

# Offshore wind: Big challenge, big opportunity

RenewableUK, Offshore Wind 2010  
Liverpool, Tuesday 29 June 2010

Michael Rea



# Big challenge, big opportunity



## Big challenge

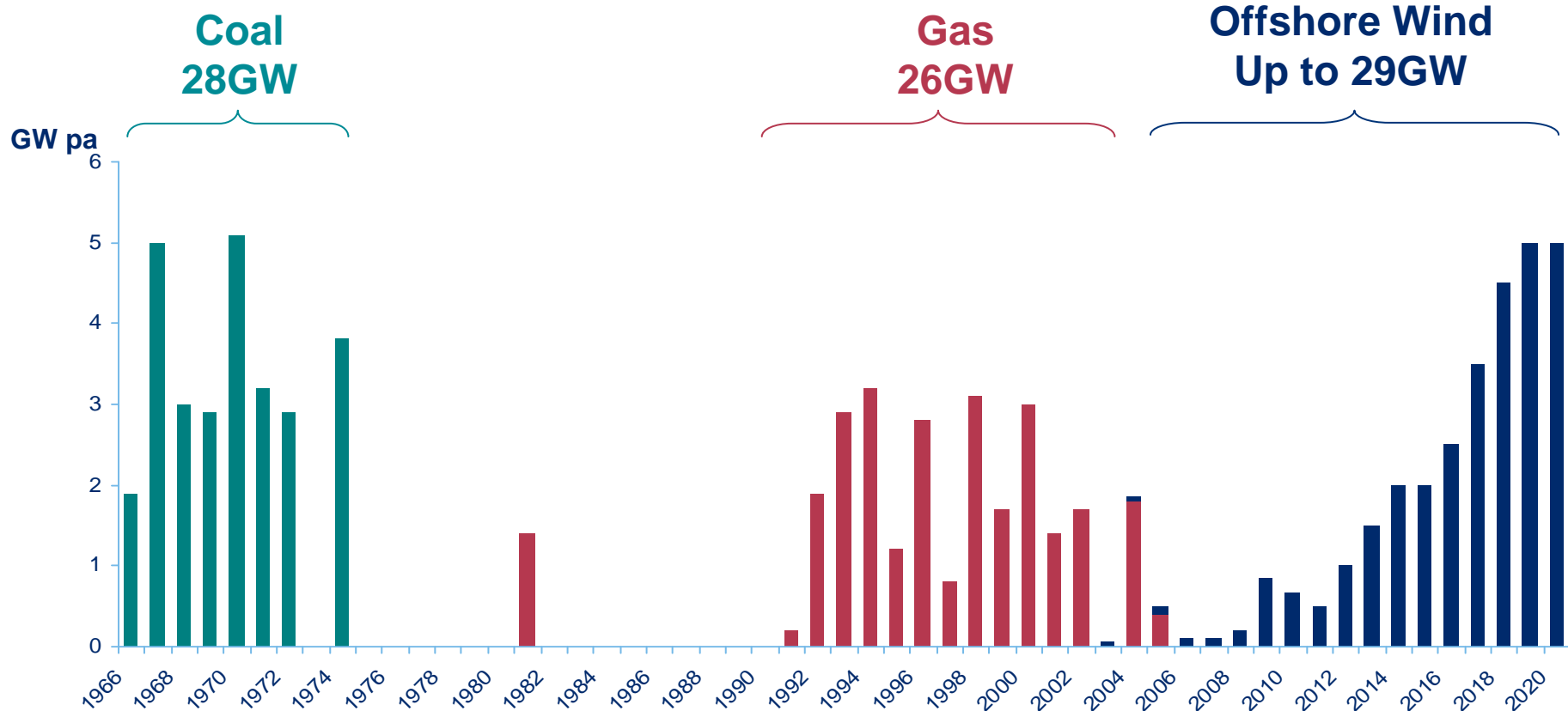
- UK needs up to 29GW offshore wind by 2020 to meet renewable targets
- This is extremely challenging, but technically feasible

## Big opportunity

- UK will be largest offshore market
- Up to 70,000 jobs by 2020
- Net economic benefit to UK of up to ~£65bn by 2050
- Reduces 35MtCO<sub>2</sub> by 2020
- Opportunity to fill up to half 2020 generation capacity gap

# Build rate similar to coal in the 1970s and gas in the 1990s

Power generation capacity additions 1966 - 2020

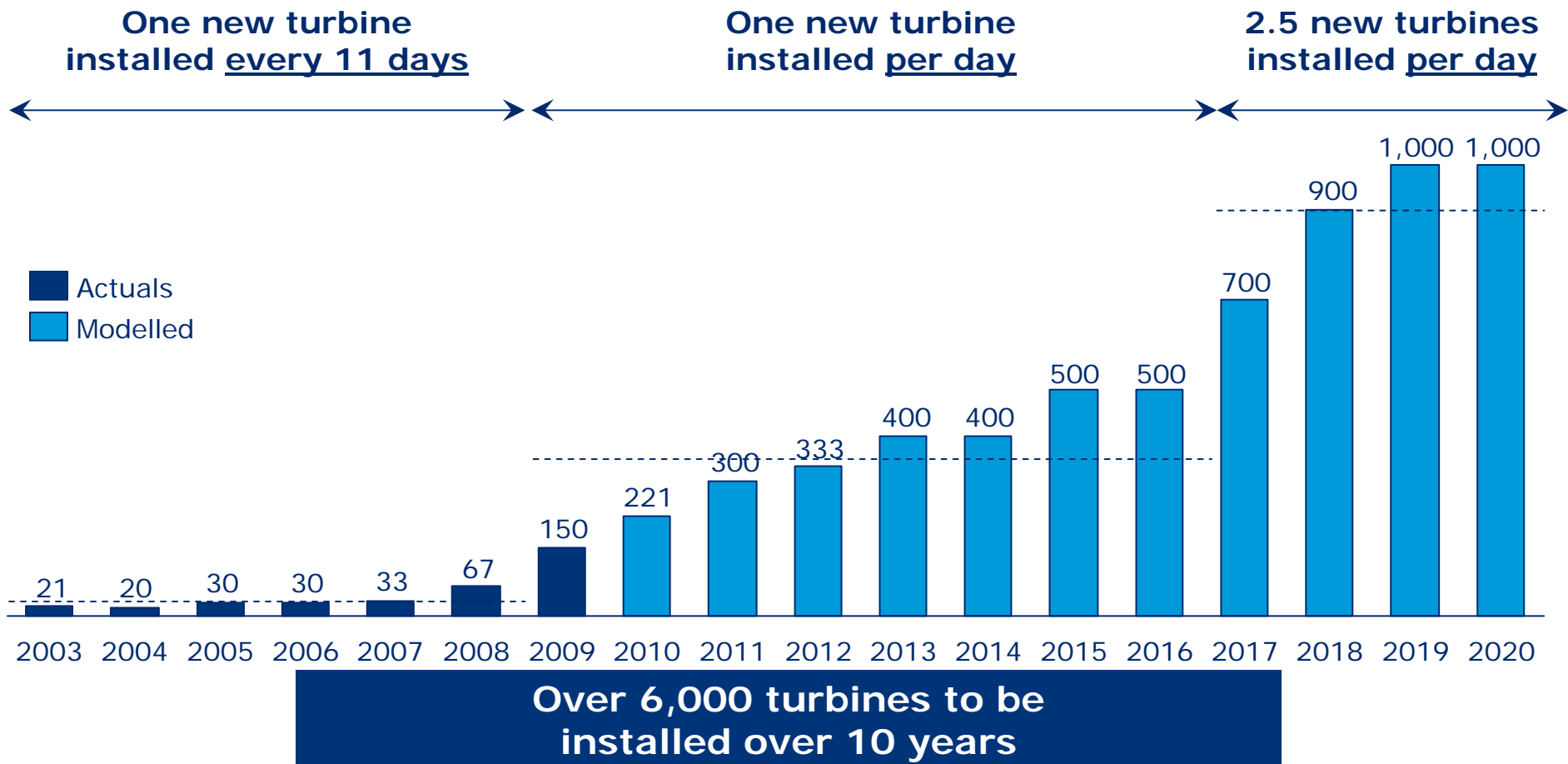


1. At 1985 prices, channel tunnel cost £4.7bn, equivalent to ~£10bn at today's prices

Source: Carbon Trust "Offshore wind power: big challenge, big opportunity", 2008; LEK Consulting, Renewable Energy Framework March 2006, BCG Analysis 2008

# Turbine installation rates will need to increase dramatically

Number of turbines installed per year 2003 - 2020<sup>1</sup>



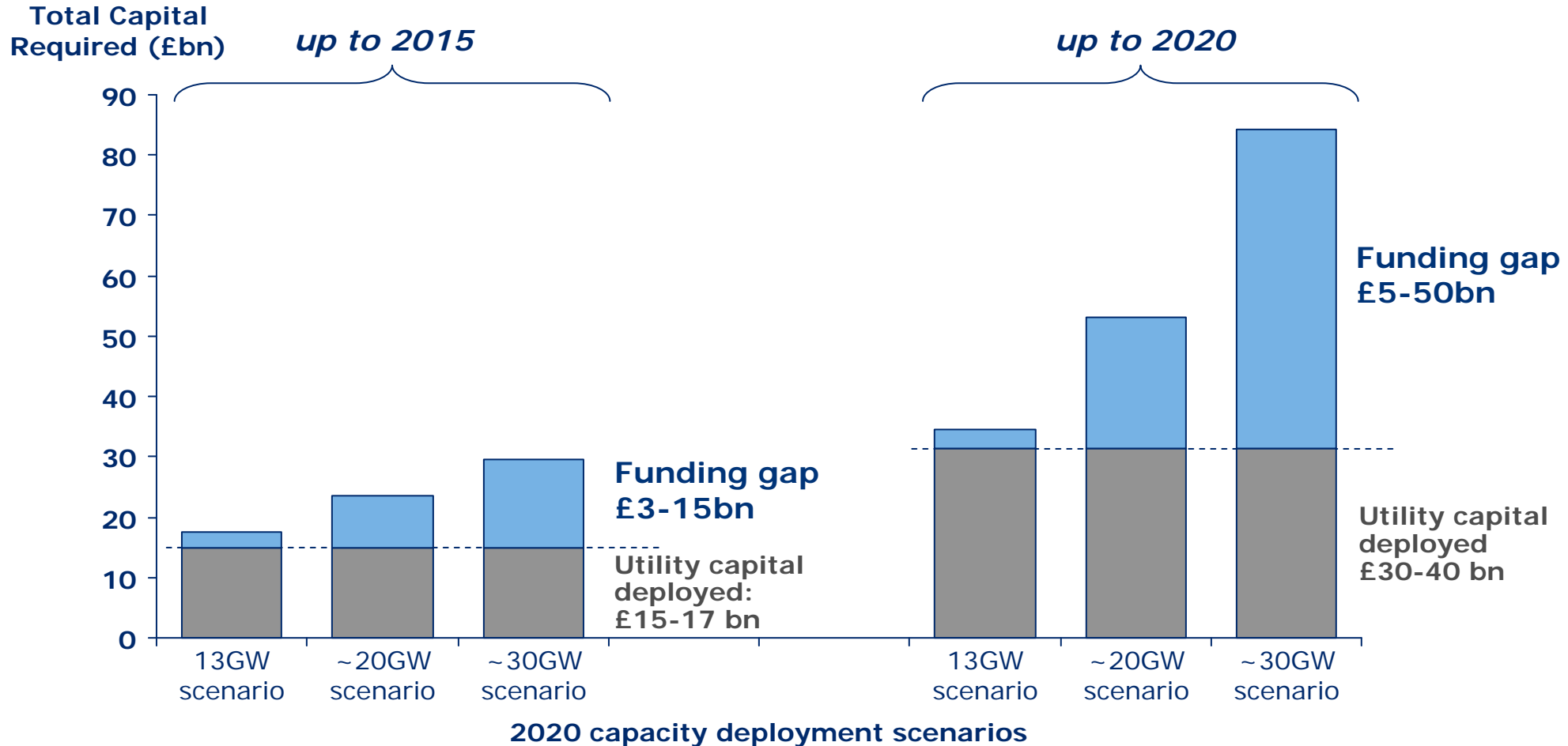
1. Number of turbines calculated from actual and forecast installed capacity figures, assuming 3MW turbines 2003 – 2013, and 5MW turbines from 2014

Source: Carbon Trust "Offshore wind power: big challenge, big opportunity", 2008; Carbon Trust analysis 2010

# There may be a significant funding gap for UK offshore wind

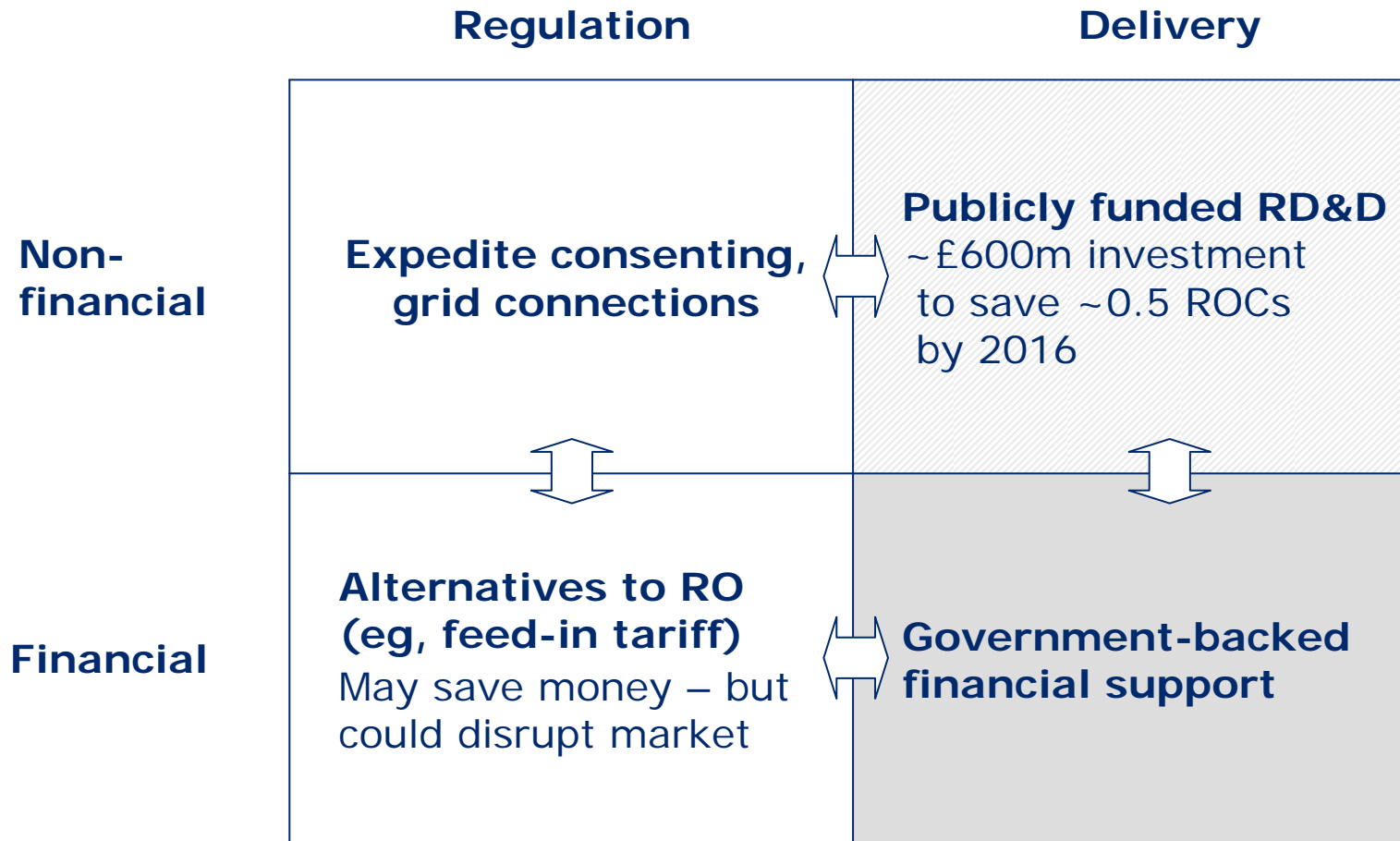


Capital required and implied funding gap under 2020 capacity deployment scenarios



Source: Carbon Trust analysis based on estimated average of capital costs for Rounds 2 & 3 Licensed Offshore Wind Sites. Mid case learning shown.

# Four types of action required to unlock offshore wind



# Carbon Trust has been working with developers to reduce costs

Objective: Reduce cost of energy by 10% through RD&D



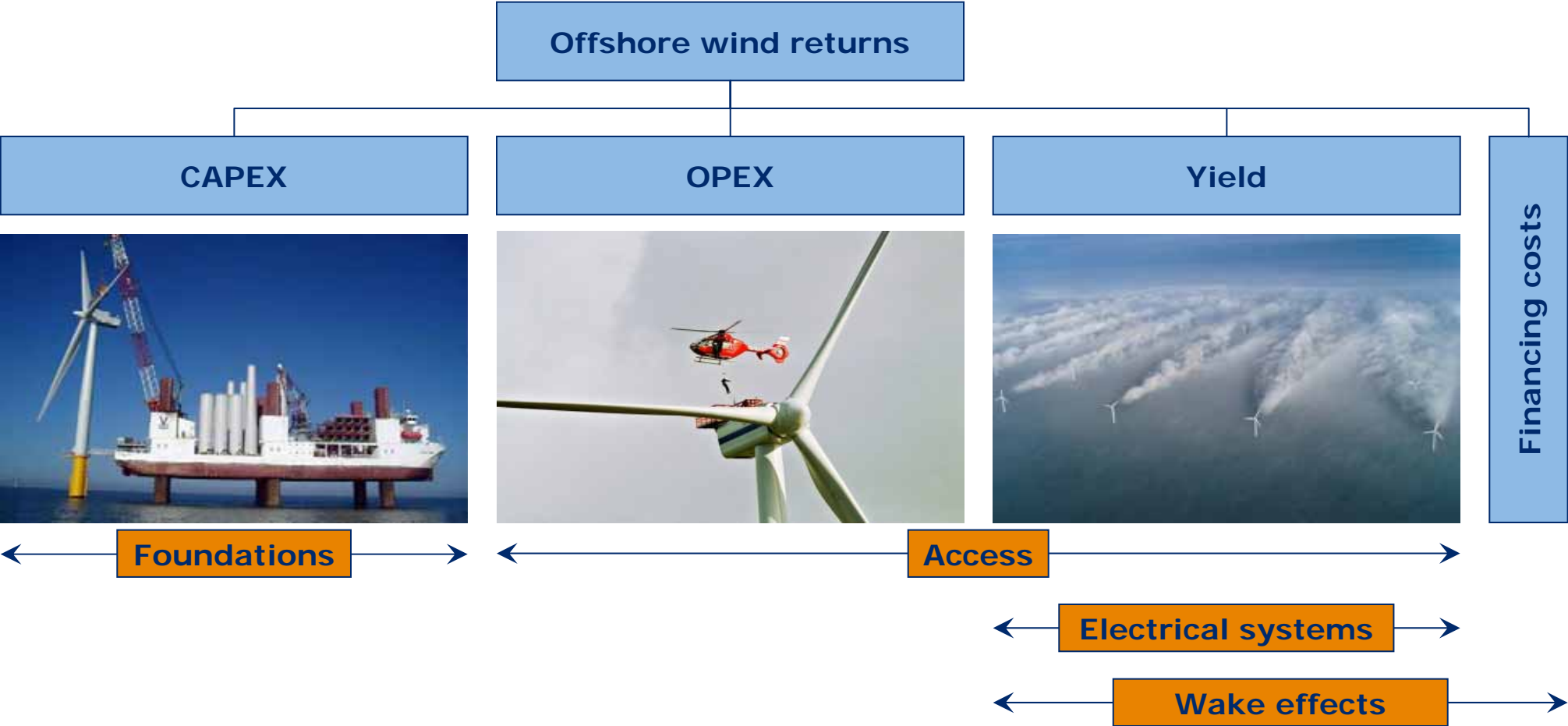
## Original partnership



- OWA launched October 2008
- Focusing on identifying and developing lower cost technologies for
  - Round 2 extensions
  - Round 3
  - Scottish Territorial Waters
- Total budget of £1.5m for collaborative R&D

# OWA focuses on strengthening economics of offshore wind

Stage I (Oct '08 to Apr '10) examined four technical areas



# OWA is delivering results

Full details: Day 2, 13:45, Hall 1A, "Research and Foundations"



<b>Foundations</b>	 A large offshore wind turbine foundation is being installed on a barge in the ocean. The barge is white with red accents and has several large white cylindrical components on deck. A crane is visible on the barge, and the wind turbine's tower is partially visible in the background.	<b>Foundations competition: four winners</b>  ➤ Reduces costs for 30-60m depths
<b>Access</b>	 A red and white helicopter is landing on the nacelle of a wind turbine. The nacelle is a large, cylindrical structure at the top of the tower, and the helicopter is positioned on a landing platform.	<b>Access strategies modelled and compared</b>  ➤ Increases availability in Round 3 conditions
<b>Wake effects</b>	 Aerial view of a wind farm showing the wake effects of the turbines. The wake is a series of white clouds trailing behind the turbines, indicating the impact of the wind turbines on the downstream turbines.	<b>Wake effects models tested and developed</b>  ➤ Reduces financing costs, improve yields
<b>Electrical systems</b>	 A close-up view of the electrical system of an offshore wind turbine. The system is a complex of metal structures, cables, and components, mounted on a platform above the water.	<b>Options for improving reliability and reducing losses assessed</b>  ➤ Reduces cost of energy

# Carbon Trust is launching Stage II of Offshore Wind Accelerator



## Original partnership



## New partners



- 4-year commitment
- Two new developers
  - Statkraft
  - Mainstream Renewable Power
- 56% of licensed capacity in UK waters (~27GW)
- Total budget of £10m for collaborative R&D
- Up to £30m of demonstration projects