

Small Wind Systems

UK Market Report
April 2010



SWS UK Market Report 2010

Summarised Statistics

3,280

no. of small wind system units deployed in the UK in 2009 (-5% on 2008)

13,915

no. of small wind system units deployed in the UK between 2005 and 2009

8.62 MW

new UK capacity in 2009 (+19% on 2008)

28.7 MW

cumulative installed capacity between 2005 and 2009

£17.12 million

UK market size (+24.5% on 2008)

£7.59 million

UK manufacturing export revenue (+45.4% on 2008)

4,447

no. of small wind system units exported in 2009 (+38.7% on 2008)

15,346

no. of small wind system units exported by UK manufacturers between 2005 and 2009

59%

proportion of output exported by UK manufacturers

1755

UK small wind market employment in 2009 (-0.2% on 2008)

75%

percentage of UK market supplied by UK-manufactured product

181%

estimated UK market growth for 2010 (£48.09 million)

RenewableUK (formerly BWEA) is the leading renewable energy trade association in the UK, as well as the voice of the UK's micro and small-scale wind industry.

Our primary purpose is to promote the use of wind, wave and tidal power in and around the UK, both onshore and offshore. We act as a central point of information for our membership and as a lobbying group to promote wind energy and marine renewables to government. We also research and find solutions to current issues affecting the industry, and act as the forum for the UK renewable industry.

The membership of RenewableUK ranges from small companies to the largest international corporations, from manufacturers to installers, from certification bodies to academic institutions, providing us with a united, representative voice.

Through our industry working groups and events, RenewableUK plays a crucial role in bringing together all the key players to tackle vital issues affecting the industry.

RenewableUK also owns and manages the national standard for small wind systems, the RenewableUK Small Wind Turbine Performance and Safety Standard, which supports the Microgeneration Certification Scheme (MCS).

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About small wind system technology

With over twenty UK-based manufacturers there is a wide variety of small wind system designs and setups.

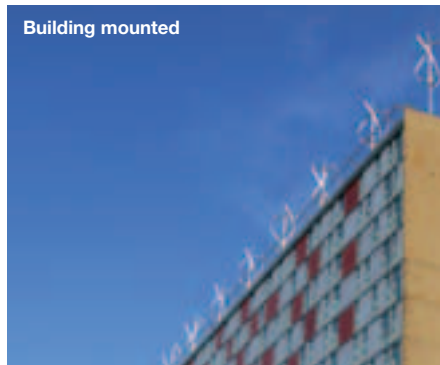
The two main designs are the horizontal axis wind turbines (HAWT) and vertical axis wind turbines (VAWT). Small wind systems generate clean renewable energy and can be connected to mains electricity supply (on grid), or alternatively used to charge batteries (off grid).

Small wind system technology can be subdivided into three categories: micro wind turbines (0–1.5kW), small wind turbines (1.5–15kW) and small-medium wind turbines (15–100kW).

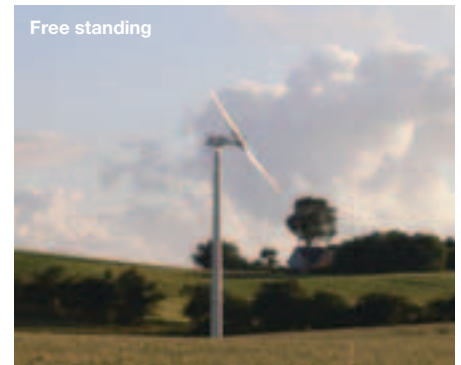
The production of energy by small wind systems over a year depends critically on the annual average wind speed at the sites – higher wind speeds produce more energy. Sites located only a hundred metres apart can be significantly different.

To assess the average wind speed at a particular site, it is recommended that on-site wind speed data and careful measurements be taken over a period of time prior to installation.

If you would like to find out more about small wind systems, please visit the RenewableUK small wind system website: www.renewable-uk.com.



Building mounted



Free standing



HAWT



VAWT



On grid



Off grid

About this Report

The UK has the best wind resources in Europe, a globally competitive manufacturing industry for small wind systems and a consumer base that is becoming increasingly more aware.

With volatile fossil fuel prices and declining technology costs, and this year's introduction of the Feed-in Tariff, interest in microgeneration is only going to grow, with more and more homes and businesses generating their own clean, green energy.

This is the third small wind system UK market report undertaken by RenewableUK (formerly BWEA) and draws on contributions from across the global micro and small-scale wind industry. The report assesses the current size and dynamic of the UK small wind system sector, offers indications towards future market development, aims to provide an introduction to small wind system technology and keep the industry up to date with the current UK and export market, and support policy development in national government.

| Small wind systems | | | | |
|--------------------|------------|--------------------------------|------------------|---------------------------|
| | Power (kW) | Annual energy production (kWh) | Total height (m) | Total installed cost (£k) |
| Micro wind | 0 – 1.5 | Up to 1,000 | 10 – 18 | 0.5 – 5 |
| Small wind | 1.5 – 15 | Up to 50,000 | 12 – 25 | 2 – 50 |
| Small-medium wind | 15 – 100 | Up to 200,000 | 15 – 50 | 50 – 250 |

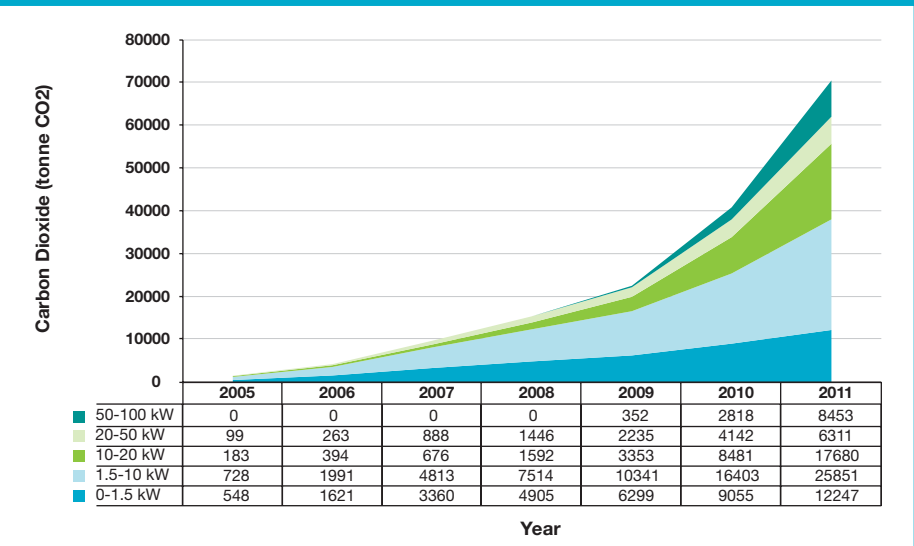
Note: The average UK domestic household consumes approximately 4,400 kWh per year.

Carbon Savings

In 2009, RenewableUK estimated the UK small wind system sector to have generated a level of energy that would have emitted 22,580 tonnes of carbon dioxide if sourced from the national grid (Digest of UK Energy Statistics).

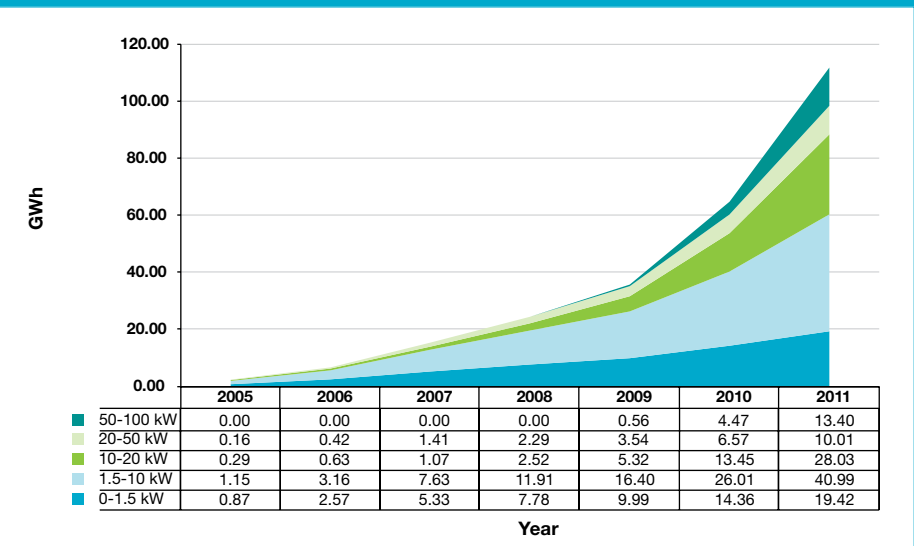
The Carbon Trust states that 'in theory small-scale wind energy has the potential to generate 41.3TWh of electricity and save 17.8Mt of CO2 in the UK annually', approximately 12% of the UK's electricity requirements.

Annual CO₂ abatement by UK small wind systems



The UK small wind system sector continues to grow its contribution to national energy requirements, with overall annual production estimated by RenewableUK to have reached 35.8GWh in 2009. Although this report does not take account of small wind systems installed in the UK prior to 2005, it is fair to say that current annual energy production levels are only scratching the surface of what may be possible in the future. RenewableUK estimates that if barriers to market growth are adequately addressed, by 2020 the UK small wind system sector will be annually generating 1,700GWh (1.7TWh) of renewable electricity.

Annual UK small wind system energy production

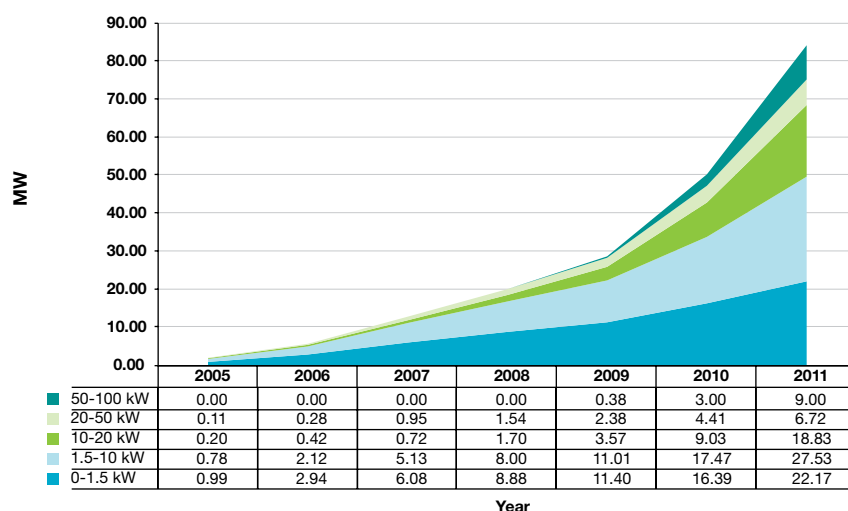


Installed Capacity

Annual deployment in 2009 surpassed previous records by almost 20%. Annual deployment of 7.24MW in 2008 grew to 8.64MW in 2009. Another steady year of deployment from industry and consumers alike saw the total installed UK capacity reach 28.7MW at the end of last year.

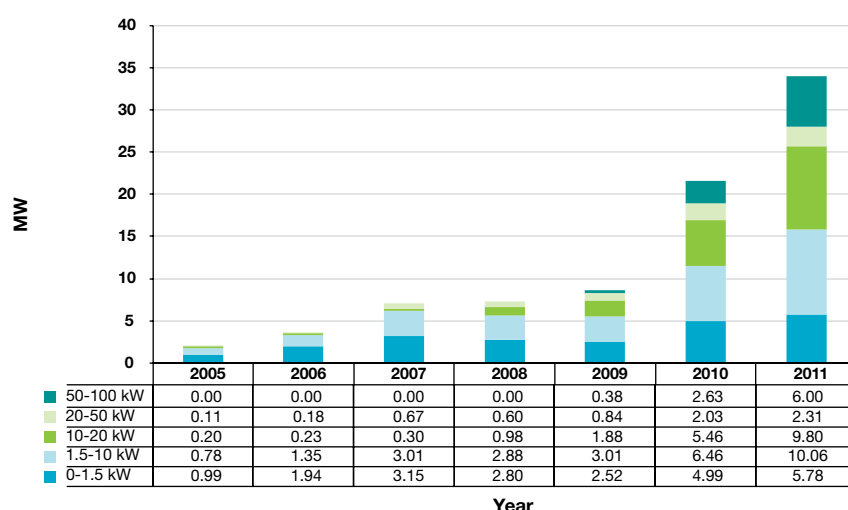
Although coming from a low base, RenewableUK estimates that the UK could have 1,300MW (1.3GW) of installed small wind system capacity by 2020, if the appropriate policies are put in place to support this fast emerging sector.

Cumulative installed UK small wind system capacity (MW)



With growing interest in grid-connected applications, small wind turbines, as opposed to micro wind turbines, are expected to continue to provide the majority of annual deployed capacity. In addition, new financial incentives launched in April 2010 (Feed-in Tariffs) are predicted to stimulate fast growth in the previously dormant small-medium wind market, in which generated energy is predominantly used to satisfy on-site demand.

Annual deployed UK small wind system capacity (MW)

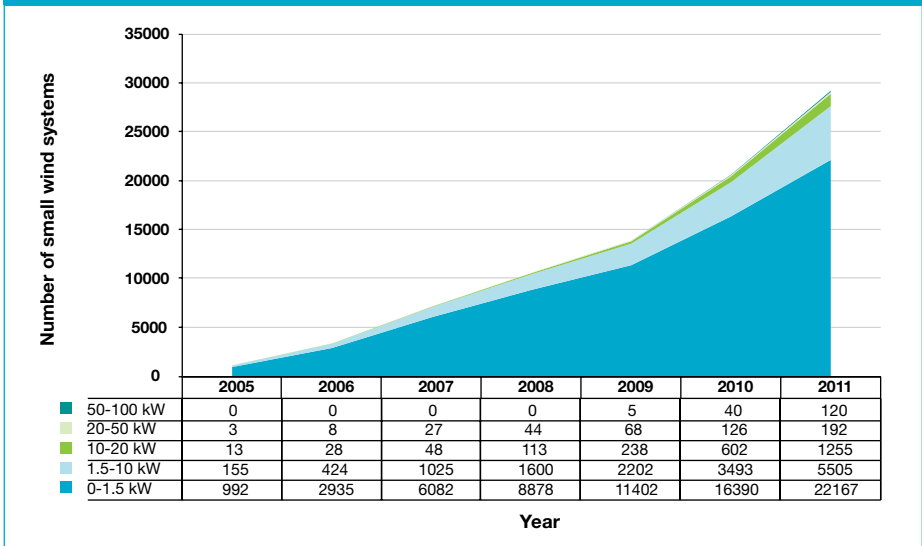


Cumulative Deployment

Since 2005, almost 14,000 small wind systems have been deployed in the UK. Although this report does not take account of small wind systems installed in the UK prior to 2005, it is fair to say that the total number of existing UK installations will likely be significantly higher than this value.

By 2020, RenewableUK estimates that over 600,000 micro, small and small-medium wind turbines could have been installed in the UK alone. With the UK enjoying the best wind resources in the whole of Europe, future technology cost reductions and fossil fuel price hikes could mean more and more potential sites become commercially attractive.

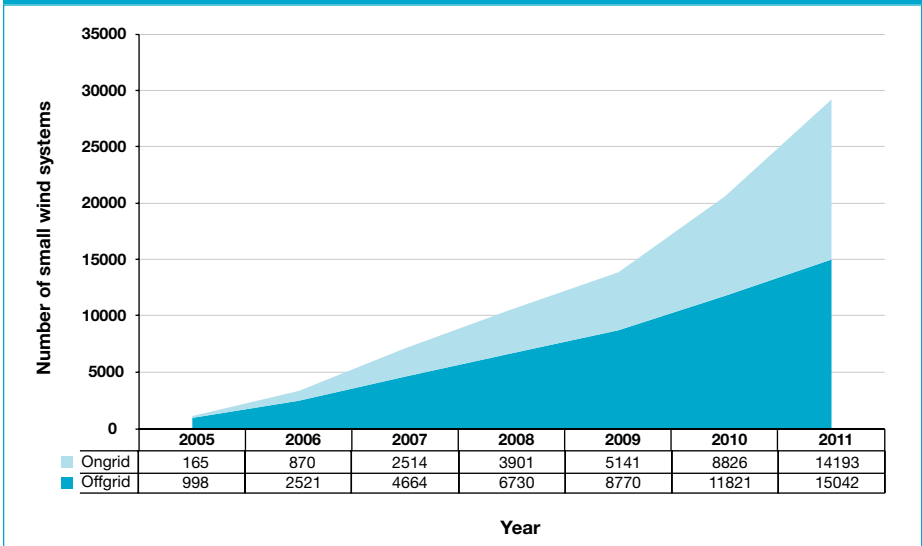
Cumulative number of installed UK small wind systems



Small wind system technologies that connect straight into the grid or feed mains electricity supply are expected to be a significant growth area in future.

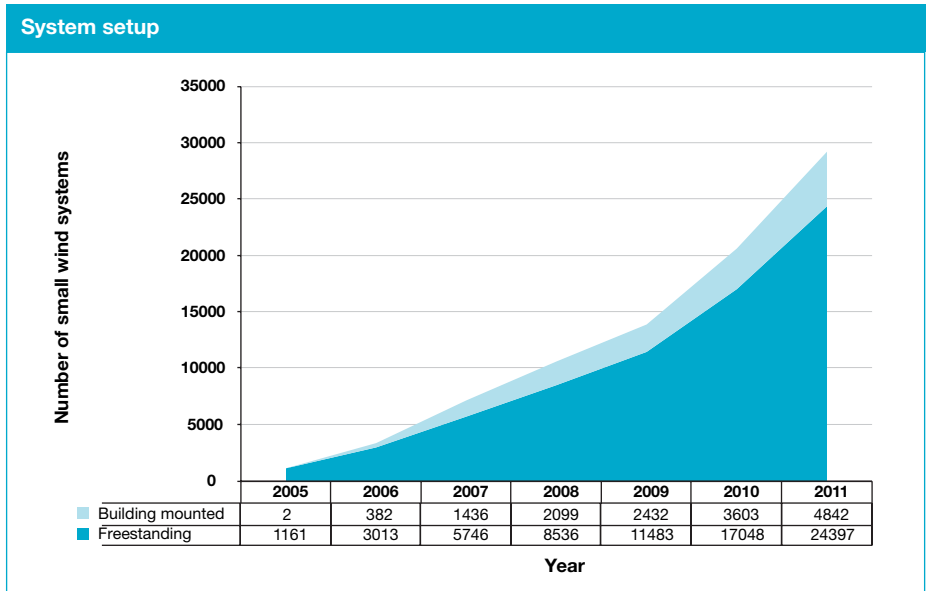
Off grid applications of small wind system technologies are expected to experience steady growth throughout the coming years. Many of these applications are installed within the leisure (e.g. marine) and industrial segments of the market.

Cumulative number of UK small wind systems (on grid/off grid)



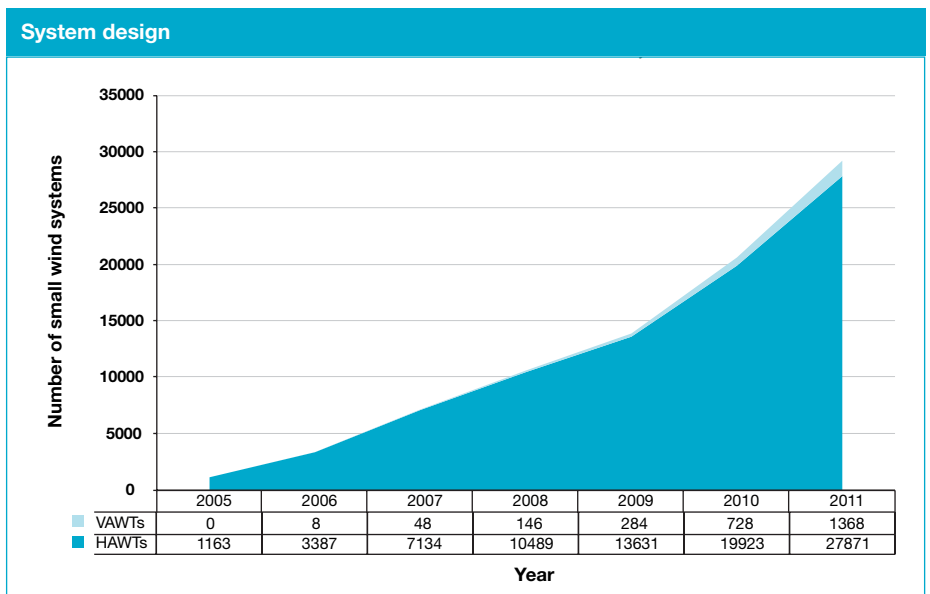
Free-standing turbines, as opposed to building-mounted turbines, are expected to continue to make up the lion's share of existing installations for the foreseeable future.

Mounting turbines on buildings is a relatively new application of small wind system technology. As with all applications of small wind system technology, due attention should be paid to the quality of available wind resources on-site prior to installation.



Vertical axis wind turbines (VAWT) are a relatively new entrant into the mainstream small wind system sector, but it is anticipated that they will play an expanding role as the overall market grows.

Horizontal axis wind turbines (HAWT) are forecast to provide a significant proportion of the overall number of annually deployed micro and small wind turbines in the near future.



Annual Deployment

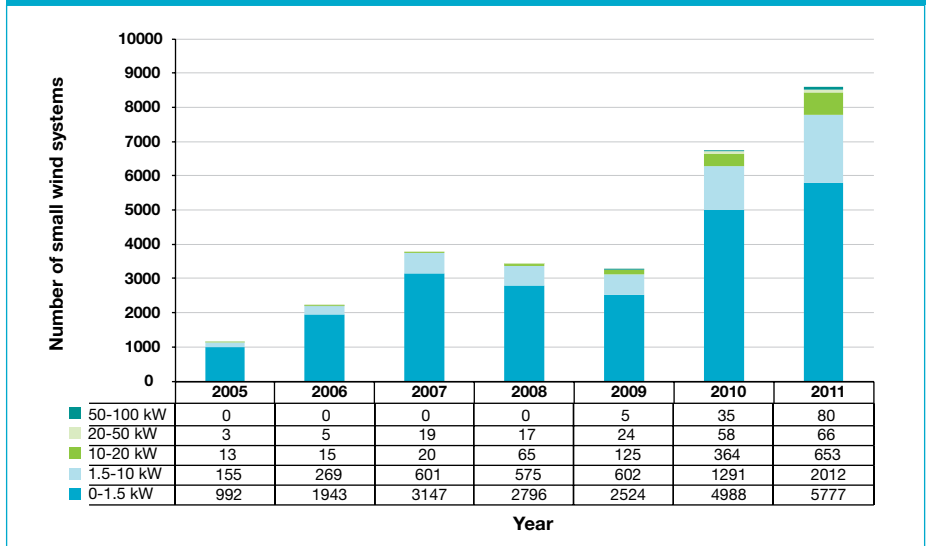
Despite UK market revenue and annual deployed capacity increasing between 2008 and 2009, the total number of turbines deployed in 2009 decreased slightly on the previous year. This means that over 2009 the average size of each installed UK small wind system grew from 2kW to 2.6kW.

Previously expected increases in annual deployment have not been realised in 2008 due to delays in introducing streamlined planning policy, namely General Permitted Development Orders (GPDO). Although set to be implemented in April 2008, GPDO policy has still yet to be implemented, which has caused many consumers to hold off installing small wind systems in the meantime.

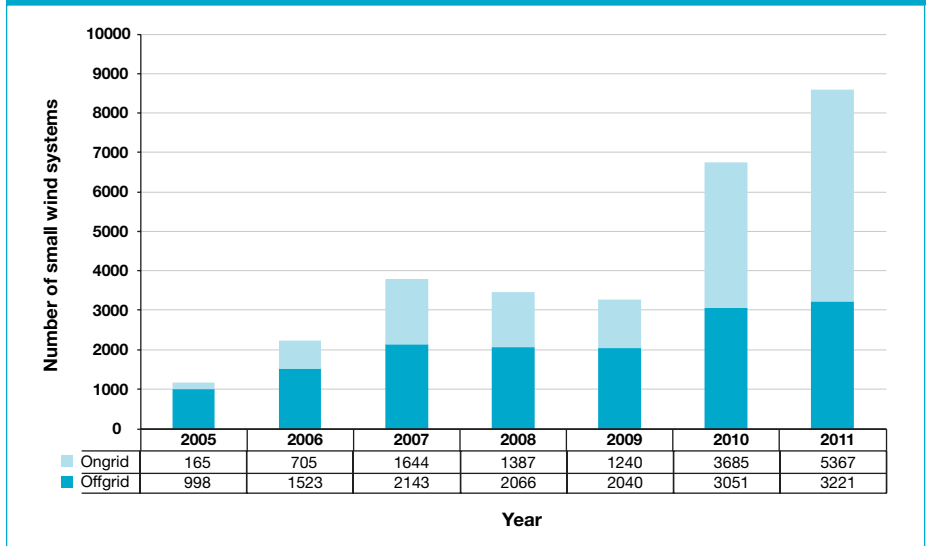
With the arrival of new financial incentives, sharp increases in annual deployment are expected for 2010 and 2011.

It is anticipated that while off grid (i.e. battery charging) applications will experience stable levels of increasing annual UK deployment in the future, the main growth market will be for those applications connecting to the grid.

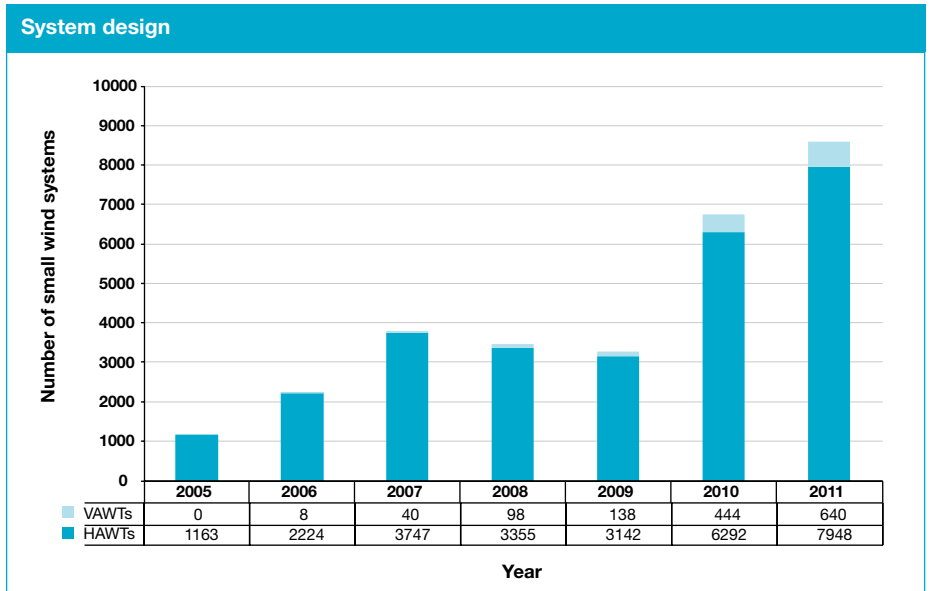
Annual deployed UK small wind systems



Annual deployed UK small wind systems (On grid vs off grid)

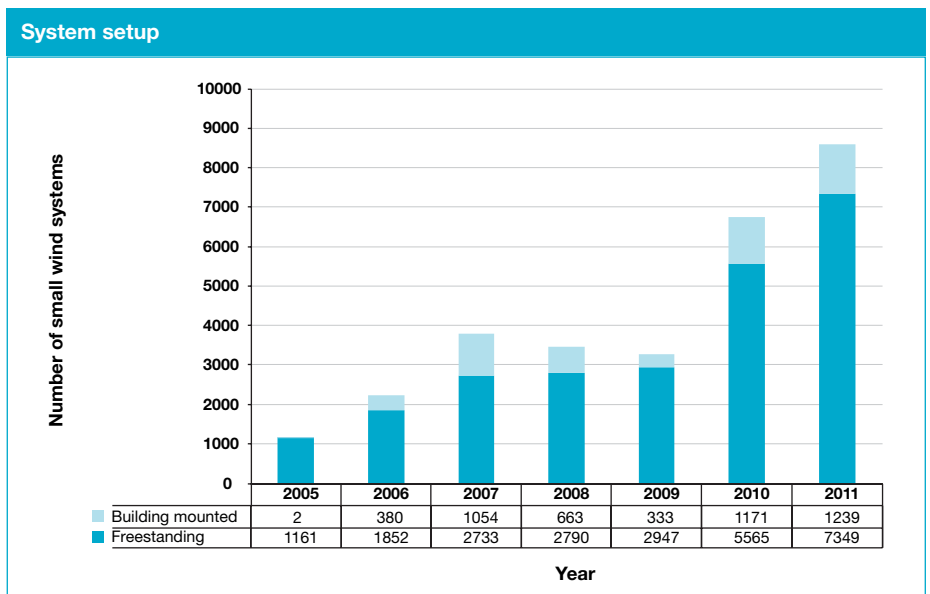


With over twenty UK manufacturers and many foreign companies active in the UK market, there is a wide variety of product design.



Free-standing turbines are expected to experience rapid and consistent growth throughout 2010.

The annual deployment rate for building-mounted systems has dropped noticeably following a peak in 2007. Significant growth is anticipated following streamlining of the planning system through General Permitted Development Orders and the introduction of Feed-in Tariffs in 2010.

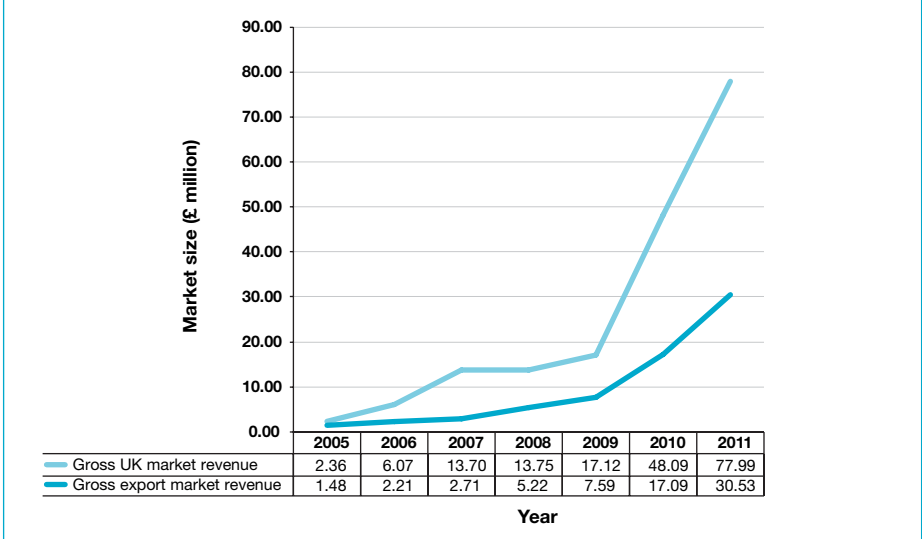


UK and Export Markets

With weakened currency rates for the pound sterling, UK manufacturers enjoyed a 45.4% growth in export market revenues for 2009.

Sharp increases are anticipated for the UK market in 2010, with manufacturing forecasting industry-wide revenue increases of up to 181%.

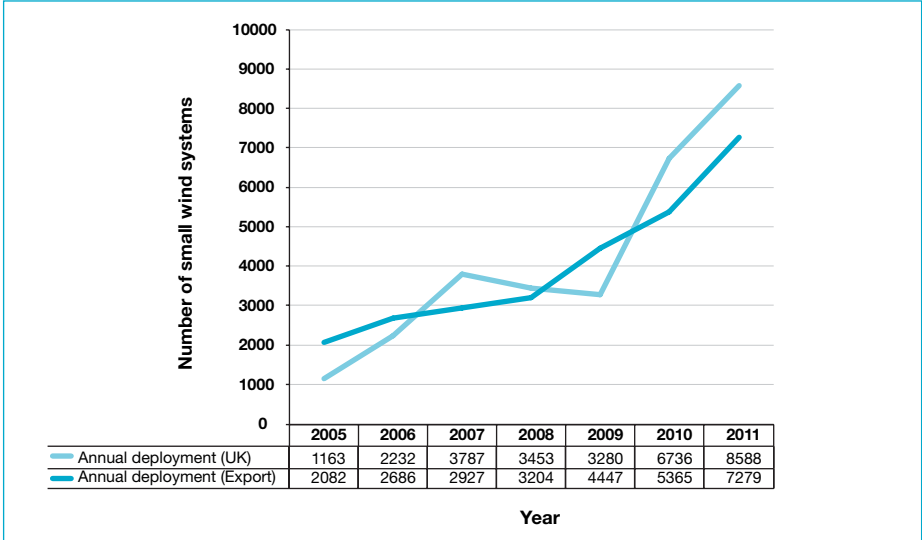
Market size (UK, Export)



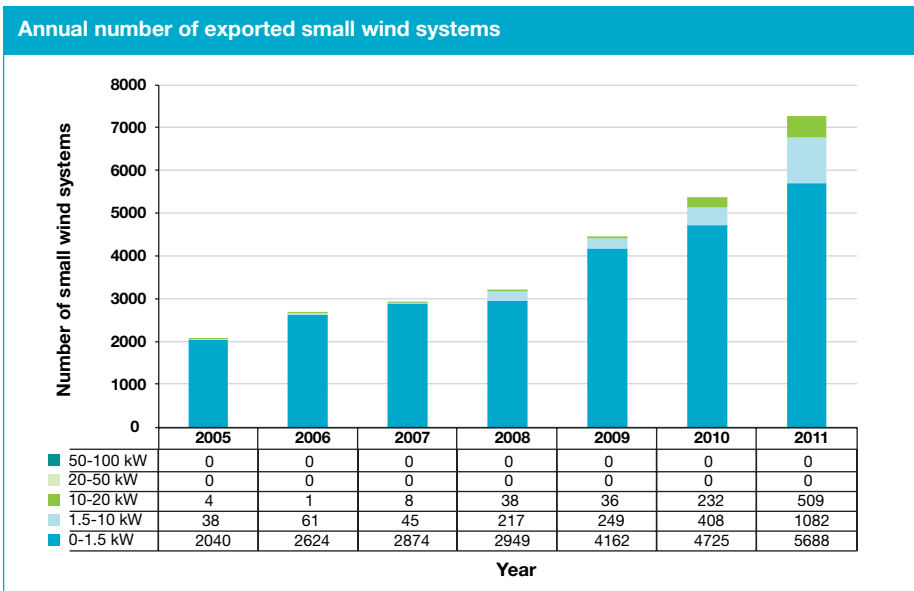
As predicted in last year's report, 2009 witnessed more small wind systems being exported by UK manufacturers than were installed across all UK territories.

Without any planning policy action from central government over the past 5 years, the UK planning system is becoming increasingly unpredictable for UK customers seeking to install small wind systems. Commitments made within the Government's Microgeneration Strategy (2006), to provide streamlined planning (General Permitted Development Orders) and technology-specific planning guidance to local authorities, have yet to be fulfilled. Scotland is expected to implement this policy in 2010, and we await a Government response to the consultation in England, Northern Ireland and Wales.

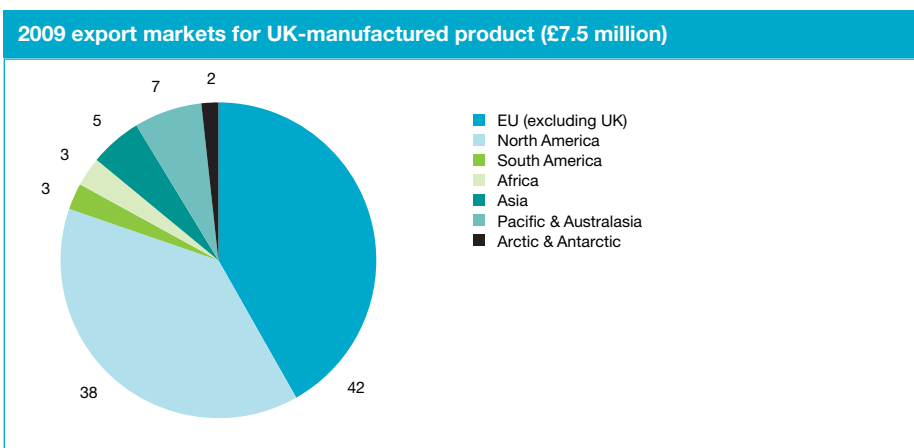
Annual deployed number of small wind systems (UK and export)



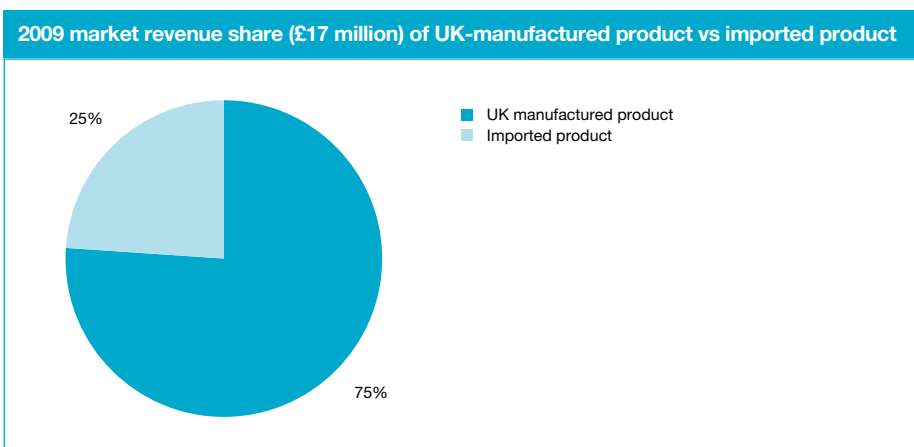
The steady growth in export markets for UK manufacturers in 2009 has come from across the sub-20kW range of small wind systems, with particular increases in the sales of micro wind turbines (0–1.5kW).



The EU and North America were the dominant markets for UK exports in 2009. The US in particular provided significant growth for UK sales.



Although UK manufacturers currently enjoy a significant share of their indigenous market, it is anticipated that competition will grow over the coming years. Indeed, UK control dropped from 85% to 75% through 2009.

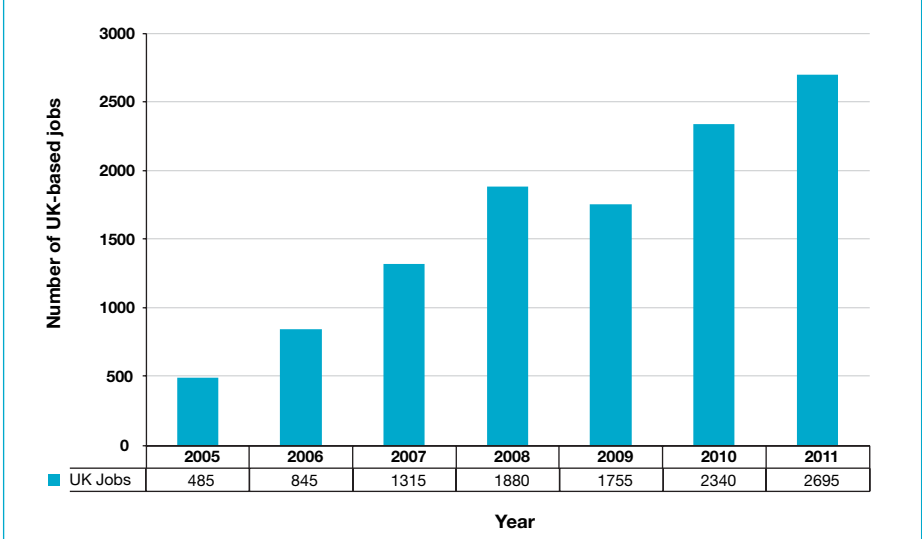


Employment Levels

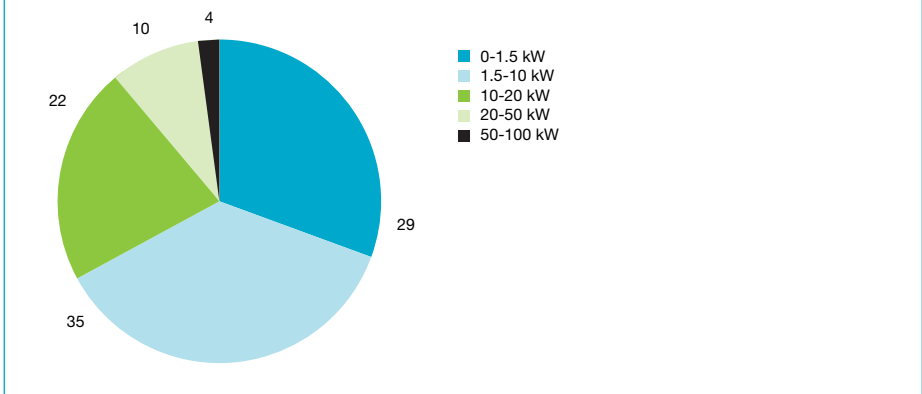
In the face of the global economic crisis, the number of UK-based jobs provided by the UK small wind system sector held firm at around 1,800. Based on current industry practice, RenewableUK estimates that for every manufacturing company-level employee, two jobs are created upstream (e.g. supply chain, components, etc.) and a further two are created downstream (e.g. installer, distributor, etc.).

RenewableUK estimates that by 2020, the small wind system sector could be employing 5,800 people with a market revenue size of £750 million plus. Assuming that there is UK market saturation and a continued participation in fast-expanding export markets, RenewableUK estimates that the UK small wind system sector could provide over 10,000 UK-based jobs, and revenue measured in the billions of pounds annually.

Small wind system sector employment



UK capacity installed in 2009 (8.6 MW)



UK small wind systems installed in 2009 (3280)

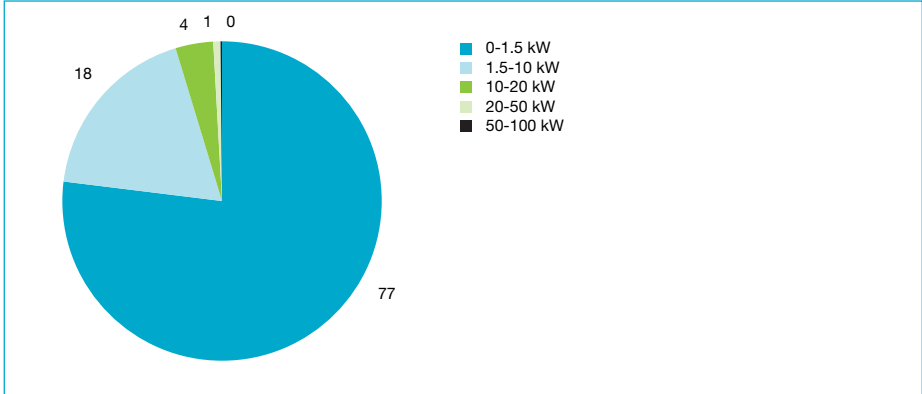


Table of Data

| | UK 2005 | TOTAL 2005 | UK 2006 | TOTAL 2006 | UK 2007 | TOTAL 2007 | UK 2008 | TOTAL 2008 | UK 2009 | TOTAL 2009 | UK 2010 | TOTAL 2010 | UK 2011 | TOTAL 2011 |
|--|------------|---------------|------------|---------------|------------|---------------|------------|---------------|------------|---------------|------------|---------------|------------|---------------|
| Small Wind Sector Employment | | | | | | | | | | | | | | |
| Employees | 485 | | 845 | | 1,315 | | 1,880 | | 1,755 | | 2,340 | | 2,695 | |
| Number of deployed units in that year | | | | | | | | | | | | | | |
| 0-1.5kW | 992 | 3,032 | 1,943 | 4,567 | 3,147 | 6,021 | 2,796 | 5,745 | 2,524 | 6,686 | 4,988 | 9,713 | 5,777 | 11,465 |
| 1.5-10kW | 155 | 193 | 269 | 330 | 601 | 646 | 575 | 792 | 602 | 851 | 1,291 | 1,699 | 2,012 | 3,094 |
| 10-20kW | 13 | 17 | 15 | 16 | 20 | 28 | 65 | 103 | 125 | 161 | 364 | 596 | 653 | 1,162 |
| 20-50kW | 3 | 3 | 5 | 5 | 19 | 19 | 17 | 17 | 24 | 24 | 58 | 58 | 66 | 66 |
| 50-100kW | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 35 | 35 | 80 | 80 |
| Total | 1,163 | 3,245 | 2,232 | 4,918 | 3,459 | 6,714 | 3,453 | 6,657 | 3,280 | 7,727 | 6,736 | 12,101 | 8,588 | 15,867 |
| System Application | | | | | | | | | | | | | | |
| Ongrid | 165 | 205 | 705 | 745 | 1,644 | 1,763 | 1,387 | 1,848 | 1,240 | 2,298 | 3,685 | 5,430 | 5,367 | 8,325 |
| Offgrid | 998 | 3,040 | 1,523 | 4,173 | 2,143 | 4,951 | 2,060 | 4,809 | 2,040 | 5,429 | 3,051 | 6,671 | 3,221 | 7,542 |
| System Setup | | | | | | | | | | | | | | |
| Building Mounted | 2 | 2 | 380 | 384 | 1054 | 1091 | 663 | 853 | 333 | 1,194 | 1,171 | 2,312 | 1,239 | 2,689 |
| Free Standing | 1,161 | 3,243 | 1,852 | 4,534 | 2,733 | 5,623 | 2,790 | 5,804 | 2,947 | 6,533 | 5,565 | 9,789 | 7,349 | 13,178 |
| System Design | | | | | | | | | | | | | | |
| HAWT | 1,163 | 3,245 | 2,224 | 4,910 | 3,747 | 6,674 | 3,355 | 6,557 | 3,142 | 7,579 | 6,292 | 11,627 | 7,948 | 14,992 |
| VAWT | 0 | 0 | 8 | 8 | 40 | 40 | 98 | 100 | 138 | 148 | 444 | 474 | 640 | 875 |
| Sales (£ thousand) | | | | | | | | | | | | | | |
| 0-1.5kW | 573 | 1,678 | 2,425 | 3,923 | 3,713 | 5,595 | 3,033 | 5,359 | 2,648 | 6,590 | 5,480 | 11,946 | 6,201 | 13,361 |
| 1.5-10kW | 1,301 | 1,612 | 3,093 | 3,745 | 7,663 | 8,133 | 8,001 | 9,862 | 7,969 | 10,692 | 20,220 | 25,363 | 30,506 | 43,014 |
| 10-20kW | 251 | 317 | 261 | 321 | 399 | 759 | 1,515 | 2,545 | 3,455 | 4,375 | 11,078 | 16,559 | 19,031 | 29,893 |
| 20-50kW | 235 | 235 | 292 | 292 | 1,920 | 1,920 | 1,200 | 1,200 | 2,156 | 2,156 | 4,265 | 4,265 | 4,800 | 4,800 |
| 50-100kW | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 895 | 895 | 7,050 | 7,050 | 17,450 | 17,450 |
| Total | 2,360 | 3,842 | 6,071 | 8,281 | 13,695 | 16,407 | 13,749 | 18,966 | 17,123 | 24,708 | 48,093 | 65,183 | 77,988 | 10,8518 |

Total = UK deployment + export from UK manufacturing
 2005-2009 data is based on historic manufacturing records
 2010 and 2011 data is based on manufacturing forecasts
 HAWT = Horizontal axis wind turbine
 VAWT = Vertical axis wind turbine

Contributors

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Kestrel Wind Turbines
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Llumarlite Energy Systems Ltd
Mariah power
Marlec Engineering Co Ltd
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Northern Power Systems Ltd
OCIP Energy
Perpetual Energy
Proven Energy Limited
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