

UNITED KINGDOM

PV TECHNOLOGY STATUS AND PROSPECTS
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GENERAL FRAMEWORK

The Energy White Paper, published in May 2007, sets out the Government's energy strategy to tackle climate change and ensure a secure, clean and affordable energy supply. One of the key elements to the strategy is to support the development of low carbon technologies.

The 2007 White Paper confirmed and strengthened the government's commitment to The Renewables Obligation (RO), the UK's key mechanism for encouraging new renewable generating capacity. The RO was introduced in 2002 and requires licensed electricity suppliers to source a specific and annually increasing percentage of their sales from eligible renewable sources. For 2007/08 the level of the RO is 7.9 % rising to 15.4 % in 2015/16. Suppliers can meet their obligation by either presenting Renewable Obligation Certificates (ROCs); paying a buyout price (34.30 GBP per MWh in 2007/08 rising each year with inflation); or a combination of the two. Renewable Obligation Certificates (ROCs) are issued to generators for every 1 MWh of eligible renewable electricity that they generate. These ROCs can then be sold to suppliers. At the end of an obligation period the money in the buyout fund is recycled to those suppliers who presented ROCs on a pro rata basis.

Minor changes to the RO introduced in April 2007 included measures to make it easier for small generators such as photovoltaic systems to access the benefits of the RO.

More significant changes to the RO are planned for 2009 and consultation on the proposed changes was conducted during 2007. The changes include providing differentiated levels of support to different technologies in order to encourage a larger contribution from emerging renewable technologies. Microgenerators (i.e. generators under 50 kW) including PV will receive two ROCs per MWh generated from April 2009.

A consultation on how the UK is to meet its contribution towards the European Union's 20% renewables by 2020 target was announced in November 2007. A full renewable energy strategy is to be published in 2009.

NATIONAL PROGRAMME

The UK's National Programme for photovoltaics consists of the following elements:

- Research and development, funded by the Department for Innovation, Universities and Skills (DIUS) sponsored Technology Strategy Board and the Engineering and Physical Sciences Research Council (EPSRC);
- Implementation of the Government's Microgeneration Strategy (BERR) which includes a grants programme (The Low Carbon Buildings Programme);
- Participation in international programmes (EC and IEA).
The overall goal is to develop the capabilities of industry and to encourage sustainable growth in the market by removing barriers to the deployment of PV. Research and development programmes are focused on cost reduction and novel PV materials.



Fig. 1 - The 23 kW solar roof at the Print House in Dalston, East London is the largest PV roof tile installation in the UK (photo The Bootstrap Company).

The UK PV Domestic Field Trial (PV DFT), which began in 2000 was the first widespread monitoring of PV systems in domestic buildings in the UK. Along side the Domestic Field Trial, the UK Large Scale Field Trial for building integrated photovoltaics was implemented to raise awareness and create confidence in the application of PV and increase UK capabilities in the application of the technology. The success of the field trials was continued by the Major Demonstration Programme which provided capital grants for quality PV projects between 2002 and 2006.

In 2006 the Government launched its Microgeneration Strategy. The term microgeneration includes solar photovoltaics, micro wind turbines, micro hydro, solar thermal, ground/water/air source heat pumps, biomass, renewable CHP, micro-CHP (combined heat and power) and fuel cells (below 50 kW). The objective of the Micro-generation Strategy is to create conditions under which microgeneration becomes a realistic alternative or supplementary energy generation source for the householder, communities and small businesses.

The strategy includes a range of actions including a new accreditation scheme, The Microgeneration Certification Scheme which has just been launched for both products and installers. Over 400 installers have already signed up. MCS assesses products and installers against robust standards for each of the microgeneration technologies (see www.microgenerationcertification.eu). The aim is to help create a rapidly growing and sustainable microgeneration industry, based on quality and reliability.



Fig. 2 – 13,7 kW PV array at Lewisham Hospital, London (photo Dulas).



Fig. 3 - This 9,9kW array was installed during 2007 as part of the Isle of Eigg Electrification project (photo Wind and Sun).

The Low Carbon Buildings Programme provides grants for certified microgeneration installations and forms part of the implementation of the strategy.

RESEARCH AND DEVELOPMENT

Research in the UK is largely funded by the Engineering and Physical Sciences Research Council (EPSRC). In addition to companies' internal research activities, some pre-competitive industrial Research and Development projects are supported by the Government funded Technology Strategy Board. Within a new call launched in Autumn 2007, the Board sought proposals for research into whole systems approaches to integrating microgeneration in buildings and also for PV technology Research and Development that significantly reduces costs and improves efficiencies.

The EPSRC Sustainable Power Generation and Supply (Supergen) Programme supported two multi-disciplinary consortia focused on advanced PV materials during 2007:

- The 'Photovoltaic Materials for the 21st Century' consortium was launched during 2004 and aims to develop low-cost thin-film solar cell devices fabricated from inorganic semiconductors. This thin film process has the potential for considerable cost reductions. The project has been approved for funding for a further four years from 2008.
- The Supergen Excitonic Solar Cells consortium, led by the University of Bath, is researching dye and nanoparticle-sensitized and organic cells which may offer the possibility of low toxicity, flexible and easy to manufacture PV materials. Consortium members are concentrating on understanding the factors which limit efficiencies as well as on combining their expertise to devise entirely new types of solar cells.

IMPLEMENTATION

The Low Carbon Buildings Programme forms part of the above mentioned Microgeneration Strategy and provides grants for micro-generation technologies including PV for householders, community organisations, schools, the public sector and businesses. The three year, UK wide scheme aims to demonstrate how energy efficiency and small scale renewables will work hand in hand to create low carbon or zero carbon buildings. Minimum energy efficiency standards must be met before applying for a grant. Up to 50 %

funding is available for new PV projects, subject to maximum levels per kW. The programme has been extremely popular with householders; an additional 6 MGBP for the householder stream was announced in March 2007 (see www.lcbp.org.uk).

Figures for the PV capacity installed during 2007 are not yet available but early indications point to similar growth to that experienced in 2006 with around 3,5 MW being installed during the year. This brings the total cumulative installed capacity to approximately 18 MW. The majority of systems being installed are grid connected building mounted installations.

INDUSTRY STATUS

PV Crystalox Solar manufactures silicon ingots in Oxfordshire, United Kingdom. The company listed on the London Stock Exchange in June 2007. Sharp, with its PV module manufacturing facility in Wrexham continues to be the single largest employer in the UK PV industry and in February 2007 announced plans to double its production capacity from 110 MW to 220 MW. Small quantities of BIPV are manufactured by Romag, the specialist glass manufacturer in Consett, County Durham.

FUTURE OUTLOOK

The ongoing implementation of the Microgeneration Strategy, including the low carbon buildings programme, will support continued growth in the UK's PV industry.

Beyond 2009 the main source of funding for domestic scale renewables will come from The Carbon Emissions Reduction Target (CERT), an obligation for energy suppliers to achieve reductions in carbon emissions in the household sector. Under CERT, which will build on an existing similar scheme called the Energy Efficiency Commitment, energy suppliers will promote energy efficiency, microgeneration and behavioural measures that will deliver financial benefits to consumers and contribute to the eradication of fuel poverty.

2007 saw the announcement of the Government's intention for all new homes to be zero carbon by 2016. This is to be implemented through changes in the building regulations. Since PV is ideally suited for building integrated applications it is likely that this will increase demand for PV and support ongoing growth.