renewableUK
The voice of wind & marine energy

www.RenewableUK.com

Small and Medium Wind Strategy

The current and future potential of the sub-500kW wind industry in the UK

November 2014

RUK14-021-7

Contents

Executive Summary

This Small and Medium Wind Strategy aims to encourage a debate about the future of the small and medium wind industry. It provides a background to this unique sector and highlights industry concerns. In conjunction with an independent cost and socioeconomic study, it offers evidence on the current state of the small and medium wind sector and its potential for growth, whilst proposing practical and affordable solutions to resolving an industry crisis. However, as made clear in this strategy, simple government interventions could address these issues to put the industry back on track.

Until recently, the UK's small and medium wind turbine sector had been one of the big successes of UK action to decarbonise our economy. The UK has been making and selling smaller-sized wind turbines for over 40 years, and is a world leader in the technology. Thanks to tariff support, falling technology costs and rising energy prices, the sector has grown rapidly. Growth in the UK has been matched by international success, and for every turbine installed here, UK manufacturers export another abroad.

And looking ahead, this sector should have a bright future. Across the 2020s the UK needs to take as much carbon out of UK electricity use as was taken out between 1990 and 2020. Not only will small and medium wind play a part in this decarbonisation, but deployment of smaller wind turbines will also help to strengthen our rural economy, supporting farms, communities and rural businesses throughout the UK.

This industry has the potential to grow significantly, with UK-based manufacturing companies leading the way. Looking ahead, a healthy industry backed by positive policies could be employing over 10,000 people by 2023, and delivering a GVA (gross value added) of £864 million to the economy. An industry at this scale would be delivering 2,460MW of generation, equivalent to saving 2.5 million tonnes of carbon each year.

And the fact that the economics of smaller wind turbines rely on the difference between generator and retail energy costs means that it will not be long before many users will choose to install wind energy as a practical solution to cutting energy costs. When this threshold is achieved,

This industry has the potential to grow significantly, with UK-based manufacturing companies leading the way.

mechanisms such as the government Feed-in Tariff (FiT) will no longer be required.

But despite small and medium wind being a great source of low-carbon generation backed up by UK manufacturers, policy changes over the last 24 months mean that the sector is currently being driven towards breaking point. Simple, practical government policies would result in a wealth of benefits. However, without help, the industry will be forced to take a different path.

Overcoming Short-term Challenges

In 2013, the deployment of sub-50kW wind turbines decreased by nearly 80% on the previous year.[1] Developers and installers of medium wind turbines fear a similar fate in light of the rapid FiT degressions and lack of political support. If these trends continue, they will start to undermine other government policies in areas such as community energy, job creation and UK manufacturing capabilities. The small and medium wind industry ticks a lot boxes, but without necessary policy changes, thousands of jobs could be lost, exports could be halted and the UK standards that lead the global industry could be wasted.

For the consumer, there are many advantages to owning a turbine, and it is vital that individuals are given the opportunity to play their part in the energy sector rather than relying solely on large-scale corporations.

Let's be clear which part of the market this strategy covers. The small and medium wind industry comprises turbines with a capacity of up to 500kW. These turbines are typically single installations on a farm, domestic property or small business, and they primarily provide electricity for on-site usage. These types of turbines are usually no taller than a mature tree. The inclusion of wind turbines in the UK energy mix is vital to ensuring a consistent and secure low-carbon source of electricity within the UK.

The introduction of the FiT scheme in 2010 no doubt had a positive impact on the deployment of turbines, and the industry demonstrated what could be achieved with positive policies. However, the introduction of Phase 2B of the Feed-in Tariff in November 2012 changed everything. It introduced lowered tariff levels for wind generation; amalgamated the tariff bracket for all turbines under 100kW; and introduced a capacity-driven degression mechanism effective from April 2014. As a result of these amendments and the increasingly negative political environment around wind energy, manufacturers and developers at the smaller scale have been forced to make redundancies and re-evaluate the future of their businesses. A significant number of companies have entered into administration over the past year. This provides clear evidence that the industry cannot sustain itself in current market and political conditions.

Small and Medium Wind's UK Contribution

The advantages of small-scale wind power are widespread across environmental, social and economic factors. The small wind industry in the UK has the advantage of a domestic manufacturing base – at least 15 UK companies build turbines suited to home, business and community generation. Not only has this UK manufacturing base enabled a reliable and efficient domestic industry, it has also allowed an export market to prosper. For every turbine sold in the UK, one is also exported to the overseas market. In response to this success, employment within the sector grew spectacularly between 2010 and 2012, with a threefold increase in jobs.

For the consumer, there are many advantages to owning a turbine, and it is vital that individuals are given the opportunity to play their part in the energy sector rather than relying solely on large-scale corporations. Farming businesses are ideally placed to benefit from on-site power generation, and the supplementary income received from energy savings creates a reduction in overheads and offers a safeguard against future electricity prices. Over a third of farms now use renewable energy on-site, and remote communities are also benefiting from small turbine installations by removing their reliance on diesel generators or oil-fuelled boilers. Commercial users, especially those with high energy demands, also have opportunities to create energy savings and safeguard themselves against future energy shocks.

Realising the Potential of Small and Medium Wind

To realise this potential, government needs to understand and back this sector in delivering growth and reducing cost. Since 2011, the industry has achieved a CAPEX cost reduction of 10.6%, yet since this date, the FiT has decreased by 43% in the 1.5kW to 15kW bracket, 37% in the 15kW to 100kW bracket, and 32% in the 100kW to 500kW bracket. In light of this imbalance, the most pressing task for government is to use the upcoming Feed-in Tariff review to address the worrying trends in the market. In 2012, government merged different Feed-in Tariff bands. Its reasoning was that this would help the market for the very smallest turbines. In fact, the opposite has happened. Feed-in Tariff degression is driving small UK manufacturers out of business, yet government has been reluctant to look at the causes or acknowledge this result as the opposite of that which it predicted.

This strategy indicates that the changes proposed would represent a tiny percentage of the overall FiT budget, and that these additional costs could be met by better management of the FiT programme.

And beyond short-term challenges, it is critical that government gets behind the longer-term growth of the sector and works with the industry. To deliver growth, reduce cost and cut carbon using small and medium wind, we would like to see government pledge to support the following objectives:

1. **An aspirational target of 1,200MW of installed <500kW wind capacity by 2023 set by government to publicly show backing for the small and medium wind industry.**
2. **A Feed-in Tariff that is fair and robust, with the appropriate banding and degression capacity thresholds to allow each scale of the sector to prosper independently.**
3. **A planning system that determines smaller-scale projects appropriately, without onerous costs or timescales.**
4. **Revised tax structures to support UK manufacturing and employment growth in order to maintain the global lead of the UK small and medium wind industry.**
5. **Increased and effective community energy support to the small and medium wind industry to help it grow community and locally owned energy schemes.**

If we want to achieve these objectives, the policy mechanisms currently in place need to be changed. A total of 19 specific recommendations have been put forward in an attempt to change the fate of the industry. The short-term recommendations include FiT amendments, reviewing tax breaks and grants, improving finance lending, as well as streamlining planning and community support opportunities. The long-term recommendations cover innovative net billing solutions and future grid reinforcements.

Industry knowledge and experience needs to be utilised to shape the best possible support schemes for the sector, and to ensure that the Levy Control Framework (LCF) budget is spent in an effective way – a way that invests in our low-carbon future and the economy of the UK.

“Over a tenth of UK farms have a turbine on their land, and many more want to follow.”

With the right action, farm-scale wind can continue to grow. Our rural businesses and farms already understand the opportunity offered by smaller wind turbines. Over a tenth of UK farms have a turbine on their land, and many more want to follow.[2] Small and medium scale wind offers energy security to farms and makes them part of the solution to decarbonising our economy. And satisfied customers in the UK mean a thriving domestic manufacturing base is able to grow and export UK technology abroad. The alternative is unhelpful tariff and planning policies shutting out householders, farms and businesses from the FiT market, and a group of UK manufacturers who must either go out of business or relocate abroad to survive. This strategy shows how we can take the brighter path.

Industry Highlights

The Current Success of the UK Industry

15 UK small and medium wind manufacturers

For every turbine installed in the UK, one is also exported overseas

10% of farms have installed a wind turbine

What We're Set to Achieve by 2023

806MW	0.8m	£202m	2,241
Deployed	Tonnes of carbon saved	Gross Value Added	People employed

What We Could Achieve by 2023

2,460MW	2.5m	£863m	11,448
Deployed	Tonnes of carbon saved	Gross Value Added	People employed

Chapter 1—Introduction to the Small and Medium Wind Industry

Wind energy is in use across the UK, and it is a vital part of our electricity supply. It is being used at all scales; however, often unnoticed is the remarkable success of wind energy at the small and medium scale.

People choose to install wind power for many reasons, but mainly because it's a sensible and practical way to secure affordable electricity. And whilst our industry has been in existence for over 40 years, it's in the last few years that it's really taken off. Technology improvements, cost reductions and a government taking action to incentivise local decentralised generation have resulted in sector growth. The government's last Energy Minister, Greg Barker, famously called for a "Big 60,000": small businesses, farms and individual householders, all meeting their own energy needs and challenging the "Big Six" energy suppliers. This shift to make decentralised generation a part of our energy mix – with small turbines and solar panels contributing alongside offshore wind farms, gas power stations and new nuclear – is a future already emerging.

UK-manufactured turbines are currently providing power around the globe, from Alaska to the Antarctic, from Tonga to Montana. Small wind manufacturers such as Ampair have been around for over 40 years, and most companies emerged many years before the launch of the government's Feed-in Tariff scheme. As a result, the small wind market is not a product of the FiT, but a market that was able to utilise the incentive scheme in order to increase deployment and achieve economies of scale. This has increased the affordability of on-site generation for a larger number of people, providing more householders and farmers with the opportunity of utilising natural resources and reducing their reliance on retail electricity and expensive off-grid fuel.

Nevertheless, the impact of the FiT scheme has seen winners and losers. Due to inappropriate banding of the FiT, different microgeneration technologies and different scales of generation have received varying levels of support. Where a 15kW turbine may once have been the obvious solution to a farmer's needs, a solar farm or a larger turbine may now provide more attractive returns due to the artificial FiT market that has been generated.

Our small and medium wind sector has grown rapidly in the last few years, with turbines hard at work across the UK. This growth is leading to cost reductions and a rapid move to cost competitiveness. But whilst the Feed-in Tariff has had many positive impacts on the industry's development, various reviews and tariff degressions are impacting parts of the sector disproportionately. This has led to a drastic downturn in the deployment of small wind turbines, which has in turn resulted in sector redundancies and pushed many manufacturing and supply chain companies into administration.

This *Small and Medium Wind Strategy* aims to encourage a debate about the future of the small and medium wind industry and shine light on some of the challenges faced by the sector. This work is underpinned by independent cost and socioeconomic analyses carried out by Arup, showing deployment and cost potentials for the sector. The results highlight the success of the small and medium wind industry and identify prospects for the future. By analysing challenges and setting out practical and affordable solutions, we are ensuring that this sector can continue to grow whilst demonstrating good value for the consumer and helping many more businesses, communities and farms across the UK.

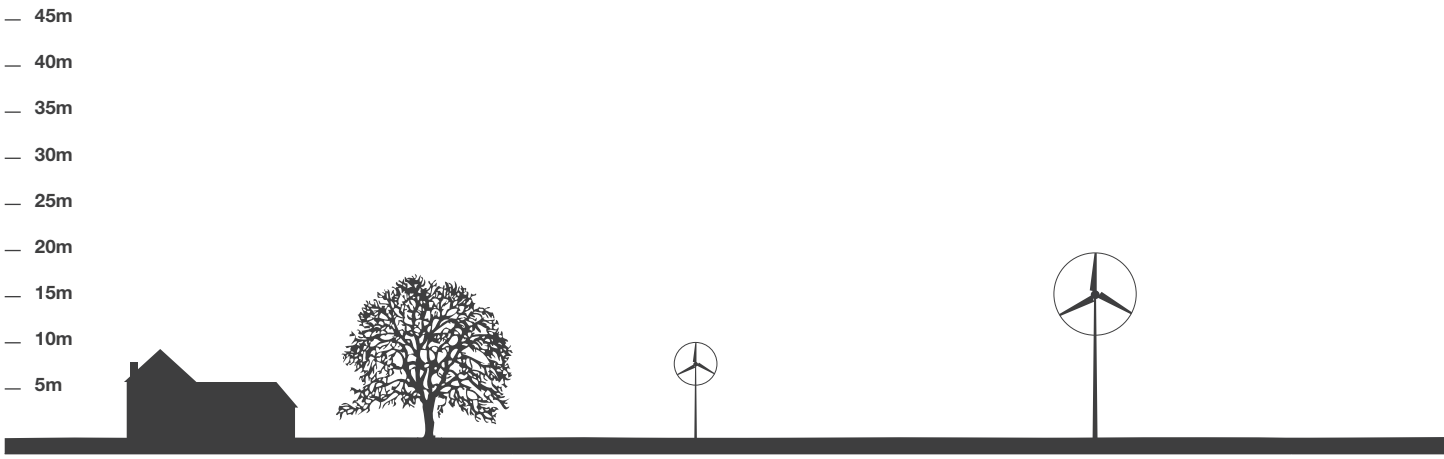
Small, Medium and Large Wind Turbines – What's the Difference?

Wind turbines come in many sizes. They vary from a small turbine used to feed a battery on a caravan or boat, to an offshore utility-scale turbine producing many thousands of times the amount of power. The diversity of scales offered by this single technology is one of its great strengths. When installing a turbine, people consider cost, reliability and performance. But they also choose a size of turbine that will suit their own on-site power needs. That is why having different scales of turbine to choose from is so important.

This strategy focuses on small and medium wind turbines up to 500kW in capacity. This group of turbines

Figure 1. Breakdown of turbine ownership[3]

Figure 2. Turbine scales and typical applications



Size (metres)	2–18	12–25
Capacity (kW)	0–1.5	1.5–15
Typical on-site electricity use	Up to 100% used on-site	Up to 90% used on-site
Typical annual energy production (kWh)	Up to 1000	Up to 60,000
Typically connected to:	House	House or farm

are suited to distributed, localised generation. Two thirds of these turbines are installed on farms to generate on-site power, though they are also popular for powering rural housing, businesses and community facilities.

Significant for many when choosing a small or medium wind turbine is that you can buy British. The UK is home to around 15 small and medium wind turbine manufacturers, producing models from several hundred watts to 225kW in size. These UK manufacturers are also active abroad, exporting turbines all around the world.

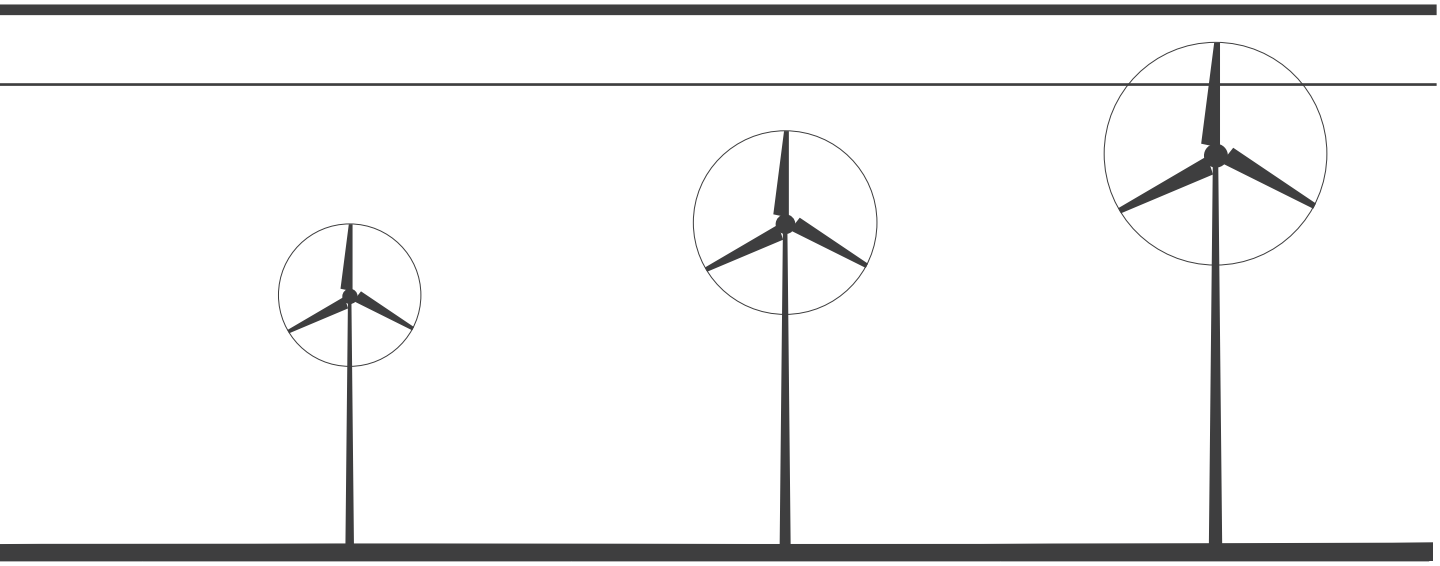
This export success comes from having a world-leading product and a strong home market, which acts as a foundation for expansion and export. However, this home market is seen as increasingly unreliable, and this continued uncertainly is likely to undermine this manufacturing success in the near future.

It is important to remember that differently scaled machines suit different users. This also means that different customer, finance and investor requirements need to be in place.

Small wind turbines (0–100kW) are commonly single-turbine installations owned by individual homeowners or farmers for on-site electricity consumption. In comparison, medium wind projects (100–500kW) are larger developments that also supply wholesale electricity to the grid, and are often investor financed.

A visual representation of the scale and typical uses of small and medium wind turbines is shown in Figure 2.

Despite the differences between small and medium wind, what these turbines have in common is that they are typically installed to provide on-site electricity. They only use the grid to sell back any excess generation above their immediate energy needs. In contrast, large-scale wind generation generally consists of wind farms – typically around 160m in height – around five times the size of small turbines. These feed all their generated electricity direct to the national grid.



20–50	35–55	45–65
15–50	50–200	200–500
Up to 80% used on-site	Up to 70% used on-site	Up to 70% used on-site
Up to 250,000	Up to 700,000	Up to 2,400,000
House or small business	Farm or large business	Community, farm or large business

Chapter 2—The Strengths of the Industry

Small and medium wind turbines bring many social, environmental and economic benefits. Apart from the obvious advantages of their carbon-free and limitless fuel source, the nature of the UK climate means that electricity is generated from wind power when we need it most, i.e. in the cold winter months when electricity demand is high. Small and medium wind turbines offer rural economies the opportunity to diversify income, and they also offer remote communities the opportunity to be self-sufficient in their energy needs. For some remote communities, lack of access to the National Grid means wind energy can be the only way to secure a reliable power supply.

Supporting Rural Economies

Distributed generation via small and medium wind power allows rural householders, businesses and farms to produce their own electricity at a set price, and shields them from increasing and fluctuating energy bills.

Over the last few years the retail price of electricity has increased markedly. Rising energy bills hit the competitiveness of rural businesses and farms. But equally worrying for these firms is the cost volatility and insecurity of not knowing what will happen to future prices.

Installing a wind turbine on a farm changes that. It means the price of electricity can be controlled, helping manage costs and reducing exposure to regular price hikes. Those selling excess electricity to the grid can also benefit from a stable source of income that is not subject to fluctuating prices, which is common for agricultural commodities such as grain, wool fleeces and milk.

Wind really helps give these farm businesses something they can rely on. And unlike solar farms, a wind turbine's actual "footprint" covers only a small portion of land, therefore allowing the farmer to continue using the surrounding pasture for crop production or livestock grazing.

Given these advantages, it's not surprising that over 10% of UK farmers now have a wind turbine installed, and of those farmers without renewable energy installations, 61% are likely to invest in some form of renewable technology in the next five years.[4] Analysis from NatWest, RBS and RenewableUK shows that farmers earn £12,000–50,000 a year from generating their own wind energy.[5]

Debbie and Neil McGowan's Perthshire farm

"Every farmer should have one!"

Debbie and Neil McGowan installed an 11kW Gaia wind turbine on their Perthshire farm in 2010. "We wanted to lower our energy bills and become carbon-neutral in our farming practice. We were using a lot of electricity after installing a water borehole with an electric pump, so we wanted to offset our energy use. Installing a wind turbine ticked all these boxes."

Over 70% of the electricity generated by the turbine is used on-site, powering the farmhouse, outbuildings and water pump. It saves the McGowan's £2,000 a year on their energy bills, and provides an additional income from the Feed-in Tariff and export payment. "The extra income has helped us enormously in making farm improvements. The Feed-in Tariff made the project viable. Without it, we would have been unable to go ahead."

The McGowan's are very proud of their turbine. "It does exactly what it was meant to do, it blends in with the area, it has very few mechanical problems and it has caused no rifts with our neighbours. The local community see the wind turbine as part of the farm. Every farmer should have one!"

"The extra income has helped us enormously in making farm improvements."

Distributed Generation

The vast majority of us take having electricity "on tap" for granted. But for many homeowners and rural communities, connection to the grid is a distant prospect. Commonly, these people rely on diesel generators to supply their electricity needs, but are increasingly turning to wind turbines as a cleaner and more affordable alternative. Wind turbines have been used for household electricity generation in conjunction with battery storage for many decades in remote areas.

Others choose wind energy to help them reduce or eliminate their dependence on grid electricity for economic reasons, or to reduce their carbon footprints. Similarly, rural communities that do not have access to mains gas have to use expensive oil or electrical heating systems. Installing a wind turbine is an alternative option that allows people to heat and power their homes using an abundant local source of energy.

Self-sufficient on Rousay, thanks to wind power

Ann Chapman lives on Rousay – a small hilly island about 3km north of Orkney's mainland, with just under 300 residents. "I began to notice how my heating oil bills were going up," explains Ann. "The price per litre kept rising, and deliveries were sometimes hard to secure when I needed them most. I was approaching retirement age and – to be honest – if the cost of heating oil carried on increasing at the same rate, I couldn't afford to continue heating and living in my home."

"… I couldn't afford to continue heating and living in my home."

Ann decided that a small wind turbine would be a sound investment. As a result, a UK-manufactured Evance turbine was installed in November 2011. Wind energy is now used to power the electric cooker and storage heaters instead of heating oil. "Financially, I'm finding that my energy bills are minimal – under £500 last year – and now I'm not reliant on oil."

Ann's story is a brilliant example of the way small wind is helping people to take control of their energy needs, and this is particularly important for individuals in remote rural areas of the UK.

The Benefits of the UK Market

Most people who have small and medium wind turbines make use of the government's Feed-in Tariff scheme. In existence since 2010, the FiT incentivises deployment of small- and medium-scale renewable energy generation in the UK (<5MW). In 2013, less than £1 of the average annual household energy bill went towards supporting small-scale wind installations via the Feed-in Tariff.[6] Since its launch in April 2010, the scheme has allowed the small and medium wind industry to grow and prosper, resulting in a cumulative deployed capacity of 130MW.[7]

Until recently, successful growth in deployment had been matched by employment growth. In 2012, 3,304 full-time employees were directly working in the small and medium wind industry.[8] This represents a threefold growth rate since 2010. At a time when job creation of all sizes is of national importance, it is absolutely vital that decision-makers recognise the valuable input of the many small manufacturing and supply businesses in this sector. The employment growth between 2010 and 2012 is a massive feat. However, much of this

At a time when job creation of all sizes is of national importance, it is absolutely vital that decision-makers recognise the valuable input of the many small manufacturing and supply businesses in this sector.

New manufacturing plant in Worcestershire

Endurance Wind Power is an international manufacturer of wind turbines for distributed power generation. Employee-owned and engineering-driven, Endurance was founded in 2007 in British Columbia, Canada. The company has since built the UK's largest fleet of turbines in the sub-100kW class, with around 500 turbines now installed across the country.

The success of its 50kW wind turbine led Endurance to open a new assembly facility in Hartlebury, Worcestershire, in order to manufacture its new 225kW turbine. Launched in 2013, this new facility is expected to build up to 100 turbines per year, with foundations, turbine towers and components all to be sourced from the UK and throughout Europe.

Endurance's new UK plant will result in significant benefits to the national economy, as well as supporting local businesses such as tower manufacturer Mabey Bridge Ltd in Monmouthshire. Endurance's expansion to the UK represents a multimillion pound investment in facilities and equipment, with the initial creation of 50–100 new UK jobs. This inward investment shows the benefits that can come from having a stable Feed-in Tariff to underpin new projects.

"… this new facility is expected to build up to 100 turbines per year"

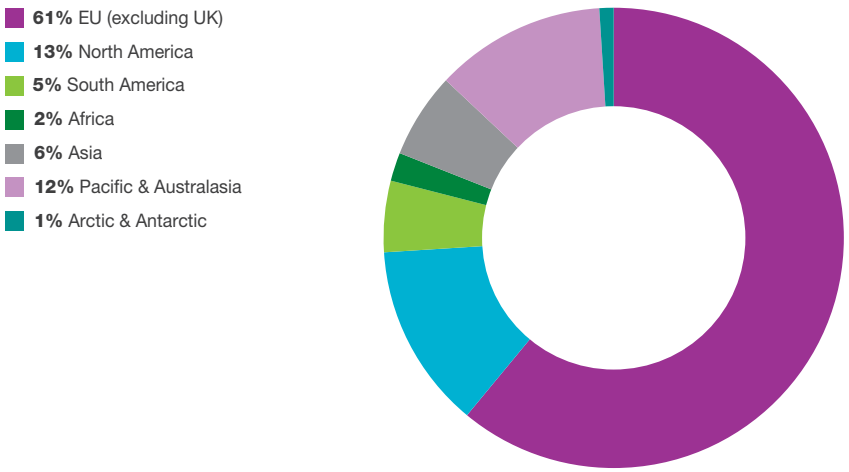
The past success of the micro and small wind export market has also contributed to the creation of sector employment.

growth is under threat. Across 2013–14 we have seen large numbers of redundancies, with some companies cutting their workforces in half in the past 18 months and some UK manufacturers entering administration. Every effort should be made to address and reverse this decline.

The past success of the micro and small wind export market has also contributed to the creation of sector employment. The strong UK manufacturing industry for micro and small turbines has generated a worldwide export market. Each year, nearly 25,000 turbines are exported overseas.[9] This has created an annual UK manufacturing export revenue of £5.26 million.[10] In 2012, sales in the micro wind bracket (0–1.5kW) amounted to £2.83 million – an increase of 11.5% when compared to 2011.[11] Two-thirds of exports are to the rest of Europe, but exports to North America and the Pacific also provide healthy export opportunities. The growth of this market has helped compensate for the shrinking home market. However, if the UK market shrinks much further, there will be little motive for the manufacturers to remain in the UK, and instead they may choose to relocate their companies to areas of overseas market demand. It is vital that we do not let this happen.

When considering the UK's medium wind export potential, this market is still very much in its infancy, with the first manufacturing facility opening in the West Midlands in late 2013. As a result, the export capability of the sector is only in its initial stages but with growth potential for the future, especially with emerging markets such as Japan and Israel providing potential high-value markets for UK wind turbines.

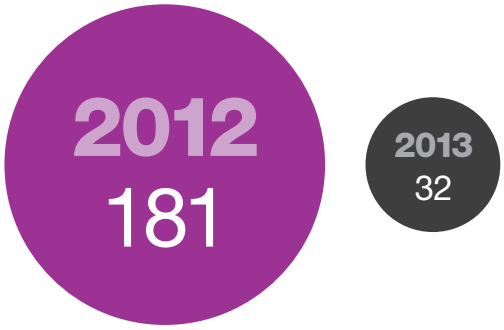
Figure 3. Breakdown of the UK export market[12]



Chapter 3—So What's Happening?

The small and medium wind industry has faced drastic changes in the past 18 months, and it is constantly battling hurdles in order to continue the installation of domestic and farm-scale turbines in the UK. To understand the current state of the industry, it is important to have a clear picture of how historical policy has shaped the market. Chapter 1 showed how the small wind market existed for many years before the launch of the Feed-in Tariff, with manufacturers focused on supply of remote systems and farm businesses.

Figure 4. Average number of sub-50kW turbines installed per month



In April 2014 only six wind turbines under 50kW were installed.

In Chapter 2 we looked at how the introduction of the FiT scheme in 2010 had a positive impact on the deployment of turbines and allowed the sector to reach an all-time peak in November 2012. However, this growth was followed by a government review (Phase 2B) and restructure of the FiT.

This review introduced lowered tariff levels for wind generation; amalgamated the tariff bracket for all turbines under 100kW; and introduced a capacity-driven degression mechanism, effective from April 2014. As a result of these changes, the advances made by the UK's small and medium wind sector have been completely reversed. In 2013, the deployment of sub-50kW wind turbines decreased by nearly 80% on the previous year.[13]

In 2011, close to 1,000 turbines were installed. This number jumped to over 2,000 in 2012, and then, following the review in 2013, deployment fell to less than 500 – the lowest level for four years. Deployment levels are now too low to sustain an industry – in April 2014 only six wind turbines under 50kW were installed.

As a result of these declining trends in the UK small wind market, companies have been forced to make redundancies and re-evaluate the future of their businesses. At least five companies have entered into administration over the past year, providing clear evidence that the industry cannot maintain business in current market and political conditions. The industry believes that government is not concerned by these trends and is failing to take action to address this decline.

What Caused Industry Decline?

So what specific changes are behind this rapid change in fortune? There are four main reasons: the introduction of excessive FiT degression; the amalgamation of FiT brackets; political instability and media commentary; and application of inappropriate planning requirements.

1. Feed-in Tariff degression

Since 2011, the industry has achieved a CAPEX cost reduction of 10.6%, yet since this date the FiT has decreased by 43% for the 1.5 to 15kW bracket, 37% for the 15 to 100kW bracket and 32% for the 100 to 500kW bracket. The Feed-in Tariff is decreasing at a rate to which the industry is unable to respond.

The degression mechanism introduced in April 2014 has sped up the process of the declining FiT rate. In April 2014, the rate decreased by 20% for all small and medium wind turbines, and a further 10% decrease is expected in October. This has occurred because the installed capacity throughout the previous 12 months triggered the top rate of degression. Yet degressions are occurring in the sub-50kW scale despite the fact that deployment levels are the lowest that they have been in four years.

Concerns regarding these low capacity thresholds were set out by the industry in 2012, supported by independent analysis.[15] And based on the industry's declining trends, this lack of support for the small and medium wind sector is clearly undermining long-term security and investor confidence.

2. The merger of all turbines under 100kW to the same FiT bracket

Up until December 2012, government used bands of 0–1.5kW, 1.5–15kW, 15–100kW and 100–500kW to direct support to different scales of small and medium wind turbines. However, its review introduced a single band for all turbines under 100kW. This change brought an immediate financial advantage for turbines in the 50kW to 100kW market. As a result, the installation rate within this scale sector has grown above the rate predicted by government, meaning that a 20% FiT degression was triggered in April.

However, despite overall growth, installation of turbines under 50kW has fallen, and now only comprises 13% of the total installed capacity under 100kW. This imbalance means that the smaller end of the scale will suffer a 20% FiT degression because of the volume at the larger end of the scale. Figure 6 shows the disproportionate split of capacity between the different scales of turbine.

A FiT market that cannot support different sizes of turbine will impact UK manufacturers, but more importantly it will affect those homeowners, small businesses and farmers who wish to install a smaller-sized turbine.

Current ineffective FiT policy is at risk of removing the option of installing a small wind turbine and forcing people to install a larger turbine than needed.

Industry concern on this issue is compounded by the fact that, when choosing to combine different FiT ratings under 100kW, the industry raised concerns that this would happen. During the Phase 2B review of the Feed-in Tariff, the Department of Energy and Climate Change (DECC) proposed two degression-banding methodologies,[17] which we have reproduced in the tables overleaf.

The chosen methodology combined all scales under 100kW, which resulted in triggering a 20% degression following the installation of 26MW of capacity. The rejected methodology would have kept the 15kW banding, and would have triggered only a 5% degression

Figure 5. 2010–13 Microgeneration Certification Scheme (MCS) turbine deployment[14]

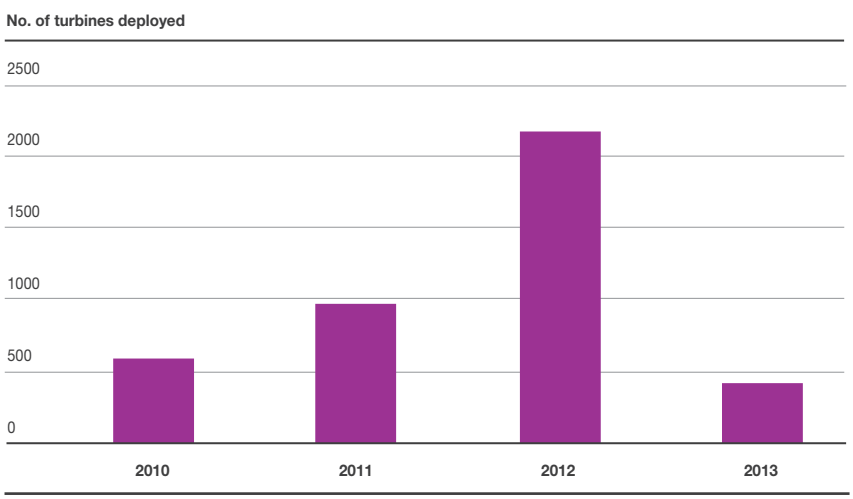


Figure 6. Breakdown of installed capacity in 2013[16]

for the sub-15kW bracket. One of the government's reasons for the combination was that it would benefit the sub-15kW wind industry by smoothing out degression. Figures 7 and 8 show government's own projections alongside what has actually happened. This reveals that the combination of bands caused sub-15kW turbines to be impacted by excessive degression rates not caused by any capacity increase.* Figure 7 shows the capacity triggers for both methodologies of the April 2014 degression. Figure 8 below shows the same for the October 2014 degression. Government has to revert to the rejected methodology if the small wind industry is to have any chance of existing this time next year.

Figure 7. April 2014 degression methodologies

		Level of annual deployment required to prompt degression (MW)					
Degression band		**2.5%**	**5%**	**10%**	**20%**	**Capacity Installed in 2013**	**Degression Triggered**
Chosen methodology	≤100kW	<3.3MW	3.3–6.5MW	6.5–13.1MW	>13.1MW	**26.06MW** installed	20%
Rejected methodology	<=1.5kW–15kW	<1.2MW	1.2–2.4MW	2.4–4.9MW	>4.9MW	**2.291MW** installed	5%
	<=15kW–100kW	<2MW	2–4.1MW	4.1–8.2MW	>8.2MW	**23.77MW** installed	20%

Figure 8. October 2014 degression methodologies

		Level of 6-calendar-month deployment required to prompt degression (MW)			
Degression band		**5%**	**10%**	**Capacity Installed Jan–Jun 2014**	**Degression Triggered**
Chosen methodology	≤100kW	4.3–8.6MW	>8.6MW	**28.00MW** installed	10%
Rejected methodology	<= 1.5kW–15kW	1.6–3.2MW	>3.2MW	**2.60MW** installed	5%
	<= 15kW–100kW	2.7–5.4MW	>5.4MW	**25.4MW** installed	10%

* At the time of Phase 2B review, DECC met with industry to discuss proposed banding. It set out analyses of the two alternative methodologies. Its presentation stated that "subdividing the 0–100kW degression band into 0–15kW and 15–100kW does not provide improved triggers for the 0–15kW band … this subdivision makes degression more likely, and at higher rates". This assumption was wrong and has not been the case.

"Government needs to show confidence in the sector, making it clear that FiT support will remain in the years to come..."

3. Political instability and media commentary

Negative briefing and political instability from government about onshore wind has had a detrimental impact on investor backing for small and medium wind companies in the UK. The majority of businesses within this sector are small and medium-sized enterprises (SMEs), which are financially backed by single-party investors. A company being funded by a single investor is more sensitive to market fluctuations and policy uncertainty. Therefore, if that investor pulls out, the company is at high risk of falling over. Government needs to show confidence in the sector, making it clear that FiT support will remain in the years to come and at a level that supports the growth of the industry.

4. Inappropriate planning requirements

The amount of documentation required when submitting a planning application and the time taken in planning before a project is decided upon are both disproportionately demanding, relative to the scale of smaller wind turbines. This adds cost and time constraints onto each project. It is becoming increasingly common for homeowners, farms and small businesses to be asked for studies and information appropriate for large, utility-scale schemes, not farm-scale installations of small turbines.

In addition, planning is taking longer. The industry has experienced a two-and-a-half-month increase in decision times in the past year alone.[18] The cost uncertainties caused as a result of planning delays and the risk of missing key target dates (e.g. for land leases, grid connections, FiTs, etc.) are extremely difficult for smaller projects to absorb. This nature of timescale uncertainty makes the new six-month FiT degression period particularly difficult for medium wind projects to cope with. However, if the planning process were to become faster, this six-month degression period would be less likely to be an issue.

Chapter 4—Our Industry's Current and Future Value

With UK commitments to decarbonise our electricity, and a desire in government that householders and businesses, not just utilities, need to be a part of this shift, the small and medium wind industry should be enjoying growth. However, experience shows mounting challenges, and our industry is at a crossroads that will determine its future.

It is important then that we look at future trends and opportunities for the sector, and the impact that a declining market will have on cost and socioeconomic benefits in the UK. As a result of mounting concerns, RenewableUK has commissioned the consultant Arup to consider possible scenarios of deployment and the resultant cost and socioeconomic benefits of the sector. This chapter provides an overview of the key findings from the study. The analysis is split into four parts:

1. **Scenarios** – the identification of expected turbine roll-out for the small and medium wind sector under low-, medium- and high-deployment scenarios.

2. **Cost analysis** – assessment of DEVEX, CAPEX and OPEX costs, and comparison with historic wind turbine cost data.

3. **Levelised cost** – the estimation of the levelised cost of generation for comparison with historic and future values of FiT revenue support.

4. **Socioeconomic analysis** – an estimation of the jobs and GVA associated with the roll-out and manufacture of small and medium wind turbines.

Scenarios

A critical element of the analysis includes the establishment of a turbine deployment forecast, broken down into low-, medium- and high-deployment scenarios.

Low scenario ("business as usual"): takes into account the negative outlook of the sector and the current expectations surrounding future FiT levels. It is thought to be the most likely deployment trajectory and considered the "business-as-usual" scenario.

Medium scenario ("positive policies"): takes into account an optimistic view of deployment for the small and medium turbine scale if some modest positive policy changes were to occur.

High scenario ("optimistic"): represents the maximum amount of capacity that could be deployed if a significant change in policy occurs.

To capture the different trends and expectations of change within the sector, the deployment curves have been split into very small (0 to 15kW), small (15 to 100kW) and medium (100 to 500kW) wind turbine brackets. The annual installed capacity (kW/annum) is shown in Figures 9, 10 and 11 overleaf, for each of the three scenarios.

Figure 9. Very small-scale wind (0 to 15kW) annual kW deployment, 2011–23

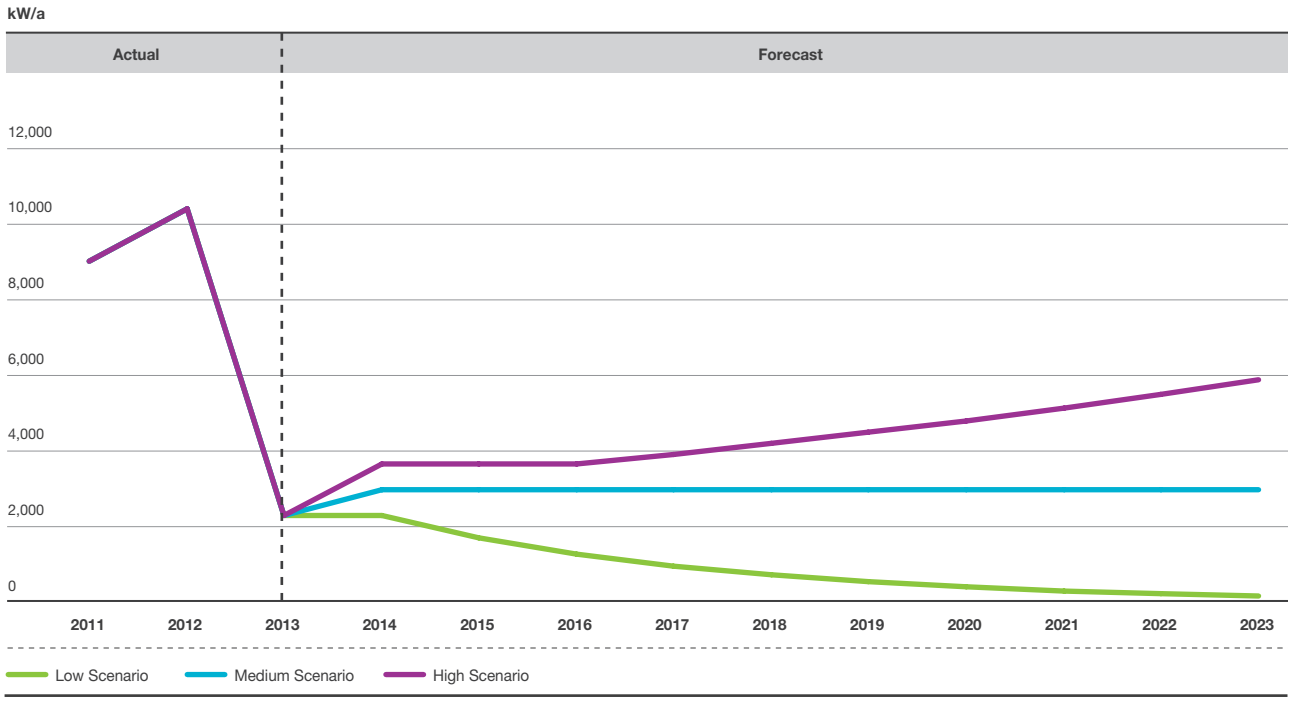


Figure 10. Small-scale wind (15kW to 100kW) annual kW deployment, 2011–23

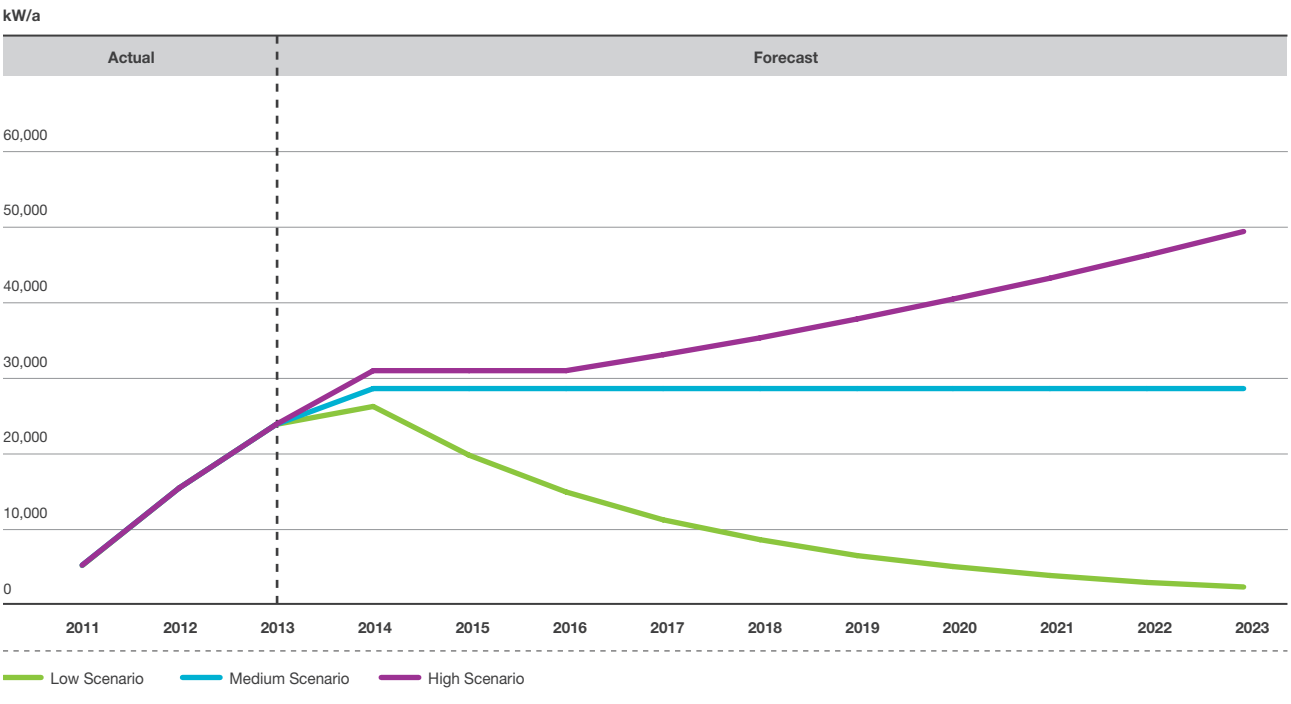
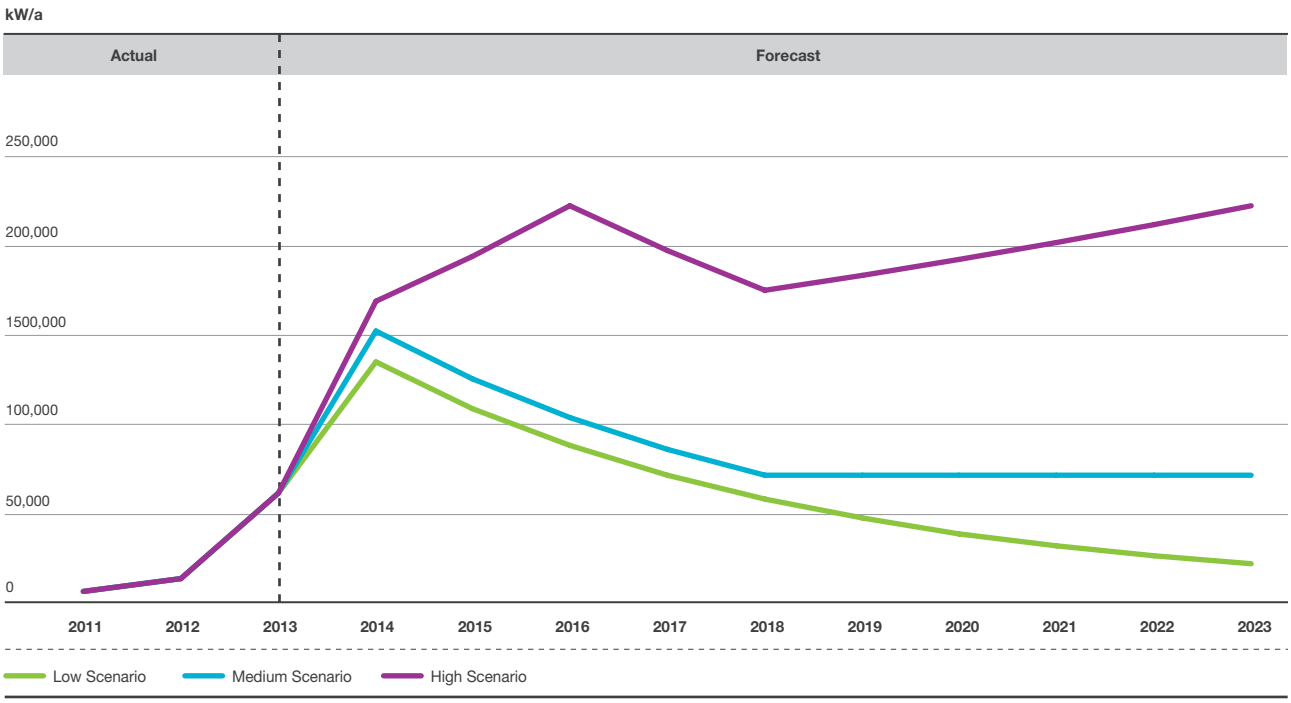


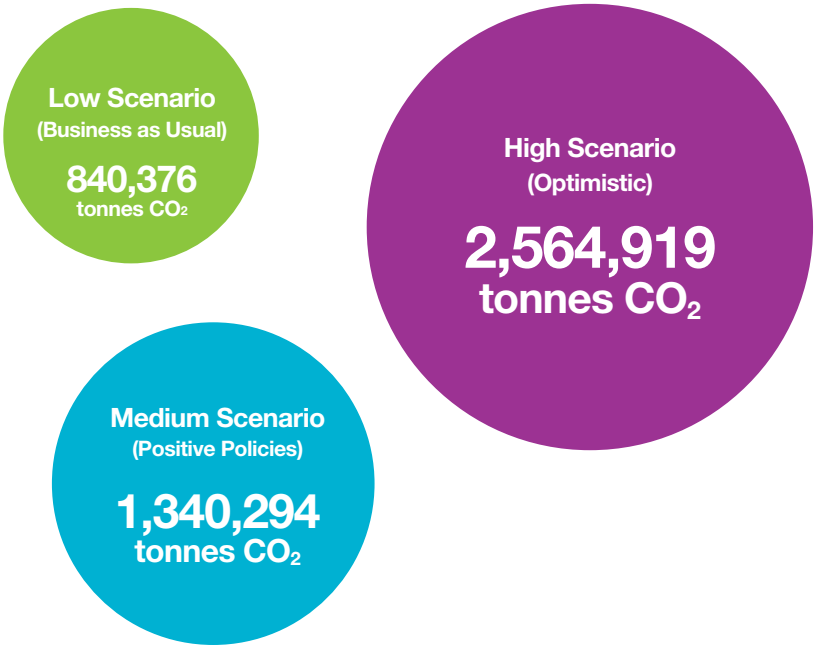
Figure 11. Medium-scale wind (100kW to 500kW) annual kW deployment, 2011–23



The wide disparity between the low, medium and high scenarios shows the potential either for the industry to come to a standstill, or to make an increasing contribution to energy needs and action against climate change.

A shift from business as usual (low) to an optimistic deployment path (high) would deliver an additional 290MW by 2016 and an additional 1.6GW by 2023. This would result in an additional saving of 1.7 million tonnes of carbon by 2023. To compare, adoption of modest policy changes would shift industry onto a positive policy path (medium), leading to an additional 78MW by 2016 and 473MW by 2023, and an additional 0.5 million tonnes of carbon saved by 2023 compared to expected business as usual.

Figure 12. Comparison of CO_2 savings between 2023 scenarios



Costing Analysis

The calculated CAPEX cost figures have been compared to RenewableUK's previous study, conducted by Element Energy in 2011.[19] This comparison shows a 10.6% CAPEX cost decline between 2011 and 2014, which is the equivalent of an annual average decrease of 2.7%, (see Figure 13).

Although the decreasing capital cost of small and medium wind turbines is a positive development, unlike solar technology, economies of scale have not been significant enough to have a substantial impact on turbine cost reduction. This reason, in combination with the lack of control over raw materials, means that this small decrease in turbine cost is not sufficient to match the drastic Feed-in Tariff degression of 20% per year.

Contributing to the trend of increasing costs, stakeholders indicate that grid connection costs are high and can vary significantly between projects. The graph, right, reveals that an average of 9% of the total project cost is absorbed by grid connection fees for medium-scale wind projects, though in some circumstances this proportion can be far higher. These findings highlight the need for policy action regarding grid reinforcement, to ensure that connection costs remain manageable.

Within the study, planning time and planning costs are highlighted as significant barriers to development. Comparison between the Element Energy and Arup studies reveals that, on average, planning costs have increased by 4.4% since 2011. More importantly, however, the length of time to achieve planning permission has increased due to the growth in the numbers of schemes now being appealed or recovered. In 2013, the average planning timescale for

Figure 13. Cost reductions between 2011 and 2014

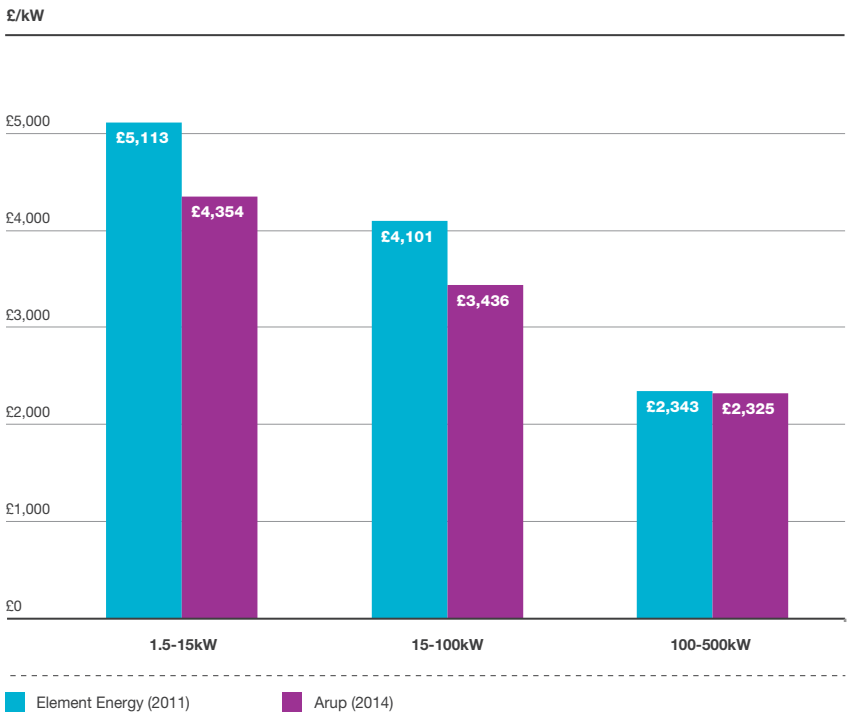
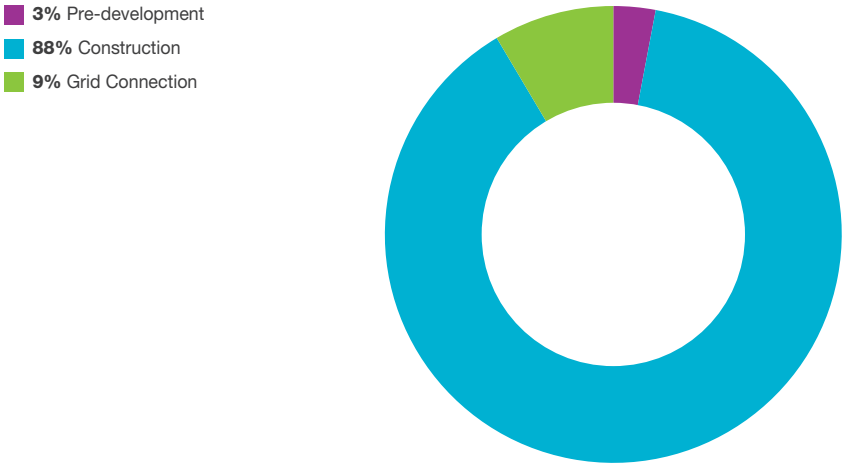


Figure 14. CAPEX, DEVEX and grid connection cost breakdown



Planning timescales have increased by 33% so far in 2014 and planning approved rates have decreased by 39%

a 100–500kW wind turbine was 30 weeks. This has increased to 40 weeks in 2014.[20] And whilst decision times are increasing, so are refusals. In 2011, 74% of schemes were approved,[21] compared to only 45% in 2014.[22] Overall, these trends reveal that planning costs and timescales are increasing, and success rates are decreasing. This creates a very real risk to potential developers.

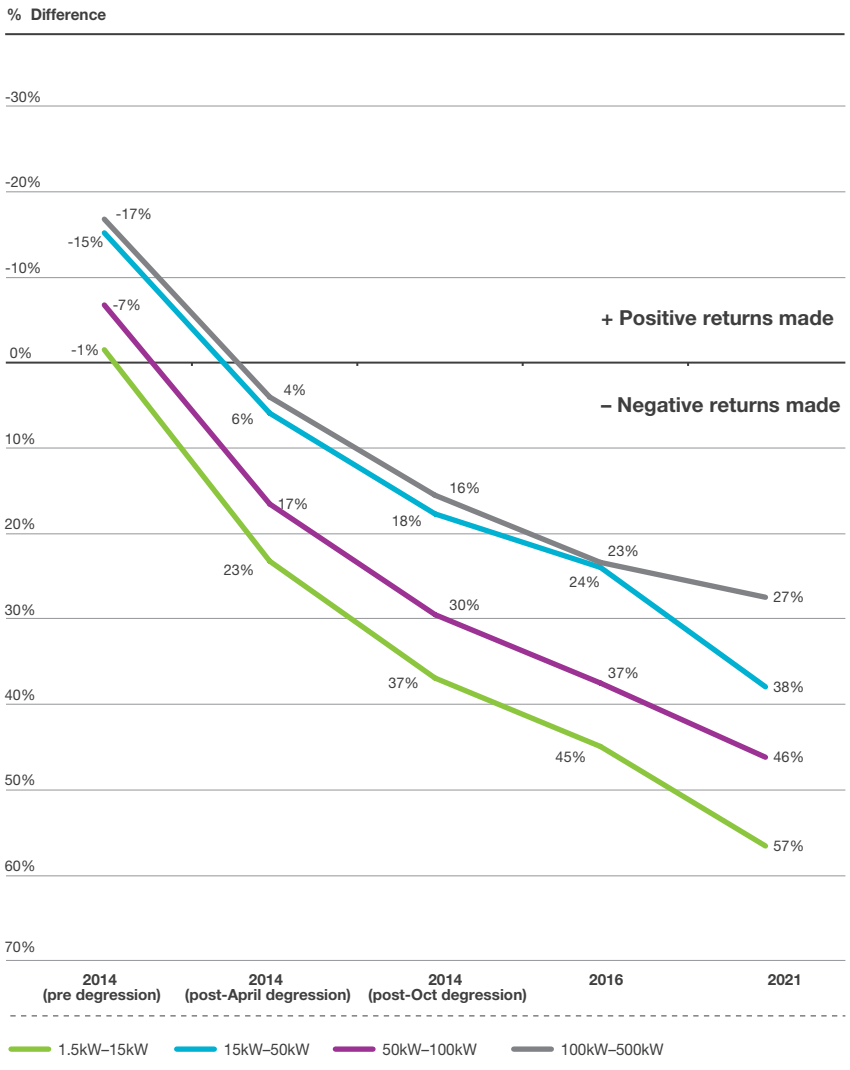
Levelised Cost

Levelised cost is the unit cost of producing a kWh of electricity. The calculated margin between levelised cost and Feed-in Tariff support indicates whether consumers will receive a positive return or a negative return on their investment in a wind turbine.

Figure 15 shows that prior to April's FiT degression, the levelised cost was below the FiT rate, which means that prior to April 2014, the owners of small and medium wind turbines would have been making positive returns. Projecting ahead, however, the circumstances change. The new degression mechanism means that cuts to tariff rates are happening faster than price reductions for any of the sub-500kW capacity ranges. This impact will mean that new owners of small and medium wind turbines across all sub-500kW scales will be set to make a loss on their investments. This analysis should ring alarm bells throughout DECC, as it clearly reveals that the Feed-in Tariff is no longer fulfilling its aim of assisting public take-up of carbon reduction measures.

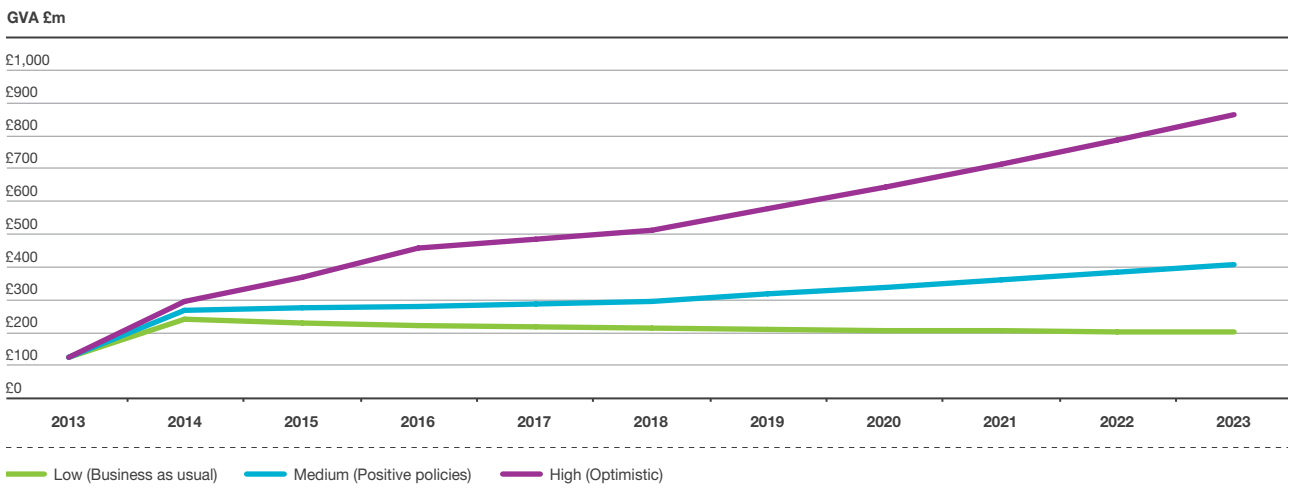
The graph also clearly shows that the 1.5–15kW range was within a 1% margin of covering cost with the FiT prior to April 2014. This highlights that marginal returns are feeding through into the very low levels of deployment evidenced in Chapter 3.

Figure 15. Percentage difference between levelised cost and FiT[23]



This impact will mean that new owners of small and medium wind turbines across all sub-500kW scales will be set to make a loss on their investments.

Figure 16. GVA predictions for the three scenarios



Socioeconomic Analysis

GVA

Gross Value Added (GVA) is an economic measure of the value of goods and services produced in an area, industry or sector of the economy. Under our business-as-usual (low) scenario, the small and medium wind sector is forecast to contribute £241m to the UK economy via GVA in 2014. An additional £16m can be attributed to "induced" effects on consumption, i.e. employees spending a proportion of their disposable incomes on goods and services within the economy.

By 2023, the low scenario predicts that GVA will have dropped to approximately £203m. In comparison, the GVA contribution in the optimistic (high) scenario could deliver an additional GVA of £0.66bn, taking GVA to £864m in 2023, (see Figure 16).

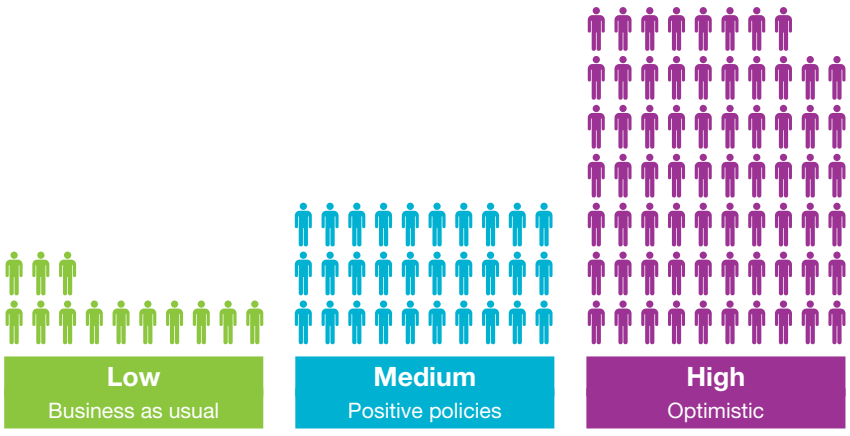
Employment

At present the small and medium wind sector and its associated supply chain employs 3,500 people (about 1,800 directly employed in the sector and 1,700 in the supply chain).

Projecting forward to 2023, the business-as-usual scenario would see employment cut by over 40% to 2,000 individuals. In comparison, an optimistic development path would result in an estimated 10,156 individuals employed. This net difference in employment (i.e. the number of jobs lost due to lack of policy support) is over 9,200 jobs. With modest policy change (our medium scenario), we estimate the sector would grow to 4,507 employees by 2023.

If the government pushed ahead with stronger policies in the small and medium wind sector, these additional roles would be a valuable contribution to the 400,000 new green jobs that it aims to create.[24] Employment opportunities are of huge significance at the moment, therefore the opportunity to create skilled employment roles in the green sector should be grasped with both hands.

Figure 17. 2023 employment comparisons between scenarios



Chapter 5—A Vision for the Future

The stakes have never been higher for small and medium wind in the UK. It faces challenging times, yet given the opportunity, it has the potential for a bright future. It helps our rural economy to diversify, helps people to become energy producers rather than consumers and helps us decarbonise our economy. With sufficient volume, the sector can deliver innovation and cost savings, and become cost competitive with other forms of generation. To secure these benefits, we ask government to pledge to the following objectives:

1.

An aspirational target of 1,200MW of installed <500kW wind capacity by 2023 set by government to publicly show backing for the small and medium wind industry.

2.

A Feed-in Tariff that is fair and robust, with the appropriate banding and degression capacity thresholds to allow each scale of the sector to prosper independently.

3.

A planning system that determines smaller-scale projects appropriately, without onerous costs or timescales.

4.

Revised tax structures to support UK manufacturing and employment growth in order to maintain the global lead of the UK small and medium wind industry.

5.

Increased and effective community energy support to the small and medium wind industry to help it grow community and locally owned energy schemes.

To overcome short-term challenges, RenewableUK recommends a number of detailed actions that need to be progressed by government. Beyond this, we have also set out longer-term actions to ensure that the sector grows to its full potential. Our approach has been conscientious, in recognition that FiT amendments will need to be cost-neutral. Industry members want to work alongside government to create the correct conditions for their industry to thrive. We have also been careful to explore opportunities outside of the FiT structure, in order to broaden the range of support mechanisms that could be pursued.

Short-term Recommendations

The most significant issue facing small and medium wind is for government to address problems within the current Feed-in Tariff system. With a 2015 review on the horizon, it is important that the government looks at how regulations and financial support are unfairly impacting particular parts of the industry. Alongside these FiT changes, there are associated actions for government and industry to address finance, taxation, grants, community energy and planning.

Feed-in Tariff Policy Amendments

➡ **Recommendation 1.**
The reinstatement of the 15kW Feed-in Tariff bracket

The Feed-in Tariff is the government's primary means of encouraging increased deployment of sub-5MW renewables. Since Phase 2B of the Feed-in Tariff was implemented in December 2012, Ofgem statistics show a clear and sustained trend of decline in the small wind industry. The amalgamation of the tariff bracket for all turbines under 100kW has distorted the market and has seriously disadvantaged the sub-15kW sector.

To remedy this, urgent action must be taken to reinstate the 15kW FiT bracket. This will recognise the different market conditions faced by this scale sector and will offer more targeted support to a category of renewable energy that maintains a strong UK manufacturing presence. We estimate that this amendment would have cost the FiT budget an additional £275,000 if it had been implemented in 2014. This sum is a relatively small annual supplement within the scope of the Levy Control Framework (LCF) budget, and further on we address some options for how this additional support can be secured.

➡ **Recommendation 2.**
An increase to degression capacities for the sub-500kW wind sector
As shown in Chapter 4, the CAPEX cost of a sub-500kW wind turbine has decreased steadily by 10.6% since 2011. However, this cost decrease has not been significant enough to account for the decrease in FiT support. As a result, the percentage margin between levelised cost and the FiT no longer covers the cost of generation for any of the sub-500kW capacity ranges. This will have a detrimental impact on the incentive to invest in small and medium wind projects.

The industry recognises that it cannot expect an increase in FiT rates, but it is important that government adjusts the pace of degression so that cost reductions are put on a sustainable rather than boom–bust trajectory. It is therefore vital that the capacity thresholds triggering degression are increased during the 2015 FiT review, to ensure that support rates decrease at a pace the industry can respond to.

We recommend that the maximum capacity trigger is increased to 152MW for the cumulative sub-500kW turbine banding in 2015. This figure is equivalent to the capacity trigger required to deliver the industry's "positive policy" medium growth scenario (see Chapter 4). This capacity should be divided between the revised degression bandings listed below:
- 0 to 15kW
- 15 to 100kW
- 100 to 500kW.

Increasing the degression capacity figure will incentivise additional investment, producing the economies of scale required by turbine manufacturers to significantly lower CAPEX costs. Through this route, an increased rate of cost reductions can be realised. Without achieving economies of scale, the FiT is not delivering its aim of assisting public take-up of carbon reduction measures.

➡ **Recommendation 3.**
Recognition that not all pre-accredited projects will be installed
Pre-accredited installations for the >50kW sector currently account for an overwhelming proportion of the "installed capacity" on the Ofgem database used to calculate degression triggers. In May this year, 87% of capacity on the database was from pre-accredited installations. It is highly unlikely that all of these pre-accredited installations will go ahead. Lack of finance, changes in FiT support and lengthy turbine lead times can all prevent projects from being installed in the allotted 12-month period, if at all.

A review of member feedback shows that an estimated 23% of pre-accredited installations will not go ahead. As a result, it is recommended that a minimum of 20% of the "installed capacity" is subtracted from the MCS and ROO-FiT datasets* when calculating the degression capacity triggers. By making this change, the visibility of installed capacity will be a more realistic picture of the market and will decrease the likelihood of degression capacities being triggered by false values.

Feed-in Tariff Cost Savings

We recognise that the above changes will have cost implications to the LCF budget. Despite these changes being low in cost, they would ensure that the FiT market remains diverse and useable by a range of rural businesses and farmers, whilst supporting wind projects across a range of scales. However, cost neutrality is an important test laid down by government that any change has to respond to. The industry has assessed this and has consequently identified a number of opportunities where FiT cost savings can be made. These are suggested below.

➡ **Recommendation 4.**
Three-month degression periods for sub-15kW wind installations
The sub-15kW wind industry proposes that the requested 15kW FiT bracket could be imposed if a three-month degression period were also implemented for this particular sector. The PV industry currently operates on a three-month degression system, and it is thought that this time period may also offer the sub-15kW wind sector a more stable market, rather than the boom and bust periods of deployment that are currently experienced. It is recommended that this measure should only be implemented for the sub-15kW wind sector, and

* Microgeneration Certification Scheme and Renewable Obligation Order Feed-in Tariff.

only if the above measure of the 15kW FiT bracket is reinstated. It is estimated that the reinstatement of the FiT bracket would have cost an additional £275,000 in 2014; therefore implementing a three-month degression period will offer the savings needed to make this amendment cost-neutral.

➡ **Recommendation 5.**
Prevent "heat dump" occurrence
Due to lacking grid capacity and lengthy connection periods, it is an unfortunate consequence that some renewable energy projects take the option of "dumping" excess electricity via heat dumps (potentially discarding excess heat into the open air). This means that projects still receive the FiT generation payment, despite being unable to usefully use the electricity or export the excess electricity onto the local grid network. There are, of course, genuine reasons why some heat dump situations occur; however, there are unfortunately a number of occurrences in which the FiT system is intentionally abused. It is recommended that Ofgem policy regulations are imposed to prevent abuse of the FiT system via heat dump instances, thereby ensuring that the LCF budget is spent fairly and effectively. Addressing this situation will save money within the budget, therefore creating cost savings that can be used more effectively elsewhere, such as raising the degression capacity triggers. The industry wants to prove that it is conscientious in utilising the support in the fairest and most effective means possible.

➡ **Recommendation 6.**
Removal of deemed 50% export capacity for sub-30kW installations
At present, renewable energy installations with a capacity under 30kW do not have export meters and instead have a deemed export capacity of 50% of the electricity generated. Installations under 50kW accounted for 45% of the total number of installations in 2013.[25] This means that a significant proportion of FiT installations are receiving export payments that have no link to their true export figures. Many customers export less than 50% and consequently make an additional return from this deemed capacity, which imposes extra costs onto UK bill payers.

Right now, deemed generation is a pragmatic approach to supporting small-scale renewable installations. However, with increased penetration of renewables comes the requirement to accurately measure output and make sure that consumer funding via the FiT is effectively spent.

At the present time, effort is being put into finalising a UK roll-out programme of smart meters. Smart meters offer the potential to help consumers increase accuracy of billing. This also applies to helping wider consumers retain confidence in the role of small-scale generation as part of the energy mix.

It is important that DECC ensures that smart meter roll-out takes into account the measurement of export payments. It will be important to avoid roll-out of a low-capability option that will prevent the measurement of actual export payments and therefore prevent the shift in paying consumers for "actual" rather than "deemed" generation. Facilitating actual export capacities will make electricity usage more transparent to Ofgem and will also save money on the CFD budget.

Tax Measures and Grant Support

➡ **Recommendation 7.**
Extension of the Enhanced Capital Allowance scheme
The Enhanced Capital Allowance (ECA) scheme enables businesses to write off the capital cost of purchasing certain energy-saving equipment against the taxable profits of the period of investment. The installation of wind turbines within business premises offers SMEs control over their energy bills, reduces overheads and diversifies the income of the businesses.

ECA has proved a good way to incentivise action on low-carbon investment. Extending the ECA scheme to include wind turbines would incentivise SMEs to invest in wind technology, hence growing the market and supporting the delivery of economies of scale. At present, only 9% of small and medium wind turbines are installed by businesses,[26] therefore incentives need to be put in place to encourage businesses to evaluate their on-site energy usage and take control over their energy bills. An ECA can provide a cash flow boost of £1,968 for every £10,000 spent in the year of purchase.[27] This is a significant sum of money, which can help an SME to invest in new jobs or research and development (R&D).

The Energy Technology Product List states that it does not permit energy-generating technology, yet it does support heat pumps and solar thermal technology. We recommend clarifying ECA guidelines, so that electricity-generation technologies are included, with the proviso that installation is scaled to meet on-site electricity usage – not generation for export. Such a condition would prevent companies profiting from export and ensure a focus on demand reduction (with on-site

generation helping reduce overall energy demand).

➡ Recommendation 8. Enterprise Investment Scheme
The 2012 consultation on the Enterprise Investment Scheme (EIS) led to the exclusion of companies benefiting from the FiT. However, the government recognised that "some types of renewable energy generation are associated with more risk than others, for example, if the technology is less proven or the upfront costs are high".[28]

The EIS can help businesses to raise finance by providing tax relief to investors who buy shares in those businesses. Income tax relief is available for investors at 30% of the cost of the shares, on a maximum annual investment of £1,000,000. This is an appealing helping hand to investors and provides breathing space on the tight returns on small and medium wind investments.

In recognition of the government ruling quoted above, our recommendation is that small and medium wind should remain eligible for EIS because the method of generation has not reduced significantly in cost (Chapter 4), and the typical customer base, such as householders or communities, would be taking on increased risk in comparison to utility-scale developers.

➡ Recommendation 9. Continuation of 5% VAT for domestic wind turbine installations
The Value Added Tax (VAT) rate on professionally installed energy-saving materials was reduced to 5% from 17.5% in 2000 by the UK Government. This provides significant cost reductions to domestic individuals installing small-scale wind turbines. Recently, however, the European Commission has announced that it will be taking the UK to the European Court of Justice over its alleged contravention of the VAT Directive by applying this reduced rate of VAT.

If this challenge were successful, the increase of VAT to 20% would likely put on-site generation out of reach for most domestic customers. The industry has been working hard to deliver on cost reductions, but achievements to date would be wiped out by a change in VAT rates. As detailed in Chapter 4, CAPEX costs have reduced by 10.6% since 2011, therefore increasing VAT would neutralise any savings achieved. Allowing individuals to install microgeneration technology was the primary aim of the FiT; therefore, government needs to make every effort to ensure that the 5% VAT rate remains.

➡ Recommendation 10. Enhanced research and development tax credits
R&D relief via corporation tax is available to small or medium sized organisations by way of a cash sum paid by HM Revenue & Customs (HMRC). These R&D tax credits are a crucial means of supporting technical innovation in the small and medium wind manufacturing industry. R&D ensures that consistent improvements are being made to increase the efficiency, affordability and durability of wind turbines. This is vital to reducing the consumer cost of turbines, and hence the support it needs via the FiT.

We recommend that these tax reliefs be increased to encourage further support of R&D in the low-carbon sector. Enhanced R&D tax credits are currently available to a broad range of SMEs in the UK. However, because low-carbon technology is a government priority, R&D in the low-carbon sector should receive heightened support. It is suggested that the existing rate is doubled, thereby providing cash sums to fund skilled employment and UK-led industry research.

➡ Recommendation 11. Energy Entrepreneurs Fund
In the past, the Energy Entrepreneurs Fund (EEF) administered by DECC has offered small wind turbine manufacturers the opportunity to receive financial support for R&D into turbine technology. R&D remains a crucial element of industry efforts to improve cost per kW and turbine efficiencies. Recently, however, funding mechanisms such as the EEF have been choosing to support non-wind research such as renewable heat technologies (due to the recent government focus on the Renewable Heat Incentive). We recommend that a wind-specific EEF or equivalent is developed, in order to ensure that the wind industry receives an appropriate proportion of this DECC funding.

Improved Finance Lending

➡ Recommendation 12. UK investment banks
RenewableUK strongly welcomes the fact that the Green Investment Bank (GIB) is researching the option of funding smaller onshore wind projects (no smaller than 100kW). This indicates that government has recognised that this scale sector is a growing and reliable segment of the industry. As a result, the GIB proposal to expand its mandate is of great significance to the industry and could help to increase the capacity of medium wind turbines.

Because of the revised Environmental and Energy State Aid Guidelines, the opportunity for the GIB to extend its funding potential to smaller onshore wind projects is currently under review by the EU Commission. If approved, the industry needs

to evidence its reliability and profitability, to provide the GIB with the confidence it needs to invest. This can be achieved via the medium wind MCS standard that is currently being progressed by the industry. It is recommended that the GIB engages with the industry's working group on medium wind standards to ensure that the scheme offers the due diligence and reliability required by investors.

The structure of the GIB funding for onshore wind should also follow the example set by the Scottish Investment Bank (SIB). The SIB offers commercially priced loans, equity investments and guarantees for renewable energy projects in Scotland via the Renewable Energy Investment Fund (REIF). This £103 million fund is run by the SIB on behalf of the Scottish Government and utilises money sourced from Scotland's Fossil Fuel Levy. It is recommended that similar commercial schemes be adopted in England and Wales, and that organisations such as the GIB learn from the successes of the REIF scheme.

Community Energy Opportunities

➡ **Recommendation 13. Improved Rural Community Energy Fund**

Government methods to increase community ownership of renewable energy projects are considered a positive move forward. However, it needs to be recognised that many different methods of ownership are possible, a large proportion of which will still contain "developer" involvement. In order to allow these different ownership models, government support needs to be flexible. At present, the Rural Community Energy Fund (RCEF) is not a successful enabler to community energy projects when compared to the Community and Renewable Energy Scheme (CARES) in Scotland. The RCEF requires community legal entities to apply for support, whereas CARES accepts landowner applications and does not require community involvement until a later date. This enables projects to be kick-started whilst community engagement is still in the process of being secured. Since September 2011, CARES has funded 211 projects. CARES loans worth over £12.5m have been given to 133 projects, and 58 start-up grants and 23 infrastructure and innovation projects, worth over £12m, have also been supported.[29]

We recommend that the administration body and additional support of the RCEF be reviewed. The CARES contract is delivered by Local Energy Scotland, which is a consortium led by the Energy Saving Trust. In addition to the CARES scheme, Local Energy Scotland offers start-up grants, due diligence support, a developer/community partnership portal and a community investment toolkit. It also acts as the first stage of REIF contact for prospective community applicants, therefore providing joined-up support and streamlined public sector resources. We recommend that the model offered by Local Energy Scotland be replicated UK-wide.

➡ **Recommendation 14. Interest-free loans**

RenewableUK welcomes the recent consultation on support for community energy projects under the Feed-in Tariff scheme. Part C of the consultation recommends that grant support to community groups should be combined with the FiT without any state aid restrictions. If this is approved by the European Commission, we recommend that 0% loans are also incorporated into this policy. This will enable community loans via schemes such as the RCEF and CARES to change from commercial rates to 0% interest. A reduction in loan rates will mean a significant reduction in development costs, which could lead to increased community energy deployment.

Streamlined Planning

➡ **Recommendation 15. Permitted development rights**

Following great anticipation from the industry, the government awarded small wind turbines permitted development status in 2012 alongside heat pumps and solar panels. However, the size restrictions imposed (i.e. 11.1m total height and 2.2m blade diameter) mean that no wind turbines supplied in the UK qualify. To date, 40 different wind turbine models have achieved MCS accreditation, ranging from 2.1kW to 20kW, but none of them are able to utilise permitted development legislation. Structuring General Permitted Development Orders (GPDO) so that only some microgeneration technologies benefit from them is preventing wind turbines from competing on a level playing field.

We recommend that government review the size restrictions within the wind turbine GPDO. Lowered planning hurdles will allow suitably sized schemes to proceed at a quicker rate and at a lower cost. This will also have a positive impact on the workload of local authority planning departments and consultees. Wind turbine applications can increase authorities' planning case-loads extensively, so an improved GPDO will make time and cost savings.

It is important that government recognises this failure of the GPDO scheme and makes amendments to reflect actual market conditions in the

small wind industry. RenewableUK proposes the size limits for domestic land use in Figure 18 (as per our submission to the 2012 consultation on "development rights for small-scale renewable technologies").

As part of the permitted development rights consultation for small-scale renewables in 2012, the government decided not to introduce permitted development rights for installations on non-domestic premises at that particular time. Instead, it committed to review the application of GPDO to non-domestic properties in the future. Based on the time elapsed since this commitment was made, the government needs to urgently undertake this promised review. RenewableUK proposes the following non-domestic GPDO size limits (see Figure 19):

➡ Recommendation 16. Planning requirements proportionate to the scale of development

Despite being smaller in scale and having significantly less impact upon local amenities, planning application demands are creating a barrier to small and medium wind development. On average, planning applications for medium wind turbines cost between 3 and 5% of total project costs.[30] Unrealistic requests, such as visual impact assessments from a 30km distance for 20m-tall wind turbines, are being made. Small projects need to be treated differently from large turbine applications. Changing GPDO guidance will have a major impact on reducing the cost of planning for the very small-scale developments.

Figure 18. Domestic GPDO recommendations

(1) Free-standing wind systems:

Centre of rotation (hub height):	12m
Total height:	13.75m
Swept area:	9.7m^2 (diameter: 3.5m)

(2) Rural size limits for free-standing wind systems (where no residential building is within 200m of the proposed installation*):

Centre of rotation (hub height):	15m
Total height:	18m
Swept area:	28.5m^2 (diameter: 6m)

(These size limits correspond with our proposed non-domestic size limits. See below.)

(3) Building-mounted wind systems:

Centre of rotation (hub height):	Use total height limit only
Total height:	3m above the ridge line of the building
Swept area:	3.81m^2

Figure 19. Non-domestic GPDO recommendations

(1) Free-standing wind systems:

Centre of rotation (hub height):	15m
Total height:	18m
Swept area:	28.5m^2 (diameter: 6m)

(2) Building-mounted wind systems:

Centre of rotation (hub height):	Use total height limit only
Total height:	18m above the ridge line of the building
Swept area:	28.5m^2 (diameter: 6m)

* Acoustic siting requirements must take precedent, if associate seperation requirement is greater than 200m.

For the larger developments, we recommend that planning authorities be provided with Community and Local Governance (CLG) guidelines to ensure that planning requirements are proportionate to the scale of development. The following guidelines are proposed:

Figure 20. Planning requirement guidelines for ≤500kW wind turbines

Turbine hub height	VIA max. distance	Max. no. of viewpoints	ZTV max. distance	Cumulative impact assessment max. distance
<15m	1km	5	Not required	Not required
15–20m	2km	7	5km	5km
20–35m	5km	10	10km	5km
35–50m	10km	12	15km	10km
50–60m	15km	15	20km	15km

➡ **Recommendation 17. Planning applications must be processed in a timely way**

Small and medium wind is struggling with the long-term horizons for planning decisions, the quantity of information requested and the lack of manpower to review this information.

The planning documentation required for submission to local planning authorities needs to be proportionate to the scale of the development, but in addition, the planning authorities need to have the appropriate resources to reach decisions in the allotted timescales. The statutory time limits for planning applications are 13 weeks for applications for major developments and eight weeks for all other types of development (unless an application is subject to an Environmental Impact Assessment (EIA), in which case a 16-week limit applies).

RenewableUK data shows that the average planning timescale for 100kW to 500kW wind turbines was 30 weeks in 2013, increasing to 40 weeks in 2014. These timescales are both far beyond the statutory time limit. The average rate of consent in 2013 was 68%, dropping to 45% thus far in 2014.[31]

Increasing determination times and decreasing approval rates make the process of installing wind turbines far less appealing to the customer, especially as the finance structure of the Feed-in Tariff is now running on a six-month degression timetable. Extending the time in planning can completely alter the initial financial viability of a project and can render it unviable after a long and expensive pre-development phase.

We recommend that increased resources be provided to local authority planning departments to allow them to speed up local authority decision times. As discussed previously, imposing improved domestic and non-domestic GPDO would generate extensive time and cost savings for local authorities by reducing their workloads with very small wind applications. This will create more time for planners to process other applications on a quicker timescale.

We also ask that the planning system be given overarching authority to make planning decisions without the interference of central government.

Enabling quicker and cheaper planning processes will reduce development costs. This in turn reduces investment risk and the levelised cost of wind power, which will lead to a reduction in government support mechanisms via the LCF budget.

Long-term Recommendations

The following long-term recommendations refer to more complex policy amendments, which should be considered as potential replacements for the Feed-in Tariff or as means of additional support post-2021.

Net Billing

➡ **Recommendation 18. Innovative approaches to net billing**

Once the Feed-in Tariff has successfully enabled appropriate cost reductions to be reached, it is assumed that support is moved from the FiT to a net billing approach. Under this approach, the generation tariff and export tariff are removed, and instead exports and imports are netted off against each other over the course of a calendar year.

RenewableUK agrees that a net billing system is the sensible approach for schemes installed to meet on-site generation needs.

RenewableUK agrees that a net billing system is the sensible approach for schemes installed to meet on-site generation needs. Our recommendation is that the import rate is set commercially (currently ~£0.15/kWh) and the export rate is set close to the import rate, minus a small sum for local distribution costs (~£0.12/kWh is proposed, leaving £0.03/kWh for administrative and Distribution Network Operator costs). At year's end, the balance would be paid out in cash by the customer to their supplier if they owed money, or vice versa if the utility owed money to the customer.

We also recommend that government set up constraints to gear against "oversizing" of on-site generation. Utilities should be limited to paying a customer balance of only 10% over the predicted annual energy production, to remove the incentive to oversize renewable installations for commercial profit and ensure that the scheme supports "on-site" renewables only.

This proposed method of support would be sourced in a similar way to the present, i.e. via consumer bills rather than via government subsidies. Properly implemented, administration needs would be reduced, as net billing would take place directly between the renewable generation customer and the utility supplier. It would be necessary for all scales of renewables to have an export meter installed. This links to previous points about smart meter specifications.

To encourage innovation, we recommend that legislation be eased to enable the general public to purchase their electricity directly from small-scale renewable energy generators. Increased export payments (and therefore reduced subsidy payments) could be achieved if generators were able to sell directly to consumers. This revolutionary way of trading electricity is already being explored by companies such as Open Utility.[32]

In a similar way, government should address the applicability of generator licence requirements to smaller-scale generators. For example, Licence Lite allows interested parties – such as local authorities – to supply electricity without having to sign up to the industry codes in full. The potential is significant, but take-up so far has been minimal.

Work is required to address how to encourage greater take-up. A recent think tank report from the Institute for Public Policy Research highlights the growth potential of local authorities in low-carbon power generation. "Cities and local authorities can provide an alternative to the big six and create cleaner, smarter, more competitive and affordable energy systems."[33] The report makes three recommendations to increase the expansion of cities' and local authorities' investment in energy generation:

1. Cities should create a collective agency for the issuance of local authority bonds, including green municipal bonds.
2. Local authority pension funds should take into account environmental, social and corporate governance factors, and proactively seek low-carbon investments.
3. Cities should work with the Green Investment Bank on discrete low-carbon infrastructure projects in which there is a clear rate of return on investment.

These recommendations provide clear and achievable routes to enhancing the success of sustainable energy deployment at the local community level.

Grid Connection Costs

➡ **Recommendation 19.**
Enhanced grid reinforcements
Much of the distributed grid network in the UK has reached capacity. Reinforcement costs are regularly beyond the financial scope of small and medium wind projects. “Minimum scheme” regulations require lowest cost scenarios to be presented within grid connection quotes. This approach can discourage DNOs from providing an efficient and coordinated network upgrade, concentrating only on their economic responsibility. These minimum requirements also lead to “sole use asset” upgrades, which are not efficient or coordinated, and result in the visual intrusion of additional overhead lines. These would be unnecessary if a coordinated approach were taken. We recommend that Ofgem and DECC permit DNOs to carry out more “enhanced scheme” upgrades, where costs are proportionately socialised, taking into account the likely future need for reinforcement, rather than treating each distributed generation connection as an individual upgrade.

We understand that the Office for Renewable Energy Deployment within DECC has recently started to request grid connection data from all six DNOs regarding grid connection quotes and acceptances. We recommend that this data is analysed to discover trends in connections, such as location, in order to identify particular areas that frequently restrict the feasibility of distributed generation. These identified areas should be reinforced via socialised costs, on the assumption that reimbursement will occur when generators connect to the new capacity.

Chapter 6—Conclusions

A number of ineffective policies are combining to derail the small and medium wind industry from reaching its potential. If these policies are not quickly resolved by government, then the UK small wind industry will soon be unable to sustain itself. And with the current rates of FiT degression, the medium wind industry may follow suit. The FiT reduction is outstripping the industry learning rate, and this will continue to have a negative impact on deployment rates, especially at the smaller scale.

Installations have fallen drastically, and in April this year only six sub-50kW turbines were installed. This deployment rate cannot keep the small wind industry afloat. A total of 3,500 jobs and annual gross market revenue of over £110 million is at stake. A significant proportion of small wind companies have already gone into administration, and surviving UK manufacturers are facing the real possibility of relocating their facilities overseas.

The small and medium wind industry is a long-standing UK success story that has evolved over many decades. As a world leader in industry standards and a major exporter of turbines across the globe, it is a sector that the UK should be proud of. Government is right to challenge industry to deliver on cost reduction, but it needs to better understand the opportunity that can be realised by offering increased backing to the sector. With practical support, in the next ten years the small and medium wind industry could grow to employ over 10,000 people, deliver over £800 million of GVA to the UK economy and help save over 2.5 million tonnes of carbon. This is a fantastic contribution to social and economic benefits within the UK, and can be achieved with a range of simple and low-cost policy mechanisms. To secure these benefits, we ask government to pledge to the following objectives:

1.

An aspirational target of 1,200MW of installed <500kW wind capacity by 2023 set by government to publicly show backing for the small and medium wind industry.

2.

A Feed-in Tariff that is fair and robust, with the appropriate banding and degression capacity thresholds to allow each scale of the sector to prosper independently.

3.

A planning system that determines smaller-scale projects appropriately, without onerous costs or timescales.

4.

Revised tax structures to support UK manufacturing and employment growth in order to maintain the global lead of the UK small and medium wind industry.

5.

Increased and effective community energy support to the small and medium wind industry to help it grow community and locally owned energy schemes.

Without long-term backing and practical support, the UK risks throwing away all the hard work and money already invested. Within the first two years of the Feed-in Tariff, the industry demonstrated the fantastic deployment rates and industry growth that could be achieved with positive policies. We need to recapture that momentum to grow again and realise the opportunities that the sector can provide.

In 2013, less than £1 of the average annual household energy bill went towards supporting small-scale wind installations through the Feed-in Tariff.[34] This proves that the LCF budget implications to amend FiT support would be minimal, and the request for the reinstated 15kW bracket has been estimated to cost only £275,000 in 2014. Areas of cost reduction within the FiT have nonetheless been identified, given government requirements that amendments must be cost-neutral. As a result, this strategy has also been careful to explore other cost saving opportunities within the FiT structure, in order to broaden the range of support mechanisms that could be pursued.

Our industry is working hard and contributing significantly to a number of government policies in areas such as community energy, employment, UK manufacturing and distributed energy generation. But this hard work needs to be rewarded with wider confidence from government. Basic amendments during the Feed-in Tariff review and simple wider support mechanisms would help to ensure that increased economic benefits are secured and that achievements within the sector do not ebb away. What happens in the next year will be crucial to the small and medium wind sector, and we hope that the government grabs this opportunity to put the industry back onto the right path.

References

1 MID Statistics Report, The Microgeneration Certification Scheme. Available at: www.microgenerationcertification.org/about-us/statistics.
2 Farm Power Station Survey Results, Farmers Weekly et al, July 2013. Available at: www.fwi.co.uk/landing-page/farmenergy/farm-power/.
3 Small and Medium Wind Market Report, RenewableUK, October 2013.
4 Farm Power Station Survey Results, Farmers Weekly et al, July 2013. Available at: www.fwi.co.uk/landing-page/farmenergy/farm-power/.
5 Renewable Energy Offers Financial Lifeline for Struggling Farmers, RenewableUK et al, February 2013. Available at: www.renewableuk.com/en/news/press-releases.cfm/2013-02-26-renewable-energy-offers-financial-lifeline-for-struggling-farmers.
6 Parliamentary question. Available at: www.theyworkforyou.com/wrans/?id=2014-03-11a.190267.h&s=michael+fallon+wind#g190267.r0.
7 Monthly Central Feed-in Tariff Register Statistics, DECC, July 2014. Available at: www.gov.uk/government/statistical-data-sets/monthly-central-feed-in-tariff-register-statistics.
8 Working for a Green Britain and Northern Ireland 2013–23, RenewableUK, September 2013.
9 Small and Medium Wind Market Report, RenewableUK, October 2013.
10 Small and Medium Wind Market Report, RenewableUK, October 2013.
11 Small and Medium Wind Market Report, RenewableUK, October 2013.
12 Small and Medium Wind Market Report, RenewableUK, October 2013.
13 MID Statistics Report, The Microgeneration Certification Scheme. Available at: www.microgenerationcertification.org/about-us/statistics.
14 MID Statistics Report, The Microgeneration Certification Scheme. Available at: www.microgenerationcertification.org/about-us/statistics.
15 RenewableUK highlighted issues raised here as part of its response to the UK Government's FiT Phase 2B Review. We commissioned the Small and Medium Wind Market Survey, 2011 from Element Energy to evidence our concerns.
16 Monthly MCS and ROOFiT Degression Statistics, DECC. Available at: www.gov.uk/government/statistical-data-sets/monthly-mcs-and-roofit-statistics.
17 FiT Phase 2B review presentation to industry, Department of Energy and Climate Change, November 2012.
18 UK Wind Energy Database, RenewableUK, July 2014. Available at: www.renewableuk.com/en/renewable-energy/wind-energy/uk-wind-energy-database/index.cfm.
19 Small and Medium Wind Market Survey, Element Energy, commissioned by RenewableUK, 2011.
20 UK Wind Energy Database, RenewableUK, July 2014. Available at: www.renewableuk.com/en/renewable-energy/wind-energy/uk-wind-energy-database/index.cfm.
21 Small and Medium Wind Market Survey, Element Energy, commissioned by RenewableUK, 2011.
22 UK Wind Energy Database, RenewableUK, July 2014. Available at: www.renewableuk.com/en/renewable-energy/wind-energy/uk-wind-energy-database/index.cfm.
23 Assuming that there will be a 10% degression in October 2014, followed by 5% per annum thereafter.
24 UK to Lag Competitors in 2020 Green Jobs Race, The Ends Report, January 2012. Available at: www.endsreport.com/24716/uk-to-lag-competitors-in-2020-green-jobs-race.
25 Monthly MCS and ROOFiT Degression Statistics, DECC. Available at: www.gov.uk/government/statistical-data-sets/monthly-mcs-and-roofit-statistics.
26 Small and Medium Wind Market Report, RenewableUK, October 2013.
27 What Is the ECA Scheme?, DECC, July 2014. Available at: www.etl.decc.gov.uk/etl/site/about.html.
28 Annex A – Draft Note for Publication Providing Further Information on Scope, 2014. Available at: www.gov.uk/government/uploads/system/uploads/attachment_data/file/312427/_OFFICIAL-SENSITIVE__Information_note_ROCs_and_RHI.pdf.
29 Scottish Government Register of Community Benefits from Renewables, Local Energy Scotland, August 2014. Available at: www.localenergyscotland.org/view-the-register/
30 Small and Medium Wind Developments: Cost and Socioeconomic Benefit Analysis, Arup, June 2014.
31 UK Wind Energy Database, RenewableUK, July 2014. Available at: www.renewableuk.com/en/renewable-energy/wind-energy/uk-wind-energy-database/index.cfm.
32 www.openutility.com/.

33 Cities and Local Authorities Can Plug Britain's Energy Investment Gap, IPPR, July 2014. Available at: www.ippr.org/news-and-media/press-releases/cities-and-local-authorities-can-plug-britain%E2%80%99s-energy-investment-gap.

34 Parliamentary question. Available at: www.theyworkforyou.com/wrans/?id=2014-03-11a.190267.h&s=michael+fallon+wind#g190267.r0.

RenewableUK
Greencoat House, Francis Street
London SW1P 1DH, United Kingdom

Tel: +44 (0)20 7901 3000
Fax: +44 (0)20 7901 3001
Web: www.RenewableUK.com
Email: info@RenewableUK.com

Our vision is for renewable energy to play a leading role in powering the UK.

RenewableUK is the UK's leading renewable energy trade association, specialising in onshore wind, offshore wind, and wave & tidal energy. Formed in 1978, we have a large established corporate membership, ranging from small independent companies to large international corporations and manufacturers.

Acting as a central point of information and a united, representative voice for our membership, we conduct research, find solutions, organise events, facilitate business development, advocate and promote wind and marine renewables to government, industry, the media and the public.

RenewableUK is committed to the environment.
This document is printed using processes that are:

100% waterless
100% alcohol- and substitute free
100% carbon neutral
100% renewable energy
100% recycled FSC stock
100% vegetable oil based inks

Zero% waste to landfill

printed by SEACOURT.net, counted amongst the top environmental printers in the world