



# Presentation at RenewableUK Offshore Conference 29-30 June

Delivery of DONG Energy's Round 2 and Round 2,5 Projects  
Per Hjelmsted, Senior Director

# Contents

DONG Energy introduction

DONG Energy's Round 2 and Round 2,5 pipeline

Challenges and solutions in the delivery of projects up to 2015/2016

# DONG Energy – an introduction

DONG Energy is one of the leading energy companies in Northern Europe

We are headquartered in Denmark. Our business is based on procuring, producing, distributing and trading in energy and related products in Northern Europe

DONG Energy has app. 6,000 employees and had a turnover of more than EUR 8 billion in 2008



# Overview of operational offshore wind farms developed and constructed by DONG Energy

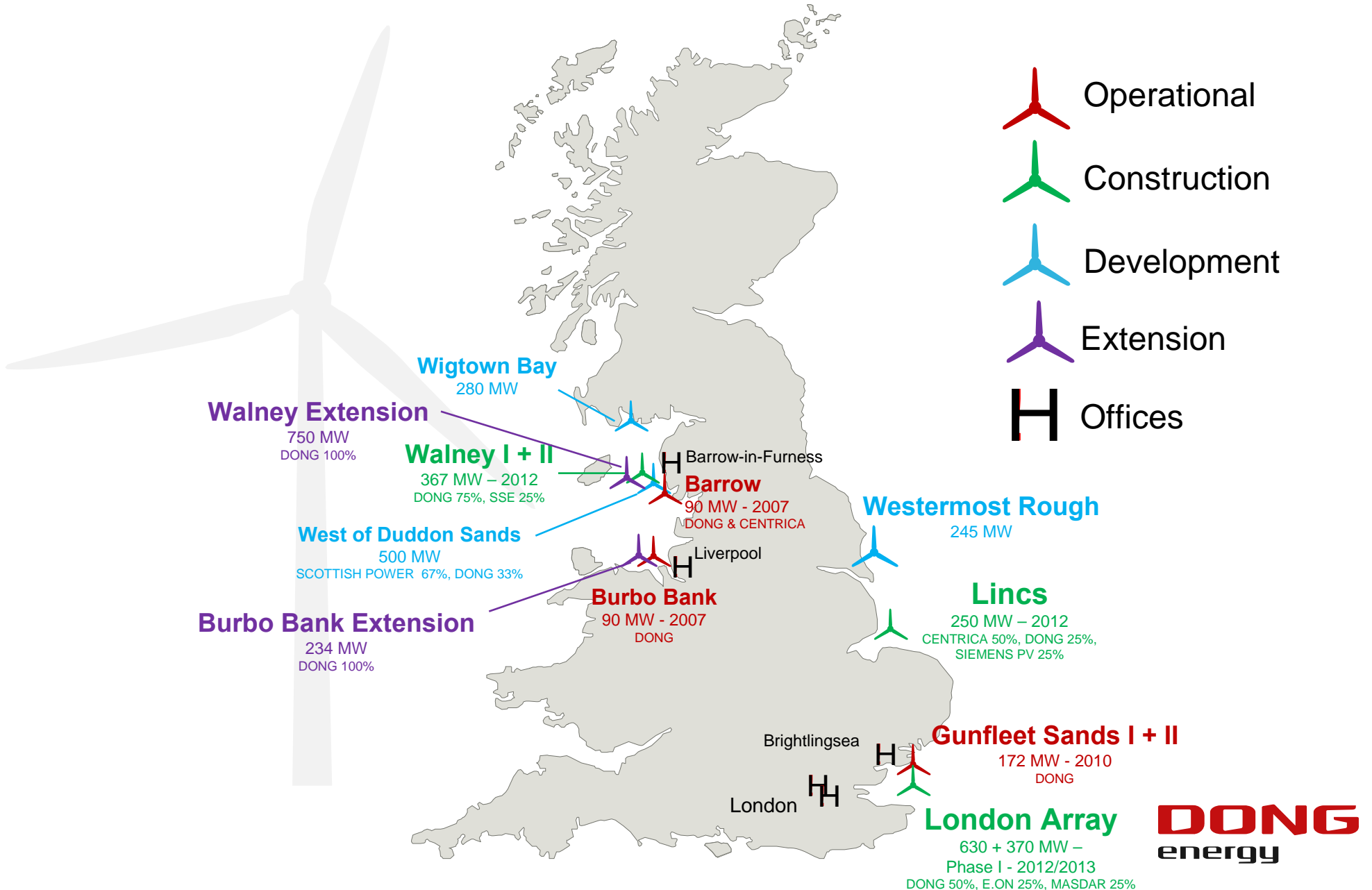
| Project               | Country | Installed capacity (MW) | Net capacity (MW)* | Prior to 2000 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010→ |
|-----------------------|---------|-------------------------|--------------------|---------------|------|------|------|------|------|------|------|------|------|------|-------|
| Vindeby               | Denmark | 5                       | 5                  | 1991          |      |      |      |      |      |      |      |      |      |      |       |
| Tunø Knob             | Denmark | 5                       | 5                  | 1995          |      |      |      |      |      |      |      |      |      |      |       |
| Middelgrunden         | Denmark | 40                      | 20                 |               |      |      |      |      |      |      |      |      |      |      |       |
| Horns Rev I           | Denmark | 160                     | 64                 |               |      |      |      |      |      |      |      |      |      |      |       |
| Nysted                | Denmark | 166                     | 133                |               |      |      |      |      |      |      |      |      |      |      |       |
| Kentish Flats         | England | 90                      | 0                  |               |      |      |      |      |      |      |      |      |      |      |       |
| Barrow                | England | 90                      | 45                 |               |      |      |      |      |      |      |      |      |      |      |       |
| Burbo                 | England | 90                      | 90                 |               |      |      |      |      |      |      |      |      |      |      |       |
| Horns Rev II          | Denmark | 209                     | 209                |               |      |      |      |      |      |      |      |      |      |      |       |
| Gunfleet Sands I & II | England | 173                     | 173                |               |      |      |      |      |      |      |      |      |      |      |       |
| <b>Total</b>          |         | <b>1,028</b>            | <b>744</b>         |               |      |      |      |      |      |      |      |      |      |      |       |

DONG Energy has pioneered offshore wind and has more than 30 years of experience within wind power, and more than 15 years of experience in developing, constructing and operating offshore wind farms

By the end of 2009, DONG Energy had constructed ~ 1,000 MW offshore wind capacity including Horns Rev II the world's largest offshore wind farm to date and operated ~ 750 MW offshore capacity

Figures represent DONG Energy's share of the projects  
Source: DONG Energy Power

# Offshore Wind Farms in the UK



# Status on Round 2 projects under construction

## ▪ Walney I

- Offshore substation - Installed
- Foundations and TP - More than half have been installed
- Grid – Onshore cabling underway and offshore cable to be installed over the summer
- Turbine installation to commence over in late summer 2010

## ▪ Walney II

- Foundation and offshore cable installation to start in April 2011
- Turbine installation to start in May 2011

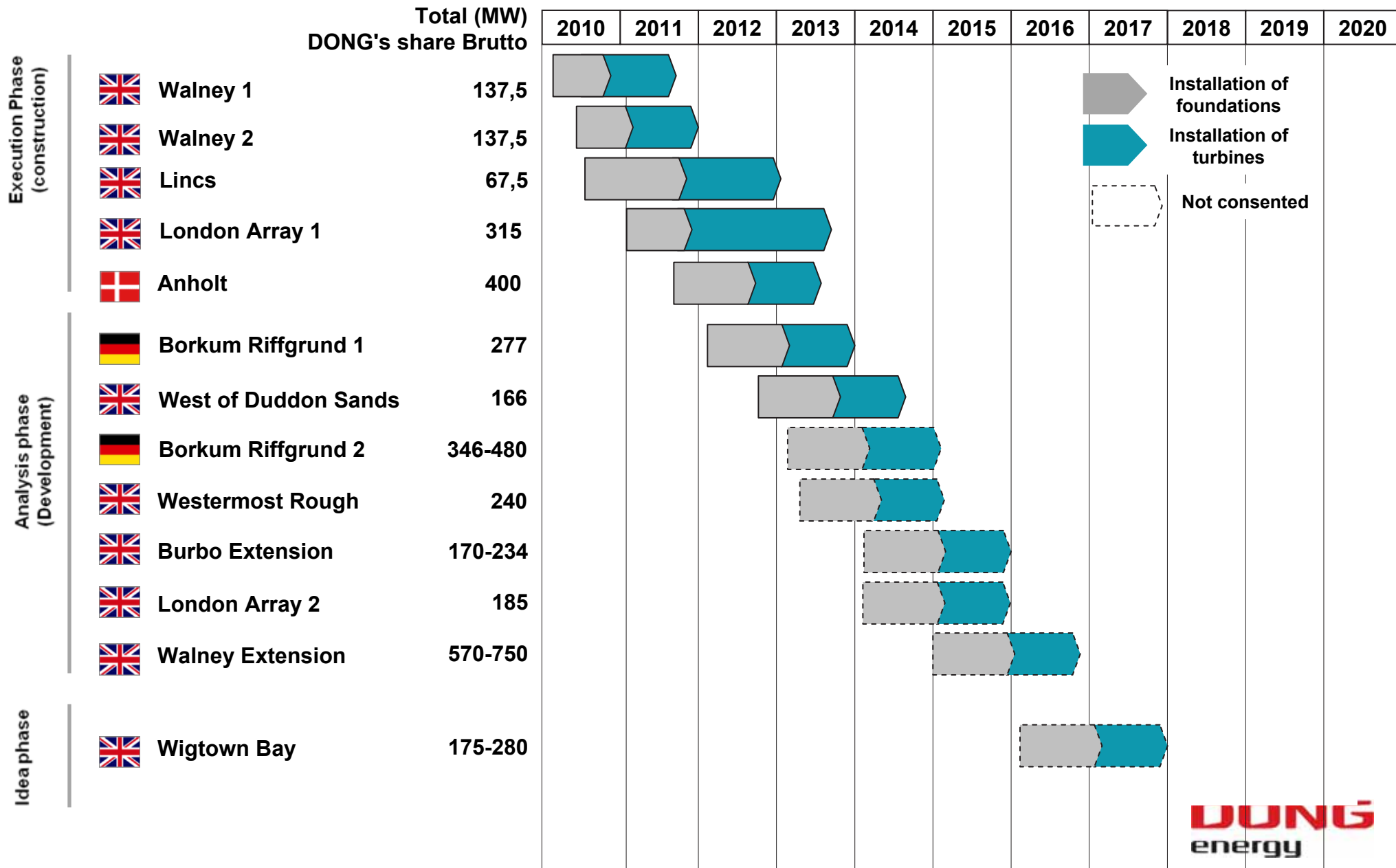
## ▪ London Array

- Onshore construction – Various grid works under construction, transformers to be delivered in July 2010
- Offshore construction commences in February 2011 beginning with substation foundations

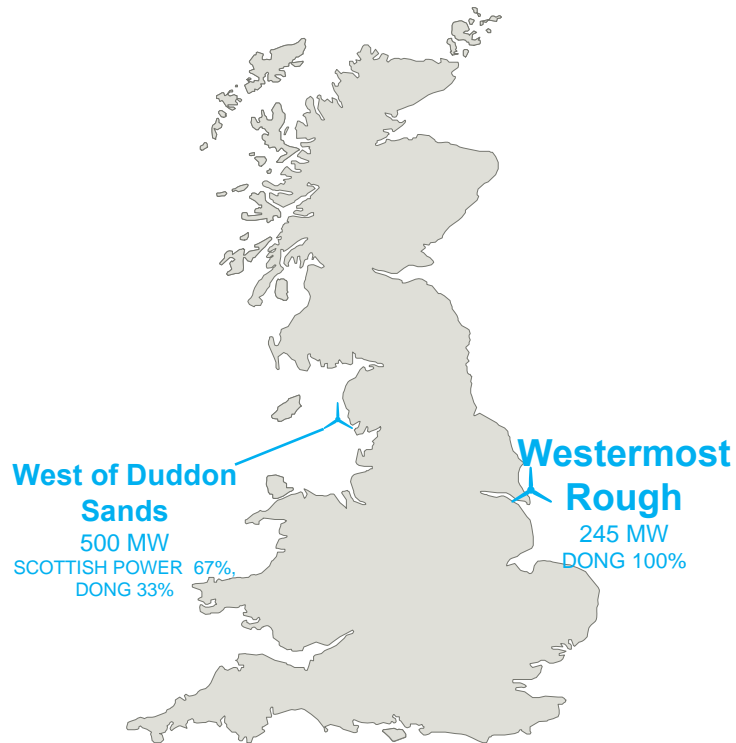
## ▪ Lincs

- Grid - Onshore cabling and other major components are currently under construction
- Foundations - Design work is ongoing and latest knowledge and solutions on grouting will be applied, foundation installation planned to commence March 2011

# DONG Energy's current offshore pipeline



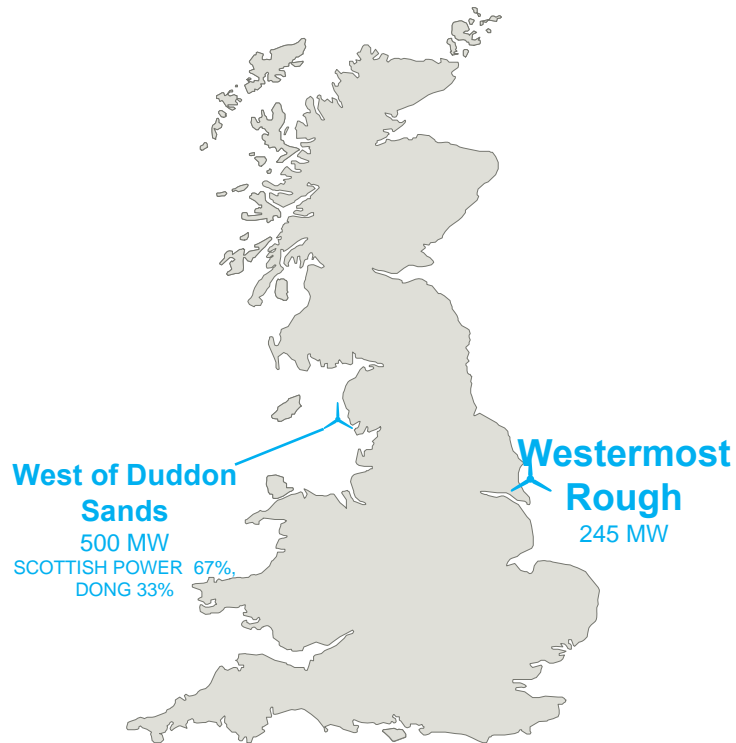
# Round 2 projects in development phase



## Challenges

- 2 ROC deadline 31 March 2014
- Meeting criteria to qualify for 2<sup>nd</sup> Transitional OFTO Tender Round
- Supply chain constraints
  - Turbines
  - Vessels
  - Cables
  - Transformers
  - Foundations

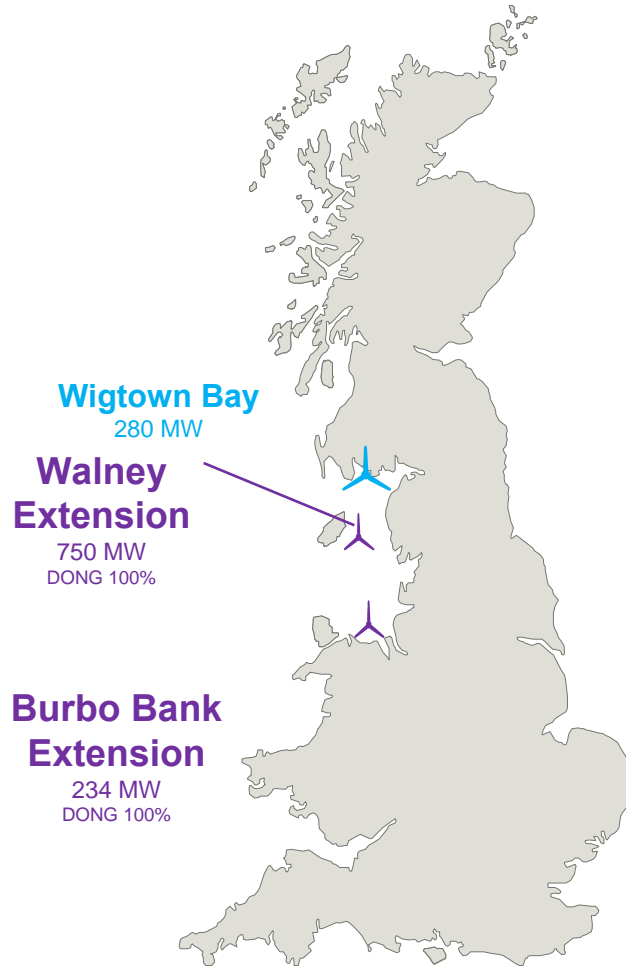
# Round 2 projects in development phase



## Solutions

- Pipeline approach to sourcing using Frame Work Agreements
  - Turbines
  - Considering large scale sourcing of cables and foundations
  - Long term commitment to vessels
  - Extending OFTO transitional regime

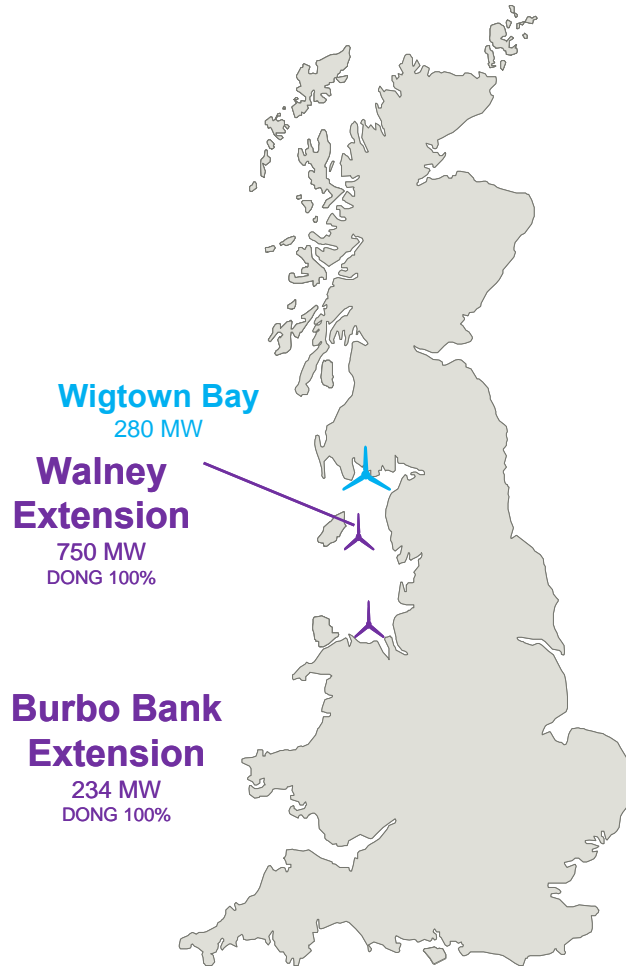
# Extensions to Round 1 and 2 (Round 2,5) and STW



## Challenges

- Tender criteria requires R2,5 projects to be delivered by 2016
- Consent required during 2013 to meet 2016 delivery
- Uncertainty about ROC regime after March 31 2014
- Enduring OFTO regime will potentially lead to delays in delivery of 1 year or more
- Walney Extension within 40-50m of water will require jacket foundations

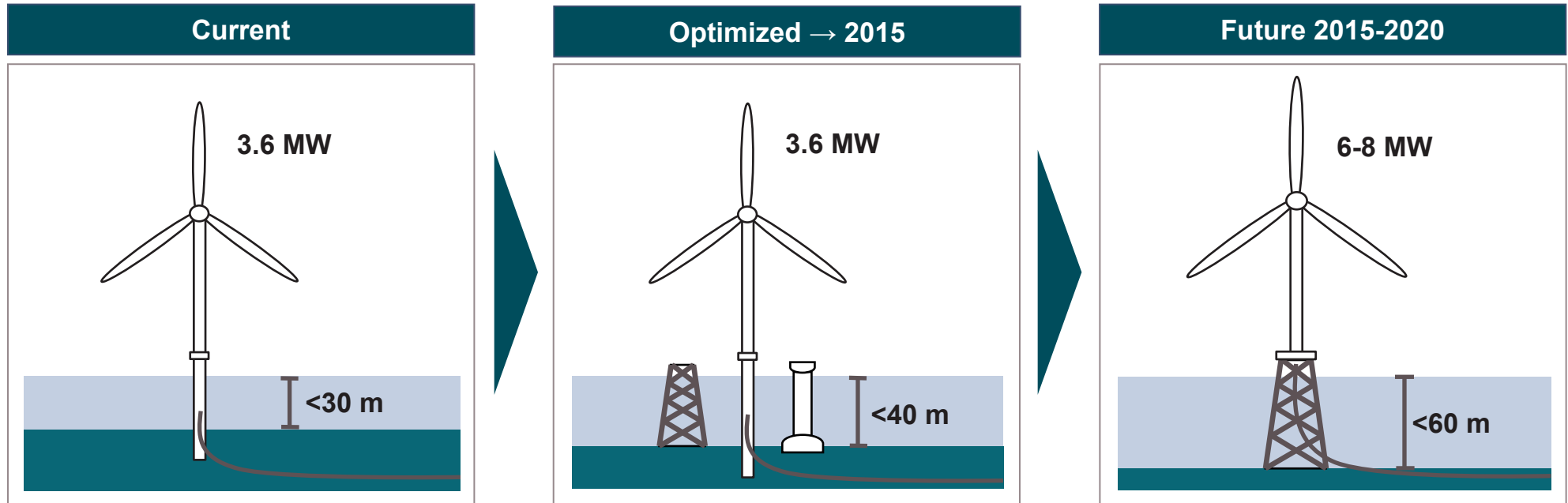
# Extensions to Round 1 and 2 (Round 2,5) and STW



## Solutions

- Irish Sea Cluster approach to development and construction will keep costs down and speed up process
- Large scale synergies in Irish Sea O&M cluster
- R&D into new foundation types e.g. Carbon Trust programme
- Extending OFTO transitional regime to include Round 2,5 projects

# DONG Energy is continuously developing, demonstrating and commercializing most competitive wind farm concepts ...



- Current technology
  - 3.6 MW WTG
  - Steel monopile with transition piece
  - 33 kV array cabling connected to an offshore substation
- Projects: Walney 1 + 2 and London Array

- Optimized technology
- Introduction / maturation of new foundation concepts
- Industrialized pipeline approach
  - Scale sourcing
  - Improved planning
  - Optimized installation approach
- Projects: WoDS, Westermost Rough

- Burbo and Walney Extensions

- Increased probability of more challenging site conditions, i.e. deeper waters and longer distance to shore
- New larger turbines with new technology, e.g. direct drives
- New / optimized foundation concepts
- New electrical infrastructure, e.g. HVDC
- Round 3

