

# BWEA

Delivering the UK's wind, wave and tidal energy

## Embrace the Revolution: Delivering 2020

## Manifesto for wind, wave and tidal power

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# Introduction: Delivering 2020

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## **Britain's changing energy mix: Securing supply**

The UK's energy mix is radically changing. Wind energy is no longer a marginal source of power. By 2016, 17GW of the current 75GW of UK electricity capacity will already have been retired, and up to a further 15GW will either close or be severely restricted in use. By 2023 there will be just one of the current generation of nuclear power stations still operating, Sizewell B – generating just over a single GW of electricity.

Without a dramatic increase in the use of wind energy the retirement of one third of the UK's domestic capacity will lead to severe overdependence on imported gas supplies, with all the likely effects of fuel poverty that we have seen recently played out. By 2020 80-90% of the UK's gas supply will be imported, compared to less than 30% two years ago, leaving the UK exposed to international markets with natural gas reserves concentrated in countries such as Russia and Iran. Already over the last 12 months gas prices have doubled.

Other options such as clean coal and nuclear are likely to play their role in the future energy mix, however, even under the new planning regime, it will still take at least 10 years for a new generation of nuclear power stations to be built, while clean coal technology is unlikely to be commercially viable much before 2020. Other renewable resources such as wave and tidal have huge long term potential but will not be significant generators of electricity until after 2020. If the UK is to meet its ambitious CO<sub>2</sub> targets and fill the looming energy gap wind energy is the only clean domestic energy source capable of delivering on the scale and in the timeframe needed.

## **Britain can reach the 2020 target**

The existing UK target for the generation of electricity from renewable resources is 10% by 2010. The new target of 15% of all energy

generated by renewable sources implies the need for a UK figure of 35% of electricity being generated from renewable sources by 2020.

While recent planning permissions for large scale wind farms mean that the capacity required to meet the 2010 target has been consented, though it may not all be completed by that year, the ambitious 2020 target will need a step change in both policy and delivery in order to deliver the 33GW worth of installed schemes needed. Nonetheless, that target is achievable: although just 3GW of wind capacity is currently operational, nearly 19GW is at one stage or another of development within the system. The wind energy industry is confident that 33GW of electricity can be provided by wind power by 2020 if current policy obstacles are removed.

Wind is clean, reliable and affordable  
Wind energy can provide a clean, reliable and affordable contribution to our energy supply. The UK has ambitious targets to reduce CO<sub>2</sub> emissions by 50% by 2020. Climate Change specialists believe that the key period for action is the next 10-15 years, precisely the timescale when wind can deliver most.

On average UK onshore wind farms run at 28% of their maximum, while offshore installations should do even better, in the range 35-40%. This compares to a 61% 'capacity factor' for UK nuclear power stations in 2006. This has led some to worry that increased use of wind would make the UK electricity system unreliable. However, National Grid calculates that 33GW of wind would require an additional 6.5GW of reserve 'back-up' supply – roughly the same proportion as is currently built into the grid system.

Rising energy prices have once again thrown the spotlight on the issue of fuel poverty and affordability. International gas and oil prices have doubled over the past year making

Britain's increasing dependence on foreign supplies of fossil fuels even less sustainable. Evidence now emerging from Denmark, Germany, Spain and Ireland shows that increased use of wind power actually acts to dampen wholesale electricity prices and thus keeps consumer bills down. Since wind's cost is almost all in the form of capital, it has virtually no marginal cost. This means that it will always be called on when available, driving off whatever is most expensive, such as oil or gas generators. The impact of this so called 'merit order effect' is to reduce the wholesale price of electricity as a whole.

### **New skilled 'green collar' jobs**

With Europe's largest wind resource we believe that the UK should be a world leader in renewable energy. Britain has a real opportunity to meet the new target of delivering 15% of all our energy supplies from renewable sources by 2020 and create thousands of new skilled green collar jobs.

There are currently 5,000 UK jobs in the wind industry, however this is set to grow dramatically in the next few years. Over the next decade and a half the proportion of the UK's electricity generated by wind, wave and tidal energy is likely to increase to well over 30% of supply. This will see £50 billion invested by the energy industry to massively expand the sector. Research undertaken for the BWEA by Bain & Co shows that between 30,000 – 60,000 new jobs would be directly created in the wind industry. These jobs would mainly be in design & production, construction & installation and operation & maintenance, without taking into account the stimulus that would be given indirectly to jobs in other sectors.

### **Britain needs wind power**

Government needs to provide the leadership so that Britain can seize the opportunity presented by wind, wave and tidal power. Although the Government has committed itself to ambitious renewable energy targets there are too many agencies, with disparate agendas and remits, which often seem to stand in the way.

Government needs to pull the different players together and ensure that all its many facets are working toward the shared goals of tackling climate change and securing our future energy supplies.

BWEA welcomes the creation of the new Department of Energy and Climate Change, it will help provide the leadership that is needed. However, the problem cannot be solved within just one ministry. Action needs to be co-ordinated across Whitehall and beyond. Issues such as the relationship between the current Strategic Environmental Assessment that is identifying the next generation of offshore wind farm sites, the designation of the new proposed Marine Conservation Zones and routes for shipping traffic need to be pro-actively managed so that they do not derail the Government's objectives.

Britain urgently needs a new generation of clean, affordable energy supply from domestic sources. Renewables, and wind energy in particular, are the only UK energy source that can deliver the scale of generation needed within the time frame necessary to avoid over reliance on increasingly expensive imported gas supplies.

We need Government to take the lead and create the policy framework necessary to deliver Britain's sustainable energy revolution.



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# Building a UK based supply chain

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## Issue

The next decade is set to see enormous investment in the UK wind industry, with the expansion of the offshore wind sector. The Government has already started the process of identifying and allocating sites for the next generation of offshore wind farms, which could result in £50 billion of investment creating upwards of 60,000 skilled direct jobs. However, there is a real danger that much of this investment might not come to the UK economy at all. The UK missed out on building manufacturing capability for the onshore wind sector in the 1990s because Britain failed to provide a stable home market. Today the danger is that the new offshore turbines and their components will be built in Germany, Denmark and China.

## Background

The most important role for Government in delivering a UK manufacturing base is to set a positive policy environment for renewable project development: the best encouragement to set up factories is a clear, consistent and predictable pipeline of contracts. Alongside providing support under a reformed Renewables Obligation, planning and grid issues must be addressed. The required actions are described elsewhere in this briefing. However, there are direct actions that Government can undertake which will help to bring forward manufacturing investment.

The Renewables Obligation was originally designed to deliver on the objective of providing 10% of our electricity from renewables in 2010. As it will stand after the current package of reforms is passed, it will be able to support delivery of 15% of renewable electricity by 2015, but not the much more stretching aim of over 35% of power by 2020. Further change, particularly to extend the system beyond its current sudden end in 2027, will be required. This is the most important single action that Government has to take in order to deliver on the 15% target.

The contribution envisaged from wind power, both on and offshore, will require about 10,000 turbines to be installed. This is not a huge proportion of the projected delivery of wind power globally to 2020, but it is anticipated that there will be strong demand for the available manufacturing capacity for much if not all of that time. It is arguable, therefore, that a UK manufacturing capability will be required if the targets are to be met, since otherwise we will have to compete hard for enough of a slice of the manufacturing 'cake'.

British sites are likely to make up 50% of the European offshore wind market over the next decade. To take advantage of this the UK Government needs to take pro-active action to attract the existing and potential large scale turbine manufacturers to base the production in the UK, and to encourage UK component suppliers who may not yet be in the wind market to enter it.

### The UK Government should:

- positively encourage UK companies into the sector, through outreach activities and suitable incentives, particularly for firms able to supply key components such as gearboxes and bearings.
- ensure the correct infrastructure is in place. Central Government must lead the Regional Development Agencies in forming coherent plans for facilities such as ports, and then provide suitable investment and/or incentives to deliver on these plans.
- partner with the renewable industries in identifying the quantity and qualification level of personnel required, and then implement plans to deliver on these.
- extend the Renewables Obligation system beyond its current sudden end in 2027, ensuring that future projects are able to secure financing.
- Establish a Cabinet sub-committee to co-ordinate the Government's delivery of the EU 2020 renewable energy target.

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# Unblocking the planning system

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## Issue

Over 7,100 megawatts of wind energy capacity is stuck in the planning system, which represents 6% of the UK's electricity supply. While 70% of major planning applications are dealt with within the 13 or 16 week deadlines, only 5% of wind farm applications achieve this. The average wind farm planning application takes 24 months to be considered.

## Background

The Planning Bill proposes a new Infrastructure Planning Commission (IPC) to take planning decisions on major infrastructure projects of national significance. Under the terms of the Bill, onshore wind farm applications of over 50MW would come under the IPC. This is a transfer of responsibility from the Secretary of State, who takes these decisions under Section 36 of the Electricity Act, not from local authorities.

Of the 7,100MW of capacity in the system, over half are in Scotland and as such are not covered by the Bill. Of the remainder, 1,143MW are in Northern Ireland and over 3,500MW are below the 50MW threshold and are being decided by local authorities, while a further 625MW worth are at Appeal. This leaves just a few hundred MWs sitting with DECC. Only these applications would be covered by the Bill as it stands.

BWEA has supported the Planning Bill as a serious attempt to tackle unnecessary delays in the planning system. However, the current version would capture a very small proportion of renewable energy projects and would do very little for our industry in tackling climate change and achieving government's renewable energy targets.

As drafted, the Bill will do little or nothing to prevent this situation from worsening as the

majority of future schemes will be either in Scotland or Northern Ireland or below the 50MW threshold for consideration by the IPC. The situation is made worse by the fact that many local councils simply ignore the existing pro-renewable planning guidance that they get from PPS22.

BWEA does not advocate a change to the 50MW threshold but seeks a commitment from the government to use its powers to refer energy schemes under 50MW if a number of local authority applications are 'clustered' and if an onshore application has spent significantly longer than 16 weeks in planning: this would amount to less 30 applications a year.

### The UK Government should:

- Ensure consistency across planning regimes, and clarity of policy hierarchy. Pre-eminence needs to be given to National Policy Statements in the preparation of development plan documents, and in advance of updating existing development plans at the regional and local level.
- The new Marine Management Organisation (MMO), will have responsibility for the consents process for offshore energy installations generating less than 100MW, whereas projects above 100MW will fall under the remit of the IPC. BWEA believes that this will create a disjointed approach to offshore planning and would unnecessarily duplicate offshore consenting skills and knowledge. For this reason the proposed 100MW threshold for IPC consideration of offshore consents should be reduced to 1MW, thereby extending its coverage to wave & tidal and aligning it with current section 36 requirements.
- BWEA believes the Community Infrastructure levy is an unjustified additional charge for developers as energy infrastructure is both prior and fundamental to the very community infrastructure that CIL seeks to support, because it is needed to provide the energy on which all such infrastructure critically depends.

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# Wind and RADAR

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## Issue

In order to achieve the Government's ambitious renewable energy target Britain will need over 30GW of installed wind capacity. This will require a range of bodies and agencies to align their priorities with the Government's goals of tackling climate change and securing our energy supplies. This includes both military and civil aviation agencies who have regularly objected to wind farm applications because of concerns over the potential impact on RADAR.

In part this issue could be resolved through better co-operation between agencies to alert developers of potential problems and objections early in the process. However, even with improved procedures there will still be a need to resolve the technical issue, including the purchase of new equipment for civil authorities and the reduction of detection of wind farms on RADAR systems.

## Background

Objections from the Ministry of Defence (MOD), NATS En Route (NERL) and individual airports have affected at least 4.5GW of the nearly 9GW in planning. Historically these agencies have often failed to seriously engage in discussions over potential project solutions and there has been a drought of technical solutions to overcome aviation concerns.

While meeting renewable targets is priority, the industry cannot deliver without investment – that investment is threatened if potential developers believe that even well advanced schemes could be subject to late objections. It is currently not possible to quantify the risk to a project from an aviation perspective – the objections cannot be easily predicted, and a pre-planning statement of no objection is not always valid through the planning process. In a competitive global market place, our wind industry investors are beginning to review their priorities and are choosing other countries to invest - countries

which do not face the unpredictability over aviation objections and which offer greater certainty of a return.

Progress has recently been made with the signing of a Memorandum of Understanding (MoU) by key government departments, aviation stakeholders, and the wind industry. The MoU has established a mechanism for highlighting issues and raising funds for the necessary research & development for resolving the outstanding technical issues.

### The UK Government should:

- Ensure timeliness in responses to planning applications rather than objections at last minute following £100,000's of investment
- Give clarity in response, so developers can understand why they are receiving an objection
- Maintain consistency in how the policy and processes are applied and the objections are received
- Encourage the Civil Aviation Authority to allow NATS En Route Ltd to upgrade its RADAR equipment to take account of the impact of wind farms.
- Match funding from the private sector into research and development for new RADAR equipment that will mitigate the detection of wind farms.



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# Building a 21st century grid network

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## Issue

Britain currently has a grid infrastructure built to transmit 75GW of power; this will need to accommodate 120GW by 2020. The current grid system was built around large central power plants, radiating out to users, often over long distances. However, the new generation of renewable generating plants is located where the source of fuel is most plentiful, such as mid-Wales, North Scotland or offshore, and these are different to where generation is currently sited.

## Background

Much of our grid infrastructure assets are coming to the end of their useful life. 60% of the grid will have to be replaced or substantially upgraded over the next 5-10 years.

The regulatory system governing the network was created around traditional forms of generation, and is not easily able to cope with significant change. It is not wholly fit for purpose for the major extension and upgrading of the grid that is required over the next decade.

National Grid operates an “invest then connect” strategy, whereby generators provide the investment signal and then National Grid designs, plans, builds and connects. This process can take a considerable time. National Grid starts route identification and design only once a generator has applied for connection. However, generators are only in a position to do this once they have secured planning permission and project financing. This can significantly delay projects: for instance, on average it takes 6½ years to complete the planning stage for offshore wind farms. Even when permission is granted for the wind farm it can take several years for the actual grid connection to be approved, as with the Beaulieu-Denny line.

The UK’s 2020 renewables target will not be achievable without a new grid connection regime. The current grid network struggles with connecting onshore wind at the moment and it will not cope with a further 20GW of offshore wind by 2020.

National Grid needs to adopt a system of advanced strategic investment for known areas of renewable generation, such as offshore Crown Estate areas, in order to reach the target on time.



### The UK Government should:

- work with industry to strengthen the guidance to Ofgem to ensure that it takes into account climate change and energy security, as well as price, when interpreting its primary remit of consumer protection, and allow National Grid to share risk with the industry.
- trial a “connect and manage” approach to grid management to provide early access for renewable generation, ending the current queuing for grid connection which undermines confidence in the system.
- allow strategic investment in upgrading grid infrastructure, once strategic development areas are identified, for instance at the end of the offshore wind SEA process.

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# Harnessing the potential of small wind systems

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## Issue

The UK's growing small wind system industry represents a new opportunity for the Britain as a whole to develop a world beating technology. Small Wind is the only micro-generation technology where the UK is currently leading the world. However, in order to take advantage of that lead and foster the development of a strong UK manufacturing base Britain needs a robust domestic market. Planning restrictions, lack of support for product certification to industry standards, and the lack of a Feed-In-Tariff style mechanism is stifling the further growth of the industry.

## Background

With the need to tackle climate change increasingly capturing the public attention – consumers ability to play their own part by installing small wind systems in their homes and businesses is increasingly important. The development of a UK small wind sector is enabling the public to directly engage in both environmental protection and reducing their own electricity bills.

Achieving the Government's target of ensuring that all new homes built in the UK will be carbon neutral from 2016 will undoubtedly help to stimulate the market. However, there are already 20,000 consumers who are unable to install wind turbines because of restrictive local planning regulations. If the required step-change is to be delivered then building & planning regulations need to be urgently addressed, and sufficient market support mechanism quickly introduced so to facilitate the necessary ramp up in manufacturing capacity.

Planning regulations are not the only constraints on the growth of the small wind sector. Consumers face obstacles from the cumbersome Low Carbon Building

Programme grant process, the double charging for export of electricity to the grid, and the lack of investment in the distribution network both to provide smart metering in the home but also smart networks capable of integrating large amounts of distributive renewables into the grid.

However, the long-term opportunities for the development of small wind are tremendous.

By 2020 there could be at least 600,000 small wind systems installed in the UK, producing as much as 1.3GW of electricity. An industry that size could have a turnover of £750m per annum, employing at least 6,000 workers in manufacturing and installation.

By 2040 the UK has the capacity to be generating nearly 9GW of our electricity from small wind, with 4 million small wind systems installed and an industry of at least 10,000 employees.

Should the UK sector be supported in the short term, UK manufacturers who already export 40% of product to over 100 countries, could potentially dominate a fast growing and significantly sized global sector, bringing tens of thousands of jobs and economic benefit to British shores.

### The UK Government should:

- Introduce the much delayed General Permitted Development Order for micro wind turbines. Other renewable energy systems are already able to by-pass much of the restrictive local planning policies. However, the GPDO for wind is being unfairly held up due to bureaucratic delay and unfounded fears over noise.
- Issue struggling local planning authorities with sufficiently detailed technical planning guidance for the processing of small wind system planning applications. Under resourced, local planning officers are currently struggling to cope with the increasing volume of applications as well as the technical complexities.
- Lift the current cap on the Low Carbon Building Programme, which restricts the ability of consumers to install the renewable system of their choice. However, in the longer term BWEA believes that we must move away from a grant based system of support for small renewables.
- Introduce a 40p/kWh Feed-in-Tariff style mechanism for small wind systems to kick start a world leading UK sector. Any schemes must not undermine the success of the Renewables Obligation, which has brought forward over 23,000MW worth of proposals since 2002. The Feed-in tariff needs to have a cap on eligible generating equipment of no more than 500kw.
- Kick start the UK sector, mirror the US Government example, and financially support manufacturers in meeting the prohibitively high cost of product certification to industry standards. Fully operational industry standards are crucial to long term consumer confidence and sector development.
- Drive research & development into the creation of smart networks, working with the Distribution network Operators to roll out technology capable of managing the complex load flows that will come with increased use of household & community renewable systems.
- Give utilities a mandate for the roll out of smart meters, a fantastic enabling technology for micro-renewables.



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# Wave & tidal power: promoting innovation and enterprise

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## Issue

As an island nation with the best coastal resources in Europe it should be no surprise that the UK's emerging wave and tidal energy sector is a world leader. As with the wind industry 15 years ago, British researchers and entrepreneurs are leading the way in developing this exciting new technology.

However, there is a danger that we will suffer the same fate as the British wind industry in the 1990's when our technological lead was squandered and manufacturing bases went to competitors overseas. In the 1990s the emerging domestic wind market necessary to support a UK manufacturing base was smothered by planning restriction and an uncertain policy framework. If that is to be avoided with wave and tidal then government must act as pro-active champions of the industry.

## Background

The Carbon Trust Future Marine Energy report argues that between 15% and 20% of current UK electricity demand could be met by wave and tidal stream energy. BWEA estimates that some 1.3GW of generating plant could be installed by 2020 and this would lead to significant industry expansion in the following decades.

The UK wave & tidal sector needs long term confidence in the policy framework & support mechanism which will govern its investment decisions over the next decade.

The industry is on a cusp, with the promise of commercial deployment just around the corner. A variety of developers are building prototypes which they are now taking to the water, moving from the developmental to pre-commercial stage. This process is proving challenging for independent entrepreneurs who do not have the financial backing of

large energy companies. The capital costs of developing wave & tidal schemes are three to four times those of wind, with some reported costs of between £6-7million per demonstration project.

There is a funding gap for initial stages of research & development for marine renewable technology as the grant funding body the Technology Strategy Board has ceased calls for applications for support from wave & tidal projects. It was hoped that the Environmental Technology Institute (ETI) would fill this gap, however as the ETI laid out its plans it became apparent that for many device developers the ETI model was not suitable as it purely offers a business deal which requires a sharing of intellectual property rights in exchange for funding. Given that at the early stage of project development Intellectual property is all that project developers have this is not a popular option. The ETI plan to fund a very small number of projects with large sums of money, thus effectively 'picking winners'. The only way to understand the actual benefits of a device is to test it in the sea. Grant funding therefore needs to be available to facilitate this open-water operation.

The current Government funding mechanism targeted at supporting the next stage in project development - the £50 million Marine Renewables Development Fund (MRDF) has also received much criticism. Despite MRDF having been set up in 2006, no projects have succeeded in fulfilling the eligibility criteria of 3 months sea trial data because the amount of funding required to get to that stage is not available. The Scottish £13.5 million Wave and Tidal Energy Support Scheme (WATES), has provided 9 schemes with support since it was established in 2006.

As further gap is created by the limited 7 year lifetime of the MRDF support for a project. A typical project of this scale would expect to run for 20-25 years. What happens to the support for the project afterwards? A mechanism needs to be established that can provide stability for the development of this nascent industry into commercial deployment. In the longer term that should shift from capital grants to a revenue based system and BWEA supports the Government's proposals for 2 ROCs support for each MWh of marine energy, however some form of short-term support to meet the exceptional capital costs of the first generation of large scale commercial projects is still needed.

### The UK Government should

- Extend enhanced capital allowance for research & development into marine renewable energy development.
- Keep a system of grants for supporting activities, such as installation vessels, grid connections, environmental studies
- Introduce a new long-term revenue support system – SuperROCs – BWEA proposes that a Government agency, the Non Fossil Fuel Purchasing Agency (NFPA) be designated to buy wave & tidal ROCs at fixed price, above market value. The difference could be funded from a range of options, such as the Non Fossil Fuel Obligation (NFFO) surplus, the prospective Emission Trading Scheme receipts or a consumer levy.
- Conduct a Strategic Environmental Assessment for England, Wales and Northern Ireland for marine renewable energy which will identify the most suitable areas for development and allow The Crown Estate to lease the seabed for commercial scale marine energy generation - as recently announced in Scotland.
- Ensure that there is a single consenting regime for offshore renewable energy developments and that responsibility is not split between the Government's new proposed planning authority, the IPC and its new proposed Marine Management Organisation.





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