

# Global Offshore Wind Prospects

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Introduction

Market Forecast

Key Countries

Market Issues

Conclusions





## Today's Presentation:

- Overview market forecasts of capacity and expenditure
- Developments in key countries
- Market growth constraints

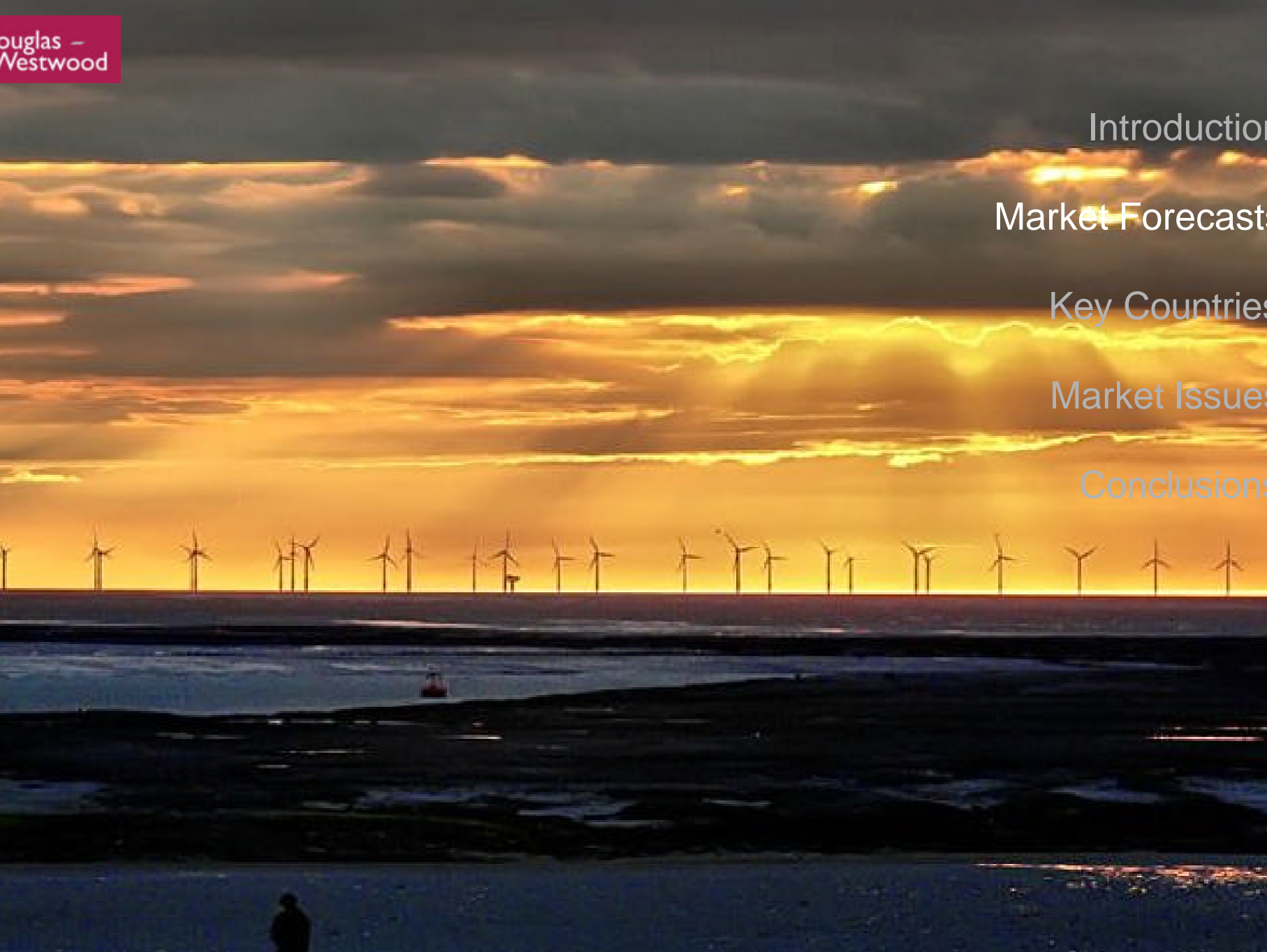
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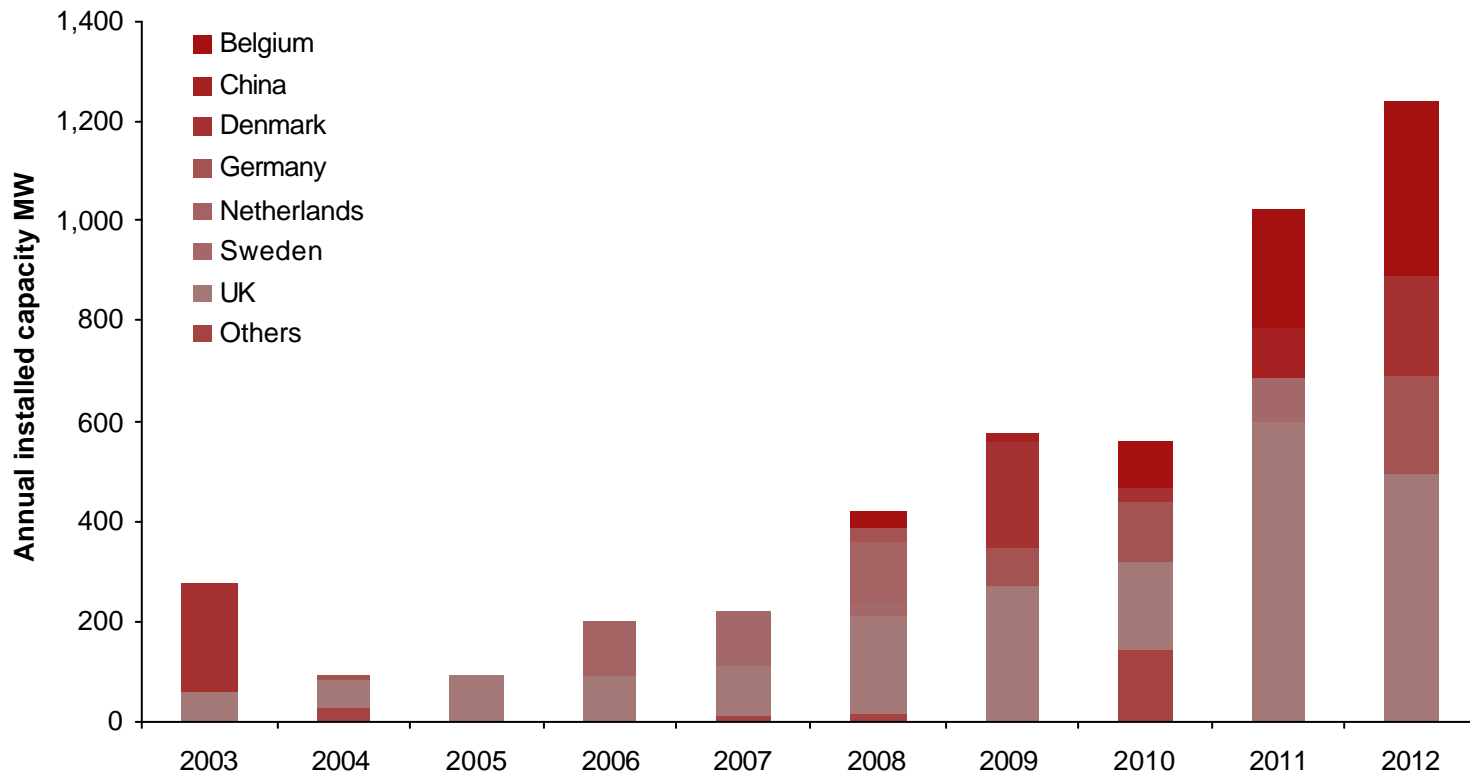
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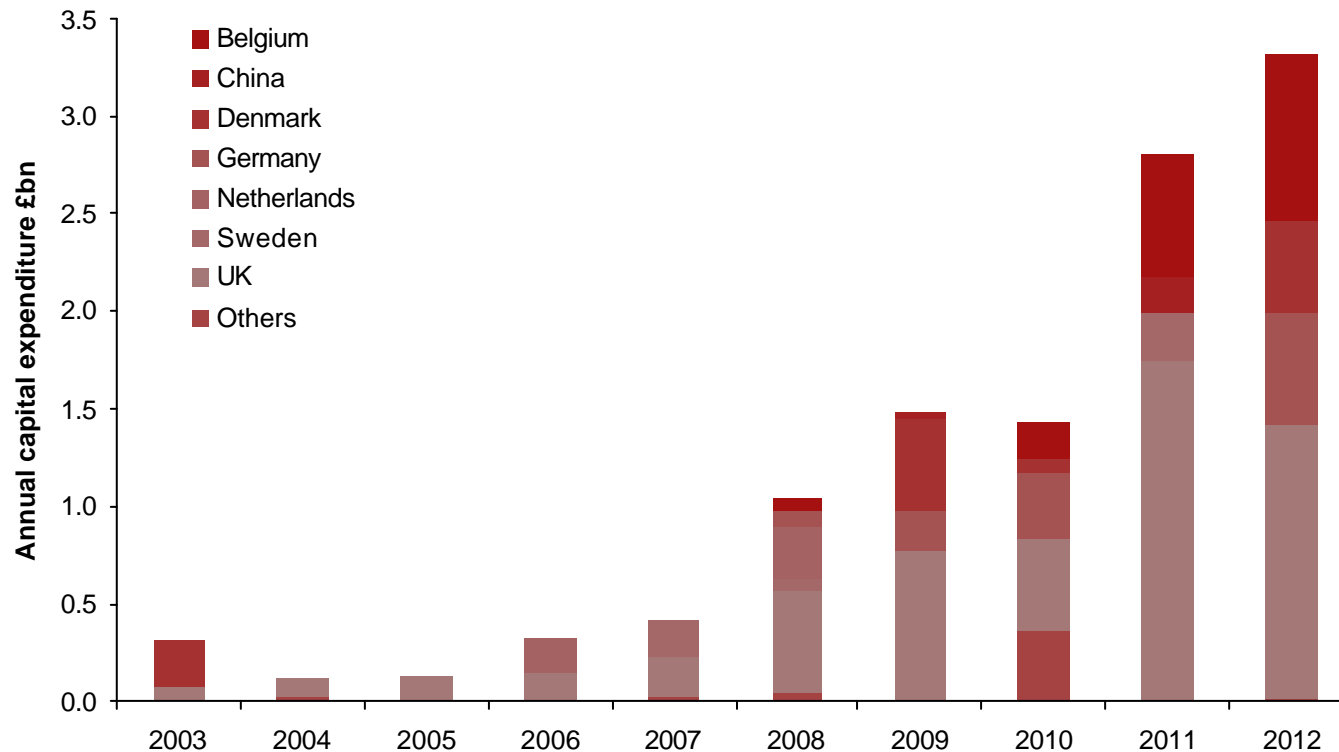


## Installed Capacity



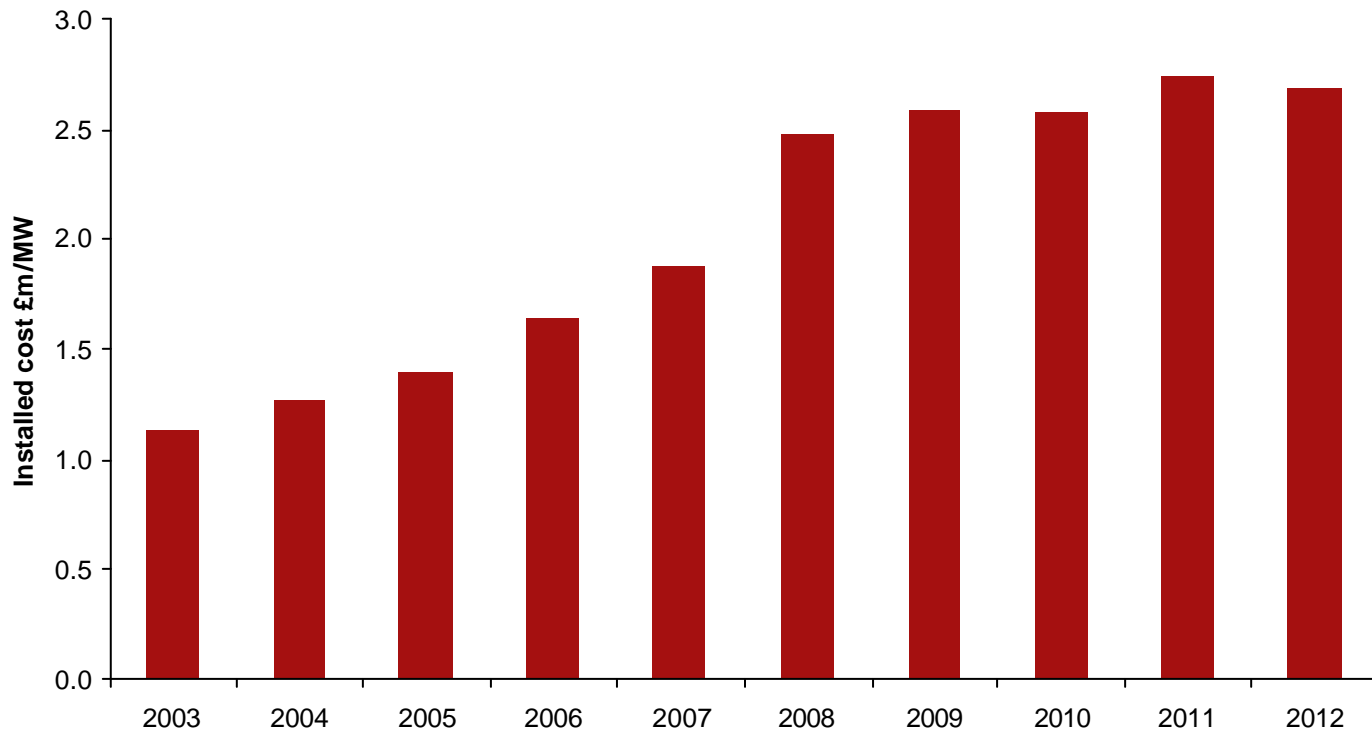
- 3.8 GW forecast for installation 2008-2012
- Annual installations grow from 419 MW in 2008, to 1,238 MW in 2012
- UK: 1.7 GW, Belgium: 700 MW, Denmark 400 MW, Germany 400 MW

## Capital Expenditure



- £10.1 bn forecast 2008-2012
- 2008 annual expenditure £1 bn, rising to £3.3 bn in 2012

## Cost



- Costs are up over 100% in five years
- Costs for projects (contracted) from 2008 to 2012 are £2.2-3 m/MW

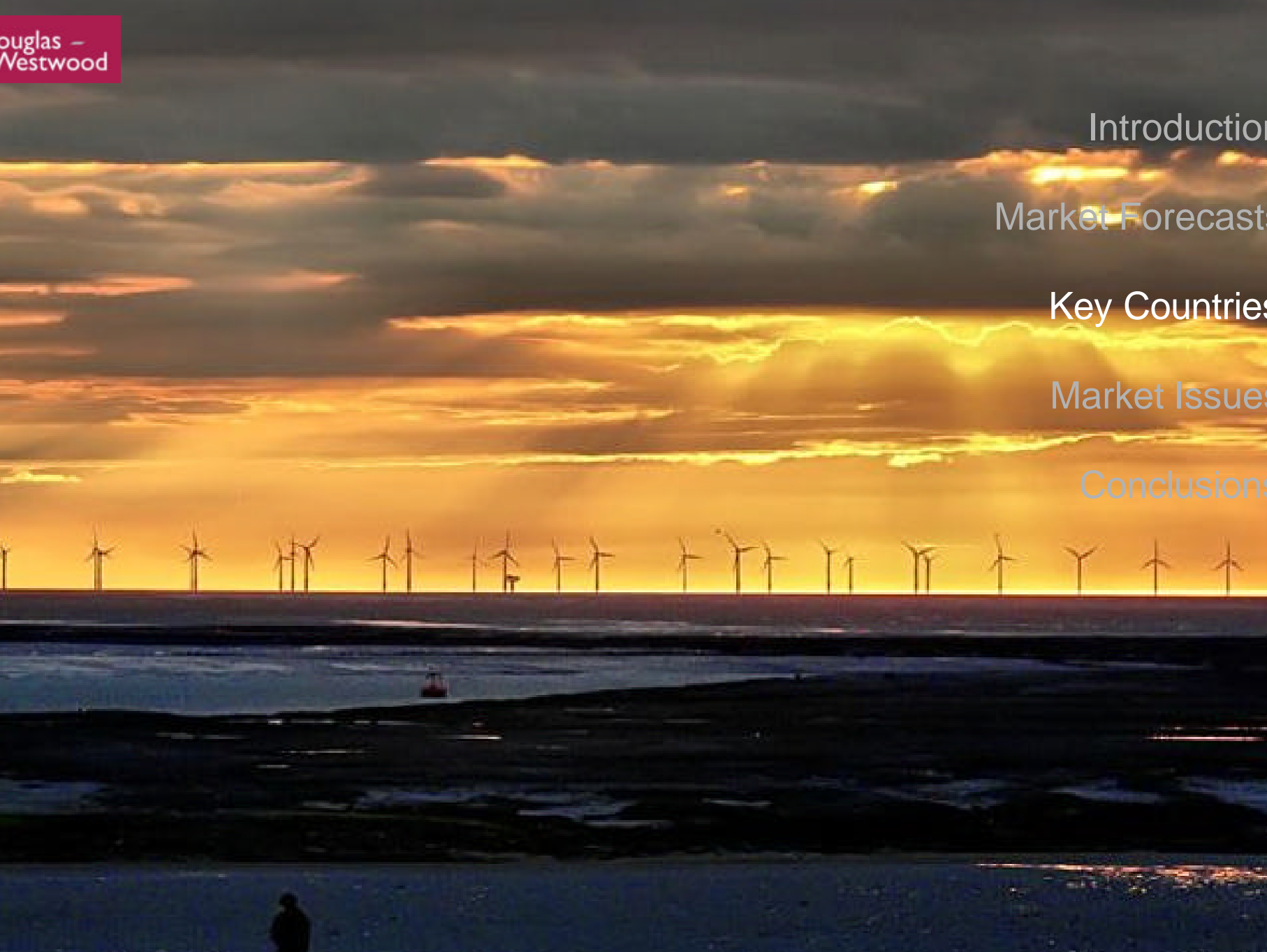
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## **UK outlook**

- Rising costs jeopardising large Round 2 projects
- Nervousness from major developers/utilities
- Increasing competition for supply chain resources from other emerging markets in Europe
- Round 3 is needed immediately for long-term confidence
- Available grid capacity – still a big questionmark

## **Germany outlook**

- Significant offshore project activity now finally happening
- Contracting well-advanced on first commercial projects
- Development of Bremerhaven area as offshore wind industry base is already proving successful

## Belgium outlook

- Construction underway at first phase (30 MW) of Thorntonbank
- Second phase (90 MW) online 2010, third (180 MW) in 2012
- 5 MW turbines on GBS foundations
- Extremely innovative project with overall cost at £2.1m/MW



- Bligh Bank (330 MW) now approved, financial close mid-08, Vestas preferred supplier of 110, 3 MW turbines.
- Two-phase concurrent installation 2009-2011

## Denmark outlook

No completions since 2003

Horns Rev II & Nysted II progressing well

Identified sites are 'easy' to develop

New tender round from Danish

Energy Authority expected in 2008



## China outlook

- Over 1.5 GW of projects now planned
- First offshore installation November 2007
- 70 km offshore
- Installed upon jacket at the Suizhong 36-1 oil field
- Cost: £2.9m



## North America

- US permitting situation is slowly improving
- Prominent project is Cape Wind, in legal hurdles for 6 years – now making some progress
- First US project expected to be Hull (14.4 MW)
- In Canada, first phase of Nai Kun (320 MW of 1,750 MW) has secured transmission routing and will bid to BC Hydro in 2008.

- \$2.2m feasibility study into offshore wind power facility (2008)
- Planning network of offshore wind farms near coastal power stations
- From 2010 onwards – expect to see more power companies investing in offshore wind
- Central Government subsidies towards construction costs
- Deeper water market

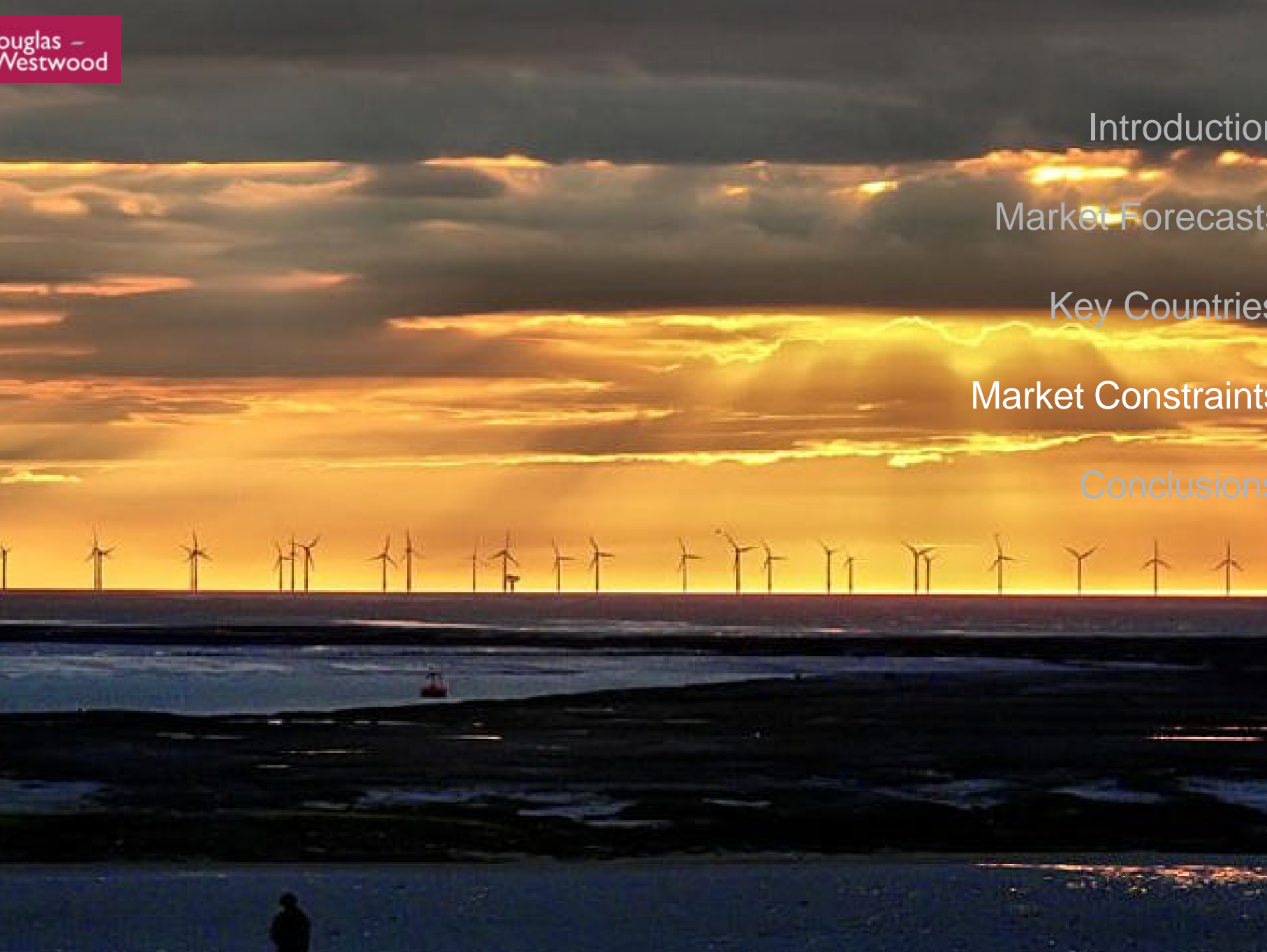
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- **Approval/ consent timelines**
- **Grid capacity and infrastructure**
- **Supply chain pressures**



## Cost

- Risk imbalance in the industry between owners/contractors
- Supply/demand situation: turbines, vessels, cables
- Developers are becoming hesitant on large future projects
- Many projects currently stalled at Final Investment Decision stage
- Projects judged on rate-of-return which are now falling
- No overall downward trends in costs are yet visible
- Increasing importance should be placed on site resource
- Many sites in planning are currently uneconomical

## Turbine Supply

- Limited turbine supply base
- Bulk of projects currently limited to two manufacturers supplying 3-3.6 MW turbines
- Lead times now 3 years
- Supply chains constrained – particularly bearings & gearboxes
- 5 MW turbine supply to remain limited
- Production capacity will have to rise significantly to meet demand whilst majors are focussing on smaller turbines.

## **Turbine Installation**

- Market becoming constrained around 2011-2012
- New vessels entering service but supply is tight
- Cost increases high and can go higher due to supply/demand shortfall

## **Vessels**

- New-build order time is now 3-4 years
- Massive international demand for ship-building
- Major yards have their order books full
- Cost of new vessels has doubled in four years

## Cable Supply

- Industry risk averse & choosing only the major cable suppliers
- Major suppliers have extensive lead times of around 2 years
- Smaller players are finding it difficult to break into the market despite much shorter lead times

## Risk

- Owners are not willing to accept some of the risk
- Weather risk prevents work October-March. No-one prepared to take the cost for days when sea conditions prevent work being carried out

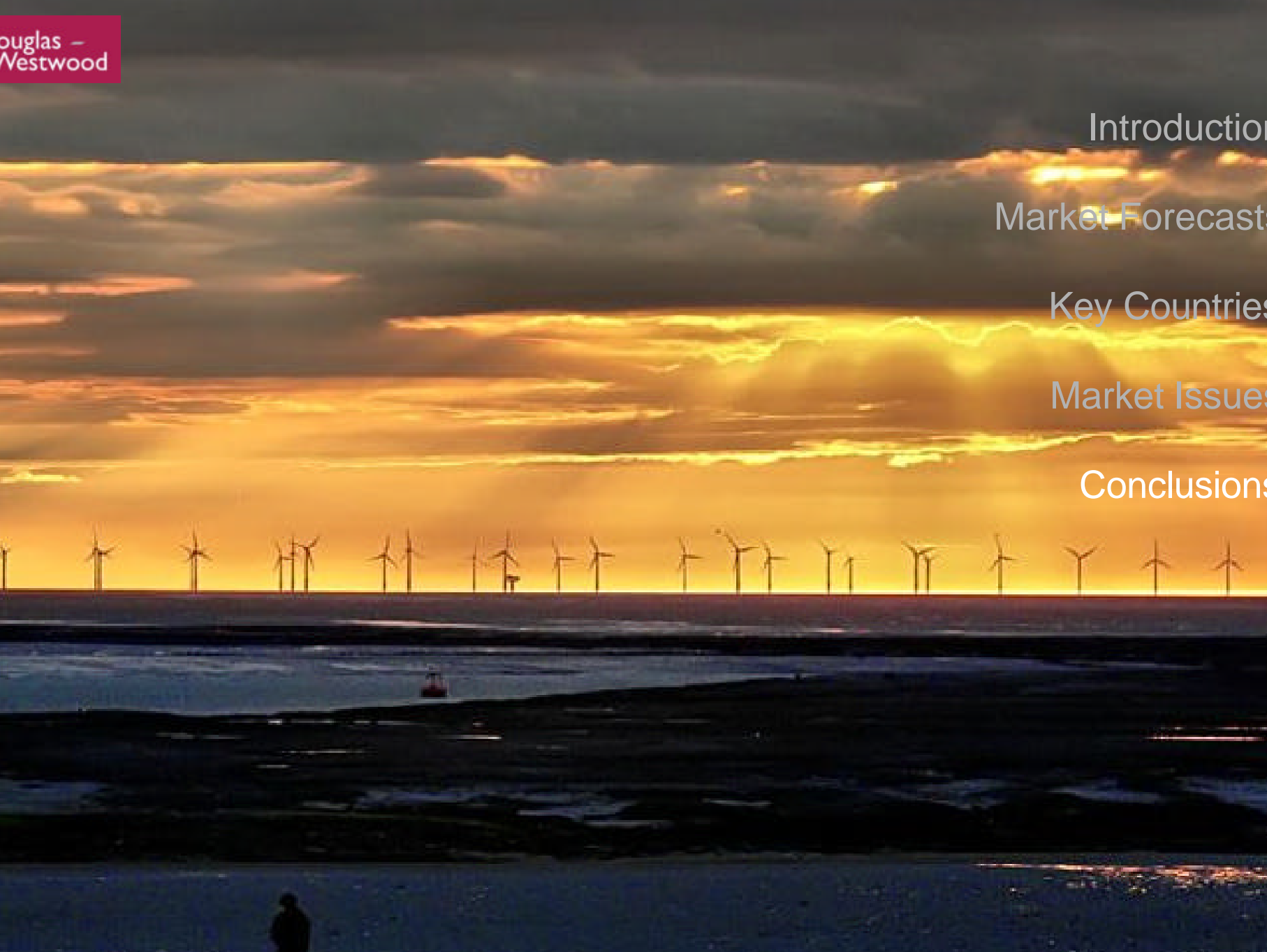
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- Significant construction & contracting activity ongoing, mainly within Europe
  - Increasing number of projects stalling at Final Investment Decision stage
  - Costs have increased massively and will continue to rise in the short-mid term
  - Major utilities pushed industry growth but concern exists over the rate-of-return investment basis
  - Approvals/consents timelines continue to be a delaying factor in increasing installation capacity
  - Risk-averse owners/developers stunting supply chain development
  - UK and Europe remains strongest market in short-mid term but faces increasing competition from other international offshore wind markets
  - Grid connection and availability – a number of countries are being more pro-active than others