

Small and Medium Wind

UK Market Report

April 2012



Contents

Small Wind System Technology	2
About this Report	3
The Industry's Growing Contribution	4
Annual Deployment	5
System Set-Up	6
UK and Export Markets	7
Sector Employment	9
A Year in Policy	10
Planning Approval Rates for Small and Medium Wind	12
Small and Medium Wind Costs	13
Table of Data	14
Contributors	15

Small and Medium Wind Technology

Market Highlights

3,086 – The number of small and medium wind turbines deployed in the UK in 2011

19,854 – The number of small and medium wind turbines deployed in the UK between 2005 and 2011

23.17MW – The additional UK capacity deployed in 2011

66.14MW – The cumulative deployed capacity between 2005 and 2011

£50.16 million – The UK's market size

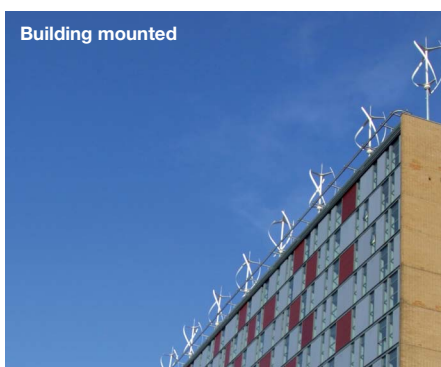
£5.76 million – The UK's manufacturing export revenue

2,986 – The number of units exported in 2011

21,724 – The number of units exported by UK manufacturers between 2005 and 2011

176% – The estimated UK market growth for 2012 (£138.66 million)

Types of Turbine



About this Report

This is the first combined Small and Medium Wind UK Market Report, which builds on the four previous Small Wind Systems Market Reports, published by RenewableUK between 2008 and 2011.

With the most significant wind resource in Europe, the UK is ideally placed to increase the output of renewable electricity from small- and medium-scale wind developments. Wind is the most widely used renewable technology and the government's Feed-in Tariff scheme offers the opportunity for landowners to take advantage of smaller-scale renewable energy generation.

The UK micro and small wind industry has seen substantial growth in recent years, with nearly 20,000 systems deployed since 2005. Medium wind projects, on the other hand, are a relatively new proposition in the UK. The sector has emerged with the Feed-in Tariffs, and promises to be one of the biggest winners under the scheme.

With a number of UK-based manufacturers and foreign companies there is a wide range of small and medium products, designs and set-ups. At the smaller end of the market, two turbine designs are available: vertical axis wind turbines (VAWT) and horizontal axis wind turbines (HAWT). Clean renewable energy generated by small and medium wind turbines can be connected to the mains supply (on-grid) or used to charge batteries (off-grid).

The report examines the current size of the small and medium wind sector in the UK, provides commentary on the current dynamics of the UK domestic and export markets, and explores some of the key opportunities and challenges to future market development.

Table 1: Definition of micro, small and medium wind turbines

	Power (kW)	Annual energy production (kWh)	Total height (m)
Micro wind	0 – 1.5	Up to 1,000	10 – 18
Small wind	1.5 – 50	Up to 200,000	15 – 35
Medium wind	50 – 500	Up to 1,800,000	25 – 55

RenewableUK uses the data in table 1 to define micro, small and medium wind turbines

Methodology

Deployment data

The study gathers data relating to turbines in the range of 0–500kW in order to estimate the number of installations and deployed generation capacity at the end of 2011.

All data reported in this study was obtained directly from manufacturers through e-mail contact, telephone interviews or both. The data is presented in line with the Feed-in Tariff size bands:

- 0–1.5kW
- 1.5–15kW
- 15–100kW
- 100–500kW

For the purpose of estimating deployed capacity, this study assumes that each turbine sold in 2011 was also installed and that the installation took place within the same calendar year as the sale. It must be noted, however, that depending on a manufacturer's sales cycle, an installation may occur after the calendar year in which it was sold.

Planning approval data

RenewableUK conducted a research study in April–June 2011 with the aim of collecting data regarding planning applications for small to medium wind projects received by local authorities across England, Scotland and Wales in the period of January 2009–June 2011. The research involved sending questionnaires to local councils as well as collating data by conducting planning searches on council websites.

Cost data

RenewableUK commissioned Element Energy in summer 2011 to quantify the likely growth of the small and medium wind sector in the coming years. The study also assessed the current technology cost and the potential for cost reduction in the period of 2011–15.

The Industry's Growing Contribution

The UK market continued to grow over the last year, largely driven by the attractive Feed-in Tariff mechanism. Based on the survey of manufacturers active in the UK market, the deployed capacity in the 0–100kW size band expanded by 53% (21.82MW) compared to the previous year. A further 1.35MW were deployed in the 100–500kW size band, resulting in a total small and medium wind deployed capacity of 23.17MW in 2011.

The most significant growth was seen in the 1.5–15kW size band, where the deployed capacity doubled over the last twelve months. The industry's projections indicate that this trend is set to continue in 2012. The majority of the UK-based manufacturers are operating in this small wind market segment (1.5–15kW). Micro wind (0–1.5kW) has continued a gentle downward trend since 2007, which demonstrates a continuous market shift towards larger, grid-connected turbines.

The substantial growth in the small and medium wind sector brought the UK's cumulative small and medium wind deployed capacity to 66.14MW at the end of last year.

Small and medium wind development forecast for next year looks very healthy, with an estimated additional 58.43MW to be deployed by the end of 2012. If the industry's expectations are realised, the total deployed capacity will reach 125MW. If this trend continues, the small and medium wind sector will make a considerable contribution towards meeting government's 2020 renewable energy and carbon reduction targets. However, in order to sustain this growth rate, the Feed-in Tariff scheme must continue to provide an appropriate support for small and medium wind developments.

Small and medium wind power provide a cost-effective way of generating electricity on a localised level, both in

Figure 1: Annual deployed UK small and medium wind turbine capacity (MW)

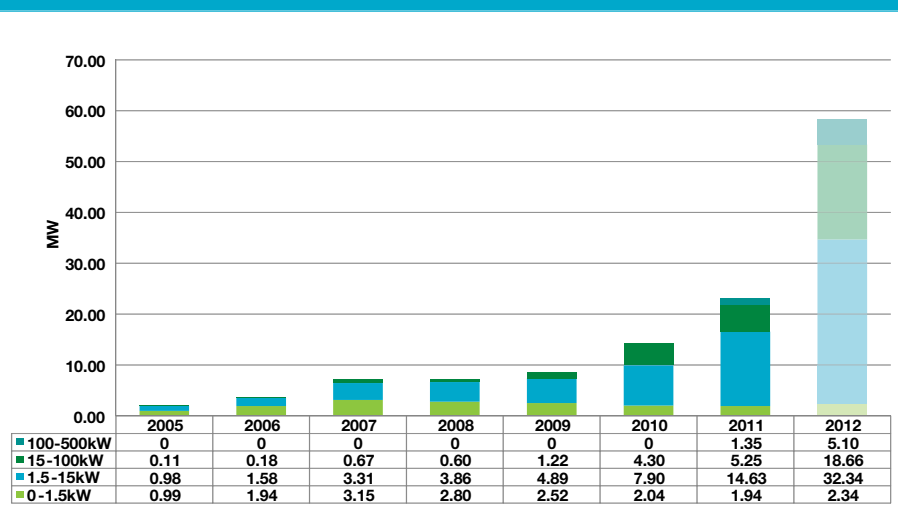
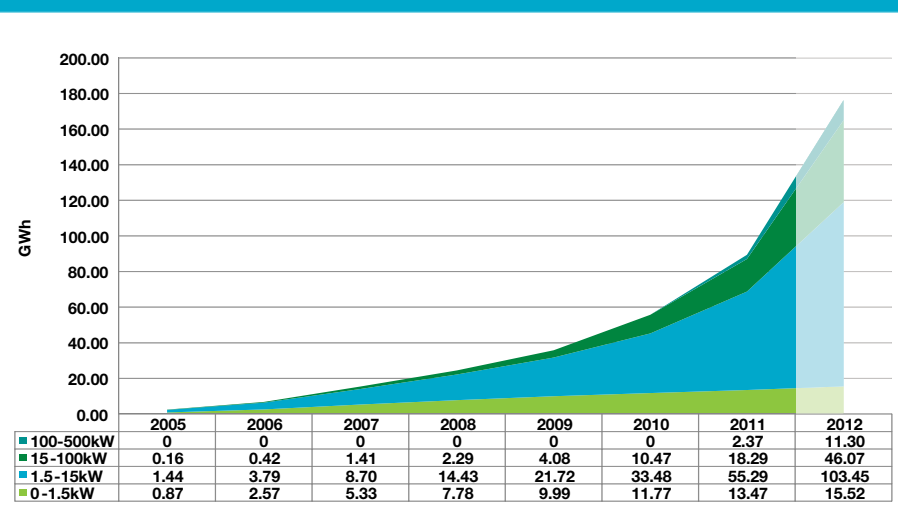


Figure 2: Annual UK small and medium wind energy production (GWh)



remote settings as well as in conjunction with power from the national grid. As noted earlier, the industry anticipates climbing over the 100MW level of deployed capacity by the end of 2012, which shows a dramatic expansion of the market since 2005. This growth should provide great encouragement for the future expansion of the small and medium wind sector.

In line with the growing deployed capacity, the UK small and medium wind sector continues to make an increasing contribution to national energy

requirements, providing an estimated 89.41GWh of clean energy generation in 2011, an equivalent of approximately 20,000 average UK households' electricity consumption. The amount of energy generated by small and medium wind turbines is anticipated to double over the next twelve months.

It is also estimated that the level of energy generated from small wind systems would have otherwise emitted 56,390 tonnes of carbon dioxide if sourced from the national grid. This is equivalent to 24,841 cars being removed from the roads.

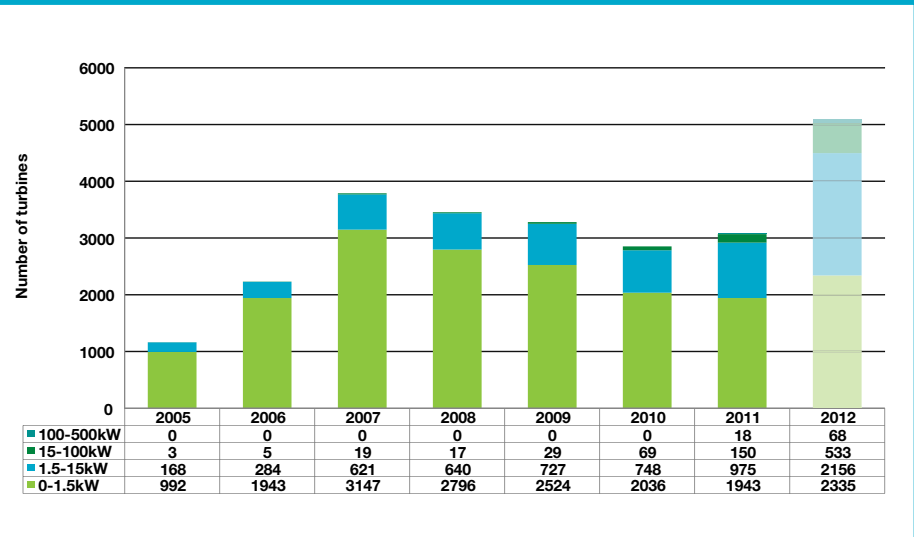
Annual Deployment

Last year witnessed a reverse in the three-year downward trend in annually deployed turbines. The total number of turbines up to 100kW newly deployed in 2011 grew by 8% compared to the previous year. This growth in annual deployment was most pronounced in the 1.5–15kW and 15–100kW market segments, which is an ongoing trend since 2008. The 1.5–15kW band is expected to follow a steep upward trend, especially once a streamlined planning policy, namely the General Permitted Development Order, is introduced for turbines on non-domestic premises (see page 10). The number of micro wind turbines installed last year dipped slightly against the previous year, although they still represented 63% of all turbines deployed in 2011.

This renewed growth in the small wind sector has been driven by a number of factors, including increasing consumer awareness, rising electricity prices and, most notably, the attractive returns on investment guaranteed through the government's Feed-in Tariff scheme.

The uptake of medium wind turbines has been more modest with six turbines registered under the Feed-in Tariff scheme to date. However, feedback from medium wind turbine manufacturers and evidence from RenewableUK's local authority survey (see page 12) suggest that the low deployment rate of medium wind turbines is due to project lead times rather than lack of investor interest. Surveyed medium wind turbine

Figure 3: Annual number of deployed UK small and medium wind turbines



manufacturers reported 18 turbines being deployed in 2011, and an additional 68 turbines are expected to be deployed in 2012.

The healthy growth in the small wind and rapidly emerging medium wind sectors has led to a cumulative number of 19,854 turbines installed by the end of 2011.

Despite uncertainties over future support under the Feed-in Tariff scheme and continuous difficulties in planning, manufacturers are positive about the future growth of the small and medium wind sector. It is projected that the total number of units deployed in 2012 could exceed 5,000.

System Set-Up

Horizontal axis remains the predominant turbine design across the UK. Based on recent market trends, RenewableUK anticipates that horizontal axis design will continue to maintain a majority share of the domestic installation market during the coming years.

Vertical axis turbines, which have a rotor shaft aligned vertically, are still relatively new entrants in the mainstream small wind system sector. There was a slight increase in VAWT installations last year, and RenewableUK anticipates that vertical axis design turbines will continue to make a growing contribution in the micro and small wind market segments.

After a peak in 2007, with 1,054 building-mounted turbines deployed across the UK, this micro wind application has been in a steep decline. Last year, only four turbines (0.13%) were building-mounted, which suggests that siting and performance challenges limit the size of this market. The industry projects modest growth of building-mounted turbines over the next twelve months.

Since 2005, nearly 20,000 small and medium wind turbines have been deployed in the UK. Micro wind turbines (0–1.5kW) have dominated the market to date, with the majority of these serving off-grid applications. Off-grid installations are expected to remain a significant part of the market for the foreseeable future, however, recent trends illustrate that the deployment of grid-tied installations continues to increase as a proportion of total small and medium wind deployment. Whilst in 2005 off-grid applications constituted 86% of all installations, in 2011 the off-grid installation share fell to 55%. It is expected that the Feed-in Tariff scheme will further stimulate the interest in larger, grid-connected turbines.

Figure 4: System set-up

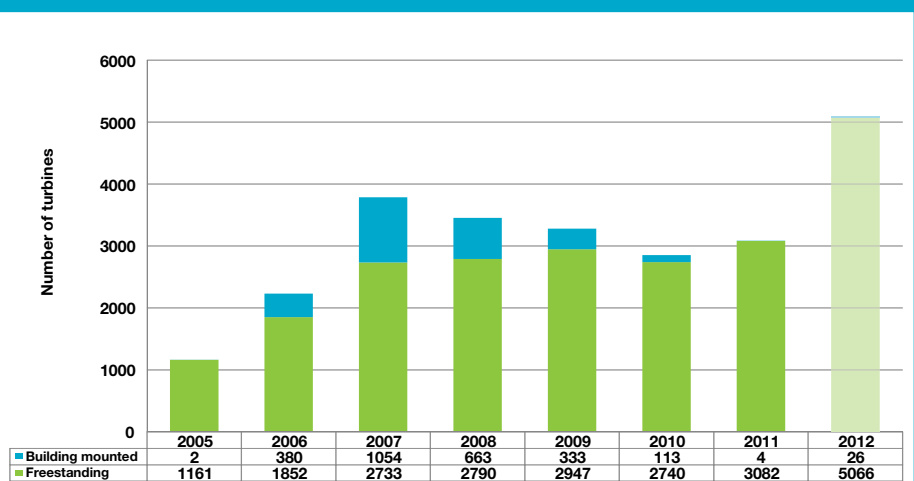


Figure 5: System design

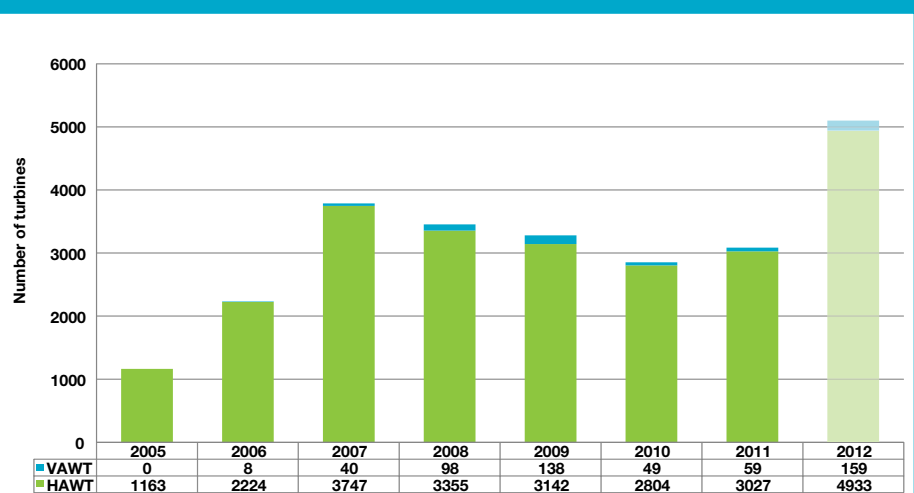
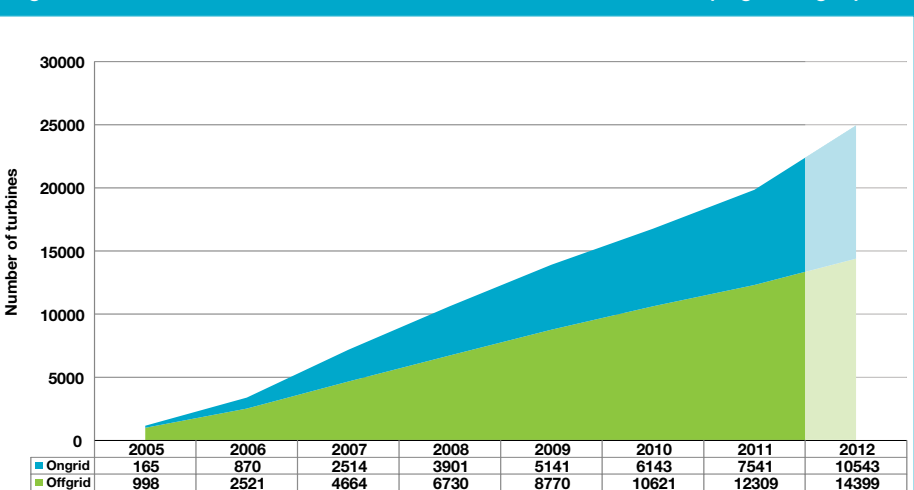


Figure 6: Cumulative number of UK small and medium wind turbines (ongrid/offgrid)



UK and Export Markets

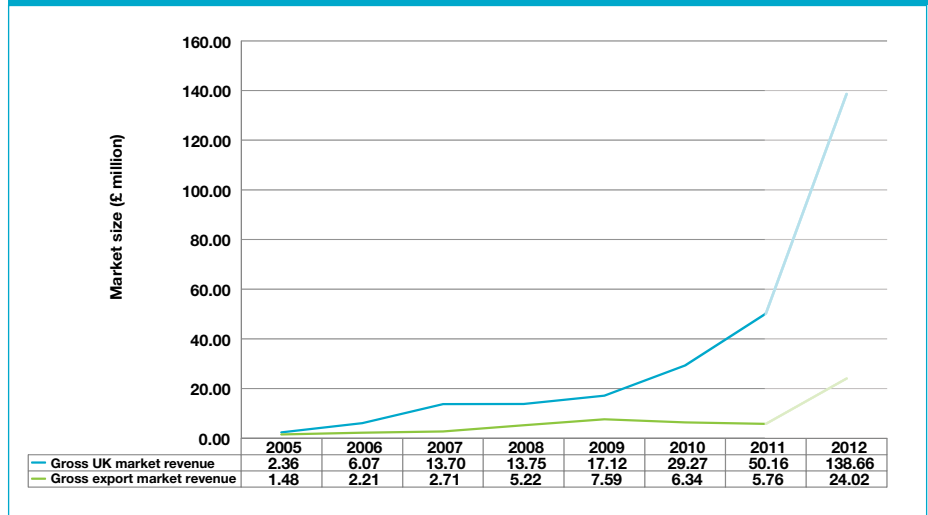
The UK small wind sector has seen substantial growth over the last year, together with the rapidly emerging medium wind sector, a new market segment with huge potential in the UK. Over 3,000 small and medium units were sold last year in the UK, totalling £50.16 million in sales. Compared to the previous year, sales revenue in sub-100kW category rose by 45%. With the medium wind developments coming forward, the annual UK sales revenue is expected to rocket over the next few years, thus providing increasing benefits to the UK economy.

Manufacturers forecast industry-wide revenue increases of up to 176% in 2012, with the predominant share coming from the 1.5–15kW and 15–100kW market segments.

However, whether the anticipated growth will be realised depends on various factors shaping the direction of small and medium wind sector growth. Planning delays and inconsistencies in the way planning applications are treated within local planning authorities remain the two biggest barriers to onshore wind developments of all sizes. At the smaller end of the wind market, the delay in introducing General Permitted Development Rights has an impact on growth, as many customers delay their purchasing decisions in anticipation of a streamlined planning system.

The ongoing Comprehensive Feed-in Tariff Review is expected to somewhat slow down market growth towards the end of the second quarter, when the new tariffs will be announced. The contrary may be seen in the first quarter, as many developers will be rushing to commission projects before the October 2012 deadline, when the new tariffs come into force. The Element Energy study has shown that the deployment levels of small and medium wind in the UK are closely linked to the support

Figure 7: Market size (UK, Export)



available from the Feed-in Tariff scheme. It is therefore important that the Government retains appropriate levels of support for the small and medium wind sector, which is just becoming established, following the Feed-in Tariff Review.

Continued support under the Feed-in Tariff coupled with an increasing consumer interest in taking control over energy bills will be the driving force for UK small and medium wind sector expansion in the short-to-medium term.

Strong growth in the domestic market over the last three years meant that, for the first time, more units have been deployed in the UK than exported by UK manufacturers. A slight drop in the number of exported turbines compared to the previous year may be explained by the fact that UK manufacturers focused on the domestic market as a result of favourable conditions being created by the Feed-in Tariff scheme.

In total, 2,986 turbines were exported by UK manufacturers, predominantly from the sub-1.5kW category. Strong export markets are expected throughout 2012, with a more pronounced increase in the sales of 1.5–15kW turbines.

The EU, North America, Australia and the Pacific were the dominant markets for UK exports in 2010. Other European markets in particular provided significant growth for UK sales.

Figure 8: Annual number of exported turbines

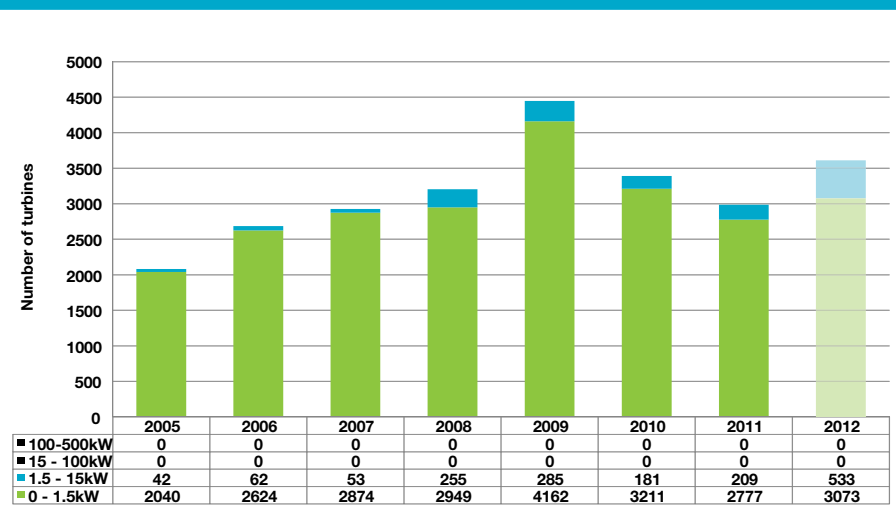
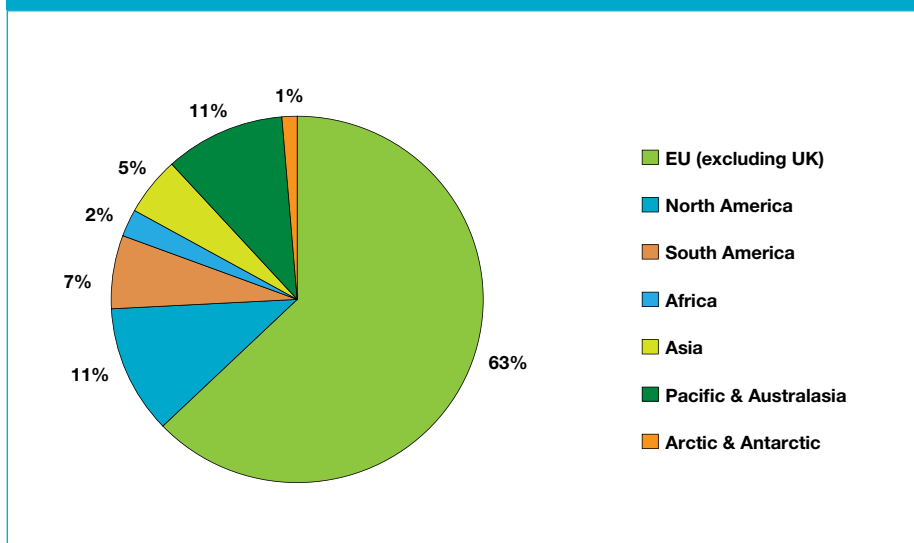


Figure 9: 2011 export markets for UK manufactured product (£5.76 million)



Sector Employment

In 2011 RenewableUK and Energy & Utility Skills jointly commissioned Cambridge Econometrics (CE), the University of Warwick Institute for Employment Research (IER) and IFF Research to conduct a study of current and future employment and skills associated with the development of the UK wind (large onshore, offshore and small wind systems) and marine energy industries. The medium wind sector was not assessed in this study, as it had just started to emerge in 2010.

The study found that 800 full-time-equivalent employees are working in the small wind systems sector in the UK. Given the industry's strengths in terms of manufacturing and export, it is not surprising that the study found that half of these are employed in either design and manufacturing or construction and installation.

Over 80% of the respondents to the Small and Medium Wind UK Market Report 2012 survey indicated that they plan to take on new staff in 2012. Some companies reported a six-fold increase in the number of employees this year. Furthermore, small and medium wind manufacturers create a significant number of indirect jobs in the whole supply chain, including component suppliers, installers, distributors, planning and legal consultants, and more. The continuous small and medium wind sector growth will translate into an increasing number of skilled green-collar jobs in both rural and urban areas across the UK.

A Year in Policy

Feed-in Tariff scheme

The Feed-in Tariff (FiT) scheme, introduced in April 2010 under powers in the Energy Act 2008, has been a significant stimulus for small and medium wind developments across the UK. The scheme guarantees 20 years of substantial green revenues for the owners of small and medium-sized turbines, with a return on investment within 3–8 years. The simple and accessible FiT scheme has the potential to guarantee the broadest possible self-generation across the country.

However, a lack of clarity around the future of the FiT scheme throughout last year undermined consumer and investor confidence in the small-scale renewables market. Developers of wind projects were particularly concerned, as these projects typically have longer lead times, and forward visibility over tariff levels is essential.

The UK Government launched a fast-track review of the current FiT mechanism for large-scale solar projects on 11 March 2011, followed by the Comprehensive Review Phase 1, which made further proposals regarding the future of the FiT for solar PV installations. Although these reviews focused entirely on solar PV, it brought uncertainty in the UK small-scale renewable energy sector as a whole.

The most recent consultation, launched on 9 February 2012, the Comprehensive Review Phase 2B: tariffs for non-PV technologies and scheme administration issues, proposes a number of amendments that will affect all installations, including wind. The proposals include the following:

- Financial aspects of the scheme, including tariff reductions and cost control mechanisms.

- Issues relating to eligibility and accreditation of installations.
- Proposals for community installations.
- Consumer issues.
- Licensee issues.

In order to ensure that any slowing in deployment levels and market growth as a result of the review are only temporary, it will be important for the Government to demonstrate continued confidence in the small and medium wind sector in the form of attractive tariff rates and a stable incentive mechanism.

RenewableUK will be responding to the consultation and working closely with the Department of Energy and Climate Change (DECC) to ensure that the outcome of the review enables the continued growth of the small and medium wind sector in the UK, and minimises the risk of future uncertainties.

Microgeneration Strategy

In June 2011 DECC published the Microgeneration Strategy, which focuses on addressing non-financial barriers to wider uptake of microgeneration technologies, including small wind. The Strategy is restricted to England only. The Scottish Government is expected to publish its own Microgeneration Strategy later in 2012.

General Permitted Development Order (GPDO)

Planning plays a significant part in delivering government ambitions towards small-scale renewable energy generation. A planning system that recognises the value of a move to local energy must be in place to maximise the deployment potential of small and medium wind turbines across the UK. The most attractive Feed-in Tariff rates will be of

little value without a timely and consistent consenting framework through which these projects can be delivered.

Over the last few years, RenewableUK has been advocating for the introduction of permitted development rights for small wind turbines, to make it easier for households and farmers to generate their own clean energy. The Town and Country Planning (General Permitted Development) (Amendment) (England) Order 2011, which came into force on 1 December 2011, makes provisions for Permitted Development for building-mounted and small-scale wind turbines installed on domestic premises. Whilst RenewableUK welcomed the new policy, aimed at making it easier for domestic users to install small wind turbines, in reality, as it currently stands, no stand-alone wind turbine installations can classify as Permitted Development due to the size restrictions outlined in the domestic GPDO.

Therefore, RenewableUK will continue working with the Government to ensure that permitted development rights are granted for turbines on non-domestic premises. A non-domestic GPDO would eliminate the planning delays, which is often the key reason that potential customers do not proceed with small wind projects. The industry expects that a non-domestic GPDO will greatly increase the rate of uptake of eligible turbines.

Localism Act

The Localism Bill was introduced to Parliament on 13 December 2010, and was given royal assent on 15 November 2011, thus becoming an Act. It shifts power from central government back into the hands of individuals, communities and local councils. The Act applies to England and Wales.

Two significant provisions in the Act include those on referenda and the Duty to Cooperate. Referenda, as previously proposed, would be non-binding and take place when 5% of the local population (or less if the local authority determine it as such) call for a referendum or if a member of the local authority calls for one.

Following a great deal of coordinated work with a number of other organisations and peers with a development interest, RenewableUK was successful in ensuring that the proposals for the general power to trigger local referenda were not included in the Act. However, the requirement to hold referenda on some particular subjects, such as neighbourhood planning, still stands.

The Localism Act also covers major infrastructure planning, the abolition of the Infrastructure Planning Commission and the transfer of its examination functions to a new national infrastructure directorate that has been created within a restructured Planning Inspectorate.

National Planning Policy Framework (NPPF)

The National Planning Policy Framework was published on 27 March 2012. It is a key part of the Government's reforms to make the planning system in England less complex and more accessible, and to promote sustainable growth.

RenewableUK's submission to the draft NPPF sought that the presumption in favour of sustainable development be made a positive planning tool by providing local authorities with much-needed guidance and time to get their local plans in place, prior to enforcing the presumption. RenewableUK expressed concerns with

the introduction of "suitable areas for renewable energy", which have been partially addressed in the final version.

On the positive side, the NPPF contains an improved definition of sustainable development and a reference to the Climate Change Act. Compared to the draft, it is now written in planning language that makes it less ambiguous. Paragraph 98 of the NPPF is of particular relevance to small projects, as it recognises their valuable contribution to cutting greenhouse gas emissions.

Natural Environment White Paper (NEWP)

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

The role of the planning system is identified as being an important means of delivering the non-legislative initiatives detailed within the White Paper. A reference to Nature Improvement Areas has now been included in the NPPF, which states that where they are included in local plans, local authorities should consider specifying the types of developments that may be appropriate in these areas. It is yet to be seen whether these provisions would potentially frustrate the Government's wider development policy by placing a presumption against the development of renewable energy in these areas.

RenewableUK will continue to make sure that these objectives are delivered in tandem and not in conflict with corresponding government objectives

for the substantial decarbonisation of the energy sector, the creation of a green economy based on the development and manufacture of clean energy infrastructure, and the need to secure an economic recovery.

Green Investment Bank

Exciting opportunities exist for local communities to develop their own renewable energy schemes, but one obstacle to such projects is private sector funding, as some banks view small and medium wind as a risky proposition.

Recent efforts by government to help communities meet the upfront costs of renewable energy projects through the Rural Community Renewable Energy Fund are commendable. It is RenewableUK's hope that government considers other sources of funding through the Green Investment Bank so that local communities are able to get these projects up and running, whilst simultaneously helping small business and putting people back in work.

Despite small and medium wind not being specifically identified by BIS as a key area of investment for the Green Investment Bank, ample opportunities exist for investors. RenewableUK will continue making the case that FiTs offer a good rate of return, and that there are opportunities for the Green Investment Bank to offer guaranteed loan provisions and/or low-interest loans.

Planning Approval Rates for Small and Medium Wind

RenewableUK conducted a survey of local authorities across England, Scotland and Wales, seeking data on the numbers of planning applications for wind turbines and their outcomes in the period between January 2009 and June 2011, in order to understand the current rates of approvals and rejections in the planning system. The survey showed that the rejection rate for small and medium wind turbines is on average 11%, whilst 74% of applications are approved. Approximately 10% of all applications are withdrawn by the applicant, although it is acknowledged that in some cases this is due to requests by the planning authority for costly supporting evidence such as noise, shadow flicker and wildlife studies.

A more significant issue, which affects whether investors decide to submit an application in the first place, is the time required to process applications. The industry reported that times to determine applications have increased recently due to resource constraints in planning departments. This has resulted in projects being determined within 4 to 6 months on average for small turbines and 8 to 12 months for medium-sized systems. Even if the probability of a planning application succeeding is high, these delays often discourage potential investors from making an application in the first place.

RenewableUK is working with government and other stakeholders to explore ways in which uncertainties and delays in the planning system can be reduced. In an attempt to provide clear and practical advice on planning issues associated with small wind turbines, RenewableUK published the Small Wind Planning Guidance. This document aims to promote greater consistency of approach and to aid the transparency of the planning process.

Table 2: Planning approval rates for small and medium wind

	Total applications	Total minus withdrawn	Rejected	% Rejected ¹	% Approved ²
0–1.5KW	50	46	6	13	78
1.5–15KW	531	483	50	10	79
15–100KW	259	225	25	11	62
100–500KW	69	62	5	8	40
TOTAL³	909	816	86	11	74

Notes:

1. The percentage of rejections excludes the withdrawn applications from the total.
2. The approved rates do not include the number of applications still under consideration; when these are included the total approval rate is 62%.
3. Data is based on responses by approximately 80 local authorities.

Small and Medium Wind Costs

Current project costs

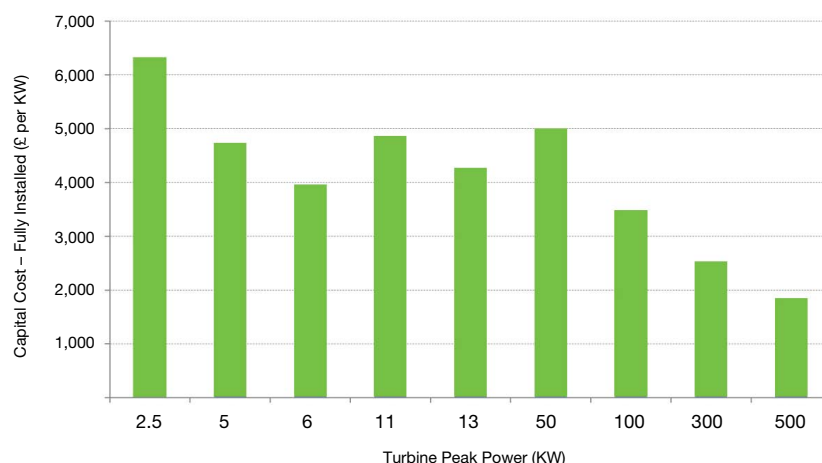
RenewableUK commissioned Element Energy to assess the cost of small and medium wind projects.

The study showed that small and medium wind project costs have risen by approximately 20% since 2009. A number of reasons were identified for recent increases in costs:

- Previous costs were driven down by cheap products that have since failed to gain certification
- Development work has focused on improvements in performance (energy production) rather than reducing capital costs, as this is currently a more effective way to reduce the cost per kWh, which is the key metric governing the economics of a wind project
- Increases in material prices (steel, copper, neodymium)
- High installer margins reflecting low volumes per installer
- Manufacturers pricing in warranty costs within the costs of turbines
- Difficulties for manufacturers in accessing debt-based working capital
- Certification costs.

The installed costs for a range of turbines with power outputs from 2.5 to 500kW are depicted below. As expected, the costs per kW of capacity are lower for larger turbines due to economies of scale. The installed cost per kW for a 500kW machine is 50% lower than for a turbine in the 5–15kW range. The costs per kW are relatively constant up to 50kW, after which costs are over £1,000 per kW lower. The cost for the 500kW turbine ranges from £850,000 to £1 million installed. The midpoint is shown below.

Figure 8: Summary of installed costs for small and medium wind turbines



Size (KW)	2.5	5	6	11	13	50	100	300	500
Installed Cost (£k/kW)	6.4	4.8	4.0	4.9	4.3	4.2	3.5	2.5	1.9
Installed Cost (£k)	16	24	24	54	56	210	350	750	950

Future cost reduction

Cost reduction in the short term is feasible, however, it is likely to be modest. Whilst commodity costs are unlikely to go down, small and medium wind project cost reduction will be largely driven by increases in sales. To maximise the potential for cost reduction, it is important that barriers such as inconsistency and delays in planning, as well as uncertainty over the future of the Feed-in Tariff scheme, are removed.

Lower installation costs are seen as an important aspect in driving overall project costs down, as higher volumes provide efficiencies in terms of installation techniques and reduced travelling distances. On the other hand, cost reductions made through improvements in manufacturing efficiency are often offset by the increased costs of raw materials such as steel and copper.

Table of Data

	UK 05	TOTAL 05	UK 06	TOTAL 06	UK 07	TOTAL 07	UK 08	TOTAL 08	UK 09	TOTAL 09	UK 10	TOTAL 10	UK 11	TOTAL 11	UK 12	TOTAL 12
Number of sold units in that year																
0 - 1.5 kW	992	3032	1943	4567	3147	6021	2796	5745	2524	6686	2036	5247	1943	4720	2335	5408
1.5 - 15 kW	168	210	284	346	621	674	640	895	727	1012	748	929	975	1184	2156	2689
15 - 100 kW	3	3	5	5	19	19	17	17	29	29	69	69	150	150	533	533
100 - 500kW	0	0	0	0	0	0	0	0	0	0	0	0	18	18	68	68
TOTAL	1163	3245	2232	4918	3787	6714	3453	6657	3280	7727	2853	6245	3086	6072	5092	8698

System application																
Ongrid	165	205	705	745	1644	1763	1387	1848	1240	2298	1002	1853	1398	2314	3002	3829
Offgrid	998	3040	1523	4173	2143	4951	2066	4809	2040	5429	1851	4392	1688	3758	2090	4869

System setup																
BM	2	2	380	384	1054	1091	663	853	333	1194	113	542	4	7	26	26
FS	1161	3243	1852	4534	2733	5623	2790	5804	2947	6533	2740	5703	3082	6065	5066	8672

System design																
HAWT	1163	3245	2224	4910	3747	6674	3355	6557	3142	7579	2804	6194	3027	5999	4933	8518
VAWT	0	0	8	8	40	40	98	100	138	148	49	51	59	73	159	180

Sales (£ thousand)																
0 - 1.5kW	573	1678	2425	3923	3713	5595	3033	5359	2648	6590	1779	5513	1442	3800	1975	4286
1.5 - 15kW	1552	1929	3354	4066	8062	8892	9516	12407	11424	15067	17905	20508	24280	27686	55964	65324
15kW - 100kW	235	235	292	292	1920	1920	1200	1200	3051	3051	9590	9590	16907	16907	53536	53536
100 - 500kW	0	0	0	0	0	0	0	0	0	0	0	0	7530	7530	27185	39535
TOTAL	2360	3842	6071	8281	13695	16407	13749	18966	17123	24708	29274	35611	50159	55923	138660	162681

TOTAL = UK deployment and export from UK manufacturing

2005–11 data is based on historic manufacturing records

2012 data is based on manufacturing forecasts

HAWT = horizontal axis wind turbine

VAWT = vertical axis wind turbine

Contributors

RenewableUK would like to thank the following organisations for their support and contributions towards building this report:

Ampair	Llumarlite Energy Systems Ltd
Better Generation	Marlec Engineering Co. Ltd
Bergey Windpower Co.	NaREC
Bryan J Rendall Ltd	Northern Power Systems Inc.
BRE Global	Perpetual Energy
Cleanfield Energy	Proven Energy Limited
C & F Green Energy	Quietrevolution
Eclectic Energy Limited	Renewable Devices Ltd
Endurance Wind Power	RWE npower
ENERCON	Seaforth Energy Inc.
Engenius Ltd	Southwest Windpower
Eoltec Wind Turbines	Sustainable Energy Consultants Ltd
Evance (Iskra) Wind Turbines Limited	Turbowind Energy
Evoco Energy Ltd	TUV NEL
Fortis Wind Energy	Urban Green Energy
FuturEnergy	Vertical Wind Energy Ltd
Gaia-Wind Ltd	Vergnet SA
Gazelle Wind Turbines Ltd	Westwind Turbines
GenDrive Ltd	Wind Energy Solutions Pty Ltd
Green Company (Europe) Ltd	Windcrop Limited
ICE Renewables Ltd	Windflow Technology Ltd
Kestrel Wind Turbines	Windsave Holdings plc
Kingspan Renewables	Windspire Energy
Leading Edge Turbines	Xzeres Wind Corp.



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

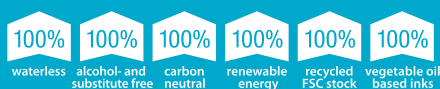
Email: info@RenewableUK.com

Our vision is of renewable energy playing 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 an established, large 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, lobby 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:



Zero
0%
waste
to landfill

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