BWEA

Delivering the UK's wind, wave and tidal energy

# Wind Energy in the UK:

# A BWEA State of the Industry Media Briefing October 2008

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# 1. Summary

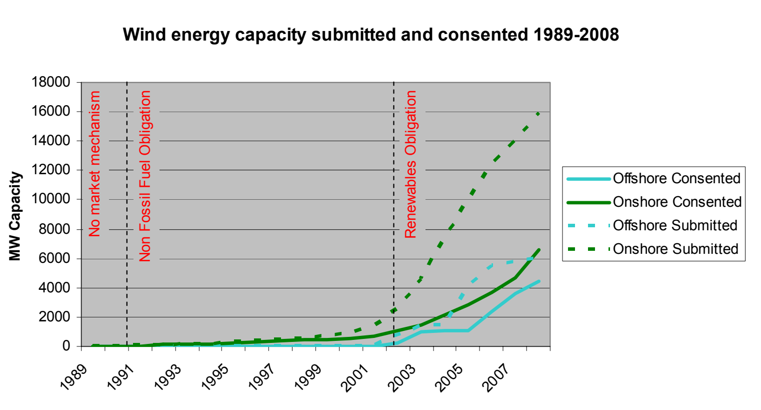
This media briefing is part of the comprehensive "State of the Industry" report available from BWEA. Chris Tomlinson, BWEA Director of Programme Strategy, tracks the progress of the industry since the first commercial wind farm planning application was submitted in 1989. This report also looks at current progress and the significant milestones that have recently been reached, investigates planning performance and makes a forecast for future growth based on the most up to date and comprehensive information available.

# 2. Industry Growth: The introduction of the Renewables Obligation

In April 2002, the Renewables Obligation (RO) was introduced to replace the NFFO as the new market mechanism to incentivise renewable development in the UK and with the RO came exponential growth. In anticipation of its introduction, onshore planning submissions rocketed, doubling year on year from 2000 until 2004 when submissions peaked. In 2005-6 there was a stabilisation of the market, with submitted capacity levelling off at around 2.5 gigawatts (GW) each year. Since then, 2007 saw a fall in submissions to just over 1.5GW, the lowest since 2002, but there seems to be a partial recovery with almost 2GW submitted in the first three quarters of 2008.

The advance in technology has also been one of the leading factors contributing to the growth of the wind energy industry and the increased contribution it is making to the UK's electricity supply, with the average turbine size currently being consented reaching 2.5MW, almost ten times that of the first installed turbines in the early 1990's.

There can be no doubt that the growth in investor confidence has arisen as a direct result of the introduction of the RO. In that sense, there would be no merit in replacing it with a feed in tariff. The RO launched the industry to a new level and has sustained a high level of investor interest in the UK market ever since, despite a range of constraints within the development process and the regulatory system that must be negotiated. *It is not the RO, but the planning system which has clearly been unable to keep up with the rate of developer interest.*



# 3. Major Milestones

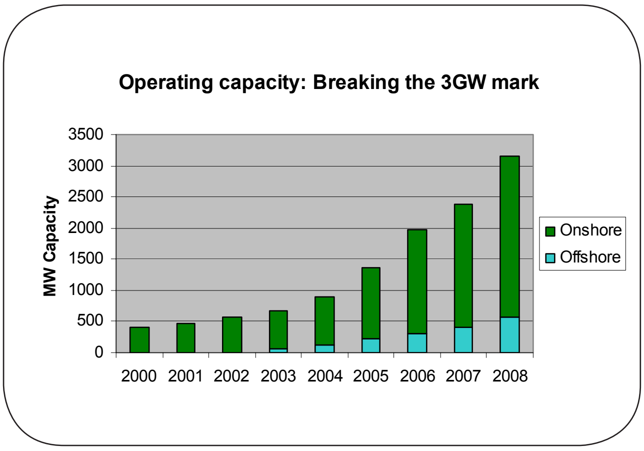
### Breaking the 3rd gigawatt of installed generating capacity

The first gigawatt (GW)of installed wind energy capacity was delivered in 2005, 14 years after the first wind farm was built. The second GW followed in February 2007 - just 20 months later. At the time of writing, one turbine is being installed every two days at Europe's biggest onshore wind farm, the Scottish Power Renewables' Whitelee site south of Glasgow. Meanwhile, at Centrica's Lynn and Inner Dowsing offshore sites, the same process is underway, albeit to a slightly slower build programme in the more harsh and unpredictable offshore environment.

At some point in October 2008, the commissioning of one of these turbines achieved another industry landmark in the installation of the 3rd generating gigawatt from wind energy in the UK - just 20 months after the 2nd GW was commissioned. 2,590MW are now generating onshore and 566MW offshore with a total of 3,156MW now installed and generating to the grid. This takes the UK to fifth in the European league table, overtaking Denmark, and with over 1GW currently under construction, the UK is hot on the heels of France and Italy. The role of Scotland cannot be overestimated in securing this milestone achievement. Even when taking into account the offshore contribution, which is all south of the border, Scotland is still currently contributing around half of the overall UK operating capacity.

### The contribution to energy supply, the economy and the environment

Considering the average capacity factor for onshore is 28% and 35% for offshore, the delivery of the 3rd GW has made significant benefits to our energy supply, environment and wider economy (see table below).




### Wind energy overtakes hydro as the leading renewable generator

Wind energy has become a vital part of the energy mix, now contributing around 2.2% of UK electricity, overtaking hydropower in 2007 to become the largest renewable generation source. The scale and rate of growth is encouraging, but there is a long way to go to deliver the 10% renewable electricity target by the end of 2010. The question is can it be done?

### How will the 10% renewable electricity target be delivered?

Since the introduction of the Government's target to source 10% of electricity from renewables by 2010, it has been accepted that 6% would have to be sourced by wind energy, it being the leading renewable technology in the UK. The remaining 4% of renewable electricity generation required to meet the target has already largely been met with existing and planned hydro plant, landfill gas and co-firing.

Earlier in the decade and at the time of the Energy White Paper consultation, BWEA believed the

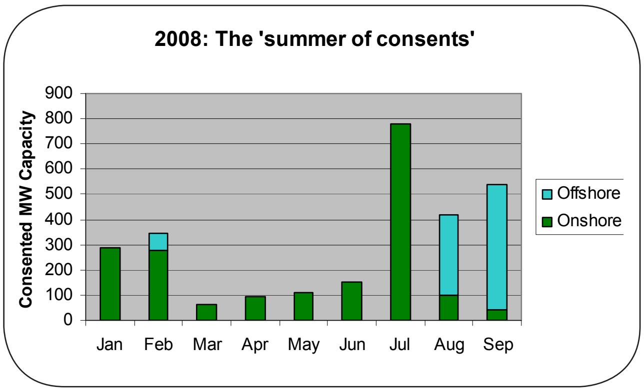
| | MW installed | TWhrs | Homes equivalent | $CO_2$ savings | Jobs created |
|---|---|---|---|---|---|
| Onshore | 2590 | 6.35 | 1,447,810 | 2,730,500 | 4,100 |
| Offshore | 566 | 1.74 | 395,492 | 748,200 | 700 |
| Total | 3156 | 8.09 | 1,843,302 | 3,478,700 | 4,800 |

Footnote: Wind benefits the environment by reducing the demand for other sources of electricity, thereby replacing significant amounts of brown energy with green. The UK's electricity generating mix will change over time, making it impossible to give a precise estimate of the savings. This calculation assumes a CO2 offset of 430 g/kWh. UK offshore wind farms have secured capacity factors of 28% to date. This is due to early teething troubles with the new technology and operation of offshore turbines. However, the wind resource suggests far higher capacity factors will be reached and wind farms elsewhere in Europe are already generating at capacity factors far higher than 35%, hence this is a conservative annual estimate for UK waters.

split would be approximately 50:50 with 4GW of onshore wind and 4GW of offshore wind required to deliver the 6%. However, it became clear that offshore wind would be unable to meet the timetable due to delays in the offshore consenting regime and offshore supply bottlenecks, meaning onshore wind would need to increase its contribution to 6GW, despite the slow and inconsistent planning process.

### Delivering 10%: The 'summer of consents'

Delivering 6GW of onshore wind by 2010 is no mean feat, given that less than half of the target was consented mid way through the decade. However, by the beginning of 2007, 3.6GW was either operational, under construction or consented. A further 1.1GW consented in 2007 meant a record year of consents in 2008 would allow the possibility of the target being built out by the close of 2010.




After a positive start to the year with almost 600MW of onshore consents, a stuttering rate of decision-making in the spring dampened hopes that 6GW could be consented by the end of 2008, let alone in the summer. However, while only six projects were consented in July, two of them were Section 36 schemes. The consent of Arecleoch added 150MW to the total, while the 579MW Clyde Wind Farm, the biggest onshore wind farm in Europe, was given approval by the Scottish Government. In all, 40 onshore projects have been consented to date in 2008, totaling a record 1.9GW of capacity and already dwarfing any previous year of onshore consents. 6741MW of onshore wind capacity is now either operating, under construction or consented.

A further three offshore approvals have been secured with two Round 2 decisions in August and September, rightly confirming the period as the 'summer of consents'. The 315MW Sheringham Shoal and 500MW West of Duddon Sands schemes have taken the total consented capacity in just three months to a staggering 1,736MW.

### Wind energy in the UK: Current status

The tables below show the current state of play of wind energy projects and capacity in the UK as a whole. While there is almost 4.5GW of offshore capacity either operational, under construction or consented, the size and scale of offshore Round 2 developments mean that the build times are greater, and while on course to deliver up to 2GW by the end of 2010, the other 2.5GW of consented capacity is unlikely to be commissioned until 2011-12. The other point of note is that the Crown Estate launch of the offshore Round 3 process is timely and welcome, as there remain only 1,678MW from Rounds 1 and 2 still under consideration in the planning system. For the EU 15% renewable energy target to become a reality, offshore wind will need to deliver 20% of UK electricity by 2020 equating to at least 20GW of installed capacity.

| Offshore Status | Schemes | MW Cap |
|---|---|---|
| Operational | 7 | 566 |
| Under construction | 7 | 467 |
| Approved, not built | 9 | 3413 |
| In planning | 5 | 1678 |

| Onshore Status | Schemes | MW Cap |
|---|---|---|
| Operational | 186 | 2590 |
| Under construction | 27 | 772 |
| Approved, not built | 131 | 3379 |
| In planning | 262 | 7142 |

Note: The operational figures include 162MW from Lynn & Inner Dowsing and 143MW from Whitelee

For onshore wind however, the market has already attracted another 7GW into the planning system. With the RO maintaining investor confidence in the onshore wind market, the planning system is therefore key to delivering the next challenge of 14GW of installed capacity by 2020.

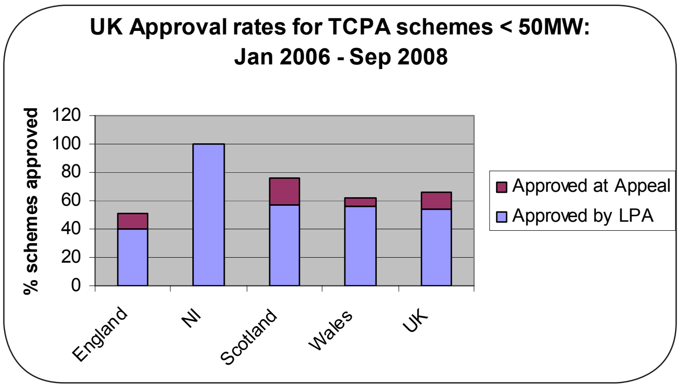
# 4. Planning pitfalls

Offshore Round 1 and 2 schemes have enjoyed a 100% approval rate to date, but the consenting system will be changing for Round 3. The planning system will be centralised around the proposed Infrastructure Planning Commission, which will be the sole decision maker for Round 3 projects. The IPC must be well resourced with skills and numbers, if it is to determine the 20GW of capacity which will be submitted over the next few years.

The onshore planning system is far more complex. Projects over 50MW are determined under Section 36 of the Electricity Act, by BERR in England and Wales, and the Scottish Government north of the border. Following a lull in Section 36 decisions in Scotland, 15 decisions have been made since the new Scottish Government stepped up its efforts and resources in summer 2007. They have gone further too, in establishing a voluntary decision-making target of nine months, which is applauded by the industry.

The real area of concern is the local decision-making process in the UK which is responsible for all wind farm applications of less than 50MW. Since January 2006, 25% of all these applications have been forced to appeal. The reason for this is twofold; first, the slow pace in decision-making at the local level is forcing the hand of developers to appeal for non-determination, as there is little incentive for local planning authorities to make a decision once the statutory 16 week target has been missed. Secondly, the inconsistency of decisions is leading to a high rate of refusals at the local level. The often expensive and time consuming appeal process is therefore becoming overloaded, which further delays decision-making.

Since January 2006 in the UK, only 54% of 167 onshore wind farm applications have been consented at the local level with England fairing worse at only 40%. This is significantly less than all other major housing, office, retail and general industrial development which when taken overall, achieve a 71% approval rate. Half of the 25% of applications which are determined at appeal are subsequently approved, equating to a total of 66% of local applications being approved since January 2006.



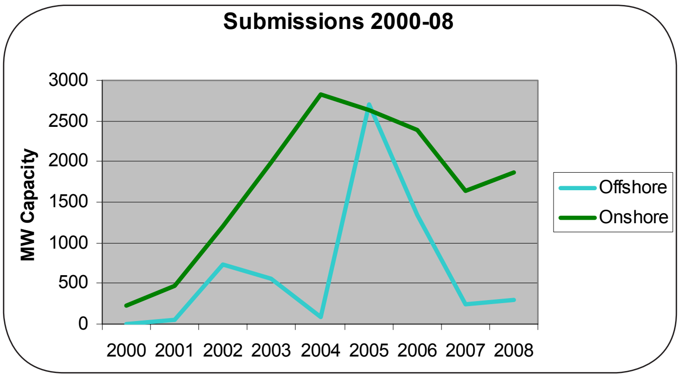

It is this planning performance at the local level which has been the lead factor in whether or not the 10% renewable electricity target will be met, and it is the same issue which will continue to threaten the industry's ability to meet the far greater challenge; to install at least 14GW of onshore wind capacity by 2020, which is required to meet the proposed UK allocation of 15% renewable energy generation.

### Increasing delays in decision-making

The overall decision-making process is now on the verge of spilling over to an average of two years. At the local level from April 2007 – March 2008, only 7% of applications were determined in the statutory 16 week target compared to the national average of 71% of all major development applications being determined in the equivalent 13 week statutory target. The locally elected planning committees should not be relying on the Planning Inspectorate to take decisions which should be taken at the local level in accordance with national and local policy. The resulting growth in the number of planning appeals increases developer risk and simultaneously absorbs growing amounts of council time and money.

### The impact of planning performance on investor confidence

The graph below shows more clearly the offshore Round 1 and Round 2 peaks in submitted applications, while the current lull signals the calm before the storm as the industry prepares for Round 3. It also highlights the step change in investment in the UK market following the introduction of the RO. However, a slow decline in onshore planning submissions in 2005-6 was followed by a significant drop in 2007 when submissions fell by nearly 50% compared with the peak interest in the UK market, in 2004. This was the lowest level of planning submissions since the RO was introduced in 2002. The significant fall in planning submissions demonstrates how volatile investor confidence can be when comparing developer risk in a competitive global market. The UK market can no longer expect investor priority over other markets based on wind resource alone. A reliable planning system must also be available to deliver consistent results and a reasonable rate of return.




### BWEA recommendations: Improving planning performance

There must be more responsibility and accountability in the decision-making process. In brief, some of the options that would streamline the planning process and lead to more consistent decisions include:

- The introduction of evolving targets for decision-making through Planning Performance Agreements, once the 16 week deadline has been passed
- Greater emphasis on local authority pre-application services
- Greater emphasis on the national need for renewables when considering wind farm applications
- Up to date and regular guidance for planning officers and planning committees on the issues surrounding wind energy developments and a possible pooling of planning expertise on renewable energy applications at a regional or sub-regional level
- Greater resources for the Planning Service in Northern Ireland
- Greater resources for the Planning Inspectorate and a more proportionate approach to be given for smaller schemes which could be dealt with through hearings or by written representation

### Current planning status – a snapshot

The following table provides a breakdown of the 7GW of onshore wind capacity currently in the planning system. Wales is still not attracting much developer interest when compared to the rest of the UK, primarily due to the long delay in refining the strategic planning policy originally adopted in the summer of 2005. The industry is continuing to play a waiting game while the lines are drawn to offer the confidence they need, with Wales being a good example of the shortcomings of the strategic planning approach.

**Breakdown of onshore wind projects & MW capacity in the planning system**

| | England | | Wales | | Scotland | | N. Ireland | | UK | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Scheme | MW | Scheme | MW | Scheme | MW | Scheme | MW | Scheme | MW |
| **LA** | 64 | 800 | 21 | 532 | 68 | 1085 | 49 | 1134 | **202** | **3551** |
| **S36** | 4 | 247 | 2 | 170 | 25 | 2522 | 0 | 0 | **31** | **2939** |
| **App** | 14 | 239 | 4 | 64 | 10 | 314 | 1 | 9 | **29** | **625** |
| **J.R.** | 2 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | **2** | **26** |
| **Total** | **84** | **1312** | **27** | **766** | **103** | **3921** | **50** | **1143** | **264** | **7142** |

Key: LA – local authority; S36 – Section 36 of the Electricity Act; App – Appeal; J.R. – Judicial Review

The most important and potentially concerning element of the data is that the vast majority of applications, 202 in all, are awaiting determination by local authorities. The 3,551MW from these projects equates to almost exactly half the capacity that is in the entire UK planning system, highlighting the need to improve performance in the planning system to prevent grid lock, to retain momentum in the UK market and to enable delivery of the 2020 renewable energy targets.

# 5. From consent to deployment

The time lag between consent and operation for onshore wind projects rapidly increased since the millennium, although it has now levelled out at around 28 months. Offshore, BWEA is receiving information from Round 2 developers to indicate that the consent to operation time is likely to increase to between 30 and 45 months. For both onshore and offshore projects, the reasons for the extended period from consent to operation relate to a number of key factors: finalising planning conditions and Section 106 Agreements, securing grid connection, and the scarcity in turbine availability, skills and expertise required to construct the projects.

## Grid constraints

Grid connection times have been increasing due to a lack of available capacity on the network. BWEA is calling for Government and Ofgem to adopt the sophisticated 'connect and manage' approach, allowing the grid to accommodate a portion of capacity from wind energy schemes and enabling connection to take place. In the longer term, to enable 30% of the UK's electricity to be generated from wind energy by 2020, major planning and investment for new infrastructure is urgently required.

## Supply chain and skills shortages

Turbine supply constraints are leading to delays in constructing consented projects. Global market conditions which are out of our hands, have lead to a shortfall in the supply of turbines as a result of increasing demand from around the world. There is no single solution to this problem. The UK must invest in coastal infrastructure such as ports and industrial facilities, in order to enable manufacture, assembly, construction and operation of wind farms in the years to come. Incentives should be offered to encourage inward investment by overseas turbine manufacturers and diversification of UK firms with the capability, into the wind sector. In this way 50% of the value of wind installations could be captured by UK plc for the benefit of our economy. The shortage in UK engineering and technical skills and expertise must also be addressed through establishing further education courses coupled with marketing of the career benefits that the renewables sector has to offer.

# 6. What does the future hold?

Offshore wind is beginning to accelerate the path to deployment. Rhyl Flats, Gunfleet Sands I & II, and Robin Rigg are under construction and Lynn and Inner Dowsing is almost complete. The larger offshore Round 2 projects at Thanet and Greater Gabbard are about to get underway, together adding 800MW to the UK's wind energy capacity. Including the 566MW already constructed, 1,840MW should be operating by the end of 2010 and more is possible.

A number of major onshore projects are also being constructed; Whitelee has commissioned 143MW of the 322MW project to date, turbine erection is complete at the first multi-turbine development in the South East with the 60MW Romney Marsh scheme, and the extension to Crystal Rig is underway and expecting generation of its 138MW in 2010.

| **Offshore consented projects - forecast timetable for delivery** | | |
|---|---|---|
| **Wind Farm** | **MW Capacity** | **Forecast completion** |
| Lynn and Inner Dowsing | 194 (162 commissioned) | 2008 |
| Rhyl Flats | 90 | 2009 |
| Thanet | 300 | 2009/10 |
| Gunfleet Sands I & II | 172 | 2010 |
| Robin Rigg | 180 | 2010 |
| Greater Gabbard | 500 | 2010 |
| Teeside | 90 | Potentially by 2010 |
| Ormonde | 150 | Potentially by 2010 |

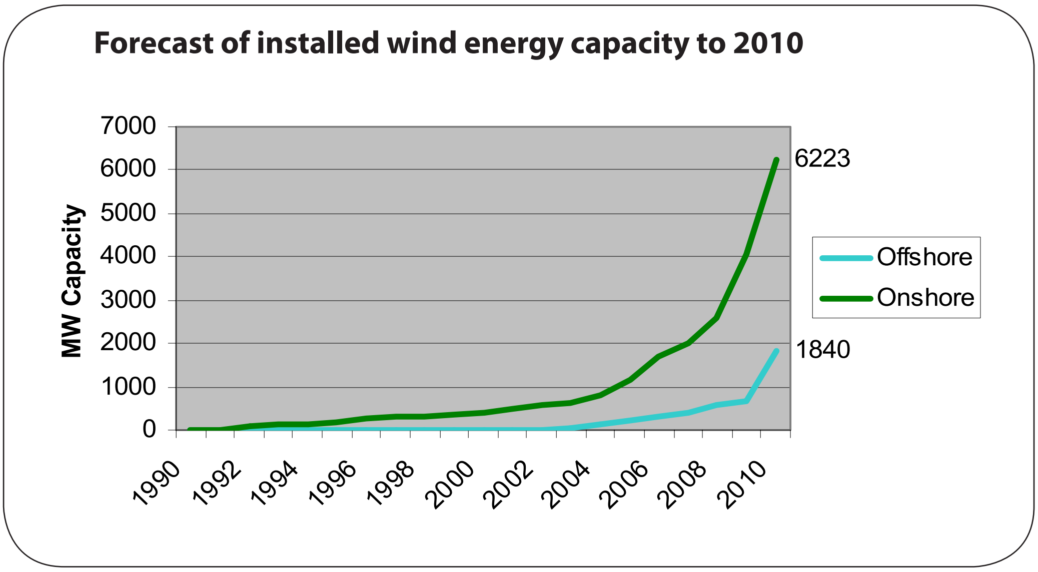
### Delivering the 4th and 5th gigawatt

There is currently 3,156MW of wind energy capacity installed in the UK. Once complete, the 772MW of onshore capacity currently under construction and the 90MW offshore at Rhyl Flats will lead to completion of the 4th gigawatt of wind energy in the UK by the end of the summer 2009, less than 12 months after the 3rd gigawatt. Beyond this, BWEA has received forecasts from offshore developers, while for onshore schemes 10% attrition is factored in and an assumption is made that projects will be commissioned 28 months following consent, based on the average taken over the last five years. This tells us that the 5th GW will most likely be completed around spring 2010.

### What is possible by 2010?

2010 is set to be a busy year with Clyde under construction and part commissioned by the end of the year. A further 1.6GW of onshore wind projects were consented prior to August 2008 and therefore should be commissioned by December 2010. Four offshore projects are currently on target for completion in 2010, totalling 1150MW, bringing the total installed offshore capacity to 1,840. A further 240MW is possible from Teeside and Ormonde which if deployed in time, would deliver the 2GW target for offshore capacity by 2010.

It is difficult to predict the 6th, 7th and finally the 8th GW which will deliver the 10% renewable electricity target but based on current performance, 6GW of onshore wind is deliverable by 2010. However, with over 2GW lined up for construction 2010, the industry can expect some extended lead times due to supply chain, grid constraints and the availability of skills to construct the wind farms. What is certain is that as 2008 has been the record year for consents, 2010 will be the record year for building and commissioning wind energy projects.




Note: All data taken from UKWED on 26th September 2008

## FOR FURTHER INFORMATION PLEASE CONTACT:

CHRIS TOMLINSON
Director of Programme Strategy
chris@bwea.com
020 7689 1963

CHARLES ANGLIN
Director of Communications
charles@bwea.com
020 7689 1966

NICK MEDIC
Communications Manager
nick@bwea.com
020 7689 1935

British Wind Energy Association
1 Aztec Row
Berners Road
London N1 0PW
Tel: +44 (0)20 7689 1935
Fax: +44 (0)20 7689 1969
www.bwea.com

The British Wind Energy Association is the trade and professional body for the UK wind and marine renewables industries. Formed in 1978 and with over 440 corporate members, BWEA is the leading renewable energy trade association in the UK. Wind has been the world's fastest growing renewable energy source for the last seven years, and this trend is expected to continue with falling costs of wind energy and the urgent international need to tackle $CO_2$ emissions to prevent climate change.