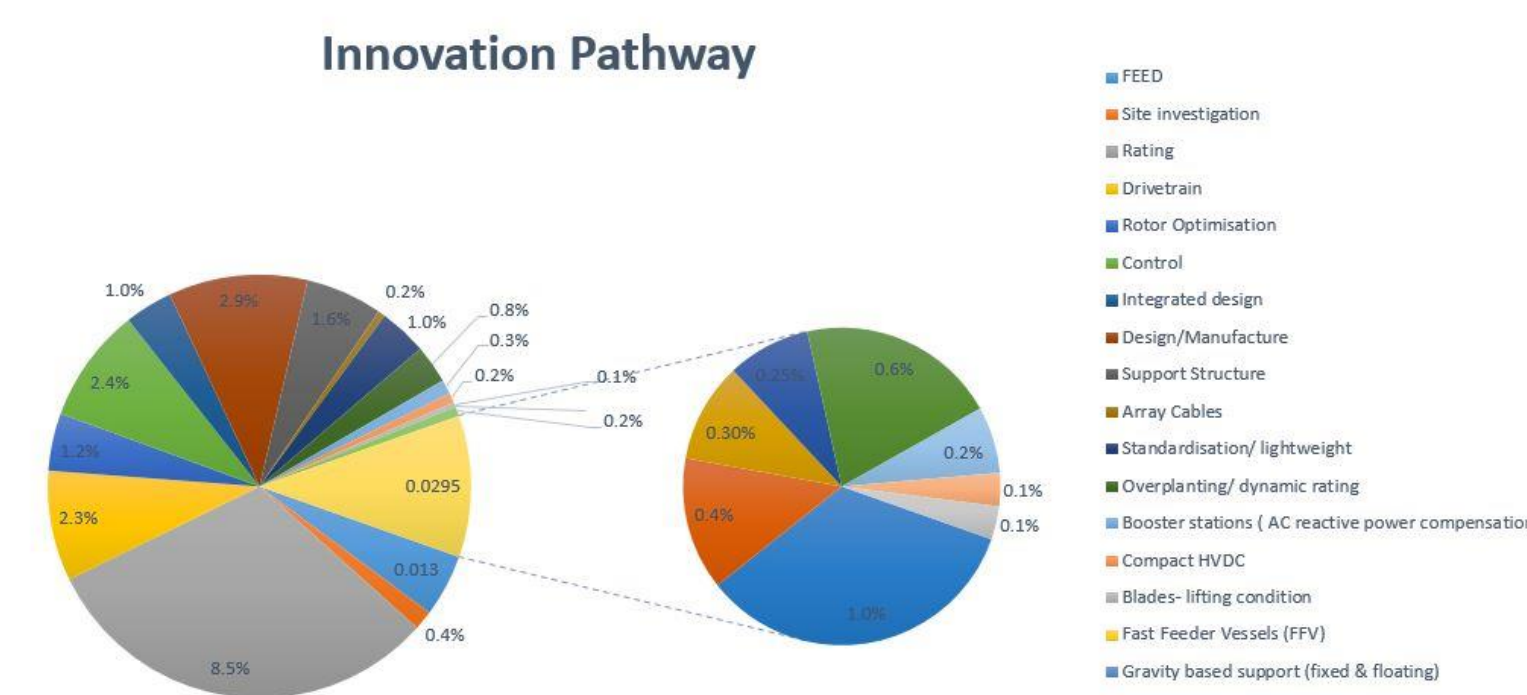
### GIS LCoE model



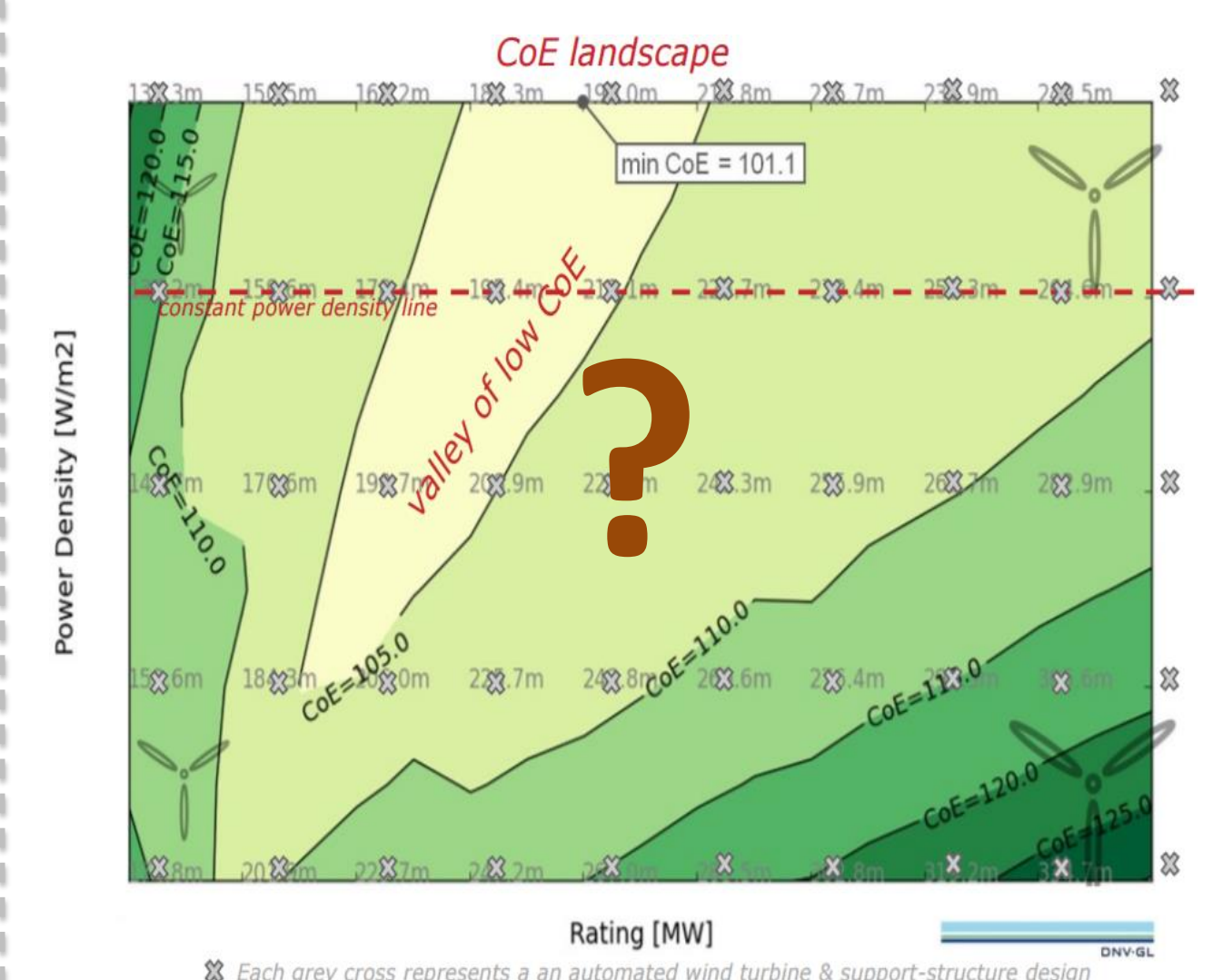
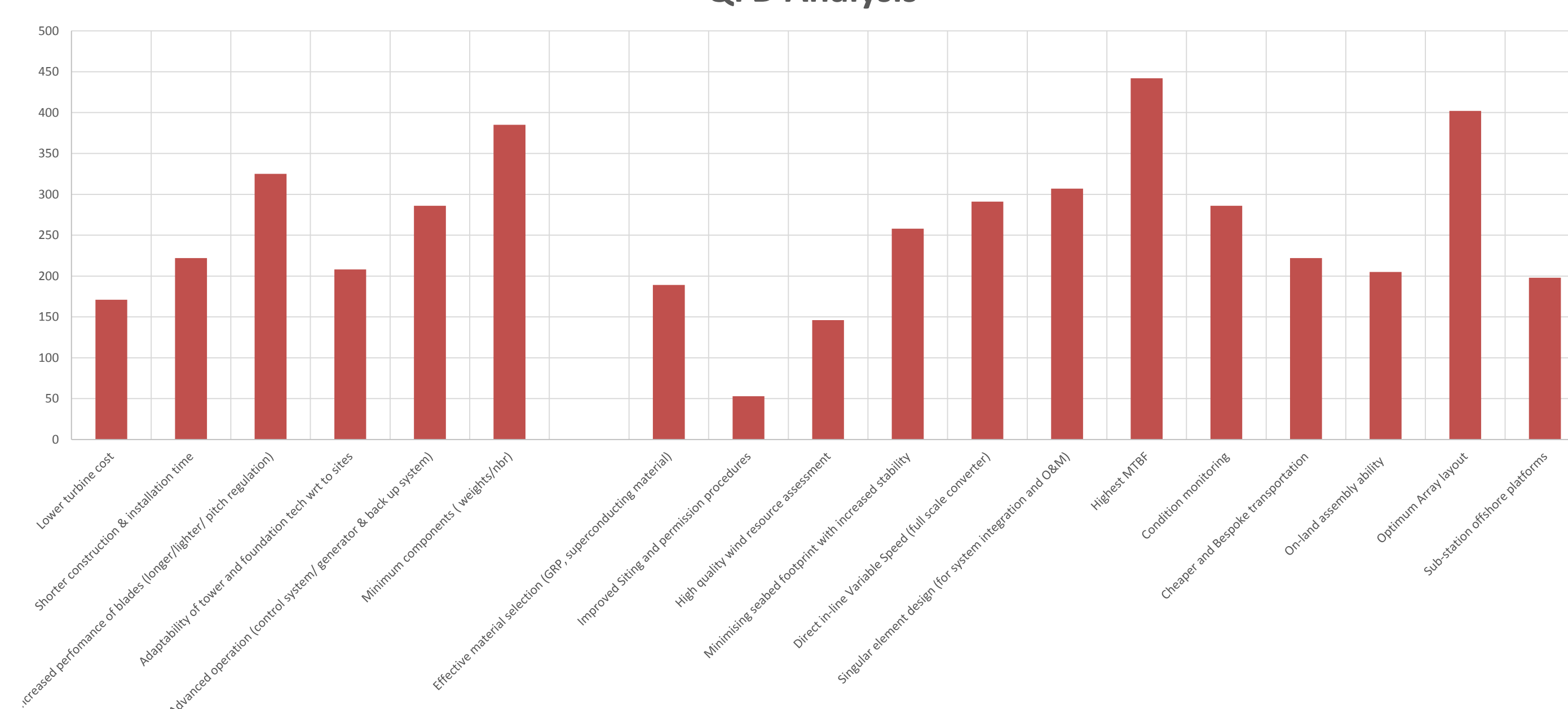
Ref: Top- [Roland Berger] and bottom- [S Bradley & I Tunga]



ESME analysis



### QFD Analysis



Ref: DNV GL

## Next Stage

- Impact of lighter weight machines on overall system performance and cost.
- Understanding the spatial and economical impact of next generation support structures.
- Financing cost and risk sharing: case study (UK wind farm versus Europe projects).
- Innovation in transmission and storage.
- GIS cost model.

This research is supported through the Industrial Doctorate Centre for Offshore Renewable Energy (IDCORE), funded by the Energy Technologies Institute and the RCUK Energy Programme Grant number EP/J500847/1.