

State of the Industry Report

Onshore and Offshore Wind: A Progress Update

October 2011





RenewableUK is the trade and professional body for the UK wind and marine renewables industries. Formed in 1978, and with over 700 corporate members, RenewableUK 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 CO₂ emissions to prevent climate change.

In 2004, RenewableUK expanded its mission to champion wave and tidal energy and use the Association's experience to guide these technologies along the same path to commercialisation.

Our primary purpose is to promote the use of wind, wave and tidal power in and around the UK. We act as a central point for information for our membership and as a lobbying group to promote wind energy and marine renewables to government, industry, the media and the public. We research and find solutions to current issues and generally act as the forum for the UK wind, wave and tidal industry, and have an annual turnover in excess of five million pounds.

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Executive Summary

Wind Energy in the UK: current status
Taking a snapshot look at the UK's wind energy development status on 30th June 2011, 5,560MW of wind capacity was operational in the UK, with 3,615MW under construction. A further 5,437MW was consented, awaiting construction, giving a grand total of 14,612MW consented, under construction or operational. A further 9,084MW remain in the planning system awaiting determination. This figure is slightly down from 9,174MW in the system at the end of 2010 and 9,299MW at the end of 2009.

2011 Deployment

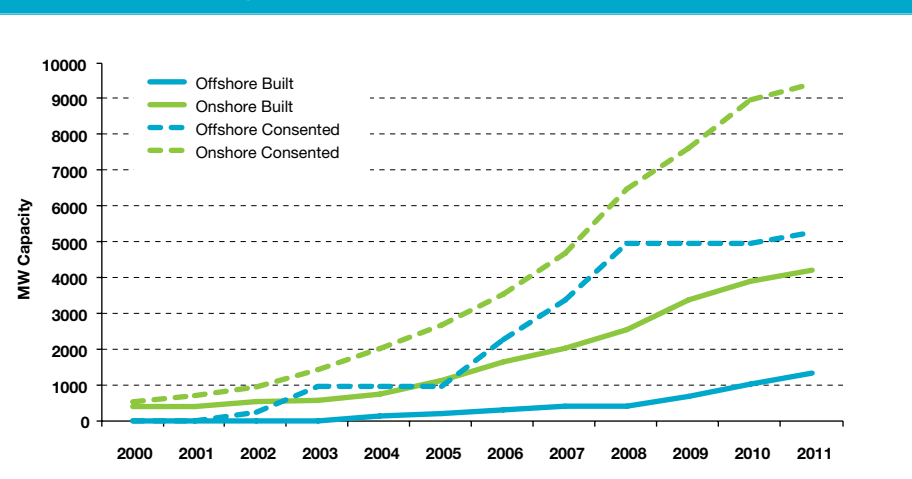
The twelve months from July 2010 to June 2011, which form the focus of this report,¹ saw an additional 44 projects (985MW) go operational across the UK. This is almost a 20% improvement on last year's figures over the same period, which saw growth of 794MW across an additional 37 schemes.

Looking ahead to the end of the calendar year 2011, deployment figures continue to look very healthy, with an additional capacity in the region of 980MW expected on line by the end of 2011, with approximately 550MW coming from onshore and 333.6MW from offshore schemes. These projects, in addition to that already deployed in the first half of 2011, are likely to bring total deployment over the year to December 2011, close to the 1.5GW of annual deployment forecast in the State of the Industry Report 2010, last September.²

Onshore

The twelve months to July 2011 saw 30 projects under construction totalling 1,377MW. This represents an onshore capacity increase of 25% on the 1,027MW recorded over the same period last year. As of the end of September this year, RenewableUK's records identify almost 1.5GW (32 projects) under construction across the UK; approximately 90 percent of which is in Scotland.

Graph 1: UK Wind energy capacity consented and commissioned mid-2000 to mid-2011



Offshore

Walney II (183.6MW) and London Array (630MW) moved into construction in the first half of 2011 contributing a total of 813.6MW potential capacity. At the end of June this year, a total of 2,238MW capacity was under construction, across seven projects; a 140% increase on the 1.6GW of existing UK offshore wind generating capacity, with final end of year deployment for 2011 expected to be 517MW.

In planning, decisions are expected on Race Bank, Docking Shoal and Westernmost Rough by the end of 2011, with Triton Knoll, the last of the Round Three projects, due to be submitted into planning before the end of this year.

Wind Energy production

2010 was an unusually low year for wind speeds across Northern Europe, including the UK. However, 2011 has seen a return to average speeds. As a result of the increased wind speed in 2011 and increased deployment there was a 70% increase in wind energy production in the first six months of 2011 to 6.97TWh compared to the 4.1TWh in the same period of 2010.

Submissions

Despite the largest ever number of onshore schemes being submitted for planning approval – 160, there has been a significant decline in the amount of

onshore capacity proposed. Capacity levels have fallen as proposed sites have become smaller, with the average size of new schemes in England falling to just 7MW, compared to 23MW in Scotland and 77.5MW in Wales. Overall, 1,792MW submitted 10/11 compared to 2008-9, when 2,565MW was submitted.

Consents

The amount of wind capacity being approved in planning rates has continued to fall for onshore wind., for the third year in a row the amount of capacity approved in the UK declined, falling from 1,564MW in 2007/08 to 1,114MW in 2010/11 representing 72 projects. Both England and Scotland saw the lowest capacity approved since 2006/07.

Only one offshore wind scheme was approved in 2010/11, the 230MW Humber Gateway, the first approved in nearly 3 years. Another, Dudgeon saw its onshore sub station effused permission by the Secretary of State in Summer 2011.

Approval rates

Under Section 36 of the Electricity Act (and the Planning Act 2008 in England and Wales) all electricity generation schemes over 50MW are decided by the Secretary of State for Energy in England and Wales and by Scottish Government Ministers in Scotland. There have been four such schemes, with a total of 381MW capacity, determined in the year

from June 2010 to July 2011, all four were approved giving a 100% success rate, up from 90% in 2009/10 and 72% in 2008/09.

Onshore the approval rates at local authority level have however seen a further decline from the historic lows of the last few years, and are now reaching a critically low level in England. Overall in the UK the approval rate fell by 11% to 42% of capacity determined.

Scotland saw a dramatic fall in the proportion of capacity approved from 57% in 2009/10 to just 39% in 2010/11. In England a 6% fall saw just 26% of capacity approved by local authorities. While Wales saw only two projects were determined, with just 28MW approved despite a backlog of schemes reaching 497MW in planning.

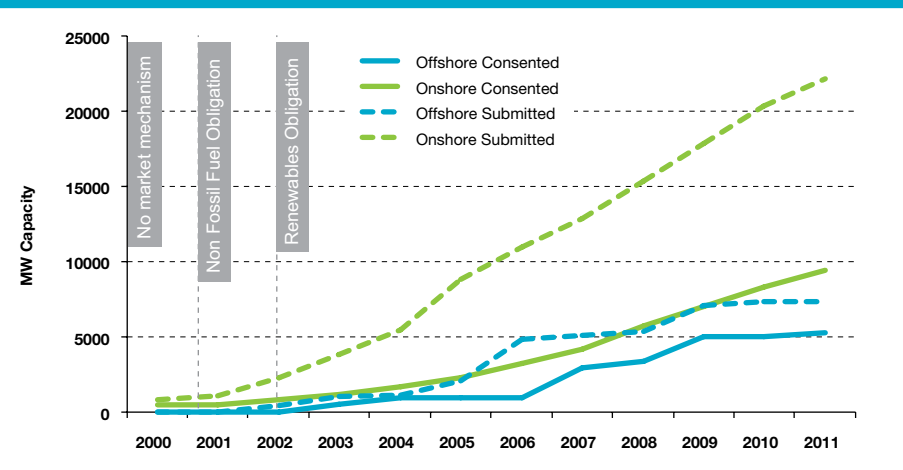
A new trend is emerging, particularly in England, where smaller schemes are receiving more favourable consideration, and larger schemes are increasingly likely to be rejected. In England in the year to July, none of the three schemes between 20-50MW were approved (compared to eight of 13 2009-10 and four of six 2008-9). Projects of 5-20MW achieved a 43% approval rate. However schemes below 5MW were much more successful, with 79% of capacity in projects between 2-5MW approved. This increased to an approval rate of 83% capacity for schemes below 2MW.

Project Delivery

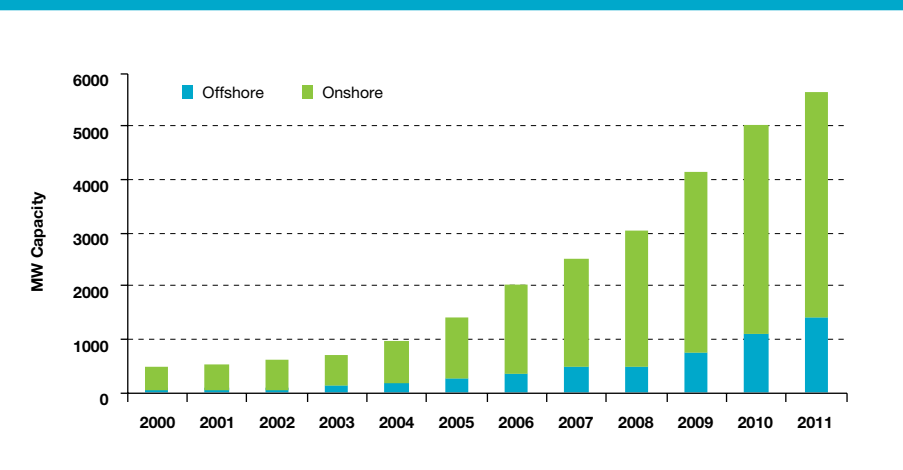
Onshore

RenewableUK commissioned an industry wide survey of developers to understand post-consent delivery trends and the potential impact of the pending Renewables Obligation Certificate (ROC) Banding Review carried out by Parsons Brinkerhoff (PB). The survey covered 78 operational wind farm developments representing developments with a cumulative total of 861 MW (20.4% of the UK's total) installed operational capacity. It also gathered data on nine

Graph 2: UK Wind energy capacity submitted and consented mid-2000 to mid-2011



Graph 3: UK operating capacity mid-2000 to mid-2011



wind farm developments currently under construction (representing a combined total of 198MW and 14.5% of the UK's total). In addition, data was received for 40 wind farm developments that are currently consented but have not yet entered the construction phase, totalling a combined rated capacity of 424.8 MW (11.3% of the UK's total).

The survey revealed that the average length of time from approval to build has increased from an average of 24 months in previous years to 33 months in 2010-11. For pre-construction projects the four key reasons were given by respondents for this were:

- Commercial viability (17%)
- The need to sell projects (14%)
- Civil radar issues (14%)

- grid connection (14%)

For operational schemes and those in construction the four reasons given were:

- The need to sell the projects post consent (26%)
- Difficulties sourcing turbines from manufacturers (21%)
- Intractable planning conditions (13%)
- Access route difficulties

Future Deployment

Onshore: ROC Banding Review

The ROC Banding review will set approval support levels for the final period of the Renewables Obligation (RO) up to 2017, after which the new Contract for Difference (CfD) mechanism will come fully into force. 89% of respondents believed that a banding

down of the ROC would effect the viability and delivery of their projects, a further 83% believed that it would also significantly affect the number of schemes they brought forward into planning.

Developers were asked to consider the impact of three scenarios for future onshore support levels, and to assess the likelihood of their schemes continuing under each of those rates of support.

- No change: 1 ROC per MW hour is retained for onshore – resulting in 11.97MW of onshore wind capacity being deployed in the UK by 2017.
- 10% cut: a new ROC level for onshore of 0.9 ROCs per MWh sees 10.36MW deployed by 2017. A loss of 1.61GW of capacity.
- 20% cut: Onshore support at 0.8 ROC per MWh leads to a loss of over 26% of potential capacity as just 8.83GW of onshore wind would be deployed.

Strikingly, even under the more moderate 10% it is the smaller, more marginal ‘community sized’ schemes, especially in England, which are achieving the highest approval rates which will be forced from the market by a cut in the support rate. Development will instead shift to larger ore profitable schemes outside of England, but under a 20% cut in ROC support, many of these will no longer be financially viable.

Offshore

BVG undertook a detailed qualitative survey of offshore developers on behalf of RenewableUK over the Summer. There is unprecedented offshore activity, with almost 2GW under construction – more than the entire 1.6GW operating fleet. However a number of important questions remain. Chiefly:

- The small pipeline of projects coming through planning.
- The pending ROC Banding Review.
- The post-Fukushima expansion of the German offshore market.

In addition the traditional concerns over financing, consenting, grid and supply

were also prominently raised.

By 2016, 8GW of offshore wind is expected to be deployed in UK waters, from a combination of Round 1, 2, 2.5 and potentially Scottish Territorial Waters projects. With annual deployment of 1.2GW expected in 2012, gradually increasing to over 2.5GW in 2016.

From 2017 onwards as Round 3 schemes begin to be deployed annual deployment of between 2.5-3.5GW is anticipated, making the central DECC scenario in its 2011 Renewable Roadmap attainable.

Offshore cost reduction & financing

There is widespread industry recognition that the cost of offshore wind energy production must be reduced. However it was also widely felt that this will only be achieved by delivering a large enough market to drive competition and innovation. There was concern that the 18GW ambition from the Government would not be great enough to achieve this.

Most developers were concerned that the introduction of CfD would lead to a fall in the support level, which when added to the uncertainty of transition could deter potential investment. While most developers were confident of their Round Two financing at present support levels of 2GW per MWh, several voices were much more cautious over Round Three.

Finance

Bloomberg New Energy Finance (BNEF) were commissioned by RenewableUK to review financing deals in onshore and offshore wind over the past five years and project trends going forward for 2012-15.

In 2006-7, prior to the economic crash financing of projects was split approximately 60/40 between project and balance sheet finance. Following the crash, this was effectively reversed so that in 2008-9 the distribution was roughly 40/60 between project and balance sheet finance. However the analysis carried out by PB demonstrates that this movement is now slowly reverting back and on present trends it

is expected that financing will return to levels experienced prior to 2008.

EIB fund

In late 2009 following extensive industry activity HM Treasury, DECC and the European Investment Bank (EIB) launched a £1.4bn initiative to improve the supply of project finance debt. This was done in conjunction with three banks: RBS, Lloyds and BNP Paribas Fortis. Collectively, these banks are contributing 50% of the loan funds. Up to the end of the third quarter of 2011, approximately half of the guideline EIB funds have been disbursed.

Onshore

Looking ahead, BNEF anticipate that the volume of debt required to finance onshore schemes will increase toward 2015 as Tier 1 companies focus on offshore wind development and as Tier 2 and 3 sponsors continue to deploy an increased number of smaller projects, causing a corresponding increase in the need for project finance.

An estimated £4.9bn will be required in the next couple of years in order to deploy the 5.1GW by the end of 2015, assuming a cost of £1.25m/MW. An estimated 31% of this capacity (1.5GW) is owned by Tier 1 sponsors, and is expected to be financed on balance sheet at a cost of just under £2.2bn. This figure includes developer equity invested alongside project debt, leaving an estimated £2.3bn of project finance debt required to fund the build-out of the remaining 3.6GW.

Offshore

Bloomberg New Energy Finance's analysis of offshore finance suggests that a further 3.67GW of offshore wind will be commissioned over 2012-15, requiring £13.6bn in investment. Only one project, the Lincs 270MW scheme, is expected to be financed pre-construction with project finance, with the remaining schemes to be deployed before the end of 2015 expected to be financed from balance sheet.

Wind Energy Production

The first half of 2011 saw significant increases in energy output from wind compared to the same period in 2010, driven by significant capacity additions and a return to average wind speeds, in contrast to 2010's unusually calm conditions. In the first half of 2011 wind generated 6.97TWh, 70% more than the 4.1TWh in the first half of 2010. Onshore wind output was up 64% from 2.97TWh to 4.86TWh, whilst offshore rose even further, up 87% from 1.13TWh to 2.11TWh.³

Across the whole of northern Europe in 2010, wind speeds were considerably lower than long-term averages, and the UK was no exception. The North Atlantic Oscillation Index, a measure of the atmospheric pressure difference between Gibraltar and Iceland, was negative for much of the year, leading to abnormally high pressure systems over the North Atlantic, sending low pressure systems over southern Europe and leading to calm conditions in the north. Consequently, wind speeds over the UK were at lows not seen for at least the previous ten years or possibly longer.

As a result, load factors were considerably down on figures for 2008 and 2009. DECC statistics show that for onshore wind,⁴ load factors reduced from a recent high of 29.4% in 2008 to 21.5% in 2010, and similarly offshore load factors reduced from 34.9% in 2008 to 29.6% in 2010.⁵

Whilst the year to December 2010 saw an increase in the amount of electrical energy provided by wind overall, due to the installation of new wind generating capacity, energy growth was low compared to capacity growth, with a 9.6% increase in energy provided, from 9.32TWh in 2009 to 10.22TWh in 2010. This low growth was due to an absolute decline in the output of onshore wind of 5%, from 7.56TWh in 2009 to 7.14TWh in 2010, despite increasing capacity, because of the low load factors.

The increase in overall output was because of a significant rise in offshore wind capacity (an increase of 653MW between January and December 2010), which drove offshore output up 74.9%, from 1.74TWh to 3.05TWh.

The return of wind speeds to more typical levels in the first half of 2011 suggests that average annual load factors will also increase in 2011. September 2011 proved to be a record month for wind generation, with over 10% of UK electricity being generated by wind at the daytime peak on 6 September.

1. This report focuses on the twelve-month period starting on 1 July 2010 to 30 June 2011. This time period is also described as "the year to July 2011".
 2. The State of the Industry Report 2010 used the twelve months from 1 October 2009 to the 30 September 2010 as the basis of assessment.
 3. See Energy Trends, September 2011 – www.decc.gov.uk/en/content/cms/statistics/publications/trends/trends.aspx.
 4. Digest of UK Energy Statistics 2011, Table 7.4 p. 214 – www.decc.gov.uk/en/content/cms/statistics/publications/dukes/dukes.aspx.
 5. On an unchanged configuration basis.

Consents

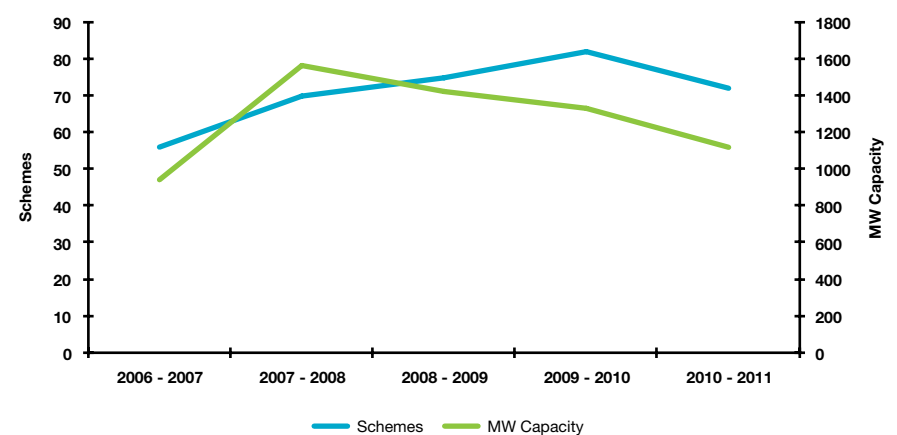
Onshore

Over the twelve months to July 2011, the UK saw 1,114MW (72 projects) consented, with 29 schemes (641MW) having been brought forward in Scotland and 31 schemes in England (226MW). Eleven schemes, totalling 218MW, were given the go ahead in Northern Ireland, whilst Tirgwynt (27.6MW) remains the sole project to have secured consent in Wales this year, with four of the five projects determined in Wales having been refused by local councils or the Planning Inspectorate.

Whilst Scotland continued to provide the lion's share of UK generation capacity, approving almost three times the capacity secured in England, this year saw a greater number of planning consents granted for wind energy schemes in England than in Scotland for the second year running. However, total UK capacity approved fell for the third year running, down from a high of 1,564MW consented in 2007-8 and the 1,420MW and 1,328MW approved in 2008-9 and 2009-10 respectively. Capacity consented in Scotland over the year to July (641MW) was also down for the third consecutive year, falling by over a third on that approved in 2007-8 (998MW) and hitting the lowest level of annual capacity since 2006-7, which stood at 512MW.

Whilst annual consented capacity in England rose significantly in the year 2009-10 to 542MW, assisted by the Section 36 consent of Ray Estate (56MW) and the approval at appeal of Green Rigg (36MW) in Northumberland, the last twelve months have witnessed a fall in consented capacity of almost 60%. With only 226MW consented at all levels in the twelve months to July, this year marks the lowest level of consented capacity in England since 2006-7.

Graph 4: UK onshore consented capacity mid-2006 to mid-2011



The average size of a consented project in England reduced by half this year, with an average capacity of just above 7MW, having remained relatively stable over the previous 24 months to July 2010, with an average scheme capacity range of 13.2 to 13.9MW. The fall in the average size of projects consented in England this year is evidence of a recent trend towards a preference to approve smaller schemes, and is discussed further in Planning Performance.

There also appears to be a trend towards smaller average capacities for onshore projects consented in the UK. The average project size for consents granted across the UK in the year to July was 15.5MW. This is slightly down on previous years, with average capacities recorded at 16.2MW in 2009-10 and 19MW in 2008-9. In fact, smaller average capacities for consented schemes have not been recorded across the UK since the year 2000-1, when average turbine size was less than 1MW.

See the Review of Planning Performance on page 10 for further details on consenting across the different areas of the UK.

Offshore

Humber Gateway (230MW) was the sole offshore scheme to have received consent in the twelve months to July 2011, having been successfully determined in February this year after almost three years (34 months) awaiting a decision. The approval of Humber Gateway marks the first offshore consent in over two years, following the consent of Gwynt Y Mor in December 2008.

Three Round Two offshore schemes; Docking Shoal, Race Bank and Westernmost Rough currently await determination by the Secretary of State. All three projects, totalling 1,400MW, are located in the Greater Wash and have been in planning for a combined period of almost ten years (118 months). It is expected that most of these schemes will receive consent shortly.

It was also hoped that autumn 2011 would see the consent of Warwick Energy's onshore substation, required to connect Dudgeon Offshore Wind Farm. The decision made by ministers Eric Pickles and Chris Huhne to reject the substation at Little Dunham could delay commissioning of the 560MW project by up to two years. The decision sets a worrying precedent in terms of consenting onshore infrastructure, and the developer is currently reviewing their options.

Wind Energy in the UK: Current Status

Taking a snapshot look at the UK's wind energy development status on 30 June 2011, 5,560MW of wind capacity was operational in the UK, with 3,615MW under construction. A further 5,437MW was consented, awaiting construction, giving a grand total of 14,612MW consented, under construction or operational. A further 9,084MW remain in the planning system awaiting determination. This figure is slightly down from 9,174MW in the system at the end of 2010 and 9,299MW at the end of 2009. This activity is broken down further in Tables 1 and 2, and Graph 5.

Onshore

Total onshore capacity in operation at the end of June 2011 stood at 4,219MW with an additional 43 schemes (685MW) pushing onshore generation capacity above 4GW for the first time. A number of projects have become operational since 1 July 2011, including Falck Renewables' Kilbraur Extension (20MW), Ecotricity's Dagenham II (2.3MW) and Kessingland (4.1MW), owned by Triodos Renewables.

The volume in construction on 30 June stood at 1,377MW, up by over 270MW on the capacity in construction in September 2010. Since July, the amount of onshore construction capacity has grown still further, now standing at an all-time high of 1,390MW.

Table 1. UK Onshore status

	Schemes	MW
Operational	294	4218.85
Under construction	30	1376.87
Approved, not built	221	3739.72
In planning	307	7123.65

The number of projects consented and awaiting build-out continues to rise, with 221 schemes (3,740MW) awaiting construction at the end of June, an increase of almost 200MW and 32 projects in the nine months since September 2010, when figures were last published.

At the end of June this year, 7,124MW onshore capacity was in planning across the UK, down slightly on the figures shown last September, which stood at 7,333MW. However, since July, the submission of an additional 232MW saw onshore capacity in planning reach 7,356MW on 1 September 2011 (see table below).

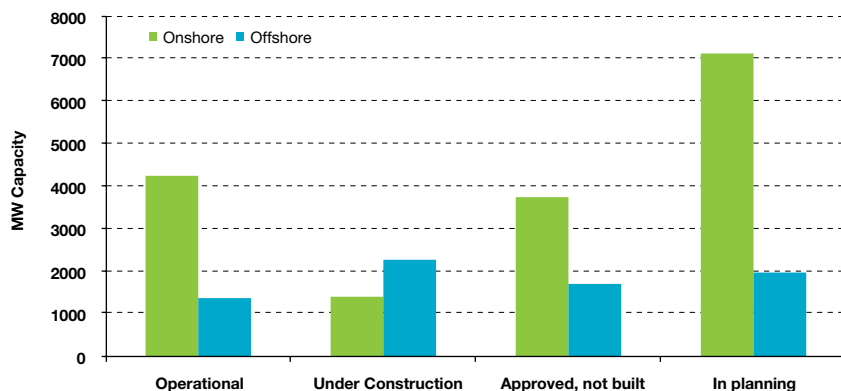
Table 2: Current UK offshore status

	Schemes	MW
Operational	13	1341
Under construction	7	2238
Approved, not built	5	1697.10
In planning	4	1960
Crown Estate Agreements* comprising:	26	39169
Round 3 ZDA	9	32000
Rounds 1 & 2 extensions	4	1539
Scottish Territorial Waters	9	5630
Demonstration sites	4	tbc

*Crown Estate Exclusivity Agreement/Agreement to lease/ Zone Development Agreements

Table 3: Breakdown of Onshore Wind Projects & MW Capacity in the Planning System

	England		Wales		Scotland		Northern Ireland		UK	
	Scheme	MW	Scheme	MW	Scheme	MW	Scheme	MW	Scheme	MW
LPA	78	675.94	18	496.88	107	1129.43	40	657.60	243	2959.85
S36	2	114.00	8	921.60	25	2693.60	0	0.00	35	3729.20
Appeal	20	321.90	0	0.00	6	59.60	1	9.10	27	390.60
JR	1	6.00	1	38.00	0	0.00	0	0.00	2	44.00
Total	101	1118	27	1456	138	3883	41	667	307	7124

Graph 5: Status of UK wind energy capacity⁶

Offshore

Since June 2010, Vattenfall's 300MW Thanet project was commissioned bringing the total offshore operational capacity to 1,341MW in September 2010. At 30 June 2011 almost 2.25GW was in construction and a further 2GW in planning.

Since the end of June, a further project, Walney I, has gone operational, with final commissioning of its 51 turbines recorded just a day later, on 1 July 2011. The completion of Walney has meant that total capacity under construction has since fallen slightly to 2,054MW.

For further status details of offshore projects, please see the section on 'Future Offshore Deployment'.

Submissions

Onshore

Across much of the UK there has been a recent increase in the number of smaller-scale applications below 2MW in capacity, with the number of projects submitted in this range growing by two-thirds in two years, from 21 schemes (15MW) in 2008-9 to 60 schemes (29MW) in 2010-11. This trend,

which now represents 38% of total UK submissions, up from just 15% in 2008-9 follows the introduction of the Feed-in Tariff (FiT) in April 2010, is consistent with industry expectations, with all areas of Great Britain having experienced noticeable increases in submissions at this scale. Only Northern Ireland experienced a fall in submissions for schemes below 2MW, as the only part of the UK without a FiT system for projects below 5MW.

A marked trend can also be seen at the other end of the project scale, in the volume of capacity coming forward in schemes above 50MW. A notable decline in the capacity submitted at this level, and a fall in the average size of >50MW submissions of around 38%, from 149.6MW in 2008-9 to 92.2MW in 2010-11, may indicate that the industry has reached a peak in terms of the largest sites.

A total of 160 projects were submitted into planning at all levels in the twelve months to July 2011, representing the highest annual rate of submissions to date. However, the volume of capacity submitted appears to have fallen sharply in the last two years, with annual submitted capacity having reached a low

not seen since 2003-4, when 1705MW were submitted across just 65 schemes. Only 1793MW were submitted in the year to July 2011, spread across these 160 schemes, bringing average project size submitted in 2010-11 to 11MW; a 68% fall in project size, from 26MW average submission size in 2003-4.

In England, the average size of projects submitted into planning fell to its lowest level since 2007-8, with average project size for submitted schemes now sitting at just over 7MW, down from an average of 11.5MW in 2009-10 and a high of 12.9MW recorded in 2008-9. In Scotland and Wales there was a small increase seen in the average size of submitted schemes in 2009-10, at 23MW and 77.5MW respectively. However, the year to July 2011 saw average capacities fall by 42% in Scotland and 55% in Wales. Scottish submitted capacity fell to an average of just over 13MW per submission and average scheme capacity in Wales fell to 35MW – the largest fall in the UK.

Offshore

No new large scale offshore schemes were submitted for determination by DECC ministers or by the Scottish Government in 2010-11, with the submission of Triton Knoll, Kentish Flats II and Galloper expected in the near future. Four projects remain in planning and are expected to be determined shortly. These four schemes have a combined capacity of 1,960MW.

As stated earlier in this report, two of four offshore demonstration sites have progressed to the application stage. DONG Energy applied to the MMO in December for their two-turbine demonstration site at Gunfleet Sands, and Aberdeen Offshore Wind Ltd submitted their proposals for a European Offshore Wind Deployment Centre to Marine Scotland in August 2011.

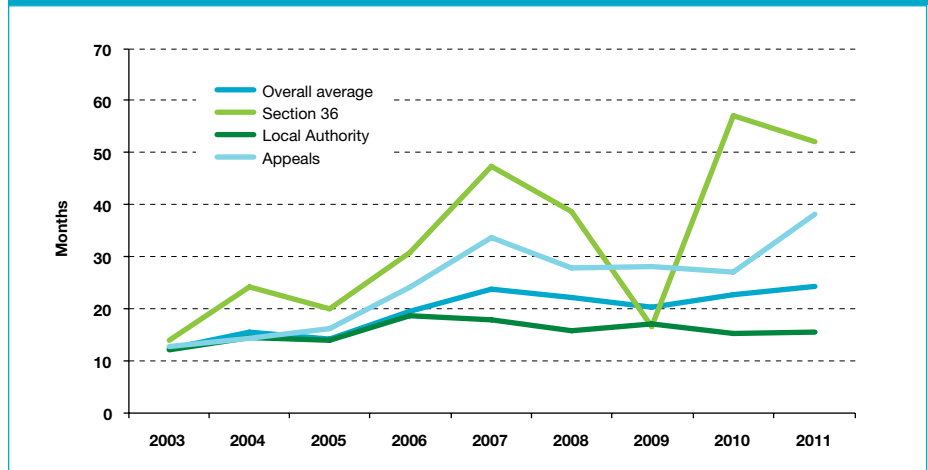
6. Status graphs show a snap-shot view, as taken at the end of June 2011

A Review of Planning Performance

The ratification of the National Policy Statements (NPSs) for energy in July 2011 may be seen to mark a significant step forward in the treatment of renewable energy infrastructure in the planning system. The clear 'statement of need' contained within both the Overarching Energy and Renewable Energy NPSs, and their role as the principle policies against which nationally significant energy infrastructure may be assessed, should facilitate a more favourable consideration of large scale renewable projects. The Government has also remained committed to ensuring that the consenting regime under the new Major Infrastructure Planning Unit (MIPU) will remain consistent with that of the Infrastructure Planning Commission (IPC) set out in the Planning Act 2008, with only minor changes being made to the Act through the current Localism Bill.

However, planning in many areas remains uncertain, both for major infrastructure projects onshore and offshore, and for onshore schemes at the local level. These uncertainties stem from a range of sources including the creation of a new National Planning Policy Framework in England, recent difficulties in planning for grid infrastructure in Wales and the surprising decision to refuse a much-needed onshore grid connection for the Dudgeon offshore scheme, off the Norfolk coast. A decline in approval rates at appeal in some parts of the UK is also of growing concern.

Graph 6: UK onshore average decision time mid-2003 to mid-2011



Offshore decision-making

The year to July 2011 saw the consent of Humber Gateway and the refusal of the proposed substation for Dudgeon East. This year was therefore a mixed year for offshore decision-making, with ministers consenting the first offshore capacity in almost three years, whilst choosing to uphold a previous decision against the installation of a substation at Little Dunham, designed to bring onshore 560MW of offshore capacity.

The industry will be closely monitoring the progress of the three projects about to submit planning applications to the IPC.

Onshore decision-making

Onshore decision-making this year shows significant differences in the way that schemes are treated in planning, both in terms of the types of projects that are likely to be consented at the local level and the conclusions reached by planning inspectors at appeal. No schemes have yet come forward for determination under the new Major Infrastructure Planning regime.

Approval rates: ministerial approval >50MW

The UK has experienced an increase in approval rates for schemes above 50MW in the year to July, currently standing at 100%, up from 90% capacity approved over the previous twelve months and from the 72% of capacity approved in 2008-2009. This year's approval rate is based on the successful determination of all four schemes decided by Ministers this year; Blacklaw Extension, Blackcraig, Dunmaglass and Fallago Rig in Scotland, with a cumulative capacity of 381MW.

However, no schemes were decided above 50MW elsewhere in the UK, causing a significant drop in the number of projects and capacity approved this year, down from the eight projects (493MW) approved in 2009-10 and the six schemes (724MW) consented in 2008-9.

Approval rates: local level <50MW

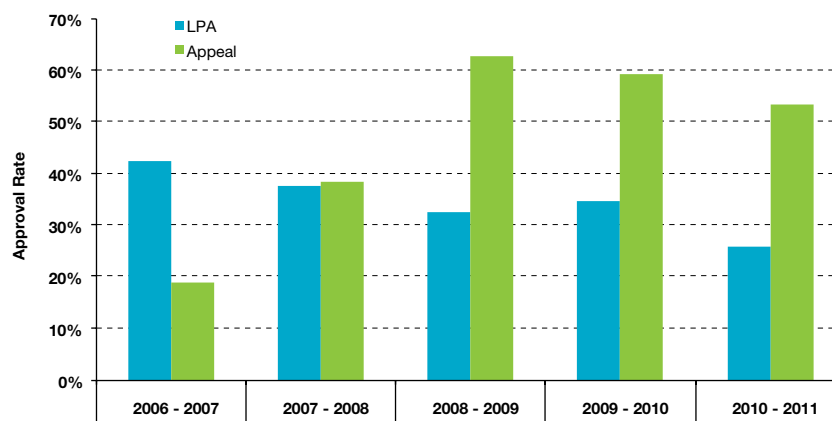
The average UK approval rate for schemes below 50MW shows a declining trend at local authority level, falling from an average of 53% consented capacity (58% of projects) in the year to July 2009 to a low of 42% capacity (54% of projects) in 2010-2011. In the twelve months to July 2011, approval rates based on capacity consented fell across England, Scotland and Wales.

In England, capacity based approval rates continue to be substantially lower than in other parts of Great Britain, with an average approval rate of just 26% capacity and 41% by project. Capacity based approval rates have seen a relatively steady decline in recent years, down from 32% capacity approved in 2008–2009 and 42% capacity approved in 2006–2007. This progressive fall in approval rates in England is all the more concerning for the increase in determinations experienced in recent years.

However, local approval rates in Scotland have seen the steepest fall over the last three years in terms of consented capacity; down from 58% in 2008–2009 and 57% in 2009–2010, approved capacity has fallen by 19%, currently standing at just 39%. Project based approval rates in Scotland have also fallen significantly, down 16%, from 78% projects consented in 2008–2009 to 62% projects in 2010–2011. The number of schemes determined at the local level in Scotland has also fallen over the last three years, down from 40 schemes decided in 2008–2009 to just 34 decisions in 2010–2011.

In Wales, a significant slow down in decision making at the local level is resulting in an increase in the volume of capacity awaiting approval, up from the 343MW sitting with local planners at the end of June 2009, to 497MW now awaiting determination. With only two projects determined and 28MW out of a potential 45MW consented in the year to July, against the approval of five out of six schemes (85MW) consented at the local level in 2008–2009, the delivery of the capacity objectives set out in TAN8 look further away than ever.

Graph 7: Approval Rate in England (MW)



Only in Northern Ireland did approval rates by capacity improve this year, with seven out of eight schemes totalling 99MW receiving consent in the year to July 2011. This is significantly up on the 34% capacity approval rate last year (58% of projects) where seven of 12 schemes determined were approved.

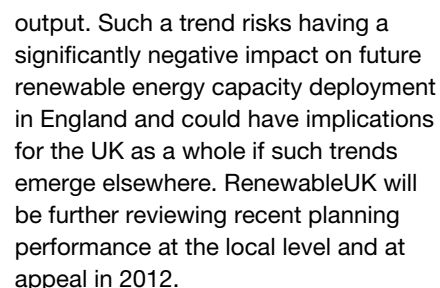
Looking at decision-making in England a little further, there appears to be a marked difference in the way that schemes of different sizes are treated by local authorities and these differences can have a significant impact on average approval rates within England as a whole.

Of the two schemes with a capacity of 20–50MW in size decided at local level in the year to July 2011, both were refused at local planning committee. A third scheme was refused at appeal. Of the 91MW potential capacity contained within these schemes, none were permitted over the course of 2010–2011. This fall in both decisions and approvals (at a local level and at appeal) for projects at this scale is seen in contrast to last year when eight of 13 projects (196 of 327MW)

were approved and to 2008–2009 where four of six projects (108 of 158MW) were approved. This trend may also be considered as symptomatic of the current planning confusion around renewable energy projects, and onshore wind schemes in particular, in England. The falling success rate for larger schemes in England is also seen in contrast to the approval rates of smaller schemes below 5MW. In the year to July, 21MW of the 26.5MW determined by local planning committees were approved in the 2–5MW size range, giving an approval rate of 79% by capacity. Similarly, of the 4.7MW determined in the 0–2MW size range, 3.9MW were approved by committee, with a capacity approval rate of 83%. For projects with a proposed capacity of 5–20MW, approval rates were 43% by capacity and 44% by scheme. While the approval rate for smaller projects in England is encouraging, taken as a whole, these findings represent a worrying trend in decision-making, away from larger schemes with a greater potential capacity, in favour of smaller schemes with lower potential

Table 4: UK Approval Rates at the local level (Jul to Jun figures) by scheme and MW

	2006 – 2007	2006 – 2007	2007 – 2008	2007 – 2008	2008 – 2009	2008 – 2009	2009 – 2010	2009 – 2010	2010 – 2011	2010 – 2011
	Scheme	MW	Scheme	MW	Scheme	MW	Scheme	MW	Scheme	MW
LPA	64%	65%	80%	72%	58%	53%	49%	45%	54%	42%
Appeal	33%	38%	50%	39%	50%	53%	50%	50%	51%	45%



Across the UK as a whole, 51% of projects and 57% of capacity were approved at appeal, with 440MW out of a potential 793MW approved in the year to July 2011.

A bar chart comparing the approval rates for LPA (blue bars) and Appeal (green bars) across three time periods: 2008-2009, 2009-2010, and 2010-2011. The Y-axis represents the Approval Rate, ranging from 0% to 60% in 10% increments. The X-axis represents the time period in MW. The chart shows that the approval rate for LPA was highest in 2008-2009 (approximately 53%) and lowest in 2010-2011 (approximately 42%). The approval rate for Appeal was highest in 2009-2010 (approximately 50%) and lowest in 2010-2011 (approximately 45%).

Period	LPA (%)	Appeal (%)
2008 - 2009	53	53
2009 - 2010	45	50
2010 - 2011	42	45

In England, there has been a noticeable increase in the number of projects at appeal over the last twelve months, up from 12 schemes in September 2010 to 20 schemes in June 2011. This increase can be seen as a direct reflection of falling approval rates at the local level, with a 40% increase in the number of projects and a 23% increase in the capacity currently at appeal. The approval rate at appeal in England currently sits at 41% by MW capacity and 52% by scheme.

UK average decision times currently stand at 52 months for projects above 50MW determined by the Secretary of State, just over 38 months for schemes at appeal and 15.5 months for projects determined at the local level. Decision times for onshore schemes determined by the Secretary of State show a fall from the 60 months average decision time recorded last year, and a relatively stable 15 months decision time at the local level. However, there has been a significant increase in the time that projects now spend at appeal, rising 46% from the 26 month average recorded over the previous twelve months. This finding correlates clearly with the increasing number of projects that are currently siting in the appeal system across parts of the UK.

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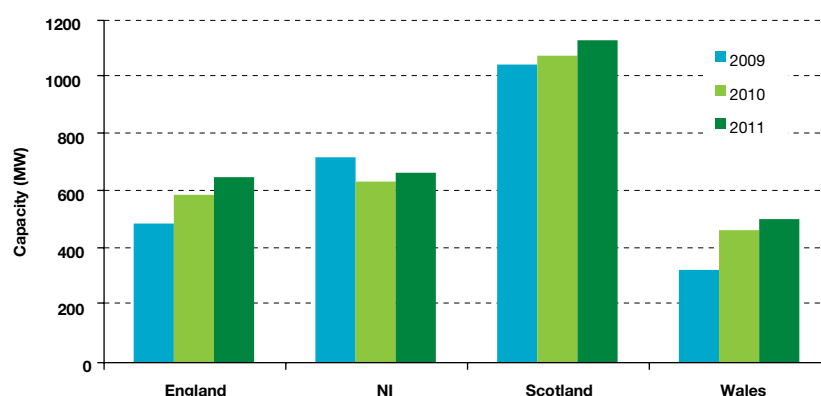
	England		Wales		Scotland		N. Ireland		UK	
	MW approved	MW%	MW approved	MW%	MW approved	MW%	MW approved	MW%	MW approved	MW%
LPA	102.92	35%	4.6	20%	186.38	45%	65.5	100%	359.4	47%
Appeal	80.9	45%	-	-	33.2	19%	119.7	99%	233.8	42%
S36	-	-	-	-	381	100%	-	-	381	100%
JR	19	100%	-	-	-	-	-	-	19	100%

In Northern Ireland, approval rates of 80% by project and 99% by capacity were recorded over the year to July 2011, with four commercial-scale schemes determined successfully, and one refusal of a sub-1MW scheme. Consented capacity at appeal totalled 99MW.

The opposite was true of determinations at appeal in Wales over the same period, with three schemes, Gorsedd Bran (39MW), Mynydd y Gwair (38MW) and Pendragon Fach (5MW) refused at appeal since last July. A fourth scheme, Pentre Tump (3.9MW) was withdrawn from appeal in November last year, following a ruling by the Welsh Assembly Government that plans for the small wind farm, which would consist of three turbines, must include an Environmental Impact Assessment (EIA). The Government's ruling came after the 3.9MW project had spent a total of eight years in development.

Approval rates at appeal in Scotland were 54% by capacity and 38% by scheme, with a total of 209MW from five schemes consented at appeal out of 380MW (thirteen projects).

Graph 10: Onshore wind capacity in planning at the local level <50MW



Graph 11: Onshore wind capacity in planning >50MW

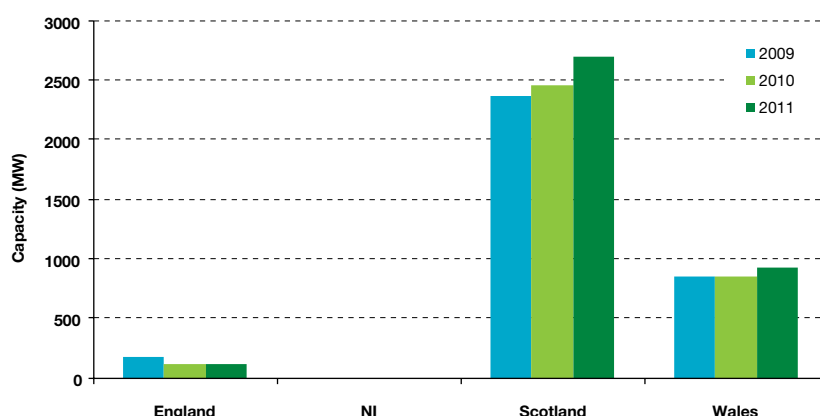


Table 7: UK onshore submissions according to project size

	Under 2MW		2-<5MW		5-<20MW		20-<50MW		50MW+	
	MW	Scheme	MW	Scheme	MW	Scheme	MW	Scheme	MW	Scheme
2008-2009	15	21	67	21	636	59	799	28	1047	7
2009-2010	11	19	57	18	661	65	618	18	1129	10
2010-2011	29	60	65	20	524	54	714	22	461	5
Total	55	100	122	59	1821	178	2131	68	2637	22

Table 8: UK onshore submissions under 2MW

	England		Wales		Scotland		Northern Ireland		UK	
	MW	Scheme	MW	Scheme	MW	Scheme	MW	Scheme	MW	Scheme
2008-2009	2	4	0	0	12	15	1	3	15	21
2009-2010	3	7	0	0	8	12	0	0	11	19
2010-2011	10	27	0.5	1	18	31	0	0	29	60
Total	15	38	0.5	1	38	58	1	3	55	100

A Year in Policy

National Policy Statements (NPS) for Energy

The NPSs for Energy were debated in the House of Commons on the 18th of July and designated under the Planning Act 2008 by the Secretary of State for Energy and Climate Change on 19th July 2011.

The NPSs set out national policy in England and Wales, against which proposals for major energy projects will be assessed and decided on by the Infrastructure Planning Commission. The NPSs comprise an Overarching Energy NPS and six thematic NPSs, including a Renewable Energy Infrastructure NPS.

In the future, if the changes to the Planning Act 2008 set out in the Localism Bill are enacted, the NPSs will also be the primary documents for the new Major Infrastructure Planning Unit which will be set up within the Planning Inspectorate to replace the Infrastructure Planning Commission, to use in its examination of applications for development consent, and for Ministers when making decisions.

Localism Bill

The Localism Bill was introduced to Parliament on 13 December 2010, with a purpose of shifting power from central government back into the hands of individuals, communities and local councils. The Bill applies to England and Wales and is expected to receive Royal Assent by the end of the year becoming the Localism Act 2011.

Two significant provisions of the Bill as it stands at the House of Lords Report stage include those on referenda and the Duty to Co-operate. Referenda as previously proposed would be non-binding and take place when 5% (or less if the Local Authority determined it as such) of the local population called a referendum or if a member of the Local Authority calls for one.

Following a great deal of coordinated work with a number of other organisations and Peers with a development interest, RenewableUK has been successful in ensuring that planning applications and wider planning policy are not subject to referendums. An amendment tabled by Lord Greaves and accepted by the House of Lords in early October has resulted in the removal of all references to non-binding referendums within the Bill and is not expected to be re-introduced in the final stages of the Bill in the Commons.

RenewableUK has also urged Government to strengthen the Duty to Co-operate provisions of the Localism Bill to place an obligation on local authorities to positively plan for renewable energy infrastructure, particularly across local authority boundaries.

The Localism Bill also covers major infrastructure planning, the abolition of the Infrastructure Planning Commission, the transfer of its examination functions to the Planning Inspectorate and the establishment of the Major Infrastructure Planning Unit once the Localism Bill receives Royal Assent.

National Planning Policy Framework (NPPF)

The draft NPPF was published in July 2011, following the publication of an Advisory Group draft. This is a key part of the Government's reforms to make the planning system in England less complex and more accessible, and to promote sustainable growth. Despite its pro-development theme, the draft NPPF does not, in RenewableUK's view, give sufficient guidance to local authorities and developers.

RenewableUK's response to the draft NPPF urged the Government to find the right balance in the NPPF in order to ensure that the provision of clear and necessary direction on national policy

priorities and appropriate planning procedures are not lost in the pursuit of a single, streamlined document. Our submission sought that the presumption in favour of sustainable development be made a positive planning tool by providing local authorities with much needed guidance and time to get their local plans in place, prior to enforcing the presumption. We consider the Scottish Government's consolidated planning policy to be a good model and would welcome such direction within national policy.

The consultation on the draft NPPF closed on 17 October 2011.

Community Benefits Protocol

In February 2011 RenewableUK launched the Community Benefits Protocol with the backing of the Department of Energy and Climate Change Minister of State Charles Hendry MP. The protocol recognises local communities' commitment to accommodating onshore wind farms by ensuring that a proportion of the benefits delivered by these projects are realised within the communities that live near them.

At a minimum, a community benefit scheme will receive at least £1,000 per megawatt of installed capacity per annum. The decision on how such funds will be allocated will rest with the community living in the vicinity of the wind farm. The protocol applies to wind farm developments in England of over 5MW and came into effect in May 2011, three months after its launch.

Natural Environment White Paper (NEWP)

The NEWP was published by DEFRA in June 2011 and sets out to halt overall biodiversity loss by 2020 through a 'landscape scale' approach. The approach supports the recovery of healthy, well functioning ecosystems and establishes coherent ecological networks with a greater number of improved areas for wildlife.

The role of the planning system is identified as being an important means of delivering the non-legislative initiatives detailed within the White Paper. It is therefore especially important that the DEFRA's proposals are consistent with, and do not frustrate the Government's wider development policy and that any new protections do not place a presumption against the development of renewable energy.

RenewableUK responded to the Paper by welcoming the Government's commitment to establishing a clear institutional framework to achieve the 'recovery of nature'. However, we also urged that these objectives be delivered in tandem and not in conflict with corresponding Government objectives for the substantial decarbonisation of the energy sector, the creation of a green economy based on the development and manufacture of clean energy infrastructure and the need to secure an economic recovery.

The RO banding review

In the first half of 2011, as part of the periodical review of the levels of support paid out to renewable energy generators under the RO, the Government has committed to publishing a consultation in the summer of 2011 on the number of ROCs due per megawatt hour to each technology supported by the RO. This banding review which needs to be passed by Parliament by 1st of April 2012, will come into force on the 1st

April 2013 for all technologies except offshore wind, which will be covered by the review from the 1st of April 2014. At the time of writing, the publication date for the banding review consultation has been delayed until late October 2011.

The Electricity Market Reform

On 11 July the Government published a white paper on the Electricity Market Reform (EMR), a wide ranging set of proposals aimed at preparing the electricity market for a new era of low carbon energy generation, mandated by the Climate Change Act (2008). The key areas of EMR are the reform of the support mechanism, which under new proposals would move from the RO to the so called 'Contract for Difference' (a variation of the FiT); carbon price support, which would set a price floor for emitting carbon; capacity payments for fossil fuel generation; and an emissions performance standard. The EMR is expected to come into force by 2017, with the industry at this stage calling for more detail and clarity in order to ensure a smooth transition.

The 2011 Budget

As the UK economy experienced sluggish growth over the four quarters preceding the 2011 budget unveiled in March, the measures contained therein to stimulate job creation and business opportunity were welcomed by the renewables sector. Primarily, the budget pledged measures to cut down planning application decision times, and announced that 'duty of sustainability' will have to be taken as a material consideration in the planning process. The Government also trebled the funds available to the Green Investment Bank, and supported a carbon floor price, which will increase the competitiveness of electricity from renewables. Finally, the industry welcomed measures on enterprise zones and education and training as they could translate into supply chain growth.

The Oil and Gas Clause

The existence of the Oil and Gas Clause in The Crown Estate's leasing agreements for offshore wind has been a major barrier to obtaining finance for developers, while increasing cost of projects. It allowed The Crown Estate to terminate a leasing agreement for an offshore wind farm, if oil and gas were discovered in the same place. However, the Written Ministerial Statement on the Oil and Gas Clause, released in July, stated that the Secretary of State would not ask The Crown Estate to terminate a lease or agreement, unless compensation had been provided by the oil and gas developer. While timely and welcome, this statement requires further refinement, primarily in terms of levels of compensation.

The 2020 Roadmap

The UK Renewable Energy Roadmap, which sets out a path on how the United Kingdom intends to fulfil its obligation to the European Union of sourcing 15% of its energy from renewables by 2020, was published in July by the DECC. In many ways the Roadmap follows from the Renewable Energy Strategy of 2009, but with some notable differences between the 2009 and 2011 documents in terms of wind energy deployment scenarios. The current headline, or middle scenario for offshore wind sees scope for 18GW by 2020, up from 13GW in 2009. The headline scenario for onshore wind, however, is down from 15GW to between 10GW and 13GW. The other main change to the previous document is that HM Treasury's *Control framework for DECC levy-funded spending* document, released in March 2011 (see opposite), now has implications for delivery across the spectrum of renewable energy technologies.

Cost reduction task force

HM Treasury's *Control framework for DECC levy-funded spending* document, published with the HM Treasury's Budget in March, has set a cost envelope across the system of renewable energy support measures. This means that the total spend for all renewables, across the various support systems, of which the RO and the FiT are of chief interest to developers, must fit within a predetermined cost. For example, the spending envelope limit for the RO in 2011-12 is £1.76 billion increasing to £3.20 billion in 2014-15, while the FiT envelope will rise from £80 million to £357 million. If spend is on course to exceed its envelope, DECC has stated that it "will consider making an adjustment to the policy, taking into account the impact on energy bills and progress towards our targets".

The implication for offshore wind deployment scenarios is that reducing costs increases the potential for more deployment, while if the cost remains high or increases further, there will be reduced scope to go beyond 18GW. Taking this into account the Government has inaugurated a Cost Reduction Task Force in July, which by mid-2012 needs to set out the pathway to reducing costs of electricity from offshore wind to £100 per MWh. A key input to the Cost Reduction Task Force's work will be The Crown Estate's 'Cost Reduction Pathways' project.

Wales Grid Issues

First Minister Carwyn Jones released a statement on June 17 that shocked the renewable energy industry as it seemed to hint that there were defined capacity ceilings to onshore wind farm development in Strategic Search Areas and that the Welsh Government (WG) would not be supporting the development of a 'large pylons' in Mid Wales. After an intense period that saw two political debates in the Senedd and an

emergency delegation meeting with the First Minister, Environment Minister John Griffiths issued a letter that has gone some way to clarifying the situation in regard to capacity within SSAs. However, the situation is still unclear in regard to WG's position on upgrading the grid infrastructure. Following the publication of the First Minister's statement, RenewableUK has been working with DECC and Welsh Government to ensure the continued development of onshore wind in Mid Wales.

Meanwhile, National Grid was conducting its public consultation to gather views on the location of a Mid Wales sub station and route corridors for a new connection. Running concurrently was Scottish Power's Energy & Networks consultation on the routes under consideration that will link proposed wind farm sites to the substation options. The plans for the grid upgrade have proven to be tremendously controversial and led to mass protest locally in Powys and in front of the Senedd in Cardiff Bay. The size of the opposition to grid, which is directly linked to wind farm development, is thought to have been the catalyst to Carwyn Jones' statement.

In response to the Minister's statement, RenewableUK has commissioned a Grid Options Study for Wales, designed to explore the full range of differing connection options into Mid-Wales and their costs. The project is in its final stages at the time of publication of this report.

2020 Routemap for Renewable Energy in Scotland

The Scottish Government's June 2011 Routemap for Renewable Energy set out Scotland's ambitious targets for renewable energy up to 2020 including supplying the equivalent of 100% of electricity demand from renewables (approximately 16GW of installed

capacity) and 30% of overall energy demand from renewables by 2020.

The Routemap builds on the 2009 Scottish Renewables Action Plan and identifies actions required to help Scotland meet the major challenges ahead including: costs and access to finance, grid capacity and charges, skills, innovation, supply chain and infrastructure. The Scottish Government estimates that in meeting these goals renewable energy in Scotland could provide up to 40,000 jobs and £30bn of investment in the Scottish economy.

Scotland's extensive wind and marine resources mean that technologies in these areas will play a crucial role in meeting these targets.

In addition to the 2.4GW of onshore wind capacity in operation and 1GW under construction, the Scottish Government identifies a further 3.5GW awaiting planning approval and 3.9GW waiting for pre-application scoping opinion. In order to expedite delivery the Scottish Government has pledged to chair a new working group into issues surrounding the Eskdalemuir Seismic Array – where Ministry of Defence (MOD) objections have limited over 1GW of onshore wind developments.

Offshore, recent leases awarded by the Crown Estate have the potential to deliver up to 10GW of installed wind capacity and much of the initial pre-commercial and commercial exploitation of Scotland's huge wave and tidal potential will take place in the Pentland Firth and Orkney Waters strategic area. The 11 leases in this area have a total potential capacity of 1.6GW.

The 2020 targets also include a target for 500MW of local and community owned renewable electricity generation, with onshore wind expected to make a key contribution.

Future Deployment

For this section of the State of the Industry Report 2011 RenewableUK commissioned consultants to derive deployment forecasts for offshore wind (BVG Associates) and onshore wind (Parsons Brinckerhoff) out to 2016/17. The purpose of commissioning this work was to enable RenewableUK, its members and other stakeholders to better understand the future size of the UK commercial wind market and to better address key barriers to deployment.

Through detailed survey data and more qualitative information provided in discussion with developers,⁷ RenewableUK has gained an improved understanding of the issues affecting deployment and the implications that these differing factors may have for future deployment projections.

Future onshore deployment

Introduction

Significant increases are expected in onshore wind energy deployment over the course of the next decade in order to meet the UK's 2020 renewable energy commitments. The industry is firmly committed to meeting these objectives. With almost 4.22GW of operational capacity, over 3.7GW of capacity awaiting construction and a further 1.3GW under construction, the UK is currently one of the most active markets for onshore development in Europe. This collective capacity amounts to around one third of the total renewable capacity required to achieve 2020 projections. However, for the necessary capacity to come forward in a timely manner, a range of potential barriers and uncertainties must be overcome throughout the project life cycle.

While there is reasonable visibility of projects within the planning process and therefore visibility of a number of associated barriers, there is currently limited data available regarding the progression of projects during the Post Consent period. Greater visibility of the factors affecting progress at the post consent phase gained through this research has also been used to inform and update our operational forecasts for build-out rates. Of key importance in forecasting build-out rates in the short to medium term is the current market incentive mechanism, the RO.

To this end, PB undertook an industry wide survey of developers, on behalf of RenewableUK, to better understand the 'barriers to progress' during the Post Consent phase, and the time delays and financial costs associated with the barriers identified.

In addition, this study provides analysis on the potential impacts of the imminent RO Banding Review on UK onshore deployment.

Methodology

The key methodologies employed to carry out the study were questionnaire surveys and some follow-up consultation with key stakeholders, providing both quantitative and qualitative data for analysis. The following questionnaires were distributed to industry:

- Post Consent Deployment Study questionnaire.
- RO Banding Review questionnaire.

The questionnaires were distributed to a large number of key companies active in the commercial-scale onshore development industry, from energy utilities to small-scale independent developers. In order to further inform the analysis, respondents were classified into one of three key typologies:

- **Smaller developers** – development companies with smaller portfolios of UK onshore wind assets (typically less than 50MW of operational capacity).
- **Large developers** – development companies with significant UK onshore wind assets (typically in excess of 50MW of operational capacity).
- **Utilities** – national utility companies with large onshore wind portfolios (typically in excess of 100MW of operational capacity).

7. All information collected through the surveys was treated as commercially sensitive. As such, no specific project or developer details are provided in these reports, and the data collected was used to identify general trends across the industry. For the purpose of this study, PB used the following figures: Operational – 4,227MW, Under Construction – 1,367MW, Approved (awaiting construction) – 3,745MW and In planning – 7,012MW.

Post Consent barriers

The Post Consent Deployment Study questionnaire was designed to gather project-specific information relating to the Local Planning Authority involved, the number of turbines and installed capacity of the scheme, and the current status of the development. This questionnaire was separated into two sections, as follows:

1. The first section was designed to understand the barriers that have been faced by projects that are currently operational or in construction.
2. The second section collated information on projects currently consented but not yet in construction (termed “pre-construction projects”), to understand the key barriers to progress currently being faced by projects.

Developers were also asked to consider which of fourteen barriers to progress had affected each of their projects. Where a project did not fall into these typologies, respondents were asked to provide information about the barrier(s) that they had overcome or were likely to need to overcome in the future.

Data was collected providing information on the historical issues and time delays that have been faced by developers during the Post Consent phase. For those projects that are currently consented but not in construction, some opinion-based information from Project Managers/Construction Managers on the likely prospects for overcoming the barriers was requested. An estimation of the cost of overcoming each barrier on a “per megawatt of installed capacity” basis was also requested from the survey respondents. This assessment was deemed necessary to understand the financial implications for a typical UK project overcoming a particular barrier.

ROC banding

The second questionnaire on the impact of the imminent RO Banding Review sought data on the impact of various revisions to the RO support level on project portfolios and the corresponding impacts on future build-out of onshore wind in developer’s portfolios. Respondents to the questionnaire were asked to comment on critical minimum levels of support from the RO needed to maintain investment in the UK onshore wind market.

In addition, the survey was designed to gauge whether uncertainties as a result of the RO Banding Review and the Electricity Market Reform processes are impacting on current development plans. PB drew together the responses and performed an analysis forecasting the scenarios which may present themselves linked to potential banding review outcomes.

Deployment projections

In establishing the build-out projections, two approaches were taken to modelling the impact of schemes at differing stages of development:

- A “Post Consent closed system” projection, which extrapolated the delivery times associated with projects that are currently progressing through the Post Consent phase across the industry and for future delivery of consented projects; and
- An “open system” projection, which sought to predict the delivery of projects currently in planning, under three RO Banding Review scenarios.

In addition, three key scenarios were established for the build-out projections beyond 2015.

The three scenarios were as follows:

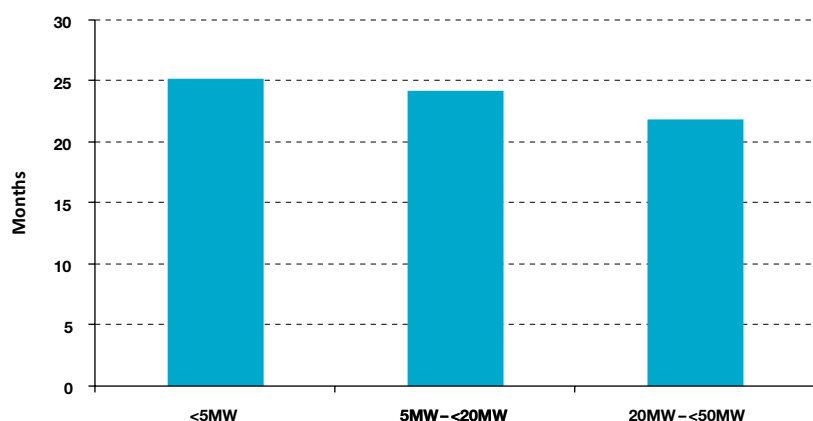
- **Scenario 1) Business as usual**
– in this scenario the RO support mechanism remains unchanged at 1.0ROC/MWh.
- **Scenario 2) April 2013** – 0.9ROC/MWh – in this scenario the RO banding is reduced to 0.9ROC/MWh.
- **Scenario 3) April 2013** – 0.8ROC/MWh – in this scenario the RO banding is reduced to 0.8ROC/MWh.

Challenges to progress

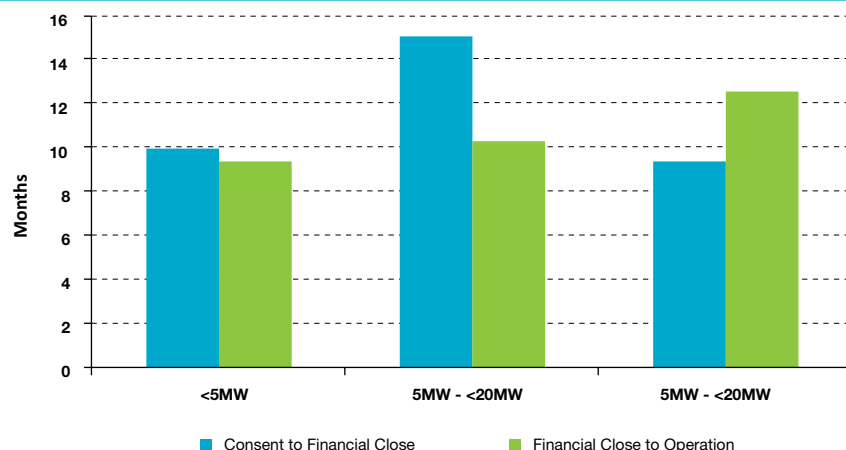
Post Consent barriers

General consensus exists across projects of varying size, and across the UK, that the Post Consent phase has seen a significant increase from a historical average of two years to a current average of two years and nine months. The key area of increased delay during this period is identified as the “Consent to Financial Close” phase, where the average time period has risen from thirteen months based on historical data to twenty months currently.

Graph 12: Average Post Consent period by project size



Graph 13: Average Delivery times for stages of the Post Consent timeline by project size



It was very clear from the industry survey that developers of all sizes have experienced, or are currently experiencing barriers to progress during the Post Consent phase of their onshore wind energy developments. It is notable from the responses, that projects currently in the pre-construction (consented but not yet in construction) phase are experiencing significantly higher numbers and a varying mix of barriers to progress compared to projects that are currently operational or in construction.

Four key issues have been identified for projects that are currently operational or in construction, and for pre-construction projects (those projects that are consented but not yet operational). For operational projects and projects in construction, the four key barriers to progress are projects pending sale (26%), difficulties sourcing wind turbines from manufacturers (21%), intractable planning conditions (13%) and access route difficulties (11%). The four key barriers to progress for pre-construction projects are the commercial viability of projects (17%), projects pending sale (14%), civil radar issues (14%) and grid connection issues (14%).

The barriers to progress identified were also assessed in relation to the geographical location and the size of the projects involved. In England, the key barriers to progress are projects pending sale and the commercial viability of schemes. In Scotland, sourcing wind turbines from manufacturers and projects pending sale are the dominant barriers. In Wales, access route difficulties and the commercial viability of projects are deemed to be the key Post Consent issues. Smaller projects (those of less than 5MW total capacity) also experience delays due to the projects pending sale. Projects in the size range 5MW to <20MW recorded greater issues associated with commercial viability, difficulties sourcing wind turbines from manufacturers and access route issues. Finally, larger projects (those of between 20MW and 50MW) face grid connection issues and intractable planning conditions.

The barrier to progress that emerges in all categories is that of projects often facing Post Consent delays whilst pending sale. One developer confirmed that it was their normal business model to sell projects at the consent stage, whilst another developer would typically own and operate the asset, but had been required to sell projects in order to fund further development activities.

The commercial viability of projects is considered an important barrier to progress in England and Wales, though is not seen as important an issue in Scotland. It is apparent that the commercial viability of projects in England and Wales is a key project issue at present, even under the current RO support of 1ROC/MWh. Time delay impacts of the key barriers identified from industry responses and experiences have been summarised in Table 9.

Financial impacts of the key barriers identified from industry responses and experiences have been summarised in Table 10.

RO banding

The majority of respondents (89%) believed that the RO Banding Review would affect the delivery of their onshore wind energy portfolio. Furthermore, 83% of respondents believed that the RO Banding Review was likely to significantly affect their projects going into planning. It is apparent that if the RO support is revised down from 1.0 ROCs / MWh to 0.9 ROCs / MWh then the majority of smaller developers would exit the market. A revision of the RO support down to 0.8 ROCs / MWh would see utilities and large developers cease investment in onshore wind projects in the UK.

Table 9: Summary of the range of time delays associated with key barriers to progress

Operational and in construction	Minimum – Maximum time
Pending sale of project	3 - 36 months
Difficulties sourcing wind turbines from manufacturers	6 - 12 months
Access route difficulties	6 - 7 months
Grid connection issues	6 - 18 months
Pre-construction	Minimum – Maximum time
Pending sale of project	Up to 12 months
Commercial viability of project	Up to 3 years
Access route difficulties	Up to 9 months
Grid connection issues	3 months up to 36 months

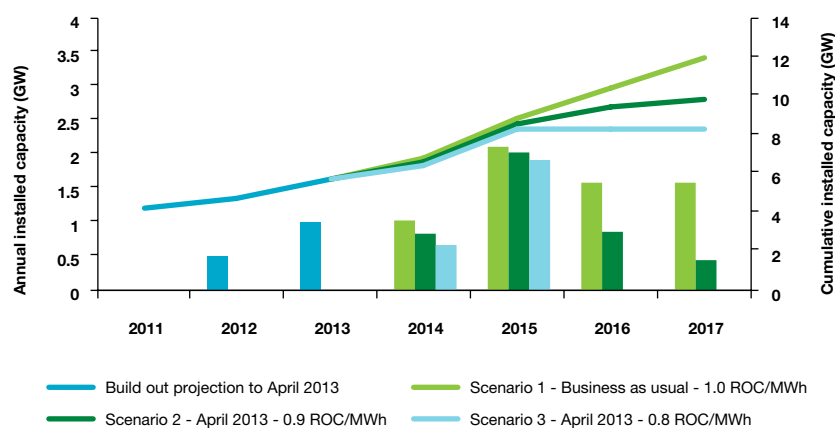
Table 10: Summary of the range of costs associated with key barriers to progress

Operational and in construction	Minimum – Maximum cost
Difficulties sourcing wind turbines from manufacturers	£100k - £150k / MW
Access route difficulties	£75k - \$500k / MW
Grid connection issues	£100k - £300k / MW
Pre-construction	Minimum – Maximum cost
Commercial viability of project More than	£20k / MW
Access route difficulties	£25k -£500k / MW
Grid connection issues	£25k -£500k / MW

If the RO support is revised downwards, then there will be a shift in development away from English and Welsh sites with marginal wind resources, and towards Scottish sites with more reliable wind resources. The second theme, which received unanimous agreement from industry, is that a reduction in support in the RO would result in a decrease in onshore deployment. In order to meet the UK's legally binding Renewable Energy Directive targets, a greater contribution would be required from alternative renewable technologies, which would ultimately increase the overall cost of achieving the 2020 targets.

Developers were also asked to comment on whether they are currently experiencing difficulties obtaining finance for projects as a result of uncertainties associated with the RO Banding Review, or whether the proposed Electricity Market Reform has resulted in them delaying projects in anticipation of a better market mechanism. It is clear that neither the RO Banding Review nor the proposed Electricity Market Reform are considered to be impacting on project financing currently, although several respondents comment that this is because they are not currently seeking to raise finance. A recurring theme that emerges is the importance of having stability in revenue mechanisms. Any reduction in support levels will affect investor confidence and affect the ability of the UK to achieve its national 2020 targets.

Graph 14: Onshore Deployment Scenarios based on level of ROC support post 2013



For those projects in the pre-construction phase in England and Wales a major barrier has been the decreasing overall commercial viability of the project. Factors behind this include a lack of financing from banks for smaller projects, the decline in the value of the pound against the euro resulting in increased turbine prices and uncertainties around the future value of the RO impacting upon access to finance.

Other significant pre-construction barriers include problems with civil radar and grid connection issues (with delays ranging from 3 months to 3 years).

Forecasts to 2017

Based on a number of assumptions from the preceding analysis on Post Consent time periods, time delays associated with barriers to progress and the impact of the RO Banding Review, three RO Banding Review scenarios were extrapolated until 2017:

- The first scenario is based on “business as usual” under continued 1.0ROC/MWh support, and sees utilities, large developers and smaller developers continue to invest in onshore wind. This scenario sees 11.97GW of onshore wind capacity in the UK by 2017.
- The second scenario, which assumes a drop from 1.0ROC/MWh to 0.9ROC/MWh, and sees smaller developers exit the market, will result in 1.61GW of potential 2017 capacity lost, and a total 2017 capacity of 10.36GW.
- The third scenario sees a drop from 1.0ROC/MWh to 0.8ROC/MWh, and both smaller and larger developers exit the market. The operational capacity (8.83GW) in 2015 becomes the national baseline for onshore wind, and no additional capacity is added during the post-2015 period.

Conclusions

It was very clear from the industry research that developers of all sizes have experienced, or are currently experiencing barriers to progress during the Post Consent phase of their onshore wind energy developments. Projects currently in the pre-construction (consented but not yet in construction) phase are experiencing significantly higher numbers and a varying mix of barriers to progress than those projects that are currently operational or in construction. For those projects operational or in construction, major barriers identified by developers included:

- issues around the sale of the project, with delays ranging from 6 months to 3 years.
- problems with sourcing wind turbines due to the high level of demand for wind turbines globally (especially for Scottish projects).
- intractable planning conditions; and
- access route difficulties (a significant problem in Wales).

Two recurring themes emerged from the analysis of respondents’ feedback on the potential impact of forthcoming changes to the RO. The most pressing theme, which received unanimous agreement from industry, was that a revision in the RO would result in a decrease in onshore deployment. In order to meet the UK’s legally-binding Renewable Energy Directive targets and in response to such a fall in onshore wind deployment a greater contribution would be required from alternative renewable technologies, which would ultimately increase the overall cost of achieving the 2020 targets, resulting in increased energy costs for consumers.

Another key theme was that if RO support is revised downwards there will also likely be a shift in development away from English and Welsh sites with marginal wind resource, and towards Scottish sites with more reliable wind resource.

Future offshore deployment

Introduction

For this offshore section of the *State of the Industry Report 2011* RenewableUK tasked BVG Associates to derive a forecast for the deployment of offshore wind in the UK to 2016, through detailed dialogue with the developer community, and to explore the issues that may affect this deployment. The purpose is to enable RenewableUK, its members and other stakeholders to better understand the future size of the UK market and to be able to address key issues relating to future deployment, and follows on from previous reports and forecasts published by RenewableUK (then BWEA).

This research, carried out in August and September of 2011, has been undertaken at a time of unprecedented UK offshore wind construction activity. As of September, almost 2GW of capacity is currently being built, which is more than the 1.6 GW of existing UK offshore wind generating capacity. At the end of 2010, the European Wind Energy Association reported that, of the 3GW of offshore wind capacity in Europe, 46% was in UK waters.

Despite the apparent buoyancy of the market, a number of important issues face the industry:

- The pipeline of consented UK projects that are still to be constructed is now relatively small, and new projects are facing untried consenting processes.
- The Coalition Government is currently undertaking a review of the RO Certificate (ROC) banding from April 2014 (for offshore wind projects) and is planning to replace the ROC system with a Contract for Difference (CfD), a variation on the FIT, from 2017.
- The pre-eminence of the UK market is being challenged by the decision in Germany to phase out nuclear generation in favour of an accelerated installation of renewable capacity. Forecasts for offshore wind deployment in Asia also reflect the enhanced commitment of China and Korea.

Methodology

This analysis is founded on dialogue with the developers of UK offshore wind projects. BVG Associates took a bottom-up approach by undertaking structured and confidential one-to-one interviews and inviting developers to provide a positive “optimistic” target timetable (20% chance of delivering ahead of this date) and a “pessimistic” timetable (20% chance of delivering after this date) for project delivery.

From this data, a mid-timetable was derived, which assumed 20% of project capacity would be installed according to the positive timetable, 20% according to the pessimistic timetable and 60% half way between these two. In dialogue with each developer, BVG also applied a probability of construction for each project, based on views of the chances of obtaining consent and then of deliverability. This probabilistic approach gives rise to fractions of projects installed in a given year and results in a “most likely” scenario. Installed capacity for any individual project cannot or should not be inferred using this approach.

BVG Associates also sought the views of developers on the anticipated cumulative installed UK offshore wind deployment by the end of 2020. This provided a “top-down” reference point. The viability and timetable of an offshore wind project is subject to a number of risks. These were explored through the interviews. Key areas of discussion were:

- Economics and finance, including the financial viability of projects in the context of the current ROC regime and Electricity Market Reform (EMR), the chance of cost reductions to provide viability being achieved, project and balance sheet finance, and associated issues.
- Consenting, including probabilities of securing consent, the significance of restrictive conditions, and potential delays in the consenting process.
- Grid connection, including the impact of the offshore transmission operator

(OFTO) arrangements on project timing, the impact of grid connection charges and the importance of an integrated offshore grid.

- Supply chain, including areas with the potential to delay projects.

Previous reports commissioned by RenewableUK on offshore wind deployment have established the timing of key project milestones. This time, the following dates were captured for Rounds One and Two projects:

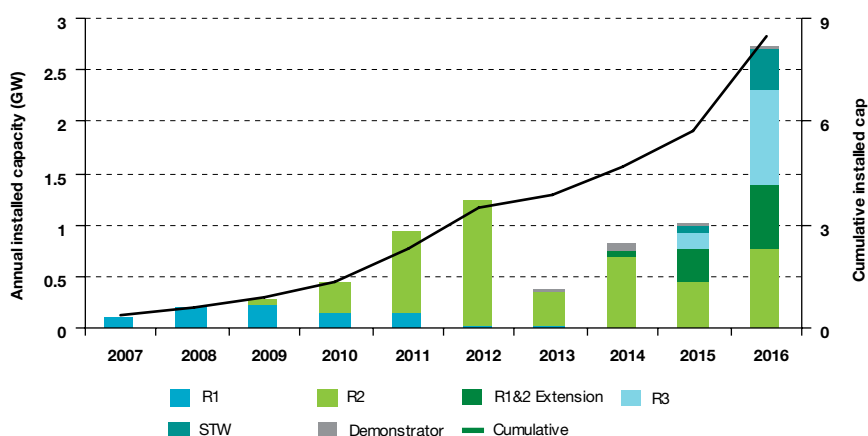
- Licence or exclusivity award
- Consent secured
- Financial close/financial investment decision
- Grid connection offer
- Start of offshore construction
- Start of generation

Forecast to 2016

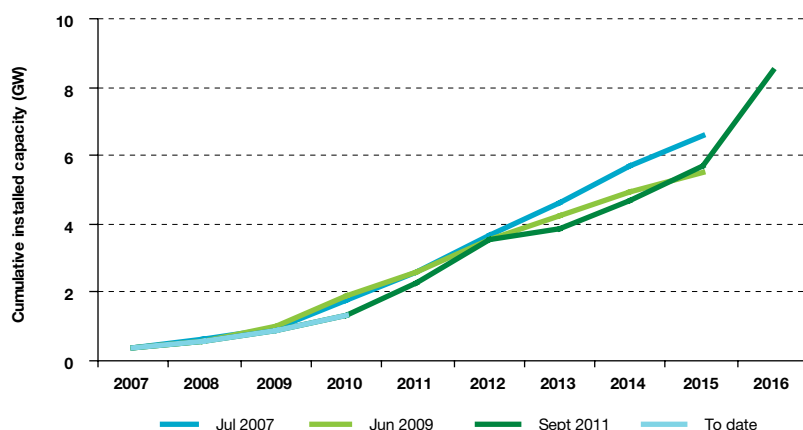
Graph 15 shows the historical and forecast annual and cumulative offshore wind deployment in the UK. It indicates that annual deployment will rise to an anticipated 1.2GW in 2012, followed by a drop in activity in 2013 and 2014. By 2015 the annual installation rate will again reach 1GW, and exceed 2.5GW in 2016, by which point the cumulative capacity is forecast to be just over 8GW.

Moving beyond the immediate 5 year timeline, the indications from the dialogue with developers are that deployed capacity in 2017 will be similar to 2016. Installed capacity was defined by the number of turbines installed, as this is straightforward to establish and developers will generally ensure that generation occurs as quickly as possible after installation.

Graph 15: UK offshore wind forecast of annual and cumulative installed capacity from 2007 to 2016 by development round.



Graph 16: Comparison of recent UK offshore wind installation forecasts commissioned by RenewableUK



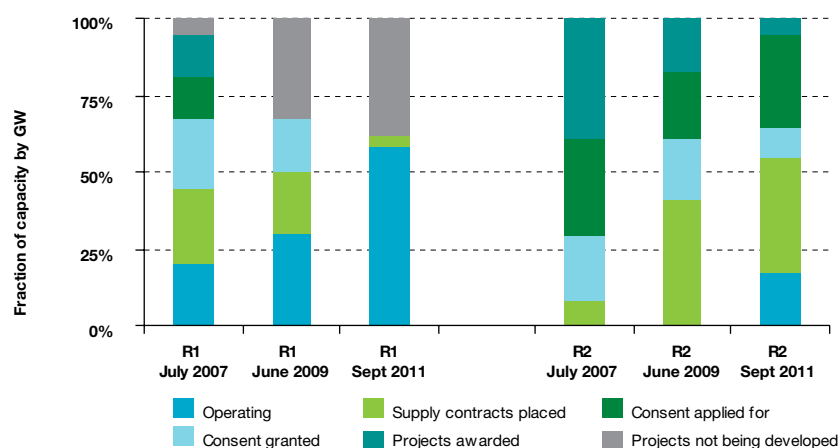
Project status

Graph 17 shows that, with the placing of contracts for the Teesside wind farm, the first UK round of development is now almost complete (excluding those projects that have been cancelled). It also shows that, for Round 2, there was healthy progress in achieving project milestones between 2007 and 2009, but in the past two years only 230MW have received planning consent. This slow progress in consenting shown in Graph 1 is a key cause of the drop-off in the pipeline of projects seen in Graph 15.

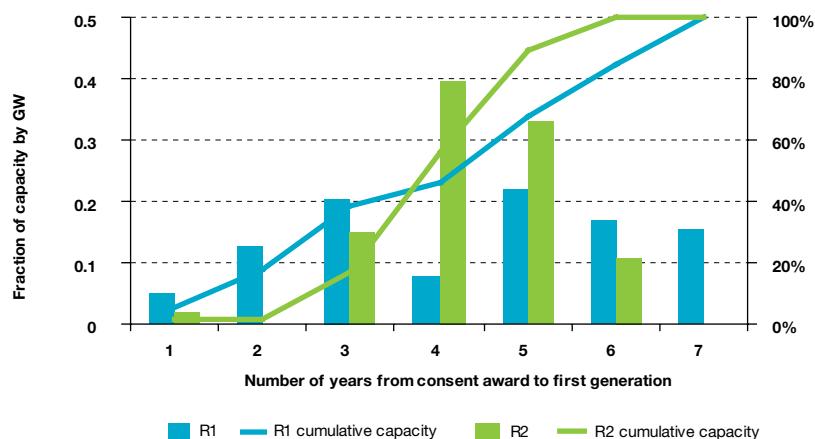
A significant reason for the drop-off in consenting would seem to be the increased time to achieve consent.

Round One projects took an average of one year, whereas Round Two projects have taken an average of two years so far. Four projects have taken even longer, with the longest being four years. Also relevant to the drop-off is the length of time between receiving consent and first generation. Graph 19 shows that the average period (by capacity) is about four years for both Rounds One and Two projects but, whilst Round One projects showed high variance, about 40% of consented Round Two project capacity has begun or is expected to begin generation four years after consent and a further 33% after five years.

Graph 17: Changes in UK offshore project status between 2007 and 2011



Graph 18: Percentage of capacity installed for Round 1 and Round 2 projects by the number of years from consent award to first generation⁸

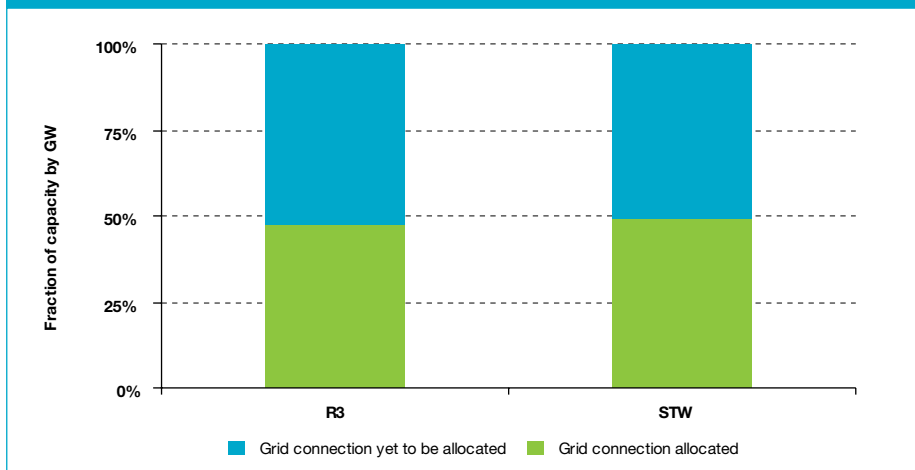


8. This graph excludes cancelled projects and projects awaiting consent

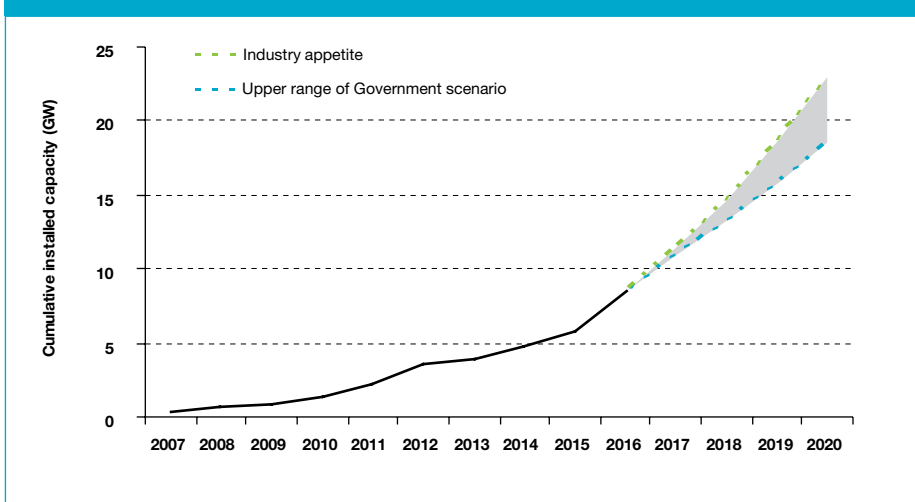
Given that it can take a year to make the final investment decision following consent, and contracting typically takes place at least two years before offshore construction, it is clear that in most cases developers have taken forward Round 2 projects reasonably promptly following consent. The Round 2 project timeline from site award to generation is likely to be in the range of 5 to 10 years.

Progress for Round 3 and Scottish Territorial Waters (STW) projects is less easy to chart, with the first applications for consent anticipated in the first half of 2012. Although an allocated grid connection is not directly related to the progress of a project, it is a useful indicator of status and Graph 19 shows that half of the capacity for these rounds already has an offer.

Graph 19: Round 3 and Scottish Territorial Waters (STW) projects with grid connections allocated (excludes cancelled projects)⁹



Graph 20: Offshore wind deployment forecast for 2016–2020



9. Note that “yet to be allocated” does not imply grid constraints, but could mean that a connection has yet to be applied for

Beyond 2016

Data for projects being installed beyond 2016 was also captured in order to establish a forecast installation rate to compare with the 18GW scenario in 2020, which was described in the Government's Renewable Energy Roadmap published in July as the upper limit of its "central range".

Aggregated feedback from developers suggests that the UK annual installation between 2017 and 2020 will be between 2.5GW and 3.5GW, which indicates that the 18GW total is attainable.

Challenges to progress

Economics and finance

ROC banding

This study has been undertaken at a time of uncertainty over the future of the UK market support mechanism. Most of the developers interviewed during this study report that 2ROC/MWh (or an equivalent level under the CfD) is the base case assumption in assessing viability of their projects. Few were willing to speculate on the viability of their projects below this level.

Cost reduction

There is recognition that continued support for the sector depends on the cost of energy from offshore wind falling, thereby enabling a decrease in the level of support required. Many advise, however, that the required levels of supply chain investment to achieve the necessary cost reductions would only be achieved by sustaining the level of support in the short term. A key concern is that an 18GW market might not be large enough to stimulate the investment and provide the opportunities for learning-by-doing needed to achieve significant cost reductions. There are strong indications from government that the cost of energy will need to fall if the 18GW is to be reached. The industry has responded to this through the Offshore Wind Cost Reduction Task Force, led by RenewableUK Chairman Andrew Jamieson.

The presence of a competitive market for next generation offshore turbines is seen as key to reductions in the cost of energy, as opportunities elsewhere in the supply chain may be more limited. For example, as a means of avoiding the danger of escalating vessel costs caused by a lack of availability, several developers have invested in their own vessels or signed long-term charters. This limits the opportunities for further innovation in the installation phase to achieve radical cost reduction. Whilst

the new vessels have been designed to meet the demands of the future offshore market and should provide cost advantages over previous vessels, further cost reductions in installation in the medium term are likely to be achieved from incremental learning alone.

Electricity Market Reform

The planned introduction of the CfD prompted a range of responses from developers. Most are more concerned over the level of support rather than the mechanism itself. Others stress that any new support system creates uncertainties and greater project risk, which threatens the financing prospects of projects. Some predict that projects planned for after 2015 would be delivered as early as possible to qualify for ROCs, in order to avoid the uncertainties of the new regime. The result of this trend could be a short-term fall in the rate of deployment after 2016. The Government is sensitive to the cost of offshore wind to consumers, and the CfD is likely to result in a reduced level of support. Developers are concerned that the tariff will be set too low to make projects viable or facilitate investment in cost reductions.

Finance

Perhaps surprisingly, finance is not seen by most developers as an issue that would threaten projects until the early Round Three phases have been completed. Several developers have now have experience in attracting finance pre-construction or in "recycling" completed projects, and these tend to be optimistic. Several voices caution that the current approaches are suitable for Round Two-scale projects, but attracting finance for Round Three will be challenging given the high risks and likely modest rates of return.

Consenting

The consenting process was widely described as the single most important factor delaying offshore wind projects. The recent setback for onshore substation consent for the Dudgeon project illustrates the challenges facing many developers. Most developers are confident that they will secure consent for upcoming projects, typically declaring probabilities of 80% or more, but there were significant concerns about the length of the process. While the 15 month timetable set out by the IPC and its successor, MIPU, is generally accepted at this stage, the IPC is not seen as sensitive to the challenge of building large projects over a number of years or the flexibility required in the project definition to limit commercial risk. Developers fear delays of a year in the IPC or MIPU accepting applications and are keen that pressure from DECC is sustained. One developer reported that the IPC is running slower than the former system and, while it is supposed to deliver simplification and acceleration, it is doing the opposite.

For projects in Scottish Territorial Waters, the consent approval process is led by Marine Scotland. It is viewed as a more political process than in England and Wales. Projects in Scotland may benefit from strong Government support, but Marine Scotland is an unknown quantity, with no track record in consenting an offshore wind farm. While it has indicated that consent will take nine months for a non-controversial project, there is no clear definition of what constitutes such a project.

A further concern among developers is that consent may come with restrictive conditions based on potential impacts on wildlife. In some cases, limitations on construction windows could undermine the economic viability of a project. This survey captured the frustration that the activities of other offshore sectors, such as oil and gas, were sometimes not regulated to the same extent.

The issues relating to the delays in consenting are the subject of a further, detailed study undertaken by RenewableUK; *Consenting Lessons Learned - An offshore industry review of past concerns, lessons learned and future challenges* published in October 2011.

Grid connection

A range of concerns about grid connections are captured in the study, generally either related to OFTO arrangements or more general grid infrastructure issues. Many comments reflect the specific circumstances of individual projects.

OFTO-related issues

The generator-build option is favoured by most developers as a way to minimise the risk to projects, even if this means securing additional finance. BVG Associates heard a further concern that OFTOs have no track record in constructing offshore grid connections. Issues to be resolved also include transfer values, the maintenance of grid assets, and details of charging.

Grid infrastructure issues

Graph 20 shows that half of Round Three and STW capacity has been allocated a grid connection, and it is not raised by developers as a major issue constraining deployment at least until the first Round Three phases are complete. In the longer term, a number of projects will depend on upgrades to the onshore grid. There is also a concern for large projects that National Grid could make a grid offer at odds with the needs of the developer, or that the interface point may change after the developer has undertaken significant amounts of work and is close to application. Some developers also fear that timetables for grid works are likely to slip.

The issue of integrated infrastructure was raised by some developers as an important means by which costs could be reduced but, in general, feedback is that any implementation would lie beyond the timetable of their projects. Integrated infrastructure could be more important as we get further into Round Three construction in the early 2020s.

Supply chain

The supply chain is not generally seen as an area that would constrain deployment before 2016. Beyond this, a significant increase in supply will be required, as well as solutions for some challenging projects where suitable technology is not yet available.

A recurring concern in discussions with developers is the availability of high-voltage direct current (HVDC) converter technology and cables, largely based on the limited number of suppliers. Up to 2016, there is limited demand from UK projects, although these will need to compete for supply with German projects for which developments scheduled in the next five years are mostly further from shore and have a greater requirement for HVDC grid connections.

Potential supply chain bottlenecks were analysed in a report commissioned by The Crown Estate and published in February 2011, titled *Towards Round Three: Progress in Building the Offshore Wind Supply Chain*.

Conclusions

The forecast presented here shows that in 2016 the UK is still likely to be the world leader in offshore wind. The acceleration in new deployment by 2015, picking up from a slowdown in 2013 and 2014, means the UK will have met the cumulative forecast from 2009. This represents a considerable achievement.

A gap between Round Two and Round Three/STW projects was anticipated by The Crown Estate in 2010 and addressed through the Round One and Two Extensions, with the hope that most would be constructed in 2014 and 2015. Our forecast suggests that these will be constructed at least a year later than hoped, albeit without the 300MW Thanet extension, but on a timetable that is consistent with the four-year average time from consent award to first generation (see Graph 19). Early Round Three and STW projects are forecast to begin construction in 2015, as envisaged, and so the extensions will not fully meet The Crown Estate's objectives and may rather increase the change in year-by-year demand.

The previous Government's implementation of increased support for offshore wind, from 1.5 to 2ROC/MWh until March 2014, successfully kept the UK offshore wind market on track. The problem is that there have been too few projects to sustain deployment levels.

This shortage of projects that could benefit from the extension of the 2ROC-period may have been caused by three factors:

- The lack of consented projects available to progress.
- The lack of grid offers for projects.
- Delays in the final investment decision.

Graph 19 suggests that, in most cases, developers have taken forward Round Two projects reasonably quickly after securing consent. Furthermore, all but one of the Round Two projects forecast for construction in 2015 and 2016 have a grid offer for 2014 or earlier. The evidence suggests, therefore, that the 2013 and 2014 drop in annual installation is attributable to the lack of consented projects. There is little that can be done now to accelerate deployment during this period.

It is clear that the Government needs to analyse carefully the impact of any changes to the support mechanism and to manage progress in assessing consents.

Our forecast shows a 100% increase in annual deployed capacity between 2015 and 2016. This would represent a major challenge for the supply chain, especially as the relatively slow years in 2013 and 2014 are unlikely to give the supply chain the confidence required to invest heavily. It is important, however, to view UK deployment in a European context. Europe-wide, we forecast annual installed capacities in 2013 and 2014 of around 3GW. Many elements of the supply chain will consider this as their market, rather than that of any single country.

The comparative strength of other European markets during these years need not be seen as a threat to the UK. Indeed, for many it is critical to managing risks that there are a number of strong discrete markets geographically close together. The continuity that the total market provides gives an opportunity for suppliers to invest. Long-term decisions on UK manufacturing locations will not be altered, provided that the supply chain is confident that the UK will resume its market leadership in 2016. This will depend not only on the absolute level of market support provided but also on its value relative to other key markets such as Germany, which also boasts a more integrated approach to offshore grid infrastructure.

With four years before the industry ramps up capacity for the second half of the decade, there is an opportunity to focus on what needs to be done to secure the long-term sustainability of UK offshore wind. This will include a major collective effort on cost reduction and an environment that will facilitate the impact of new technologies on the market.

The deployment forecast presented here may be viewed as a challenge for government and industry, which both wish to see the UK offshore wind sector grow steadily and sustainably. It is important therefore to learn lessons about providing stability whilst also continuing to put in place the strong institutional foundations that the industry needs to progress. Looking forward, however, offshore wind continues to represent the single most important route to meeting 2020 renewable energy targets whilst, at the same time, offering a major opportunity in terms of value creation for UK businesses. It is critical for government and industry to work together to address challenges and drive down costs, thereby establishing a sustainable sector of huge potential for many years to come.

Finance

The ability to secure the finance necessary for projects both onshore and offshore to move into construction has been of increasing interest in recent years. Analysis by Bloomberg New Energy Finance (BNEF), looking at the period 2012-2015 and obtained for the purpose of this report, shows evidence that finance for onshore and offshore development is improving, with finance and deployment steady over this period.

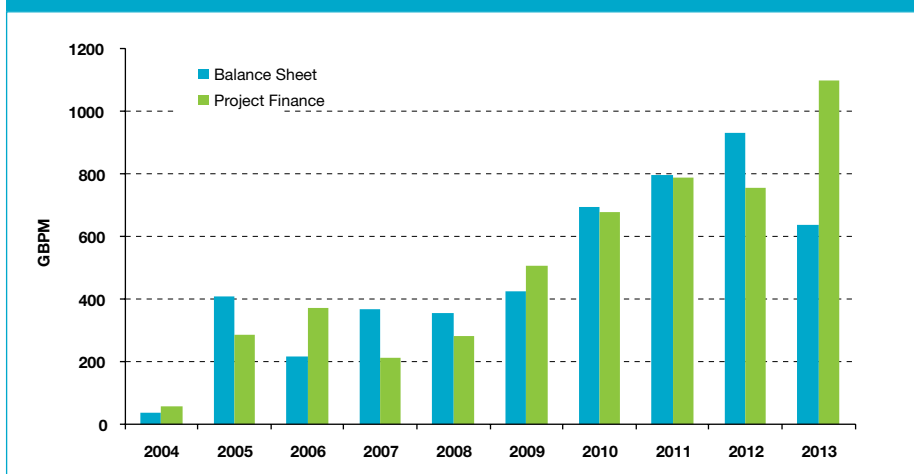
Onshore

In late 2009 HM Treasury, DECC and the European Investment Bank (EIB) launched a £1.4bn initiative to improve the supply of project finance debt. This was done in conjunction with three banks: RBS, Lloyds and BNP Paribas Fortis. Collectively, these banks are contributing 50% of the loan funds. Up to the end of the third quarter of 2011, approximately half of the guideline EIB funds have been disbursed.

In looking at the performance of the onshore sector since the EIB initiative, BNEF analysed 233 schemes (5.1GW). Based on this analysis, BNEF suggests that there may be a further increase in onshore deployment over the course of 2012, above the ~900MW potential build-out in the calendar year 2011. It is also estimated that as much as 5.1GW additional capacity could be built out between now and the end of 2015. This increase would require an annual build-out rate of 1.4GW over 2013-2015 and represent a 121% increase on existing onshore operational capacity. Over 3GW of this additional capacity (60%) would be expected to be deployed in Scotland.

In looking further at future project finance, BNEF placed each of the 233 schemes into one of three tiers, on the basis of ownership, access to capital, developer experience and project status. Results of this work show that 3.6GW or 70% of the projects analysed are owned by developers reliant on project finance for construction (Tier 2 & Tier

Graph 21: UK Onshore Wind asset finance by type 2004–2013



3). It is assumed that these owners will finance their assets using project finance with a 70% debt ratio. While this finding suggests that the significant majority of onshore capacity is reliant on the wider investment community, it also demonstrates that there has been some improvement in the willingness of banks to lend on projects since the scheme's introduction, with a debt ratio of 50-60% reported by some developers in 2009-2010. It is also likely to be for this reason that deployment levels in 2009-2010 were lower than previously envisaged.

The findings show that the remaining 1.5GW of capacity - owned by Tier 1 providers comprising utilities and oil and gas majors - can be funded from balance sheet finance. Despite this, some of these companies may opt for project finance in certain situations, with 10% of Tier 1 investments assumed to come from project finance. Looking ahead, BNEF anticipate that the volume of debt required to finance onshore schemes will increase toward 2015 as Tier 1 companies focus on offshore wind development and as Tier 2 and 3 sponsors continue to deploy an increased number of smaller projects, causing a corresponding increase in the need for project finance.

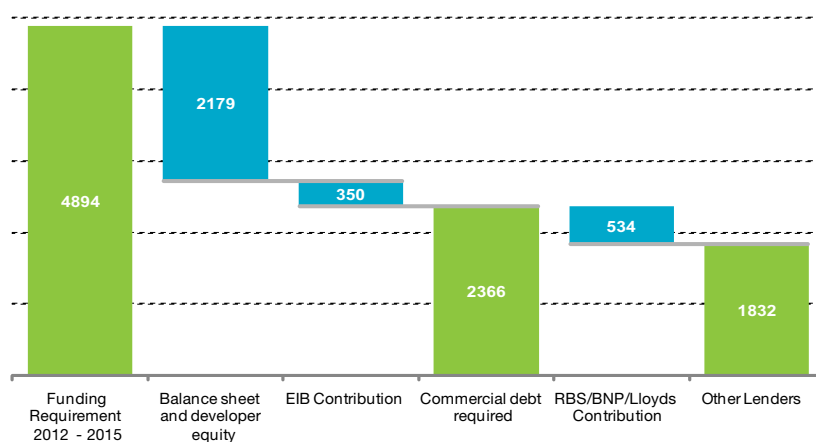
An estimated £4.9bn will be required in the next couple of years in order to deploy the 5.1GW by the end of 2015, assuming a cost of £1.25m/MW. An estimated 31% of this capacity (1.5GW) is owned by Tier 1 sponsors, and is expected to be financed on balance sheet at a cost of just under £2.2bn. This figure includes developer equity invested alongside project debt, leaving an estimated £2.3bn of project finance debt required to fund the build-out of the remaining 3.6GW.

With £516m of the £1.4bn loan programme already lent, the remaining £884m of this debt should be allocated to unfunded projects seeking to build over 2012-2015. A further £1.8bn of project finance will be required from other banks over this period to enable 5.1GW deployment. In order to further facilitate this deployment, assistance from the Government's new Green Investment Bank would be welcomed.

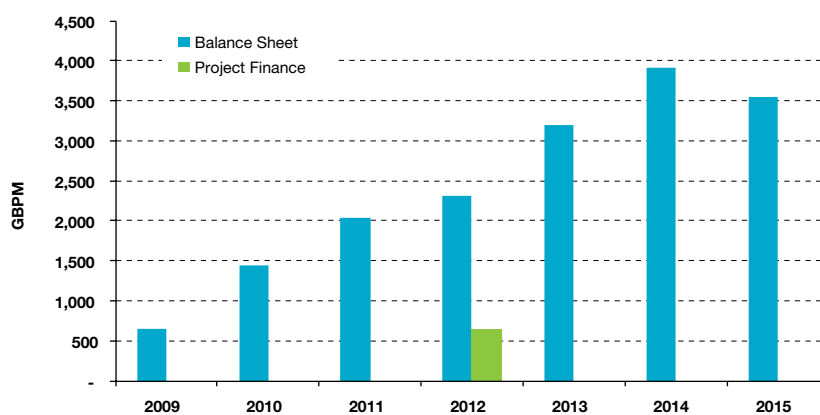
Offshore

Bloomberg New Energy Finance's analysis of offshore finance suggests that a further 3.67GW of offshore wind will be commissioned over 2012-15, requiring £13.6bn in investment. Only one project, the Lincs 270MW scheme, is expected to be financed pre-construction with project finance, with the remaining schemes to be deployed before the end of 2015 expected to be financed from balance sheet.

Graph 22: UK Onshore Wind asset finance 2012–2015



Graph 23: UK Offshore Wind asset finance by type 2009–2015



UK Manufacturing

The year to September 2011 saw an increase in UK manufacturing capability in the onshore and offshore wind sectors, providing many direct inputs to wind energy in the UK.

Onshore manufacturing

In the onshore sector, the formal opening of Mabey Bridge's £38 million tower manufacturing facility, near Chepstow, Wales, in May 2011, and their establishment of framework agreements with REpower and EWT provided a welcome addition to a sector that is now one of the largest markets for onshore wind in Europe.

In May 2011, Wind Towers Ltd, a joint venture between Scottish and Southern Energy plc (SSE) and Marsh Wind Technology Ltd, completed the purchase of a tower manufacturing and assembly plant near Campbeltown, Scotland. The plant had been threatened with closure when previous owners Skykon went into administration in January 2011. The factory is currently supplying towers for the Clyde windfarm near Abington, which is set to become the UK's largest onshore development.

UK manufacturing also contributes directly to the turbine components supply chains, with well-established UK businesses such as Converteam (Kidsgrove) and BGB (Grantham) exporting components to turbine manufacturers based in Europe. A seminar hosted jointly by DECC and RenewableUK in June 2011 recognised established and newer entrants to onshore wind energy manufacturing, including David Brown Gear Systems (Huddersfield) and SEM Motors (Orpington). Other UK-based operations exporting components include HV Wooding (Hythe), Mettex (Banbury) and Moog (Reading and Southampton).

Offshore manufacturing

In the first quarter of 2010, a sense of the potential for the UK to become a centre for turbine manufacturing started to emerge clearly, with announcements from Siemens and GE that they intended to invest in UK manufacturing sites.

These investments were subject to securing a share of funds available via a £60m offshore wind site development competition. It became clear that the £60m funding was under threat as part of the 2010 Comprehensive Spending Review. RenewableUK undertook a campaign to save the funding. The confirmation in October 2010 from Prime Minister David Cameron that the £60 million funding was to be retained was welcomed by RenewableUK and was immediately followed by turbine manufacturer Gamesa announcing its intention to establish UK manufacturing facilities. On 2 November 2010, the First Minister of Scotland announced an additional £70m for Scotland.

January 2011 saw the announcement that Siemens had signed a Memorandum of Understanding with Associated British Ports to develop Alexandra Dock in Hull as a potential site for its UK manufacturing facility for its new 6MW turbine. In May 2011, Vestas announced that they had signed an option on land at the Port of Sheerness, Kent, and the firm announced plans to build its new 7MW turbine at a new factory on this site.

Details of sites for GE, Gamesa and a number of other turbine manufacturers have yet to be announced, with final decisions to be made based on assessment of orders.

Beyond the turbines, Burntisland Fabrications (Methil, Fife) completed the delivery of 30 jacket foundations to the Ormonde windfarm in the Irish Sea. TAG Energy opened their new monopile manufacturing facility on the banks of the River Tees near Billingham in September 2011. MTL group opened new facilities in Rotherham and Blyth, and have won a contract to supply Weserwind with foundation components for German projects. Rochdale base crane manufacturer Granada Material Handling secured business to supply 164 units for the Gwynt-y-mor project.

Subsea, JDR cables extended their manufacturing facility at Hartlepool and supplied inter-array cabling for the 630MW London Array project. South Shields based manufacturer MCPS also supplied sacrificial anodes from their factory to London Array, as well as exporting to the Anholt (Denmark) and Borkum West (Germany) projects. Tekmar supplied cable protection systems from their Darlington factory to the Anholt, Borkum West and Belgian Thornton Bank Phase 2 projects in addition to UK projects including Ormonde and Walney. The company, new to the offshore wind sector in 2008, is currently manufacturing equipment for the 576MW Gwynt-y-mor wind farm.

New business was awarded to Prysmian Cables in Wrexham who will be supplying onshore export cable for RWE npower's Gwynt-y-mor 576MW project. Siemens T&D, whose new Renewable Energy Engineering Centre is due to open in Manchester in 2012, awarded the two offshore substation structure manufacture contract for Gwynt-y-Mor to Harland & Wolff in Belfast. Construction of the substations is currently well progressed, with delivery due from Harland & Wolff in 2012.

The Role of Wind Energy by 2020: What Does the Future Hold?

Uncertainty around consenting systems, future incentive mechanisms and wider Electricity Market Reform are resulting in instability in the market and wider investor confidence. This uncertainty in national policy frameworks is compounded by the continuing financial crisis facing much of the EU, which is directly impacting upon the availability of finance, particularly for smaller onshore developers without balance sheet finance and potentially larger-scale offshore consortia, as Round Three projects move forward.

The Government's proposed move from the RO to a new Contract for Difference arrangement continues to cause significant concern for the industry. Delays in bringing forward the ROC Banding Consultation, a lack of detail regarding the operation of CfD, and widespread industry fears that forthcoming changes will reduce levels of support under both the RO and CfD are fuelling market uncertainty. The industry is aware that the Government is alive to these concerns, and would welcome further engagement regarding the incentive framework.

Whilst current deployment levels remain relatively buoyant, a number of barriers to build-out need to be overcome in order to ensure that the supply of projects moving into construction remains steady across the wind sector. These barriers include both financial and non-financial constraints, ranging from the discharge of planning conditions through to difficulties in achieving financial close. Turbine supply continues to be a difficulty for some onshore developers, due to outdated planning requirements for turbines no longer in production.

Recent planning decisions made at local and ministerial levels, concerning both onshore and offshore schemes, have been disappointing, with an increase in the rates of planning refusal experienced in many parts of the UK

and the Dudgeon onshore substation setting a worrying precedent. As a result, developers are facing increasing planning risk in the development of schemes and their associated infrastructure, which in turn have implications for investment.

Key concerns for the sector are summarised as follows:

Onshore

- Post Consent barriers are resulting in increasing delays to commissioning.
- Planning approval rates are causing increasing concern – falling across the UK – at local authority level and at appeal stage.
- There is a continuing, and perhaps accelerating trend towards smaller project sizes, with a notable increase in applications for single turbines.
- The impact of re-banding onshore wind RO Certificates:
 - smaller operators to leave the market at 0.9ROC;
 - bigger players exit at 0.8ROC causing deployment to significantly slow post-2013;
 - shortfall in renewable electricity generation would need to be met by more expensive technologies.

Offshore

- The Government has made it clear that costs must fall and cost reduction is now a key focus of the industry.
- Consenting barriers are becoming an increasing concern, as consents remain slow.
- The impact of moving from RO Certificates to a Contract for Difference may negatively impact upon project viability and the ability of the industry to invest in cost reductions.

However, these barriers are not insurmountable. The industry currently has a great opportunity to resolve many of these uncertainties, working in partnership with government to successfully bring forward the new national regulatory frameworks. Close

engagement and cooperation between government and the industry will be needed in the next few months as the details of these regulatory frameworks are finalised.

The industry remains confident that the Government's lead scenarios for deployment can be exceeded, with deployment of 14–15GW onshore and 23GW offshore considered to be achievable by 2020. This report should, once again, provide the Government with renewed confidence that the growth projections put forward in the National Action Plan are not only possible, but are being delivered with increasing speed, at a time of continued financial turmoil.

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