



AMEC Wind Energy

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Unless otherwise stated, amounts and percentage movements throughout this presentation relating to the profit and loss account are stated before goodwill amortisation and exceptional items. Amounts and percentage movements relating to total operating profit and margin of the Engineering and Technical Services, Oil and Gas and Project Solutions activities are stated before corporate costs, goodwill amortisation, and exceptional items.

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Introduction


- AMEC has been in wind energy development in the UK since the acquisition of Border Wind in 2000
- Business has a 10 year track record
- Core capabilities: site acquisition, wind farm development, wind modelling, construction project management, operations and maintenance
- Reputation for stretching the envelope – offshore, larger machines
- Team of 35 people, some with 20 years in the sector
 - Four PhDs, 20 Masters, 15 professional engineers/scientists
- Based in Hexham, Northumberland

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Wind energy terminology explained – Rated output and quantity of electricity produced

- **Rated output is expressed in watts**
 - A watt is the energy needed to heat up 1 cm³ of water by 10C in 1 second
 - We use megawatts (1 MW = 1,000,000 watts) to keep the numbers manageable
- **Quantity of electricity produced is expressed in watt.hours**
 - A watt.hour is the quantity of electricity produced in 1 hour by a device generating at a rate of 1 watt
 - A unit of domestic electricity is 1000 watt.hours or 1 kilowatt.hour (1 kWh)
 - We use megawatt.hours (1 MWh = 1,000,000 watt.hours) or gigawatt.hours (1 GWh = 1,000,000,000 watt.hours) to express the quantity of electricity generated over a year
 - In wind, the output depends on rated output and availability of wind to drive the turbines (the typical wind farm produces about 30% of the quantity that it would do if the wind blew strongly all year round – the capacity factor)
- **Example**
 - For a typical 50 MW wind farm, the annual energy production would be 50 times 24 (hours in the day) times 365 (days in the year) times 30% (capacity factor)
 - That is 131,400 MWh or 131.4 GWh

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AMEC Wind Energy portfolio


- Total portfolio under development is around 2,500 MW, broken down as follows:
 - Onshore**
 - AMEC's share of onshore developments – 1,100 MW
 - Third parties' share of onshore developments managed by AMEC – 400 MW
 - Offshore**
 - Offshore developments where AMEC is providing consultancy/project management services to Centrica – 1,000 MW

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Onshore portfolio

Name/Location	Rating (MW)	No of wind turbines	Tip height (m)	Planning status
<i>1. Proposals being developed by AMEC</i>				
Long-term prospects, various	100+	100	100+	Pre-planning
Kyle Forest, Ayrshire	300	100	125	Planning application submitted Q4 2004
Isle of Lewis (AMEC's 50%)	351	117	140	Planning application submitted Q4 2004
Clashindarroch, Aberdeenshire	130	47	100	Planning application submitted Q3 2003
Aultmore, Moray	60	30	100	Planning application submitted Q4 2003
Minch Moor, Borders	20	14	100	Planning application submitted Q2 2003
Edinbane, Isle of Skye	50	27	100	Conditional consent Q4 2002, awaiting planning notice
Tees Wind North, Teesside (AMEC's 50%)	25	9	140	Conditional consent Q2 2002, awaiting Corus decision on land



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Onshore portfolio *continued*


Name/Location	Rating (MW)	No of wind turbines	Tip height (m)	Planning status
Clachan Flats, Argyll & Bute	16	9	79	Planning notice received

Notes on the above

- Data based on planning submissions made or management estimates where proposals are at an earlier stage
- Developments are subject to environmental and planning risk until fully consented and to delays in the commissioning of the national grid infrastructure needed to support renewable energy expansion

2. Projects developed by AMEC in the past and sold to third parties

High Volts, Co. Durham	8	3	100	Operational (2004)
Hare Hill, Co. Durham	5	2	100	Operational (2004)
Holmside Hall, Co. Durham	5	2	100	Operational (2004)
High Hedley, Co. Durham	2	3	71	Operational (2001)
Kirkheaton, Northumberland	2	3	67	Operational (2000)
Great Eppleton, Northumberland	2	4	70	Operational (1997)
Blyth Harbour, Northumberland	3	9	41	Operational (1993)



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Offshore portfolio


Name/Location	Rating (MW)	No of wind turbines	Tip height (m)	Planning status
<i>1. Developments where AMEC is providing environmental consultancy/project management services to Centrica</i>				
Race Bank, Greater Wash	c500	c100	tba	Pre-planning
Docking Shoal, Greater Wash	c500	c100	tba	Pre-planning
Lynn, Skegness	90	30	150	Construction pending

Notes on the above

- Data based on planning submissions made or management estimates where proposals are at an earlier stage


2. Projects developed by AMEC in the past and sold to third parties

Blyth Offshore, Northumberland	4	2	91	Operational (2000)
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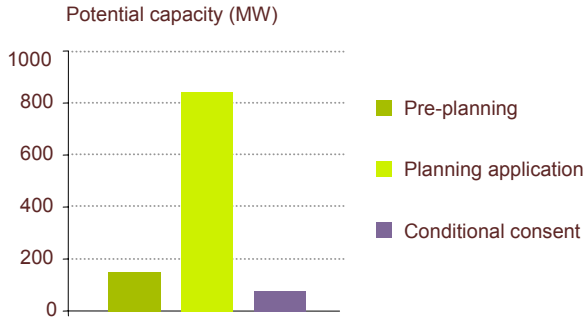
Key development issues

- Unpredictable development timescales
 - Process is one of discovery and accommodation (or abandonment)
 - Statutory bodies involved in process are fairly 'random'
 - Political Will varies between local authorities
 - Protestors are piling on the pressure
- Grid infrastructure
 - Capacity 'booked' but not yet taken is available to early projects
 - Later projects will face delays
- Wind monitoring
 - Increasing reliance on high quality, long-term, site-specific data
 - Reliance on self-generated data (two years or more)

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Wind Energy

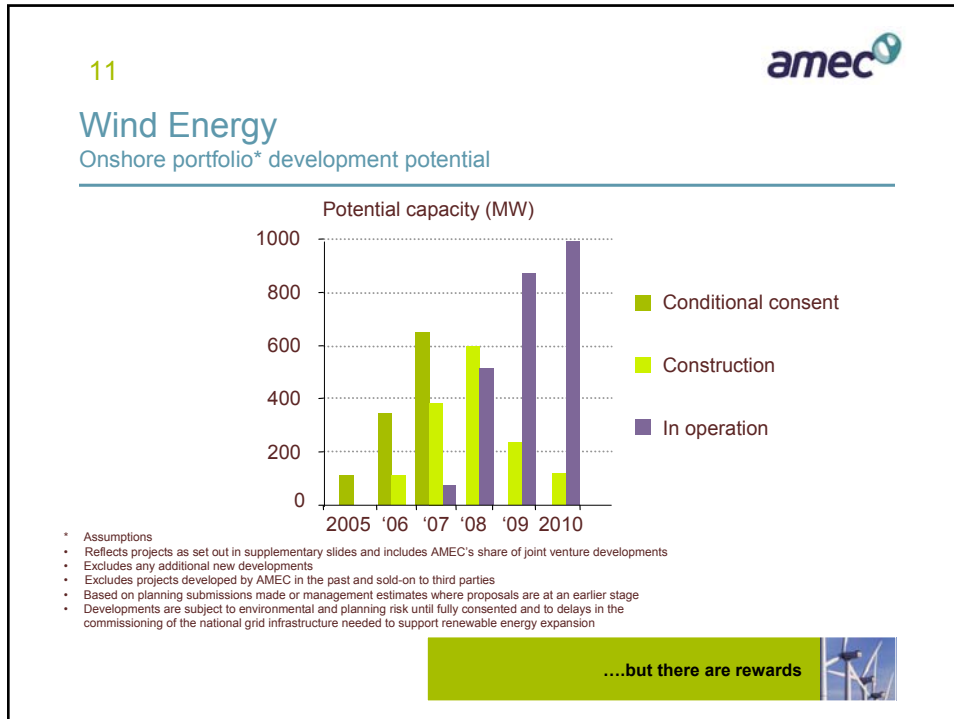
Onshore portfolio* planning status at December 2004



Planning Status	Potential Capacity (MW)
Pre-planning	~150
Planning application	~850
Conditional consent	~100

- * Assumptions
- Reflects projects as set out in supplementary slides and includes AMEC's share of joint venture developments
- Excludes projects developed by AMEC in the past and sold-on to third parties
- Based on planning submissions made or management estimates where proposals are at an earlier stage
- Developments are subject to environmental and planning risk until fully consented and to delays in the commissioning of the national grid infrastructure needed to support renewable energy expansion

The planning process is slow..... 



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- amec**
- ## Current focus
- ### Onshore portfolio
- Bringing Clachan Flats into shape for sale or finance
 - Grinding Edinbane through the final stages of the planning process
 - Bedding-down the Lewis and Kyle planning submissions
 - Lewis 234 wind turbines, 702 MW rated output
 - Kyle 100 wind turbines, 300MW rated output
 - Clearing Clashindarroch and Aultmore, probably via public inquiry
- ### Offshore portfolio
- Supporting Centrica on Lynn/Inner Dowsing build-out
 - Driving the two Round 2 projects to application

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Costs

- Business costs £3.5 million per annum
 - Labour and premises
 - Environmental Consultants
 - Lawyers (land deals)
 - Land option fees
 - Grid connection deposits
 - Contributions from Centrica and O&M contracts

- Capital cost of onshore wind farms £650-800/kW

- Annual operating costs of wind farms around £35k/MW

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What are the projects worth?

- Sale of development rights
 - Ready market for 'paper' projects
 - Deals contingent on project success
 - Heavy discount for residual uncertainty

- Turnkey sale – benchmark just under £400k per GWh of annual output
 - October 2004: Centrica paid £31m for 80 GWh of annual output from the Glens of Foudland scheme
 - December 2004: Hg Capital paid £21.6m for the 21.25 MW Tir Mostyn scheme which we estimate would yield around 55,000 GWh/a (30% capacity factor)

- AMEC-led finance
 - Synergies with AMEC's PFI activities
 - Interaction between power purchase agreement, equity and debt
 - 20% equity returns achievable for AMEC
 - £50m would pay for a half share in a £400m portfolio geared at 75:25



Photograph taken during the construction of the High Volts Wind Farm near Hartlepool in County Durham (three NEG Micon NM80 wind turbines with an overall height of 100 m, each rated up to 2.75 MW)

AMEC developed the project through to receipt of planning permission then sold the project to E.On (formerly Powergen) Renewables. AMEC was retained by E.On Renewables to project manage the construction and commissioning of the project and is currently providing operational support services to the wind farm.