Fred Olsen Renewables

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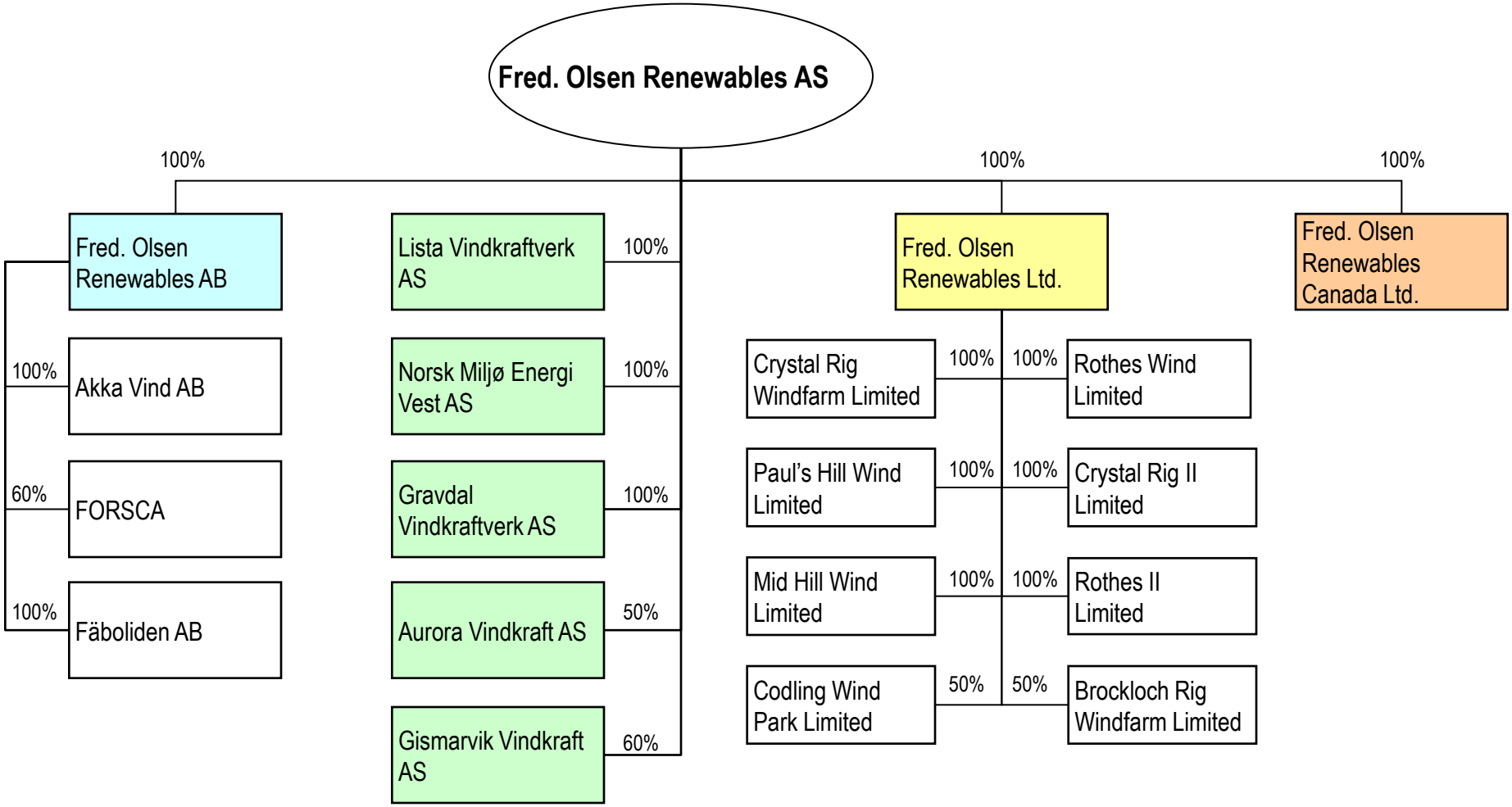
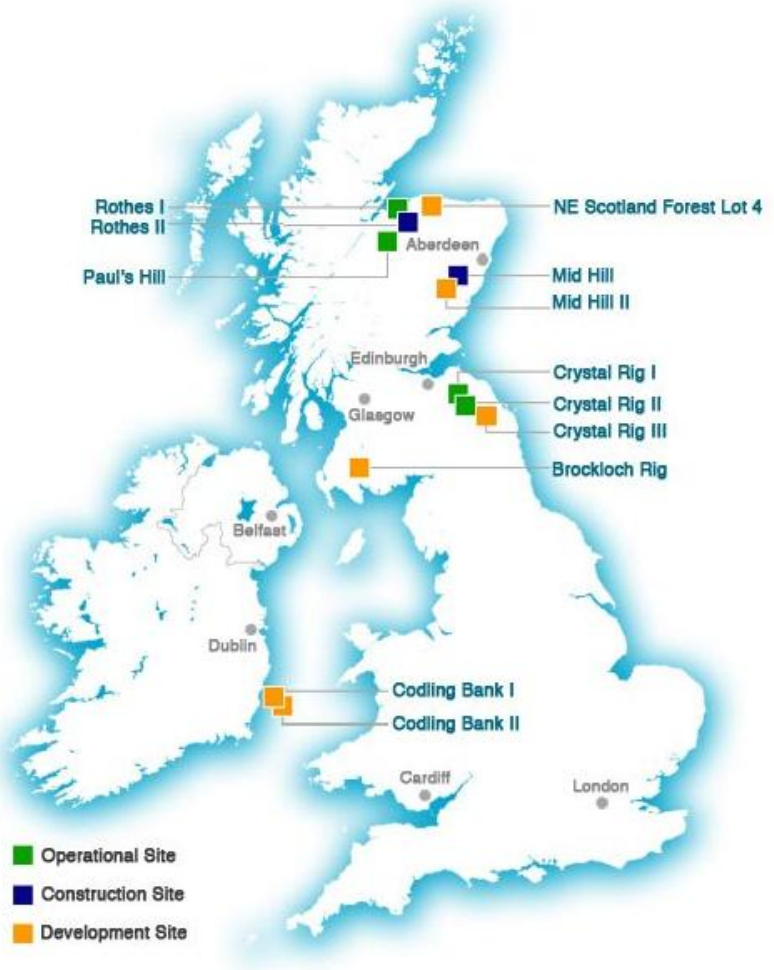
History and Future Ambitions

- The Fred. Olsen group has been involved in wind power since the mid-1990s
- Fred. Olsen Renewables is owned (50/50) by the listed companies Bonheur and Ganger Rolf
- Presence in UK, Norway, Sweden, Ireland and Canada
- It's a preference to be involved from "cradle to grave" – the business model has four key activities
  - Site Investigation
  - Development
  - Construction
  - Operation and Decommissioning
- All key disciplines are managed in-house
- Interest to grow the business internationally and also to expand into generation from renewable
- sources other than wind

Structure


Fred. Olsen Renewables AS
100%
100%
100%
Fred. Olsen Renewables AB
100%
Akka Vind AB
60%
FORSCA
100%
Fäboliden AB
Lista Vindkraftverk AS
100%
Norsk Miljø Energi Vest AS
100%
Gravdal Vindkraftverk AS
100%
Aurora Vindkraft AS
50%
Gismarvik Vindkraft AS
60%
Fred. Olsen Renewables Ltd.
Crystal Rig Windfarm Limited
100%
100%
Rothes Wind Limited
Paul's Hill Wind Limited
100%
100%
Crystal Rig II Limited
Mid Hill Wind Limited
100%
100%
Rothes II Limited
Codling Wind Park Limited
50%
50%
Brockloch Rig Windfarm Limited
Fred. Olsen Renewables Canada Ltd.

Projects in the UK and Ireland



Achievements to Date

- Fred. Olsen Renewables have 323 MW wind power in operation
- Own and operate turbines from Nordex, Siemens, Enercon and REpower ranging from 600 kW to 2.5 MW
- The projects have long term Power Purchase Agreements
- Additional 879 MW is consented and is due to be constructed within the next years
- Total investment to date is £437 million
- Total generation is ~800GWh / year

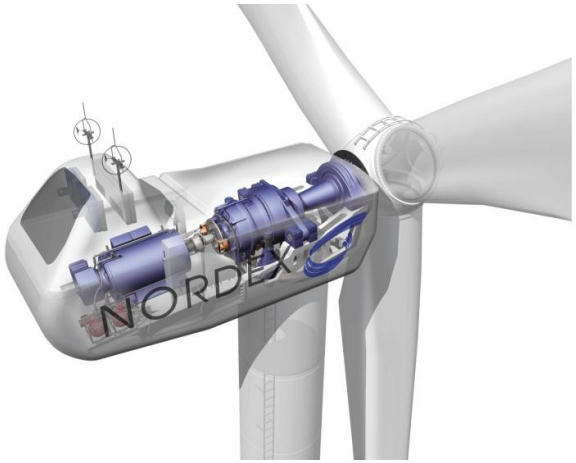
Fred Olsen Renewables – UK sites

Site Name	Location	Type of Turbine	No. Of WTG	Installed Capacity (MW)	Equiv. No. of houses
Crystal Rig	East Lothian	Nordex N80	25	62.5	34,946
Rothes	Moray	Siemens 2.3 CS	22	50.6	28,293
Paul's Hill	Moray	Siemens 2.3 CS	28	64.4	36,009
Crystal Rig II	East Lothian	Siemens 2.3 VS	60	138	77,162
			135	**315.5**	**176,410**

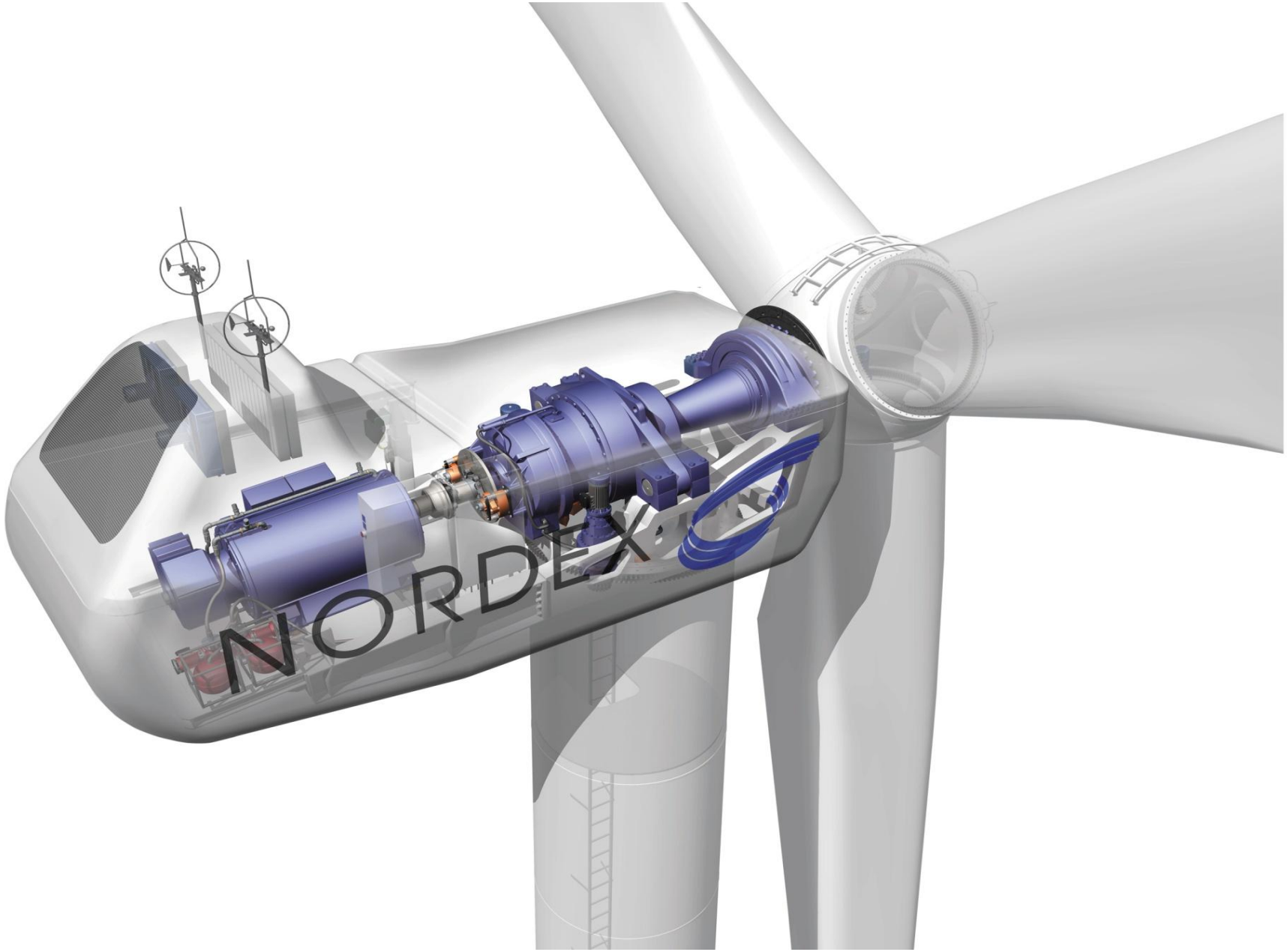
Crystal Rig I

Crystal Rig Windfarm

- Crystal Rig Wind Farm is located on the Lammermuir Hills east of Edinburgh and south of Dunbar in the Scottish Borders. The area around the wind farm is sparsely populated and the turbines are hidden among the hillsides.
- Crystal Rig Wind Farm commenced operation in October 2003.
- When completed Crystal Rig Wind Farm was the largest (onshore) wind farm in Scotland with a rated output of 50 MW



No. Of Turbines		**25**
Type		**Nordex N80**
Output per turbine	**MW**	**2.5**
Site output	**MW**	**62.5**
Hub height	**metres**	**60**
Rotor diameter	**metres**	**80**

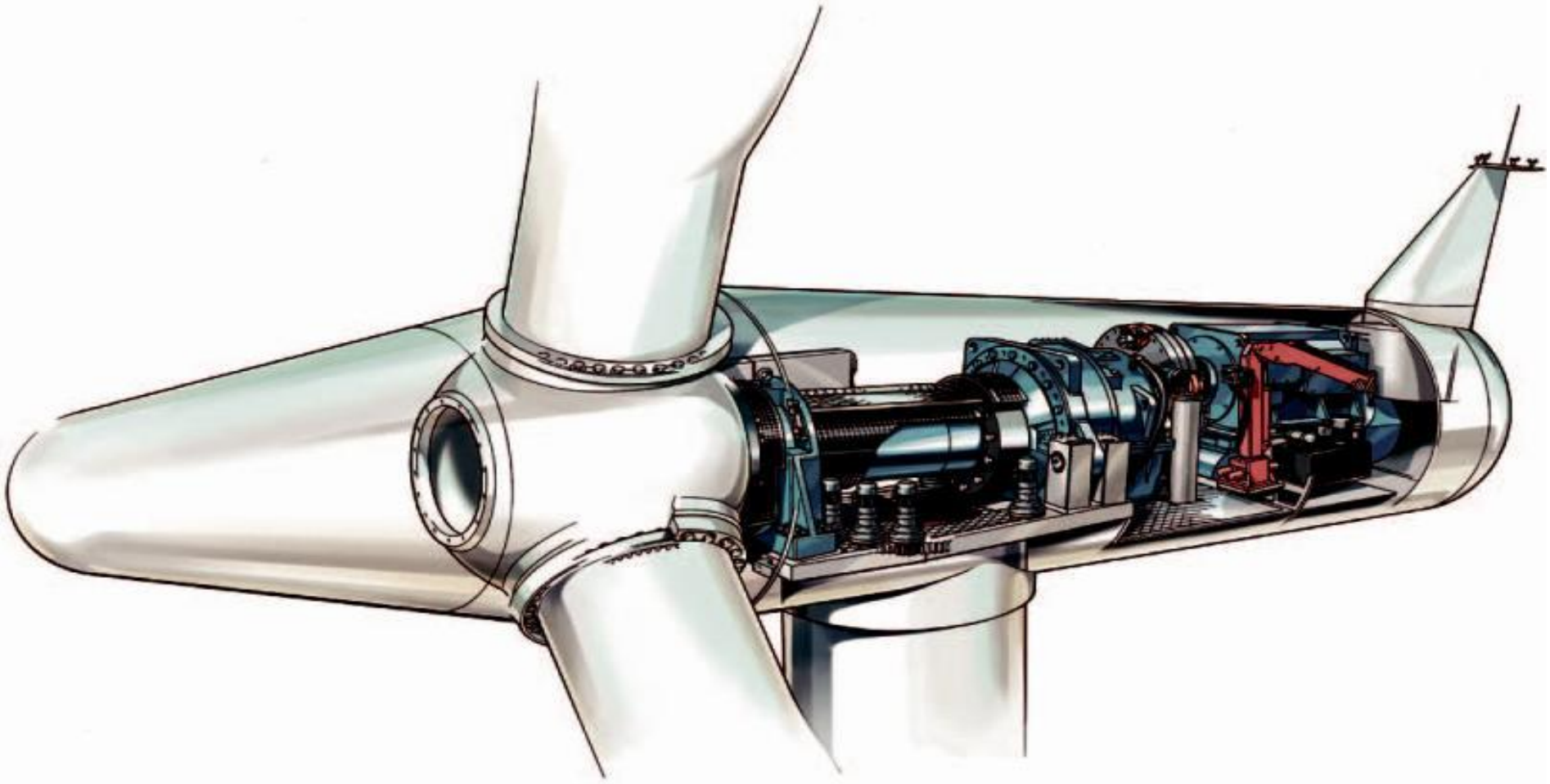

NORDEX

Rothes Windfarm

- Rothes Wind Farm (also known as Cairn Uish) is located in the North of Scotland near Elgin.
- Rothes Wind Farm started operation in March 2005.

No. Of Turbines		**22**
Type		**Siemens 2.3 CS**
Output per turbine	**MW**	**2.3**
Site output	**MW**	**50.6**
Hub height	**metres**	**60**
Rotor diameter	**metres**	**82**

Siemens 2.3MW Combi-Stall



Paul's Hill Windfarm

- Paul's Hill Wind Farm is located in the North of Scotland near Elgin and just 10km away from Rothes Wind Farm
- Paul's Hill Wind Farm started operation in April 2006.

No. Of Turbines		**28**
Type		**Siemens 2.3 CS**
Output per turbine	**MW**	**2.3**
Site output	**MW**	**64.4**
Hub height	**metres**	**60**
Rotor diameter	**metres**	**82**

Crystal Rig II Windfarm

- Crystal Rig II Wind Farm is an extension (mainly to the west) of the existing Wind Farm near Edinburgh and Dunbar.
- The first turbines started working in January 2010 and the full site was handed over during Summer 2010.

No. Of Turbines		**60**
Type		**Siemens 2.3 VS**
Output per turbine	**MW**	**2.3**
Site output	**MW**	**138**
Hub height	**metres**	**60 ~ 80**
Rotor diameter	**metres**	**82**

Future Development

Site Name	Location	Type of Turbine	No. Of WTG	Installed Capacity (MW)	Equiv. No. of houses
Crystal Rig	**East Lothian**	**Nordex N80**	**25**	**62.5**	**34,946**
Rothes	**Moray**	**Siemens 2.3 CS**	**22**	**50.6**	**28,293**
Paul's Hill	**Moray**	**Siemens 2.3 CS**	**28**	**64.4**	**36,009**
Crystal Rig II	**East Lothian**	**Siemens 2.3 VS**	**60**	**138**	**77,162**
Rothes II	Moray		18	45	25,162
Mid Hill	Aberdeenshire		25	62.5	34,947
Brockloch Rig	Dumfries and Galloway		30	90	50,323
Offshore					
Codling Bank	Irish Sea		220	1000	559,144
			428	**1513**	**845,986**

A head for heights?

Local Renewable Energy Employment Opportunities

Wind Turbine Technician

- Good all round mechanical/electrical knowledge
- Qualifications such as HNC Mechanical/Electrical engineering useful, but potential remains to grow the right people
- Siemens offer apprenticeship scheme based in Newcastle with onsite attachment

Utility Grid Maintenance

- Recognised that a large proportion of technical personnel approaching retirement and utilities are considering opening apprentice schemes
- Work often outdoors and remote requiring considerable systems discipline

Operations Assistant

- Knowledge of Health and Safety law
- Facilities Management
- Auditing
- Budget control

Local Green Employment Opportunities

Civil Maintenance

- The extensive site tracks and drainage systems require monitoring and repair to ensure access and the silt run off does not pollute.
- Agreements with local agricultural contractors has allowed for greater employment and utilisation of plant during summer (prior to harvest period!)
- During winter period same personnel and equipment is utilised for ensuring access by clearing tracks of snow

Ecology

- Each site has conditions attached to the planning consent in order to mitigate impact on the environment
- This includes an agreed process of monitoring and works to encourage certain habitat and species to flourish. Locally to Moray we utilise 2 ecologists and a number of specialist contractors to implement these programmes and have enjoyed notable successes with Hen Harrier breeding

Natural Power

- Natural Power are a consultancy and operations company privately owned by Fred Olsen

Natural Power

- Based rurally in Dumfries and Galloway, offices in Inverness, Falkirk, Wales, France, USA, Chile
- Currently employ 210 people and are involved in all types of green energy employment, including Wind, Wave, Tidal, Biomass, Solar and Hydro
- Roles from project development, technical analysis of yield wind flow, geological studies, ecology and hydrology studies, civil engineering, electrical engineering, construction design and control, operation and maintenance, asset management, due diligence studies and the operation of a control centre
- Always looking for fresh graduates in related disciplines as well as those with transferable experience.

Searoc

- Offshore renewables consultancy privately owned by Fred Olsen
- Provides full service for marine operations, health and safety, risk management, marine co-ordination – a dynamic team of knowledgeable and focused professionals who enjoy what they do
- Involved with many large round 2 offshore projects
- Currently involved with preparation for round 3 offshore
- Based on south coast of England