

National Assembly for Wales

Micro electricity technologies and the uptake of Feed-in Tariffs in Wales

July 2012

Feed-in Tariffs were introduced by the UK Government in April 2010 to incentivise the uptake of small-scale renewables and low-carbon electricity generation in the UK. Feed-in Tariffs pay registered users for both generating electricity and exporting electricity to the National Grid.

This paper examines the uptake to date of Feed-in Tariffs in Wales for solar photovoltaic, wind, hydro and micro combined heat and power. The uptake of domestic solar photovoltaic installations registered for Feed-in Tariffs in Wales is compared with England and Scotland.

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Micro electricity technologies and the uptake of Feed-in Tariffs in Wales

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Summary

Microgeneration is a term used for the generation of low/zero carbon or renewable energy with a heat capacity up to 45 kilowatts or an electricity capacity up to 50 kilowatts. The Welsh Government's *Energy Policy Statement 2010*¹ identified local micro-generators as having the potential to contribute one gigawatt capacity to Welsh energy supply by 2020.

Feed-in Tariffs (FiTs) were introduced by the UK Government to incentivise the uptake of small-scale renewables and low-carbon electricity by paying users for both generating electricity and exporting electricity to the National Grid. The FiTs scheme commenced in April 2010 and supports domestic, commercial, industrial and community installations for solar photovoltaic (solar PV), wind, hydro, anaerobic digestion and micro combined heat and power (microCHP) installations.

The total capacity of FiT registered units installed in Wales from 1 April 2010 to 31 March 2012 was 56.70 megawatts (MW). The majority of FiTs installations to date are domestic with approximately 98 per cent, 100 per cent, 84 per cent, and 87 per cent of solar PV, microCHP, hydro and wind installations, respectively.

There are over 18,000 registered solar PV installations in Wales, which account for approximately 97 per cent of the total capacity of FiT registered installations. The uptake of solar PV in Wales is characterised by a gradual increase in uptake initially, followed by a surge in uptake towards the end of 2011. There was an approximately 2.5-fold increase in installed solar PV capacity registered for FiTs from 20.9 MW at the end of November 2011 to 55.0 MW by 31 March 2012. This surge is almost certainly the result of the UK Government's review of FiTs towards the end of 2011 which resulted in a reduction in the tariff for solar PV from April 2012. Further reductions in tariffs for solar PV and most other technologies are being consulted on at the moment.

Hydro, wind, and microCHP so far have much lower total capacities than solar PV with only 0.7 MW, 0.9 MW and 0.014 MW, respectively.

An estimated 1.4 per cent of all dwellings in Wales currently have solar PV installations registered for FiTs with at least 2.0 per cent of dwellings in Wrexham, Monmouthshire, Torfaen, Powys, Ceredigion and Pembrokeshire having solar PV installations. The take-up to date is lower in England and Scotland with an estimated 0.9 per cent of dwellings in England and 0.6 per cent of dwellings in Scotland having solar PV installations registered for FiTs.

¹ Welsh Government, [Energy policy statement](#), March 2010 [accessed on 07 March 2012]

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1. Microgeneration

Microgeneration is a term used for the **generation of low/zero carbon or renewable energy at a 'micro' scale**². It includes small-scale generation of heat and power by individuals, communities and small businesses. The *Energy Act 2004*³ defines microgeneration as having a capacity of up to 45 kilowatts (kW) for micro-heat and up to 50 kW for micro-electricity.

Microgeneration technologies are grouped into two categories⁴:

- Micro-electricity technologies

This includes solar photovoltaic (PV) panels, micro-wind turbines, micro-hydro, and micro-combined heat and power (microCHP), and;

- Micro-heat technologies

This includes heat pumps, biomass and solar thermal.

This research paper focuses on **micro-electricity technologies**. The Welsh Government's *Energy Policy Statement 2010*⁵ identified local generators (wind/hydro/solar PV) as having the potential to contribute **one gigawatt (GW) total capacity to Welsh energy supply by 2020**. The Policy Statement proposes⁶:

- A step-change in the energy efficiency performance of all housing stock in Wales, and;
- Small scale renewables are used to produce a significant amount of energy either locally or domestically

The Welsh Government's *Microgeneration Action Plan 2007*⁷ originally set the following targets:

To install 20,000 microgeneration heating units by 2012, with the order of 100,000 by 2020;

To install 10,000 micro-electricity units by 2012, rising to numbers in the order of 200,000 by 2020, and;

To have in place 50 combined heat and power (CHP) and/or district heating systems by 2020.

The targets have been superseded by the introduction of the *Arbed* Strategic Energy Performance Investment Programme which was set up in 2009⁸. The Welsh Government expects *Arbed* to support commitments to minimise climate change, contribute to eradicating fuel poverty and boost economic development and

² Department of Energy and Climate Change, [Microgeneration](#). [accessed on 07 March 2012]

³ Energy Act 2004, Part 2, Chapter 1, Section 82. [Microgeneration](#). [accessed on 07 March 2012]

⁴ Welsh Government, [Microgeneration](#). [accessed on 07 March 2012]

⁵ Welsh Government, [Energy policy statement](#), March 2010 [accessed on 07 March 2012]

⁶ *ibid*

⁷ Welsh Government, [Microgeneration action plan for Wales 2007](#). [accessed on 07 March 2012]

⁸ Welsh Government, [Arbed – strategic energy performance investment programme](#). [accessed on 07 March 2012]

regeneration in Wales⁹. Phase one of the *Arbed* programme cost £61 million and installed energy saving and energy generation technology in over 6,000 homes in Wales, including solid wall insulation to nearly 3,000 social and private homes, installation of 1,800 solar PV panels, solar heated hot water to 1,080 homes, and heat pumps to over 100 homes. Phase two of *Arbed* aims to improve the energy efficiency of at least 4,800 homes in Wales and reduce carbon dioxide gas emissions by a minimum of 11.6 kilotonnes by 2015.

The Welsh Government believes that **Feed-in Tariffs (FiTs) will help to provide future investment into the microgeneration sector**¹⁰.

⁹ Welsh Government, [Arbed – strategic energy performance investment programme](#). [accessed on 07 March 2012]

¹⁰ *ibid*

2. Micro Electricity Technologies

2.1. *Solar Photovoltaic (Solar PV)*

PV cells/panels harness the sun's energy to create electricity. Solar PV panels are installed at an angle on a roof or a wall, or as a free-standing structure. Solar cells are made up of two layers of conducting material e.g. silicone. As photons (solar energy) reach the cell it creates an electric field across the two layers, which generates electricity. Under stronger sunlight, more electricity is produced. However, electricity is still produced under overcast conditions¹¹.

2.2. *Hydro*

Hydroelectric power is the energy produced from flowing water. Turbines extract kinetic energy from flowing water and convert it to mechanical energy in the form of turbines rotating at a high speed. The turbines drive a generator which converts the mechanical energy to electrical energy. The amount of energy produced is dependent on the speed of water flow and the vertical distance the water falls. Turbines can be installed in rivers or man-made installations such as reservoirs¹².

2.3. *Wind*

Wind turbines harness the power of wind to create electricity. Wind forces turbine blades to turn, which turns a shaft, creating a magnetic field within the generator which then produces electricity. The amount of energy created is dependent on the wind-force¹³.

2.4. *Micro Combined Heat and Power (microCHP)*

MicroCHP produces both heat and electricity from the same fuel source with a typical ratio of 6:1. Domestic microCHP installations are powered by liquefied petroleum gas or mains gas, which are both fossil fuels. The technology is considered to be low carbon as it is more efficient than typical burning of fossil fuels for heat and electricity exported. MicroCHP systems are similar to boilers; however, electricity is also supplied as the water is being heated. There are three main microCHP technologies, which differ in the way that electricity is generated:

¹¹ Welsh Government, [Solar photovoltaics](#). [accessed on 08 March 2012]

¹² Welsh Government, [Hydropower](#). [accessed on 08 March 2012]

¹³ The Microgeneration Certificate Scheme, [Microgeneration technologies. Wind energy](#). [accessed on 08 March 2012]

sterling engine microCHP, internal combustion engine CHP and fuel cell CHP technology¹⁴.

2.5. Anaerobic Digestion

Anaerobic digestion (AD) refers to the natural biological process where microorganisms found in waste break down organic matter in the absence of oxygen (anaerobically). The organic matter is broken down into a biogas made up of both carbon dioxide and methane. The biogas produced can be used directly in engines for CHP, cleaned and used as natural gas or fuel or burned to produce heat. Nitrogen-rich digestate is also produced, which can be used as a crop fertiliser or soil conditioner¹⁵.

2.6. Planning Regulations for Domestic Generation of Renewable Energy

The Welsh Government has produced several documents relating to the generation of renewable energy and low/zero carbon energy using domestic installations. *A Planning Guide for Householders, Communities and Businesses*¹⁶ and *The Current Planning Regulations*¹⁷ provide information on planning guidance. *A Planning Guide for Householders, Communities and Businesses*¹⁸ states that priority should be given to improving energy efficiency in households rather than the domestic electricity generation e.g. insulation and high energy efficiency boilers.

Since September 2009, **permitted development rights**¹⁹ were extended to allow a **range of domestic microgeneration technologies to be installed without requiring planning permission.**^{20,21}

Permitted development rights are established by the *The Town and Country Planning (General Permitted Development) Order 1995*²², which sets out the rules and limits for domestic development without the need for planning permission.

¹⁴ Energy Saving Trust, [Micro-combined heat and power](#). [accessed on 08 March 2012]

¹⁵ [The Wales Centre of Excellence for Anaerobic Digestion](#). [accessed on 06 February 2012]

¹⁶ Welsh Government, [Generating your own energy – a planning guide for householders, communities and businesses](#). [accessed on 07 March 2012]

¹⁷ Welsh Government, [Generating your own energy – the current planning regulations November 2011](#). [accessed on 07 March 2012]

¹⁸ Welsh Government, [Generating your own energy – a planning guide for householders, communities and businesses](#). [accessed on 07 March 2012]

¹⁹ Permitted Development relates to small developments on households without the need for planning permission

²⁰ Welsh Government, [Domestic micro-generation permitted development: a guide for householders](#). [accessed on 08 March 2012]

²¹ Planning Aid Wales, [Permitted development](#). [accessed on 08 March 2012]

²² [The Town and Country Planning \(General Permitted Development\) Order 1995. Article 3](#), SI 1995/418. [accessed on 08 March 2012]

The Welsh Government has published a leaflet explaining these permitted development rights. **Solar PV and solar thermal panels on roofs and walls, free-standing solar PV and solar thermal panels, and heat pumps and flues for biomass heating and CHP are eligible for Permitted Development**²³. However, subject to an Article 4 Direction, permitted development rights can be removed if the property is a Listed Building or is in a Conservation Area or World Heritage Site, or there is a condition on the original planning permission which removes these rights²⁴. There are no limits relating to the amount of electrical output produced by households. However there are limits on the size of solar PV panels for stand-alone systems²⁵.

²³ Welsh Government, [Domestic micro-generation permitted development: a guide for householders](#). [accessed on 08 March 2012]

²⁴ [The Town and Country Planning \(General Permitted Development\) Order 1995. Article 4](#), SI 1995/418. [accessed on 08 March 2012]

²⁵ Welsh Government, [Domestic micro-generation permitted development: a guide for householders](#). [accessed on 08 March 2012]

3. Feed-in Tariffs (FiTs)

The FiTs scheme is an environmental programme introduced by the UK Government to **incentivise the uptake of small-scale renewables and low-carbon electricity generation technology**. FiTs are just one of several government incentives which promote the generation of renewable energy. Other similar schemes include the **Renewable Heat Incentive** which incentivises the uptake of technology which generates renewable heat²⁶, **Ynni'r Fro** which is a Community Scale Renewable Energy Generation Programme²⁷ and the **Carbon Trust Business Loan**²⁸ which incentivises the generation of renewable energy.

The **FiTs scheme commenced on 1 April 2010** and supports domestic, commercial, industrial and community installations²⁹. The scheme states that **owners of eligible systems will be paid a set amount (Generation Tariff)** for each kilowatt hour of electricity generated, whether the electricity is used or exported to the grid. **An additional, lower price is paid for every unit exported (Export Tariff)**³⁰.

The FiTs scheme is administered by Licensed Electricity Suppliers and the Office of Gas and Electricity Markets (Ofgem) and public information is provided by the Energy Saving Trust³¹ and Carbon Trust.³²

The scheme is applicable to **solar PV, wind, hydro, and anaerobic digestion** up to a maximum capacity of 5 MW³³. **MicroCHP installations are also eligible** up to a capacity of 2 kW³⁴. In order to be eligible for FiTs, technologies must be certified by the **Microgeneration Certification Scheme (MCS)**³⁵ and be installed by an MCS accredited installer.^{36,37}

There are 2 routes of accreditation for FiTs³⁸:

- Solar PV, wind, hydro and microCHP installations less than 50 kW apply for FiTs through MCS.
- Installations with a capacity between 50 kW and 5 MW in capacity and any anaerobic digestion installations apply directly to Ofgem.

²⁶ Department of Energy and Climate Change, [Renewable heat incentive scheme](#). [accessed on 13 March 2012]

²⁷ Energy Saving Trust, [Ynni'r fro](#). [accessed on 08 March 2012]

²⁸ Carbon Trust, [Business loans for customers in Wales](#). [accessed on 08 March 2012]

²⁹ Ofgem, [Feed-in Tariff scheme factsheet](#). [accessed on 07 March 2012]

³⁰ *ibid*

³¹ Ofgem, [Feed-in Tariff scheme factsheet](#). [accessed on 07 March 2012]

³² Carbon Trust, [Feed-in Tariffs](#). [accessed on 07 March 2012]

³³ Ofgem, [Feed-in Tariff scheme factsheet](#). [accessed on 07 March 2012]

³⁴ *ibid*

³⁵ The MCS is an independent, industry-led certification scheme for microgeneration technologies accredited by the United Kingdom Accreditation Service. MCS certification bodies assess microgeneration technologies and installers against consistent standards to provide quality, durability and energy generation assurances and guarantees to consumers.

³⁶ Welsh Government, [Generating your own energy – a planning guide for householders, communities and businesses](#). [accessed on 07 March 2012]

³⁷ [The Microgeneration Certification Scheme](#). [accessed on 08 March 2012]

³⁸ Ofgem, [Feed-in tariff scheme factsheet](#). [accessed on 08 March 2012]

4. Uptake of Feed-in Tariffs in Wales

Table 1 shows the total capacity of FiT registered units installed in Wales from 1 April 2010 until 31 March 2012 was **56.7 MegaWatts (MW)**. Almost all of the total installed **capacity was solar PV installations**. To date there have been no AD installations in Wales registered for FiTs.

Table 1: The number and capacity of renewable energy technology installations registered for Feed-in Tariffs in Wales from 1 April 2010 to 31 March 2012

<u>Technology</u>	<u>Number of installations</u>	<u>Capacity (MW)</u>	<u>Percentage of total capacity</u>	<u>Average capacity per installation (kW)</u>
Solar photovoltaic	18,294	55.04	97.11	3.0
Wind	136	0.90	1.59	6.6
Hydro	45	0.72	1.27	16.0
MicroCHP	14	0.01	0.02	1.0
Total	18,489	56.68	100.00	3.1

Source: Ofgem³⁹

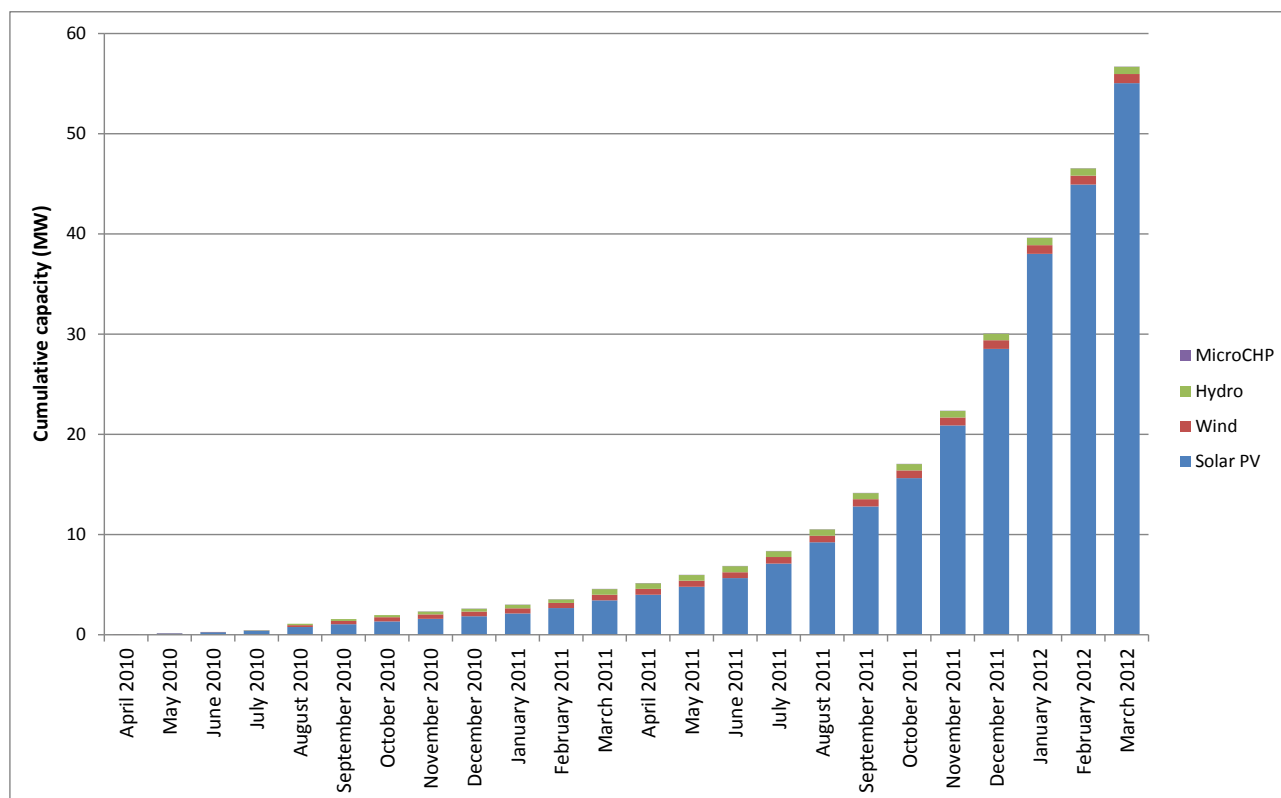
Notes: Components may not sum to total due to rounding

Between April 2010 and April 2011, a total capacity of 5.2 MW was installed in Wales as shown in Figure 1. A further 5.4 MW was installed between May 2011 and August 2011. **An average capacity of 6.6 MW was installed every month between September 2011 and 31 March 2012**, representing an increasingly rapid uptake of FiTs as the scheme progressed. **This surge in take-up is almost certainly due to the UK Government tariff reviews which have led to lower tariff rates for solar PV from April 2012 (see Section 7)⁴⁰.**

³⁹ Ofgem, [Feed-in tariff installation statistical report](#). [accessed on 24 May 2012]

⁴⁰ Department of Energy and Climate Change, [Comprehensive review phase 1: consultation on feed-in tariffs for solar PV](#). [accessed on 03 April 2012]

Figure 1: Cumulative uptake of Feed-in Tariffs in Wales by type of technology from 1 April 2010 until 31 March 2012



Source: Ofgem⁴¹

Note: There is a lag between Feed-in Tariff application and confirmation. Feed-in Tariff applications are only confirmed at the end of the application process and therefore values for the most recent months are likely to be underestimates.

4.1. Uptake of Solar PV Feed-in Tariffs in Wales

Table 2 shows the number of solar PV installations registered for FiTs in Wales for domestic, community, industrial and commercial installations. Up until 31 March 2012, there were **18,489 solar PV installations registered for FiTs in Wales with a total capacity of 56.7 MW**. Approximately **98 per cent of solar PV installations in Wales are domestic** and account for around 93 per cent of total installed capacity. Commercial installations represent less than 2 per cent of installations but over 6 per cent of total capacity.

⁴¹ Ofgem, [Feed-in tariff installation statistical report](#). [accessed on 24 May 2012]

Table 2: Solar photovoltaic installations registered for Feed-in Tariffs by type from 1 April 2010 to 31 March 2012

Type	Number of installations	Capacity (MW)	Percentage of total installations	Percentage of total capacity	Average capacity per installation (kW)
Domestic	18,099	52.7	97.9	92.9	2.9
Commercial	339	3.4	1.8	6.0	10.1
Community	38	0.3	0.2	0.5	8.1
Industrial	13	0.3	0.1	0.5	20.9
Total	18,489	56.7	100.0	100.0	3.0

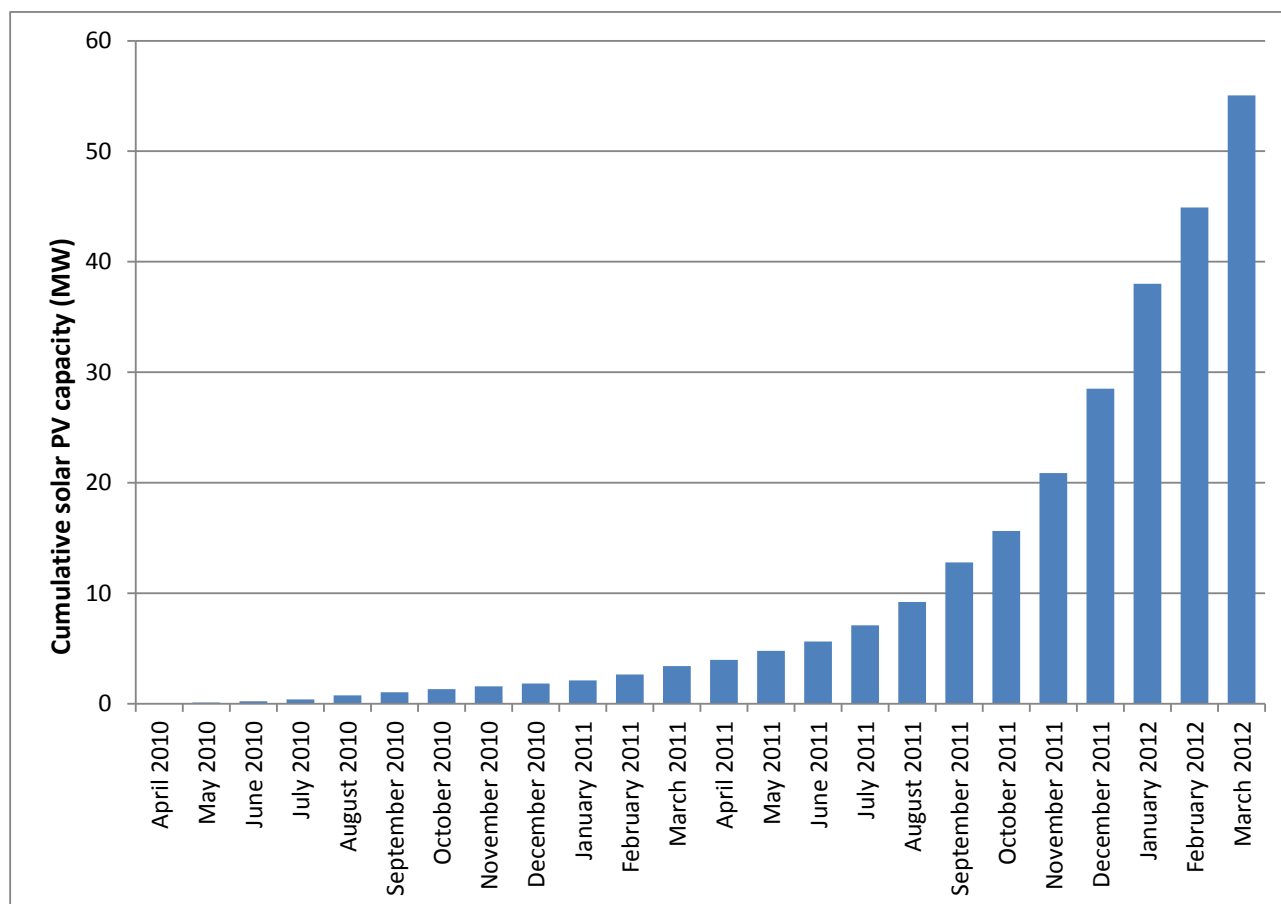
Source: Ofgem⁴²

Notes: Components may not sum to total due to rounding

Solar PV uptake was relatively slow at first, with less than one MW capacity added each month from April 2010 until June 2011 as shown in Figure. 2. **From June 2011 uptake increased steadily** and a large surge of uptake occurred towards the end of 2011, with approximately a 2.5-fold increase in cumulative capacity from 20.9 MW at the end of November 2011 to 55.0 MW by 31 March 2012.

⁴² Ofgem, [Feed-in tariff installation statistical report](#). [accessed on 25 May 2012]

Figure 2. Cumulative solar photovoltaic capacity registered for Feed-in Tariffs in Wales from 1 April 2010 to 31 March 2012



Source: Ofgem⁴³

Note: There is a lag between Feed-in Tariff application and confirmation. Feed-in Tariff applications are only confirmed at the end of the application process and therefore values for the most recent months are likely to be underestimates.

Table 3 shows the number and capacity of domestic solar PV installations by local authorities in Wales that are registered for FiTs. **Wrexham, Powys, Carmarthenshire and Pembrokeshire** have both the **greatest number and largest installed capacities** at over 1,000 installations each and between 4.06 and 5.57 MW total capacity.

An estimated 1.4 per cent of all dwellings in Wales have solar PV installations registered for FiTs. Wrexham, Monmouthshire, Torfaen, Powys, Ceredigion, and Pembrokeshire and each have solar PV installations registered for FiTs in more than 2 per cent of dwellings. Wrexham currently has the greatest percentage of dwellings with solar PV installations, with 3.3 per cent of all dwellings.

⁴³ Ofgem, [Feed-in tariff installation statistical report](#). [accessed on 25 May 2012]

Table 3: Domestic solar photovoltaic installations registered for Feed-in Tariffs by local authority in Wales from 1 April 2010 to 31 March 2012.

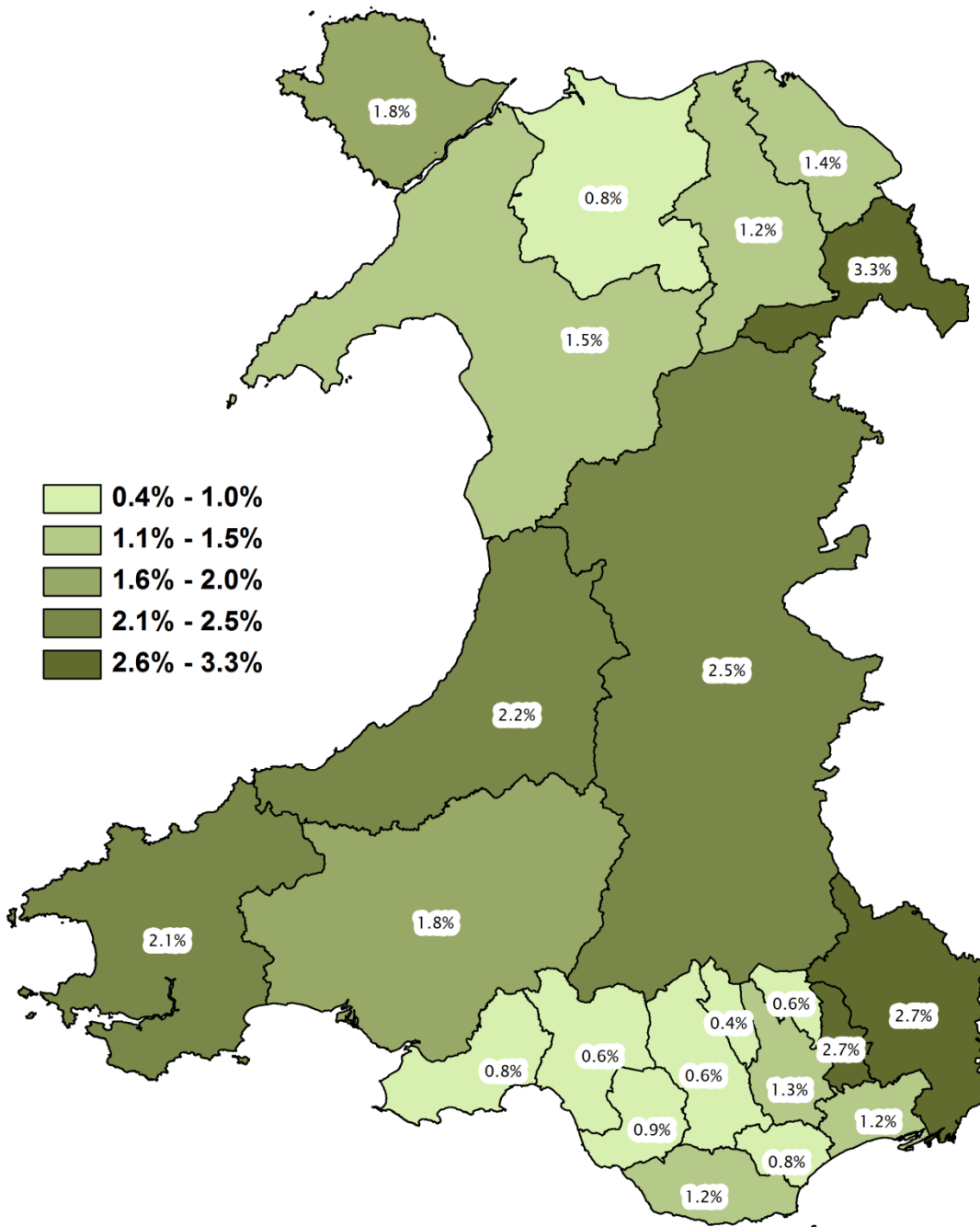
<u>Local Authority</u>	<u>Number of installations</u>	<u>Installed Capacity (MW)</u>	<u>Dwelling stock estimate 2010-11</u>	<u>Percentage of dwellings with installations</u>
Isle of Anglesey	571	1.6	32,373	1.8
Gwynedd	869	2.8	58,307	1.5
Conwy	424	1.4	53,340	0.8
Denbighshire	532	1.8	43,564	1.2
Flintshire	881	2.7	64,093	1.4
Wrexham	1,956	4.1	58,666	3.3
Powys	1,516	5.6	60,561	2.5
Ceredigion	764	2.9	34,789	2.2
Pembrokeshire	1,185	4.5	57,091	2.1
Carmarthenshire	1,437	5.5	82,026	1.8
Swansea	846	2.9	106,024	0.8
Neath Port Talbot	406	1.3	63,664	0.6
Bridgend	536	1.6	59,218	0.9
Vale of Glamorgan	655	2.1	54,092	1.2
Cardiff	1,106	3.1	142,382	0.8
Rhondda Cynon Taff	638	1.9	103,445	0.6
Merthyr Tydfil	101	0.3	25,741	0.4
Caerphilly	969	2.2	75,826	1.3
Blaenau Gwent	199	0.4	32,219	0.6
Torfaen	1,059	2.3	39,701	2.7
Monmouthshire	1,064	3.4	39,444	2.7
Newport	775	2.4	63,070	1.2
Wales	18,489	56.7	1,349,636	1.4

Source: *Ofgem*⁴⁴ and *StatsWales*⁴⁵

⁴⁴ Ofgem, [Feed-in tariff statistical report](#). [accessed on 25 May 2012]

⁴⁵ Statistics for Wales, [Dwelling stock estimates for Wales, 2010-11](#). [accessed on 25 May 2012]

Figure 3. Percentage of dwellings with solar photovoltaic installations registered for Feed-in Tariffs by local authority in Wales from 1 April 2010 to 31 March 2012



Source: Ofgem, Feed-in Tariff Installation Statistical Report

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Ordnance Survey 100047295

Source: Ofgem⁴⁶ and StatsWales⁴⁷

⁴⁶ Ofgem, [Feed-in tariff statistical report](#). [accessed on 25 May 2012]

⁴⁷ Statistics for Wales, [Dwelling stock estimates for Wales, 2010-11](#). [accessed on 25 May 2012]

5. Uptake of Non-solar PV Feed-in Tariffs in Wales

5.1. Hydro Feed-in Tariffs

There were **45 hydro installations registered for FiTs in Wales with a total capacity of 0.7 MW**. Similar to solar PV, the majority of hydro installations are domestic (84 per cent) as shown in table 4. However, the disparity between average capacities for this type of installation is greater e.g. commercial and domestic installations have an average capacity of approximately 62 kW and 9 kW, respectively. Therefore, although **commercial hydro installations make up only 11 per cent of total installations, they account for over 43 per cent of total installed capacity**). It should be noted that this analysis is based on a small number of installations between April 2010 and March 2012.

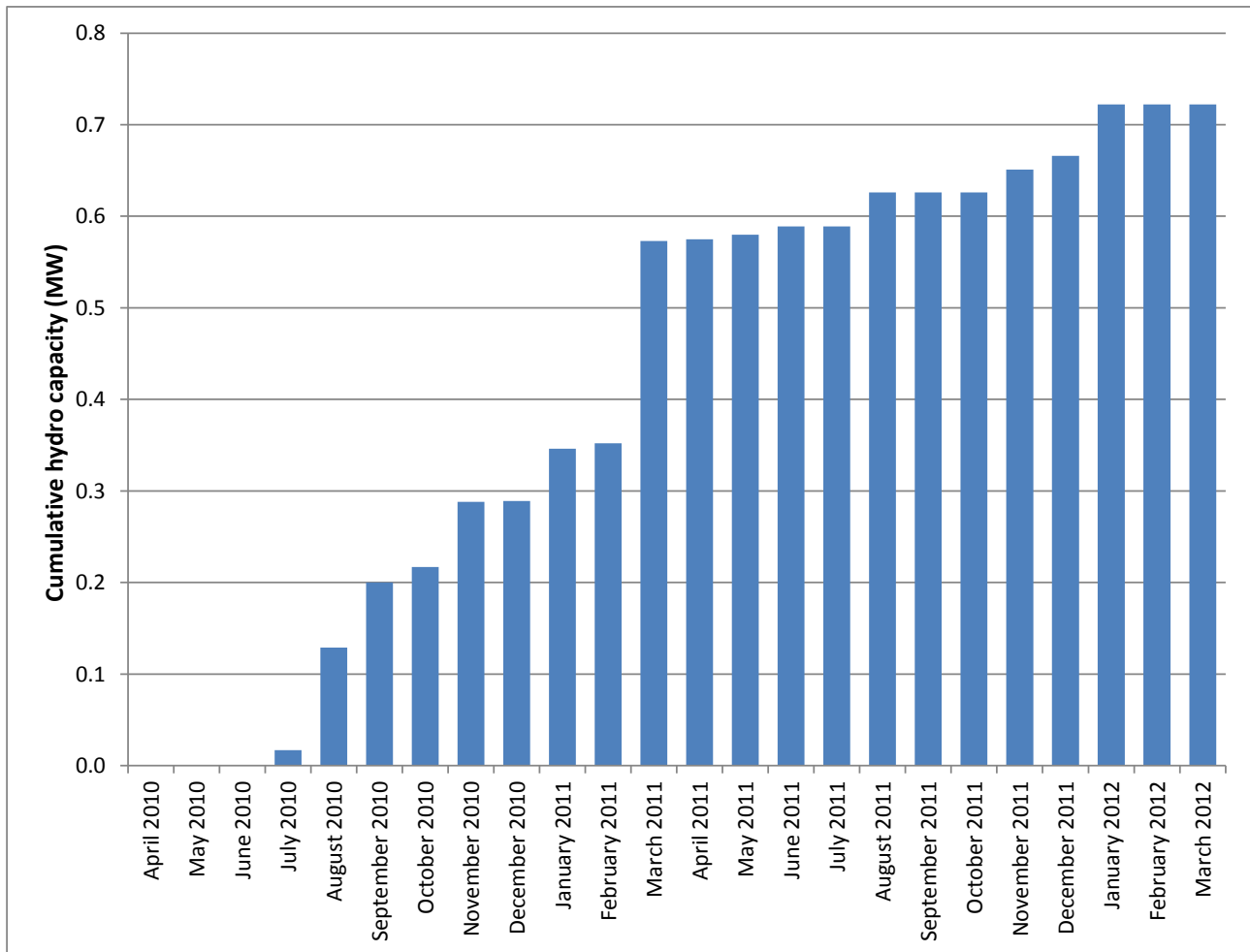
Table 4: Hydro installations registered for Feed-in Tariffs by type from 1 April 2010 to 31 March 2012

Type	Number of installations	Capacity (MW)	Percentage of total installations	Percentage of total capacity	Average capacity per installation (kW)
Domestic	38	0.3	84.4	47.5	9.0
Commercial	5	0.3	11.1	43.3	62.4
Industrial	2	0.1	4.4	9.3	33.5
Community	0	0.0	0.0	0.0	0.0
Total	45	0.7	100.0	100.0	16.0

Source: Ofgem⁴⁸

⁴⁸ Ofgem, [Feed-in tariff statistical report](#). [accessed on 25 May 2012]

Figure 4. Cumulative hydro capacity registered for Feed-in Tariffs in Wales from 1 April 2010 to 31 March 2012



Note: There is a lag between Feed-in Tariff application and confirmation. Feed-in Tariff applications are only confirmed at the end of the application process and therefore values for the most recent months are likely to be underestimates.

Source: Ofgem⁴⁹

⁴⁹ Ofgem, [Feed-in tariff statistical report](#). [accessed on 25 May 2012]

5.2. Wind Feed-in Tariffs

There are 136 wind installations in Wales registered for FiTs with a total capacity of 0.9 MW. As with solar PV and hydro, the majority of wind installations are domestic, accounting for approximately 87 per cent of total installations shown in table 5.

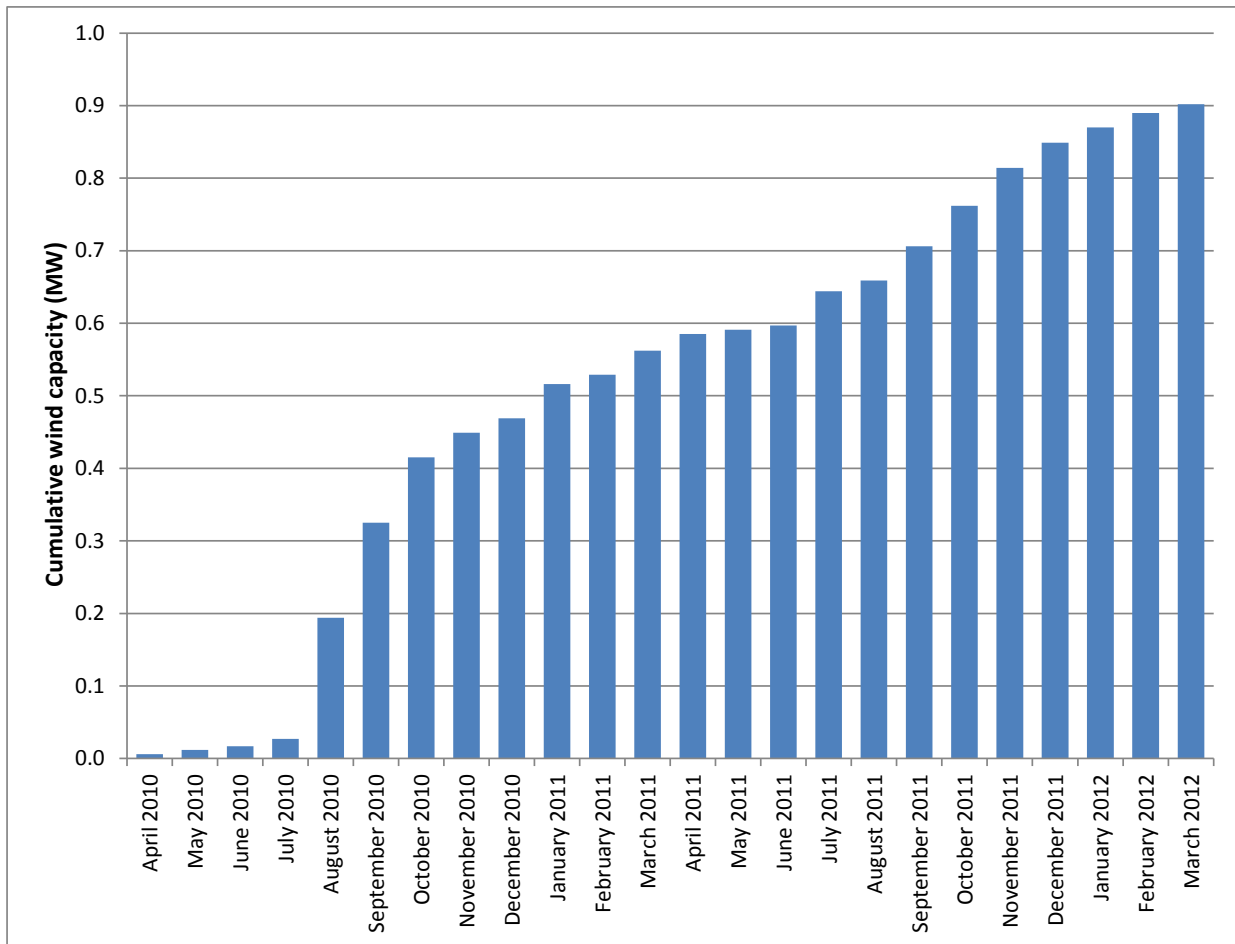
Table 5: Wind installations registered for Feed-in Tariffs by type from 1 April 2010 to 31 March 2012

Type	Number of installations	Capacity (MW)	Percentage of total installations	Percentage of total capacity	Average capacity per installation (kW)
Domestic	118	0.73	86.8	81.6	6.2
Commercial	15	0.14	11.0	15.4	9.3
Industrial	2	0.02	1.5	2.4	11.0
Community	1	0.01	0.7	0.7	6.0
Total	136	0.90	100.0	100.0	6.6

Source: Ofgem⁵⁰

⁵⁰ Ofgem, [Feed-in tariff statistical report](#). [accessed on 25 May 2012]

Figure 5: Cumulative wind capacity registered for Feed-in Tariffs in Wales from 1 April 2010 to 31 March 2012



Note: There is a lag between Feed-in Tariff application and confirmation. Feed-in Tariff applications are only confirmed at the end of the application process and therefore values for the most recent months are likely to be underestimates.

Source: Ofgem⁵¹

⁵¹ Ofgem, [Feed-in tariff statistical report](#). [accessed on 25 May 2012]

5.3. MicroCHP Feed-in Tariffs

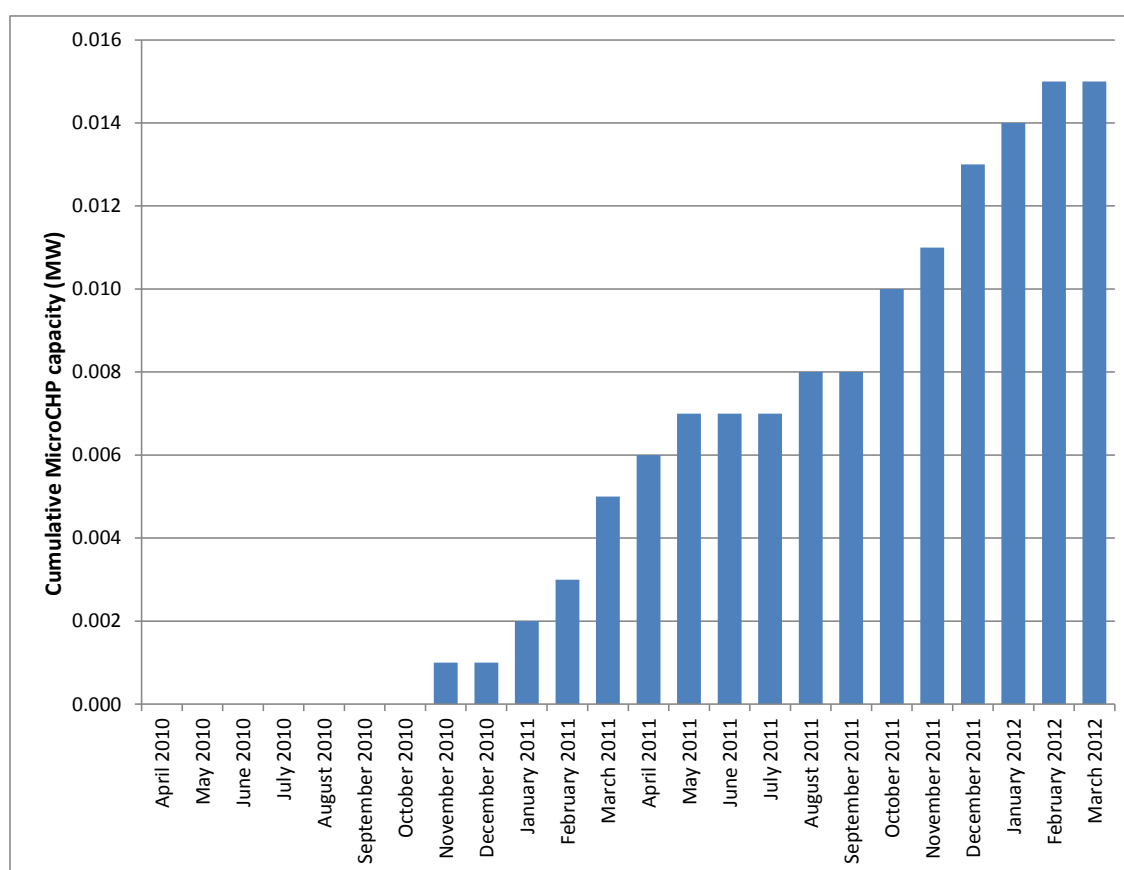
There are only 14 microCHP installations in Wales registered for FiTs with a total capacity of only 0.014 MW. All microCHP installations are domestic.

Table 6: Micro combined heat and power installations registered for Feed-in Tariffs by type from 1 April 2010 to 31 March 2012

Type	Number of installations	Capacity (MW)	Percentage of total installations	Percentage of total capacity	Average capacity per installation (kW)
Domestic	14	0.014	100.0	100.0	1.0
Commercial	0	0.000	0.0	0.0	0.0
Industrial	0	0.000	0.0	0.0	0.0
Community	0	0.000	0.0	0.0	0.0
Total	14	0.014	100.0	100.0	1.0

Source: Ofgem⁵²

Figure 6. Cumulative micro combined heat and power capacity registered for Feed-in Tariffs in Wales from 1 April 2010 to 31 March 2012



Note: There is a lag between Feed-in Tariff application and confirmation. Feed-in Tariff applications are only confirmed at the end of the application process and therefore values for the most recent months are likely to be underestimates.

Source: Ofgem⁵³

⁵² Ofgem, [Feed-in tariff statistical report](#). [accessed on 25 May 2012]

⁵³ Ofgem, [Feed-in tariff statistical report](#). [accessed on 25 May 2012]

6. Uptake of Solar PV Feed-in Tariffs in England and Scotland

An estimated 0.9 per cent of all dwellings in England have solar PV installations registered for FiTs at the end of March 2012. The Isle of Wight, Cornwall and Somerset have the greatest percentage of dwellings with solar PV installations at 2.5 per cent, 2.3 per cent and 2.1 per cent, respectively.^{54 55}

An estimated 0.6 per cent of all dwellings in Scotland have solar PV installations registered for FiTs at the end of March 2012. Dumfries & Galloway, Scottish Borders and Perth & Kinross have the greatest percentage of dwellings with solar PV installations at 1.8 per cent, 1.6 per cent and 1.3 per cent, respectively.^{56 57}

⁵⁴ Ofgem, [Feed-in tariff statistical report](#). [accessed on 25 May 2012]

⁵⁵ Department for Communities and Local Government, [Number of dwellings by tenure and district, England 2010](#). [accessed on 09 March 2012]

⁵⁶ Ofgem, [Feed-in tariff statistical report](#). [accessed 25 May 2012]

⁵⁷ National Records of Scotland, [Estimates of households and dwellings in Scotland 2010](#). [accessed on 08 March 2012]

7. Changes to Feed-in Tariffs in the UK

Overall, the uptake of FiTs in the UK increased considerably towards the end of 2011 (Figure. 1). The surge in uptake was principally due to an increase in solar PV installations (Figure. 2). The Department for Energy and Climate Change (DECC) announced that installed solar PV capacity in the UK reached 900 MW by December 2011 compared with the originally anticipated figure of 116 MW⁵⁸. According to DECC the **rates of return for solar PV installations have grown far higher than the anticipated 4.5 per cent for installations up to 4 kW and 5 per cent for installations larger than 4 kW**⁵⁹. It stated that rates of return should not be higher than its statutory purpose and subsequently tariff rates would be lowered accordingly. A *Consultation on Fast-track Review of Feed-in Tariffs for Small Scale Low Carbon Electricity*⁶⁰ proposed lower tariff rates for large scale solar PV installations (50 kW -5 MW) with an eligibility date on or after 1 August 2011, which has since been confirmed⁶¹. The Fast Track Review also increased tariffs for farm-scale AD installations (less than 500 kW)⁶² as uptake was slower than expected⁶³.

In October 2011 the UK Government released the *Comprehensive Review Phase 1 – Consultation on Feed-in Tariffs for Solar PV*⁶⁴. The Consultation proposed the introduction of **new tariffs to solar PV installations from 1 April 2012**, with an eligibility date on or after 3 March 2012 (Table 7), which was confirmed in January 2012⁶⁵. The originally proposed eligibility date for the updated tariffs was 12 December 2011; however following a legal challenge the High Court rejected the early introduction of the new rates before the end of the consultation period. The UK Government's final appeal on this issue to the Supreme Court was rejected on 23 March 2012⁶⁶.

The *Government Response to Consultation on Comprehensive Review Phase 1: Tariffs for Solar PV* also states that there will be an introduction of new 'multi-generation' tariffs⁶⁷. A new energy efficiency requirement was also confirmed where buildings with solar PV installations must meet the Energy

⁵⁸ Department of Energy and Climate Change, [Consultation on comprehensive review phase 2A: solar PV cost control](#). [accessed on 09 March 2012]

⁵⁹ *ibid*

⁶⁰ Department of Energy and Climate Change, [Consultation on fast-track review of feed-in tariffs for small scale low carbon electricity](#). [accessed on 03 April 2012]

⁶¹ Department of Energy and Climate Change, Feed-in tariffs scheme, [Summary of responses to the fast track Consultation and Government response](#). [accessed on 03 April 2012]

⁶² *ibid*

⁶³ *ibid*

⁶⁴ Department of Energy and Climate Change, [Comprehensive review phase 1: consultation on feed-in tariffs for solar PV](#). [accessed on 03 April 2012]

⁶⁵ Department of Energy and Climate Change, [Government response to Consultation on comprehensive review phase 1 – tariffs for solar PV](#). [accessed on 09 March 2012]

⁶⁶ Solar Power Portal, [Supreme court rejects DECC appeal](#). [accessed on 03 April 2012]

⁶⁷ Department of Energy and Climate Change, [Government response to Consultation on comprehensive review phase 1 – tariffs for solar PV](#). [accessed on 09 March 2012]

Performance Certificate level D. The DECC estimate that approximately 51 per cent of UK dwellings currently meet this standard⁶⁸.

Table 7: Changes to solar photovoltaic generation tariffs (pence per kilowatt hour)

Band	Current generation tariff (p/kWh)	New generation tariff from 1 April 2012 (p/kWh)
≤4 kW (new build)	37.8	21.0
≤4 kW (retrofit)	43.3	21.0
>4-10 kW	37.8	16.8
>10-50 kW	32.9	15.2
>50-100 kW	19.0	12.9
>100-150 kW	19.0	12.9
>150-250 kW	15.0	12.9
>250 kW - 5 MW	8.5	8.9*
Stand alone	8.5	8.9*

* Tariffs were not altered through Phase 1, however, the tariffs were adjusted in line with the Retail Price Index from 1 April 2012

Source: DECC⁶⁹

A further two Consultations have subsequently been released: *Consultation on Comprehensive Review Phase 2A: Solar PV Cost Control*⁷⁰ and *Consultation on Comprehensive Review Phase 2B: Tariffs for Non-PV Technologies and Scheme Administration Issues*⁷¹. The Phase 2A consultation proposes new **generation tariffs to be applied to solar PV installations with an eligibility date on or after 1 July 2012**⁷². According to DECC the further reductions in tariff rates are a result of the continued reduction in the costs of manufacturing and installing solar PV panels.

The Phase 2A consultation proposes **three alternative tariff options**, which are dependent on the volume of deployment of solar PV during March and April 2012 are shown in table 8⁷³.

⁶⁸ Department of Energy and Climate Change, [Government response to Consultation on comprehensive review phase 1 – tariffs for solar PV](#). [accessed on 09 March 2012]

⁶⁹ *ibid*

⁷⁰ Department of Energy and Climate Change, [Consultation on comprehensive review phase 2A: solar PV cost control](#). [accessed on 09 March 2012]

⁷¹ Department of Energy and Climate Change, [Consultation on comprehensive review phase 2B: tariffs for non-PV technologies and scheme administration issues](#). [accessed on 09 March 2012]

⁷² Department of Energy and Climate Change, [Consultation on comprehensive review phase 2A: solar PV cost control](#). [accessed on 09 March 2012]

⁷³ Department of Energy and Climate Change, [Consultation on comprehensive review phase 2A: solar PV cost control](#). [accessed on 09 March 2012]

Table 8: Proposed changes to solar photovoltaic Feed-in Tariffs (pence per kilowatt hour)

Band (kW)	April (p/kWh)	Option A* (p/kWh)	Option B* (p/kWh)	Option C* (p/kWh)
≤4kW	21	13.6	15.7	16.5
>4kW-10kW	16.8	10.9	12.6	13.2
>10-50kW	15.2	9.9	11.4	11.9
>50-150kW	12.9	7.7	9.7	10.1
>150-250kW	12.9	5.8	8	10.1
>250-5000kW	8.9	4.7	6.8	7.1
Stand alone	8.9	4.7	6.8	7.1

* Option A would be preferred if the new capacity installed with an eligibility date between 3 March and the end of April 2012 was >200 MW. Option B would be preferred if deployment was between 150 MW and 200 MW, and Option C if deployment was <150 MW

Source: DECC⁷⁴

The Phase 2A consultation also proposes an **automatic baseline reduction of 10 per cent every six months** and that this is brought forward if deployment exceeds pre-determined levels.⁷⁵ It also proposes an annual review, a review of export tariffs, a possible reduction in tariff lifetimes and changes to indexation of tariff rates⁷⁶.

The Consultation on Comprehensive Review Phase 2B proposes a **decrease in stages for FiTs for non-solar PV installations until 2021** (Table 9)⁷⁷. The Consultation suggests that the tariff for MicroCHP is raised to 12.5 pence per kilowatt hour to give a rate of return similar to that of other low carbon technologies⁷⁸. It also proposes that a tariff review and deployment levels are triggered at 12,000 microCHP installations⁷⁹.

⁷⁴ ibid

⁷⁵ ibid

⁷⁶ ibid

⁷⁷ Department of Energy and Climate Change, [Consultation on comprehensive review phase 2B: tariffs for non-PV technologies and scheme administration issues](#). [accessed on 09 March 2012]

⁷⁸ ibid

⁷⁹ ibid

Table 9: Proposed changes to hydro, wind and anaerobic digestion Feed-in Tariffs (pence per kilowatt hour)

Technology	Tariff band	<i>Generation tariff of new installation (p/kWh), 2012 prices</i>				
		Oct-2012 (p/kWh)	Apr-2014 (p/kWh)	Apr-2016 (p/kWh)	2018/19 (p/kWh)	2020/21 (p/kWh)
Hydro	≤15	21	20	18	16.2	14.7
	>15-100	19.7	18.7	16.8	15.2	13.7
	>100-2000	12.1	11.5	10.4	9.4	8.4
	>2000-5000	4.5	2.3	2.3	2.3	2.3
Wind	≤1.5	21	20	18	16.2	14.7
	>1.5-15	21	20	18	16.2	14.7
	>15-100	21	20	18	16.2	14.7
	>100-500	17.5	16.6	15	13.5	12.2
	>500-1500	9.5	9	8.1	8.1	8.1
	>1500-5000	4.5	4.1	4.1	4.1	4.1
Anaerobic digestion	≤250	14.7	14	12.6	11.4	10.3
	>250-500	13.7	13	11.7	10.6	9.6
	>500-5000	9	9	8.1	8.1	8.1

Source: DECC⁸⁰

⁸⁰ Department for Energy and Climate Change, [Consultation on comprehensive review phase 2B: tariffs for non-PV technologies and scheme administration issues](#). [accessed on 09 March 2012]