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Research paper

Renewable Energy in Wales: in figures

August 2013

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National Assembly for Wales
Research paper

Renewable Energy in Wales: in figures

August 2013

Caitlin Pearson and Graham Winter

This paper provides a numerical overview of the contribution of renewable energy sources to electricity generation in Wales. Data from the Renewable Energy Planning Database is presented to show operational, approved and potential renewable energy schemes by size and location.

The Research Service gratefully acknowledges the fellowship provided to Miss Pearson by the Biotechnology and Biology Research Council, which enabled this paper to be completed.

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Summary

Renewable energy is a general term used to describe any source of energy that occurs naturally and is not exhaustible. Developing renewable energy sources for electricity generation is necessary to meet EU and UK Government targets on greenhouse gas emissions and to ensure fuel security. In its 2010 Energy Policy Statement, '*A low carbon revolution*', the Welsh Government set out aspirations totalling 22.5 Gigawatts of installed capacity from different renewable energy technologies in Wales by 2020/25.

Gas is currently the main fuel for electricity generation in Wales, accounting for 39 per cent of the electricity generated in 2011. The contribution of renewable energy to electricity generation in Wales rose steadily throughout the period considered in this paper (2004-2011), reaching a high of 7.9 per cent in 2011. At this time, wind energy accounted for 68 per cent of the installed capacity of renewable energy sources in Wales.

The Renewable Energy Planning Database gathers information from Local Planning Authorities and developers on renewable energy projects that have been through the planning system. As of the end of June 2013, there were 90 operational renewable energy projects in Wales listed in the database, with a total capacity of approximately 760 MW. Additionally, there are 72 approved applications which if all built have a potential additional generating capacity of 2,200 MW. A further 48 applications (1,000 MW total installed capacity) have been 'submitted' to consenting bodies and are awaiting decisions.

Currently, the renewable energy projects with the greatest installed capacity are Rhyl Flats offshore wind farm (90 MW), North Hoyle offshore wind farm (60 MW) and Cefn Croes onshore wind farm (58.5 MW). Several large-scale projects have gained consent, including Gwynt-y-Mor offshore windfarm (576 MW), Port Talbot biomass plant (350 MW), Anglesey biomass plant (299 MW) and the Pen-y-Cymoedd onshore windfarm (256 MW).

Renewable projects with an installed capacity less than 5 MW are eligible for feed-in-tariffs from the UK Government. As of July 2013, over 28,000 projects with a combined installed capacity of about 93 MW are receiving feed-in-tariffs. About 97 per cent of these projects are domestic installations and 97 per cent of these are solar photovoltaic.

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In figures: Renewable Energy in Wales

1. Introduction

1.1. *Renewable Energy*

Renewable energy is a general term used to describe any source of energy that occurs naturally and is not exhaustible, such as solar energy, wind energy or wave energy. Energy from biological sources, such as wood burned as fuel, can also be described as renewable if the crop is managed sustainably.

1.2. *Types of renewable energy*

There are several different technology types used to generate electricity from renewable sources.

Wind energy is the harnessing of the wind, usually by wind turbines, to generate electricity. A distinction can be made between on-shore and off-shore wind farms. Hydropower utilises the force of flowing water to turn turbines in order to generate electricity. Usually, hydropower stations use a dam to control the storage and release of water. Similarly, tidal power uses the movement of water in tidal currents to turn turbines for electricity generation. Solar power or photovoltaic panels convert sunlight directly into electricity.¹

Several types of renewable fuel are combusted to produce steam to drive turbines. Decomposition of landfill waste and of sewage produces methane which can be combusted as a renewable fuel. Municipal and Industrial waste plants directly combust waste products. Biomass plants combust organic resources such as wood chip, energy crops or residues from agricultural processing.² Anaerobic Digestion refers to the natural biological process in which microorganisms indigenous to waste break down organic matter in the absence of oxygen (anaerobically). The biogas produced can be used as natural gas or fuel, or burned to produce heat.

¹ Alternative energy resources (website) [Alternative Energy Resources - Renewable resources we should all be using](#) [accessed 24 May 2013]

² Biomass Energy Centre (website) [What is biomass?](#) [accessed 24 May 2013]

1.3. Policies on reducing carbon emissions and increasing renewable energy

1.3.1 EU policies

The European Union has set targets for climate and energy known as the '20-20-20' targets. These are to achieve, by 2020:

- A 20% reduction in EU greenhouse gas emissions from 1990 levels;
- An increase in the contribution of renewable sources to energy consumed in the EU to 20%; and
- A 20% improvement in the EU's energy efficiency.³

Several pieces of legislation are in place to ensure the EU meets these targets. The first aspect of the target is implemented under the '*Emissions Trading Directive*' (2003/87/EC)⁴ and the '*Effort Sharing Decision*' (406/2009/EC),⁵ which covers sources that are not included in the Directive. In 2011, the European Council reconfirmed the objective of reducing greenhouse gas emissions, setting a target of an 80 per cent reduction on 1990 levels by 2050.⁶

The *Renewable Energy Directive* (2009/28/EC)⁷ establishes a common framework for the production and promotion of energy from renewable sources. The Directive commits EU Member States to increase the proportional contribution of renewable sources to EU-wide energy consumption to 20 per cent by 2020. Each Member State has a target for the share of energy generated from renewable sources by 2020; the target for the UK is 15 per cent.

Additional motives for increasing renewable energy use include increasing the security of energy supply and reducing reliance on imported fuels.

³ European Commission (website) [The EU climate and energy package](#) [accessed 10 May 2013]

⁴ [OJ L 275/32, 25.10.2003](#)

⁵ [OJ L 140/136 5.6.2009](#)

⁶ Communication from the Commission to the European Parliament, the Council, the European economic and social Committee and the Committee of the Regions, [A Roadmap for moving to a competitive low carbon economy in 2050. Roadmap for moving to a low-carbon economy in 2050](#) [accessed 10 May 2013]

⁷ [OJ L 140/16, 5.6.2009](#)

European Commission, *Communication from the Commission to the Council and the European Parliament Renewable Energy Road Map: Renewable energies in the 21st century: building a more sustainable future*, January 2009

1.3.2. UK policies

In the *Climate Act, 2008*⁸ the UK Government set their own goal of reducing CO₂ emissions by 80 per cent compared to 1990 levels by 2050. Renewable sources of energy are recognised as an essential element for achieving this target. To drive progress towards this target, legally binding limits on emissions were set out for five year periods. The first three of these carbon budgets were set in law in May 2009 and require emissions to be reduced by at least 34 per cent compared to 1990 levels by 2020.⁹ The fourth carbon budget, covering the period 2023–27, was set in law in June 2011 and requires emissions to be 50 per cent lower than 1990 levels.¹⁰

The UK-wide commitment to renewable energy was strengthened by publication of the *UK Renewable Energy Strategy* in July 2009¹¹ which set out the path to meet legally-binding EU targets of 15 per cent of UK energy from renewable sources by 2020.

The *Renewables Roadmap*, published jointly by the four administrations in July 2011, outlines a plan of action to accelerate renewable energy deployment while driving down costs.¹² This UK Roadmap builds on the actions already underway: financial support mechanisms for renewables, the Green Investment Bank to help companies secure investment in green infrastructure, and encouraging the development of new offshore wind manufacturing facilities at port sites.

The UK Government intends to publish an annual update on the *Renewables Roadmap*, the first of which was published in December 2012.¹³ This document shows that the UK is on track to meet the first target of sourcing 15 per cent of all energy from renewable technologies by 2020.

⁸ [Climate Act, 2008](#) [accessed 10 May 2013]

⁹ [Carbon Budgets Order, 2009](#) [accessed 10 May 2013]

¹⁰ [Carbon Budgets Order, 2011](#) [accessed 10 May 2013]

¹¹ Department of Energy and Climate Change, *The UK Renewable Energy Strategy, July 2009*

¹² Department of Energy and Climate Change, [UK Renewable Energy Roadmap, 2011](#) [accessed 10 May 2013]

¹³ Department of Energy and Climate Change, [UK Renewable Energy Roadmap: Update, 2012](#) [accessed 10 May 2013]

1.3.3. Wales

The powers over energy generation are not fully devolved to the Welsh Government. Energy developments over 50 Megawatts (MW) onshore and 100 MW offshore are considered at the UK level by the National Infrastructure Directorate within the Planning Inspectorate with the final decision being taken by the Secretary of State. Offshore developments between 1 and 100 MW are determined by the UK Marine Management Organisation. Onshore energy projects of 50 MW or less are determined by local planning authorities.

In the Technical Advice Note on Renewable Energy (TAN 8) published in 2005, the Welsh Government set the targets of 4,000 GWh (Gigawatt hours) of electricity per annum to be produced by renewable energy by 2010 and 7,000 GWh by 2020.¹⁴

In March 2010, the Welsh Government published an Energy Policy Statement, ‘A low carbon revolution’, which sets out the potential for 22.5 GW of installed capacity from renewable sources by 2020/25.¹⁵ The Policy Statement sets out how this installed capacity should be achieved with individual ‘aspirations’ for different renewable energy technologies in Wales (see table 1). This information is repeated in Figure 12.1 of Planning Policy Wales.¹⁶

Table 1: Renewable energy potential for Wales, set out in ‘A low carbon revolution’ policy statement, 2010

Technology	Target capacity (GW)	Target date(s)
Onshore wind	2.0	2015/2017
Offshore wind	6.0	2015/2016
Biomass	1.0	2020
Tidal range	8.5	2022
Tidal stream/Wave	4.0	2025
Local electricity generation	1.0	2020

Source: Welsh Government

Notes: 1GW = 1,000 MW

¹⁴ Welsh Government, *Technical Advice Note 8: Planning for Renewable energy*, 2005 [accessed 15 May 2013]

¹⁵ Welsh Government, *A low carbon revolution, the Welsh Assembly Government’s Energy Policy Statement*, 2010 [accessed 10 May, 2013]

¹⁶ Welsh Government, *Planning Policy Wales Edition 5*, November 2012 [accessed 23 July, 2013]

1.3.4. *Government support for renewable energy generation*

The UK Government provides financial support for renewable energy generation through the Renewables Obligation scheme and the Feed in Tariff scheme.¹⁷

The Renewables Obligation (RO) scheme is the main support mechanism for large scale projects; for information on Feed in Tariffs see section 4 of this paper.

The RO covering England and Wales and the Scottish RO came into effect in April 2002. Northern Ireland introduced a similar scheme in 2005.¹⁸ The RO places an obligation on electricity suppliers to generate a certain portion of electricity from renewable sources and is regulated by the Office for Gas and Electricity Markets (Ofgem). Renewable Obligation Certificates are awarded for energy produced from renewables but the number of certificates per MWh varies with technology type to reflect differences in technology costs.¹⁹ Certificates can be traded between suppliers. Each company has an obligation to gain a certain number of certificates each year and failure to meet this target results in a 'buy out' fine. The scheme is funded by this buy-out fund and remaining funds are distributed between suppliers in proportion to their contribution to the RO.²⁰

Renewable technologies eligible for certificates are: wind energy, hydropower, tidal and tidal stream energy, wave energy, photovoltaics, geothermal, all biodegradable material, landfill gas, sewage gas and co-firing of biomass with fossil fuel.²¹

¹⁷ Ofgem (website) [Renewables Obligation](#) [accessed 24 May 2013]

¹⁸ *ibid*

¹⁹ House of Commons, [The Renewables Obligation Standard Note](#) 2012 [accessed 24 May 2013]

²⁰ Ofgem (website) [Renewables Obligation](#) [accessed 24 May 2013]

²¹ Department of Energy and Climate Change (website) [Renewables Obligation](#) [accessed 24 May 2013]

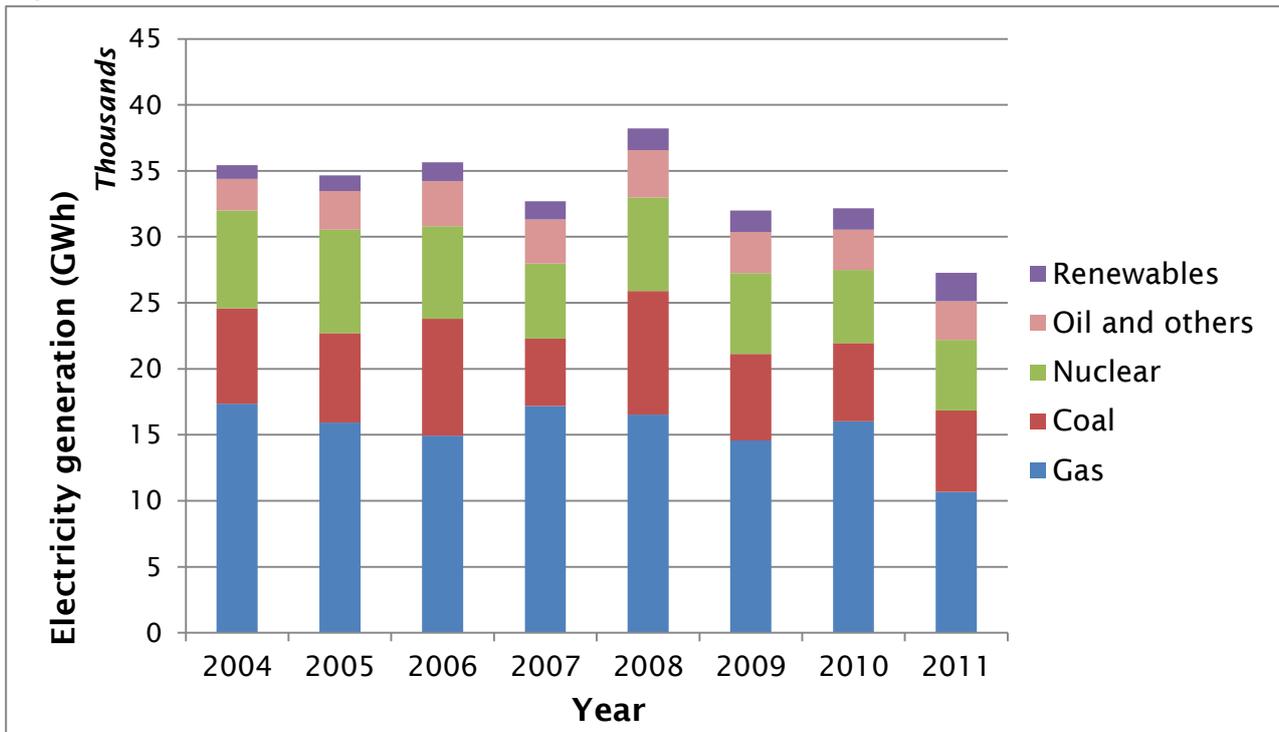
2. Contribution of renewables to energy generation in Wales

Between 2004 and 2010, the total amount of electricity generated in Wales fluctuated between 32,000 GWh and 38,000 GWh with no consistent trend (figure 1). In 2011 the total amount of electricity generated in Wales fell by 15 per cent from the previous year, to 27,284 GWh. This is largely attributable to a 33 per cent decline in electricity generated from gas in this period (figure 1).

Gas is the main fuel for energy generation in Wales, accounting for 39 per cent of total energy generation in 2011. There are six large combined cycle gas turbine power (CCGT) stations in Wales (figure 2). Coal is the next most significant fuel source in Wales. The two remaining coal power stations in Wales accounted for 22 per cent of electricity generation in 2011. Wales has a single nuclear power plant, which accounted for 20 per cent of electricity generated in Wales in 2011 (figure 1 and 2).

An application for a new gas CHP plant at South Hook in Pembrokeshire (500 MW) has also now been submitted and there are three further proposals at the ‘pre-application’ stage for new power stations (non-renewable energy sources) – a new nuclear plant at Wylfa B (2,600 MW), a new CCGT plant in Wrexham (1,200 MW) and a gas-fired power station with a nominal generating capacity of up to 299 MW in Hirwaun.²²

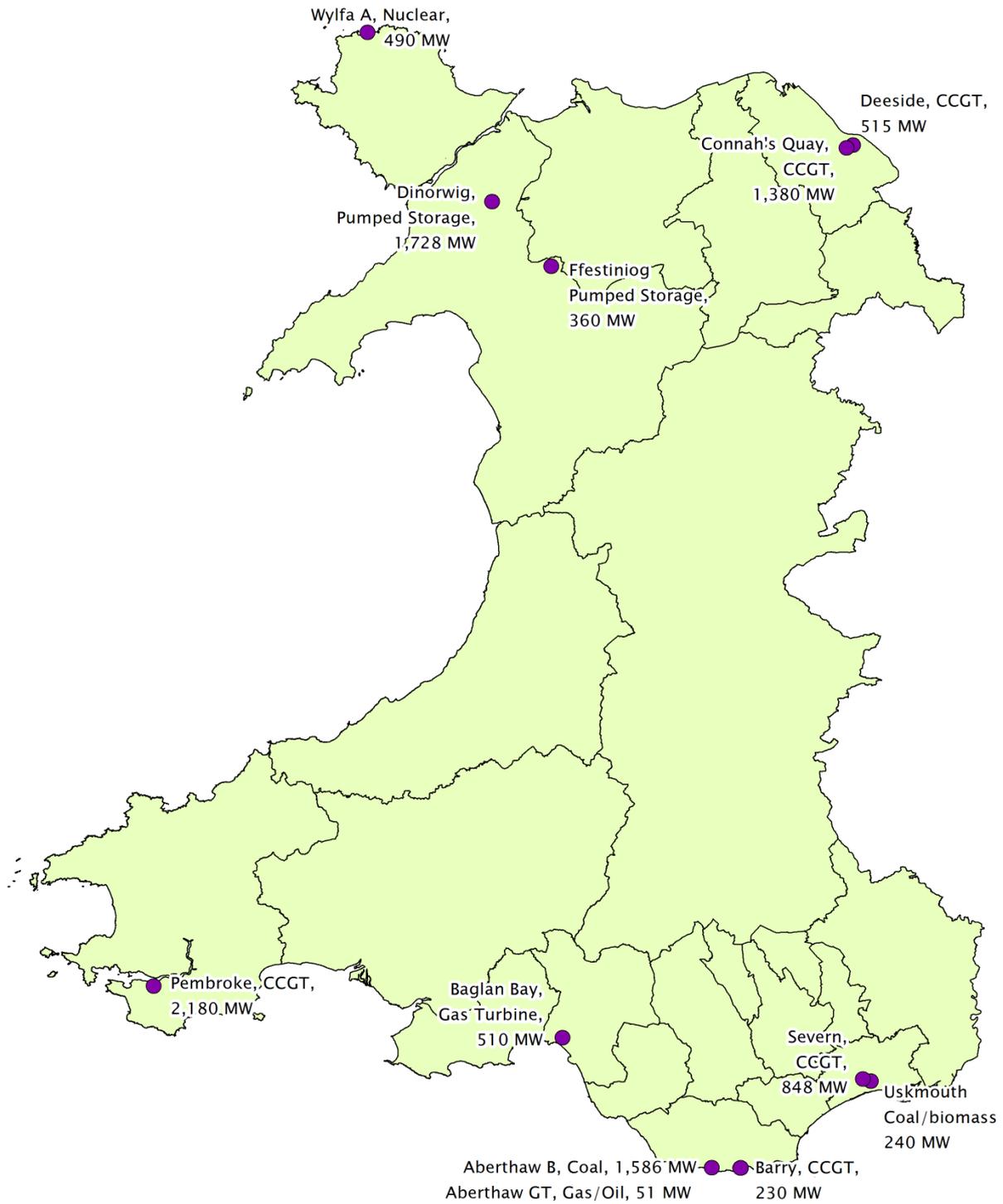
Figure 1: Generation of electricity by fuel type in Wales, 2004 to 2011



Source: Department of Energy and Climate Change

²² Planning Inspectorate, National Infrastructure Planning, [Projects in Wales](#) [accessed 23 July, 2013]

Figure 2: Power stations in the electricity supply system in Wales, excluding renewables (June 2013).



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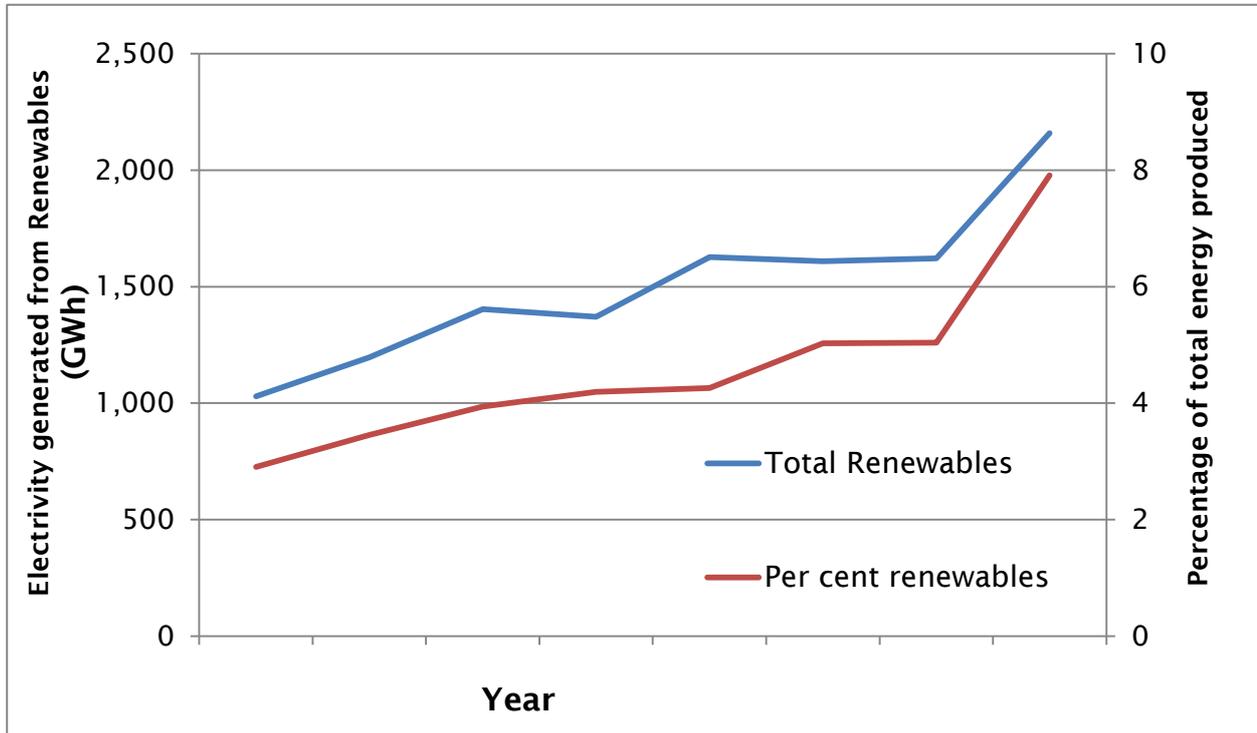
© Crown copyright and database rights 2013.
Ordnance Survey 100047295.

Source: Digest of UK energy statistics, Department of Energy and Climate Change

Notes: CCGT stands for Combined Cycle Gas Turbine. Pumped storage systems are a type of hydro-electric power generators which utilise off-peak electricity from the National Grid to elevate water. During periods of peak demand the water is released to generate electricity. These stations are net consumers of electricity and do not contribute to the generating totals analysed in this paper.

For the period considered (2004-2011) both the total amount and percentage of electricity generated from renewables in Wales continually increased, reaching a maximum of 2,159 GWh in 2011, which was 7.9 per cent of the total energy generated in Wales in that year (figure 3).

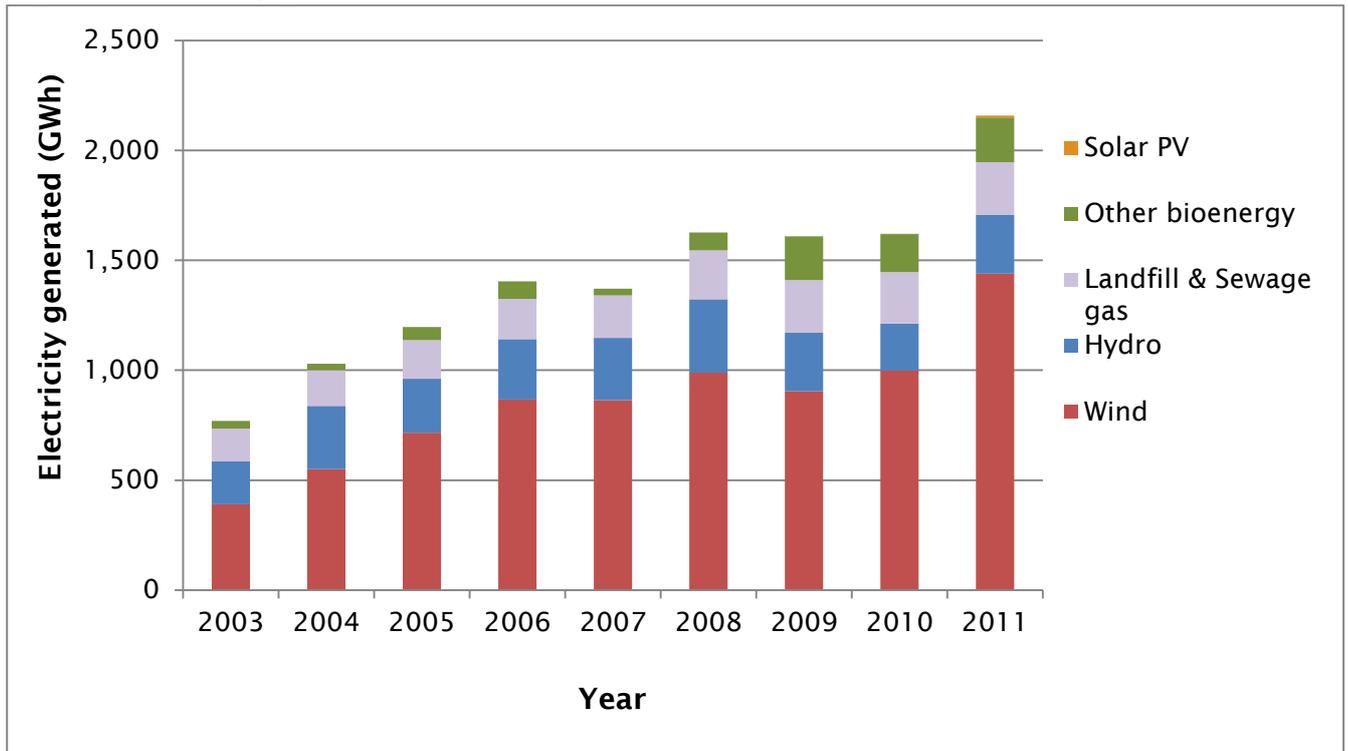
Figure 3: The total and relative amount of energy generated in Wales from renewable sources



Source: [Welsh Government, Energy Generation and Consumption for Wales, 2011, Statistical bulletin](#); Data Department of Energy and Climate Change,

This increase in renewable energy generation was largely attributable to the increase in electricity generated from wind energy (figure 4). The amount of electricity generated from wind more than tripled between 2003 and 2011, from 391GWh to 1,439 GWh, and accounted for two thirds of the energy generated from renewables in 2011 (figure 4). Hydropower is the second biggest contributor to renewable electricity generation but the amount of electricity generated from hydropower has not increased between 2004 and 2011 (figure 4).

Figure 4: Electricity generated from renewable sources in Wales, 2003-2011



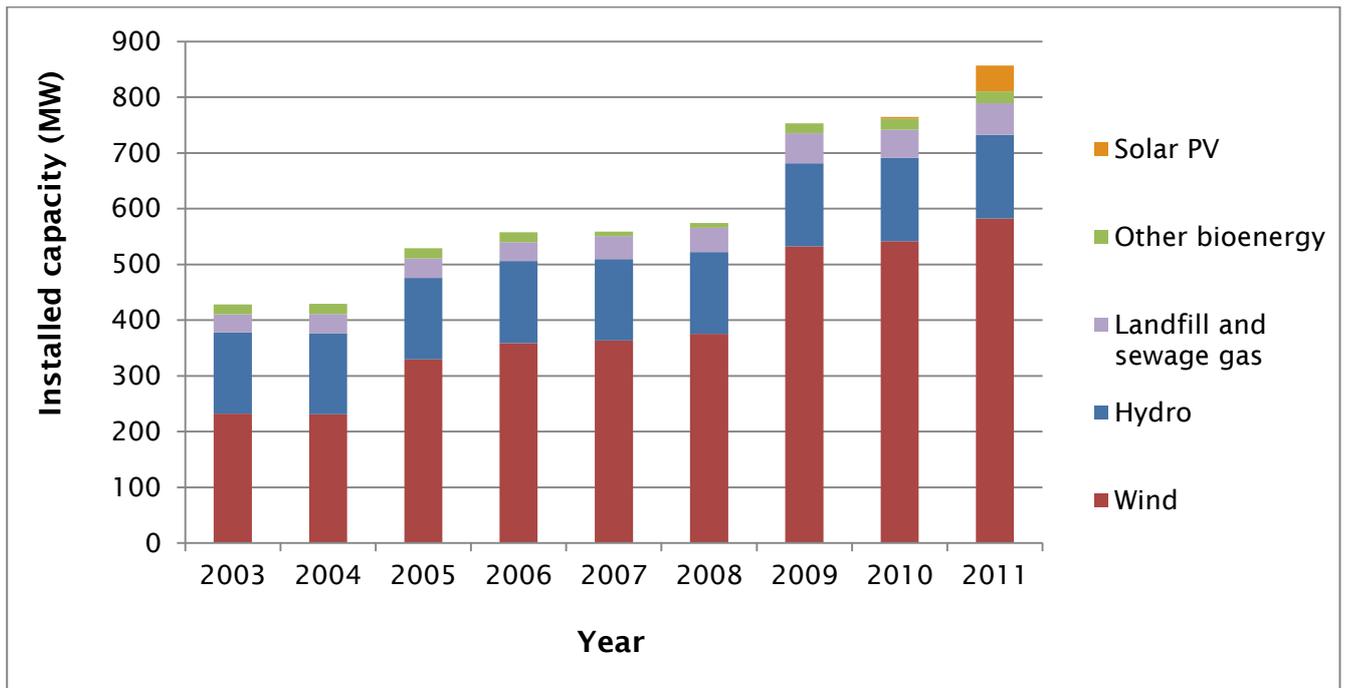
Source: [Department of Energy and Climate Change](#)

An increase in both the number of renewable energy sites and the total installed capacity of renewable energy installations occurred between 2003 and 2011 (figure 5 and 6).

The number of wind energy sites increase almost tenfold between 2003 and 2011 (figure 6) whilst the installed capacity of wind energy increased by 2.5 times (figure 5). This shows an increase in the development of small scale wind farms during this period. Similarly, the number of hydropower sites more than doubled between 2003 and 2011 (figure 6) but the installed capacity of hydropower installations increased by only three per cent (figure 5), reflecting that most of the increase was in small scale projects. The first sewage gas projects became operational in 2009 and increased in number, installed capacity and generation between 2009 and 2011 (figures 5 and 6).

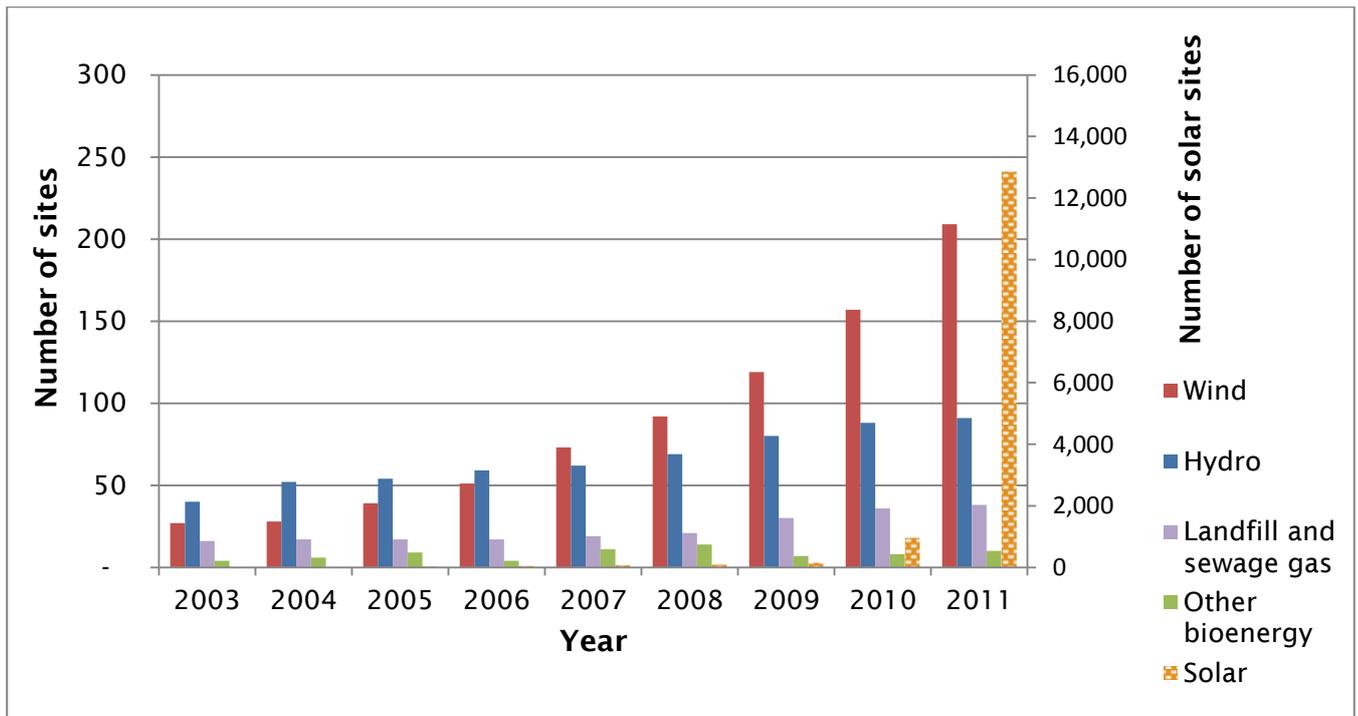
There was a very large growth in the number of solar installations particularly between 2010 and 2011, mostly due to the introduction of Feed In Tariffs. In 2011, solar installations accounted for 97 per cent of the renewable energy projects in Wales by number but only 5 per cent by installed capacity. Solar installations are mostly domestic solar panels with small installed capacities (figures 5 and 6).

Figure 5: Installed capacity of renewable energy installations, by technology type, in Wales, 2003 and 2011



Source: Department of Energy and Climate Change

Figure 6: Number of sites generating electricity from renewable energy, by technology type, in Wales



Source: Department of Energy and Climate Change

Notes: The number of solar sites is shown against the secondary axis due to the scale of the numbers involved

3. Renewable Energy Planning Database: Statistics for Wales

Local planning authorities in Wales have responsibility for determining planning applications for onshore renewable projects that have a capacity of 50 MW or less, within the provisions of the *Town and Country Planning Act 1990*. Responsibility for determining major energy projects over 50MW onshore and 100MW offshore is the responsibility of the National Infrastructure Directorate within the Planning Inspectorate, with the final decision being taken by the UK Government's Secretary of State under powers contained in the *Planning Act 2008*, as amended by the *Localism Act 2011*. In addition there are some major energy projects that are still to be determined by the UK Government under the previous regime provided by the *Electricity Act 1989*. Offshore developments of between 1 and 100 MW are determined by the UK Marine Management Organisation.

The Planning Database Project provides data to the Department for Energy and Climate Change (DECC) on the status of renewable energy projects in the UK with a capacity over 0.01 MW.²³ Data is collected from local planning authorities and renewable energy developers on the status, installed capacity and location of projects, and is made publically available on the DECC website.

The data presented in this section are taken from the Renewable Energy Planning Database (REPD) and as such is not an exhaustive list of all renewable projects in Wales. The database records applications for development rather than individual projects and so an application to extend an existing site will be counted as a new project on the database. The database excludes projects with an installed capacity less than 0.01 MW and also excludes most projects that don't need planning permission or development consent. The database was established in 1995 and so some older schemes, particularly some long-established hydro-electricity generation schemes are also excluded. **For these reasons the data from the Renewable Energy Planning Database set out below does not correspond with the data presented in the previous section.**

The database is updated each month; data used in this publication is up-to-date as of June 2013. The scale of each project is measured by its installed capacity. This is the maximum output the installation is capable of generating and not a measure of its output. Projects classified as '**approved**' have gained planning or development consent but have not yet started construction or are under construction. Projects classified as '**submitted**' are awaiting a decision from the relevant authorities. The database only records a scheme as '**operational**' once it becomes fully operational.

²³ [Renewable Energy Planning Database](#), RESTATS, Department of Energy and Climate Change (website) [accessed 10 May 2013]

3.1. Characteristics of Renewable energy projects in Wales

In June 2013, there were 90 ‘operational’ renewable energy projects in Wales listed in the database that have been through the planning system, with a total installed generating capacity of approximately 760 MW (table 2 and figure 7). Additionally, there were 72 ‘approved’ applications which have gained planning permission or other consents and are awaiting or undergoing construction (table 2). These projects have a potential additional generating capacity of 2,200 MW. A further 48 applications (1,000 MW total installed capacity) had been ‘submitted’ to consenting bodies and were awaiting decisions.

Table 2: Number of renewable projects in Wales, in the Renewable Energy Planning database, by generation capacity and planning status (June 2013)

Installed Capacity (Megawatts)	Status (Number of projects)		
	Operational	Approved	Submitted
0.01- 5	57	37	20
5 to 25	25 ^a	20	13
25 to 50	5 ^b	10	9
Over 50	3	5	6
Total	90	72	48

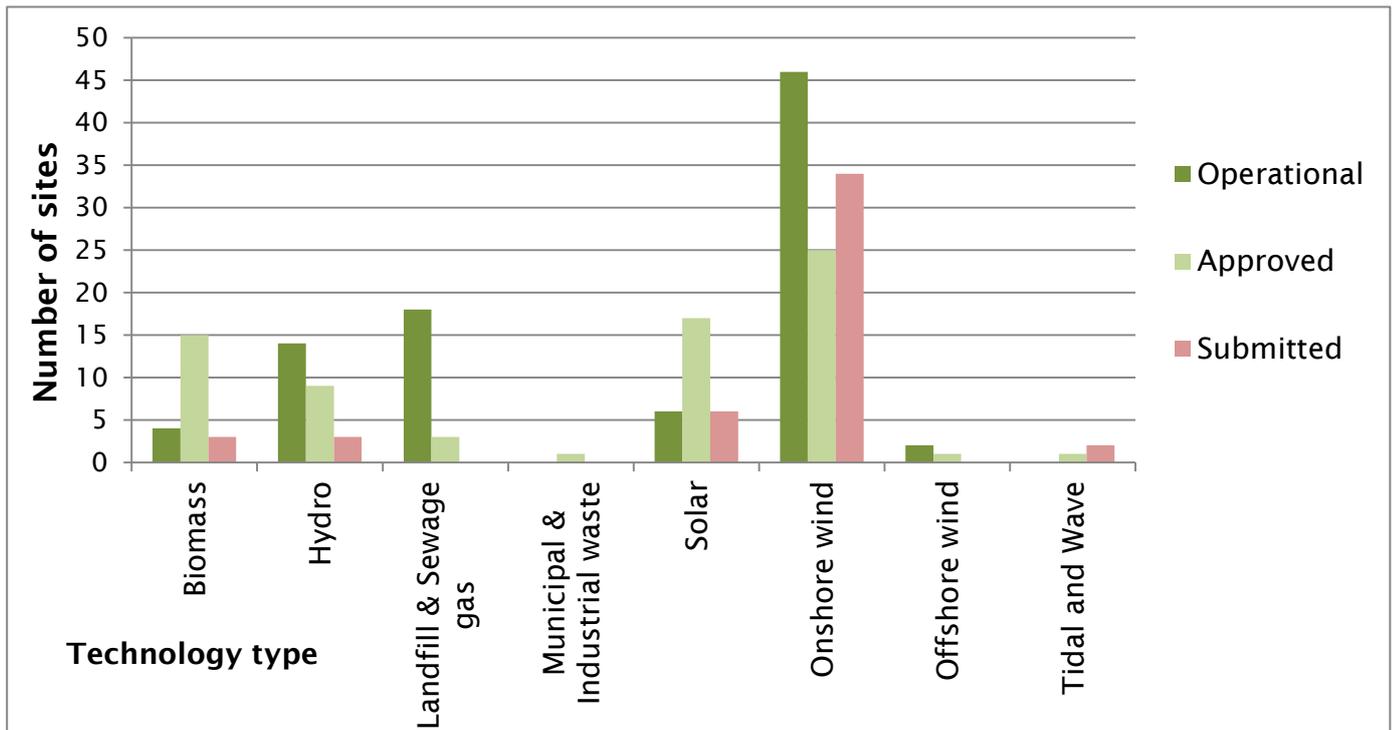
Source: DECC Renewable Energy Planning database

Notes: (a) There is also one hydropower scheme of this size not included in the database

(b) There are also three hydropower schemes of this size not included in the database

Wind energy accounts for the largest share of ‘operational’, ‘approved’ and ‘submitted’ applications by both number and installed capacity (figures 7 and 8). Currently there are four ‘operational’ biomass plants in Wales that have been through the planning system, which account for 7 per cent of installed capacity from renewables, the second biggest contribution after wind energy (figure 8). If all the ‘approved’ sites become ‘operational’, the contribution of biomass to total installed capacity will increase to 30 per cent, while the relative contribution of hydropower and landfill gas will decline (figures 7 and 8). The potential increase in biomass is mostly due to two large approved schemes that have not yet been built: the Port Talbot Renewable Energy Plant (350MW) and Anglesey Aluminium Metal Renewables (299MW).

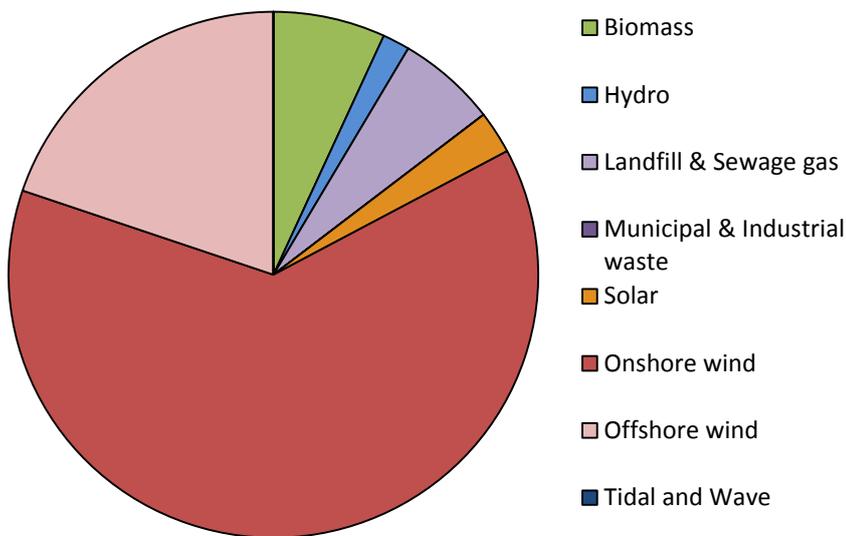
Figure 7: Number of renewable projects in Wales, by technology type and planning status (June 2013)



Source: DECC Renewable energy planning database

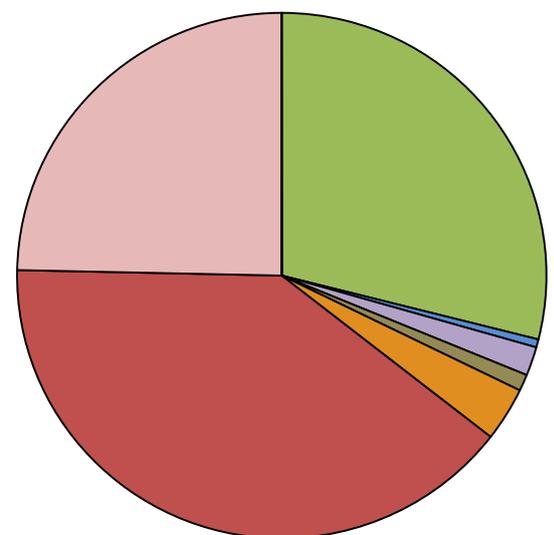
Figure 8: Proportional contribution of different technology types to installed capacity of renewable energy projects in Wales (June 2013)

Currently Operational



Total ~ 760 MW.

Combined operational & approved



Total 2,900 MW

Source: DECC Renewable Energy Planning Database

3.2. *Distribution of renewable energy projects in Wales by size*

3.2.1. *Projects with a generating capacity exceeding 50 MW*

Welsh Government planning policy states that onshore wind renewable energy projects of more than 25MW are ‘large-scale’ and should be concentrated in the Strategic Search Areas specified in Technical Advice Note 8.²⁴

There is currently only one ‘operational’ on-shore renewable energy project with a generating capacity **exceeding 50 MW** in Wales; Cefn Croes wind farm (58.5 MW capacity). A further two ‘operational’ sites exceeding 50 MW capacity are located offshore north of Wales; Rhyl flats wind farm (90 MW capacity) and North Hoyle wind farm (60 MW capacity). Five further schemes with a generating capacity exceeding 50 MW have been ‘approved’ and are awaiting or are under construction, the largest of which is the Gwynt y Mor offshore windfarm (576 MW – see figure 9).

There are an additional six onshore wind farm schemes of over 50 MW that have been ‘submitted’ for approval to the UK Government but have yet to be decided.²⁵ In addition there are six renewable energy schemes that have been notified to the National Infrastructure Directorate of the Planning Inspectorate²⁶ that are currently at the ‘pre-application’ stage (figure 10). Some of these may not proceed to a formal application for development consent.

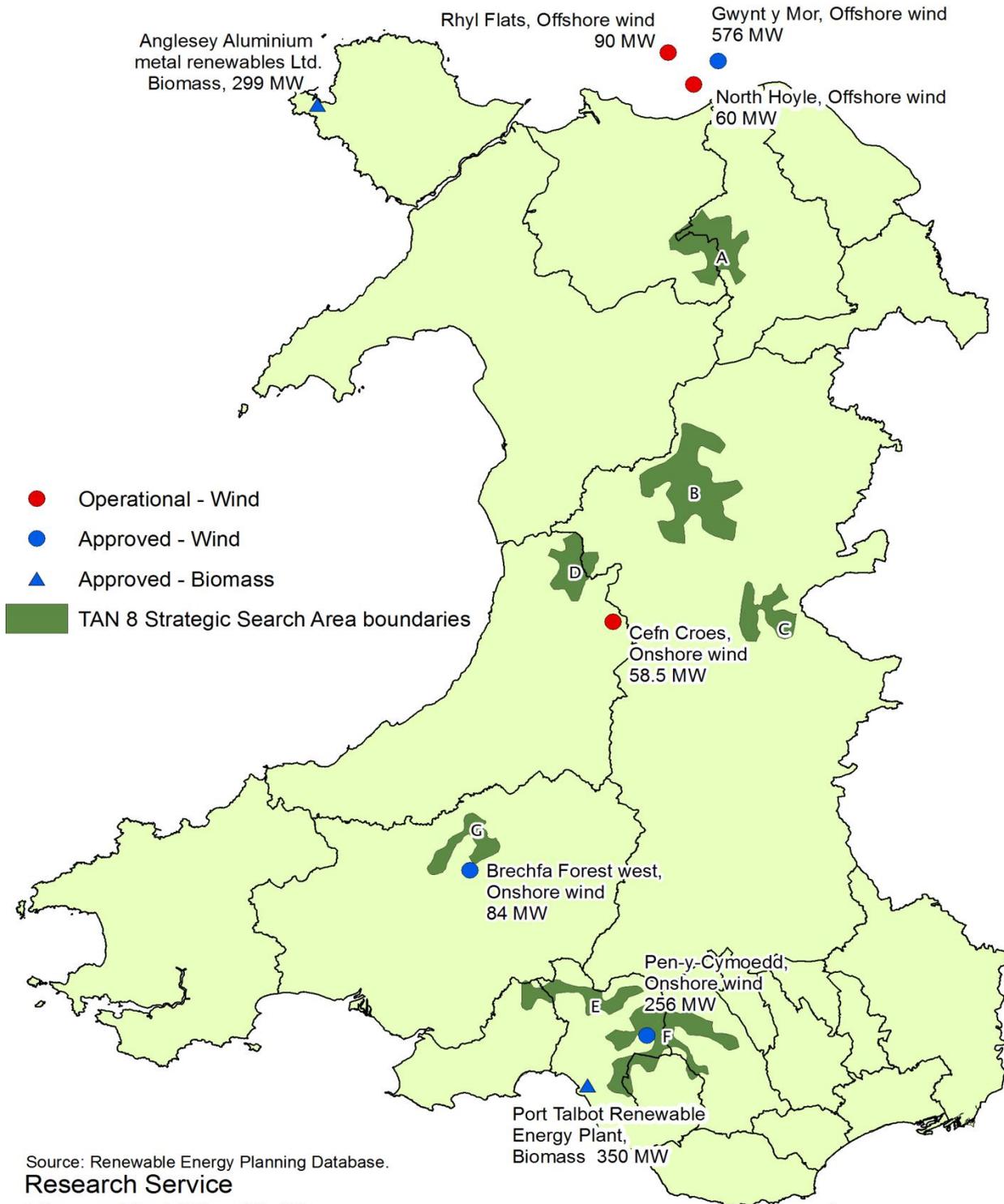
²⁴ Welsh Government (2005) Planning Policy Wales, [Technical Advice Note 8:Planning for Renewable energy](#) [accessed 24 May 2013]

²⁵ Five of these in Powys are currently subject to the Mid Wales (Powys) Conjoined Wind Farms Public Inquiry

²⁶ The Infrastructure Planning Commission before April 2012

²⁶ Welsh Government (2005) Planning Policy Wales, [Technical Advice Note 8:Planning for Renewable energy](#) [accessed 24 May 2013]

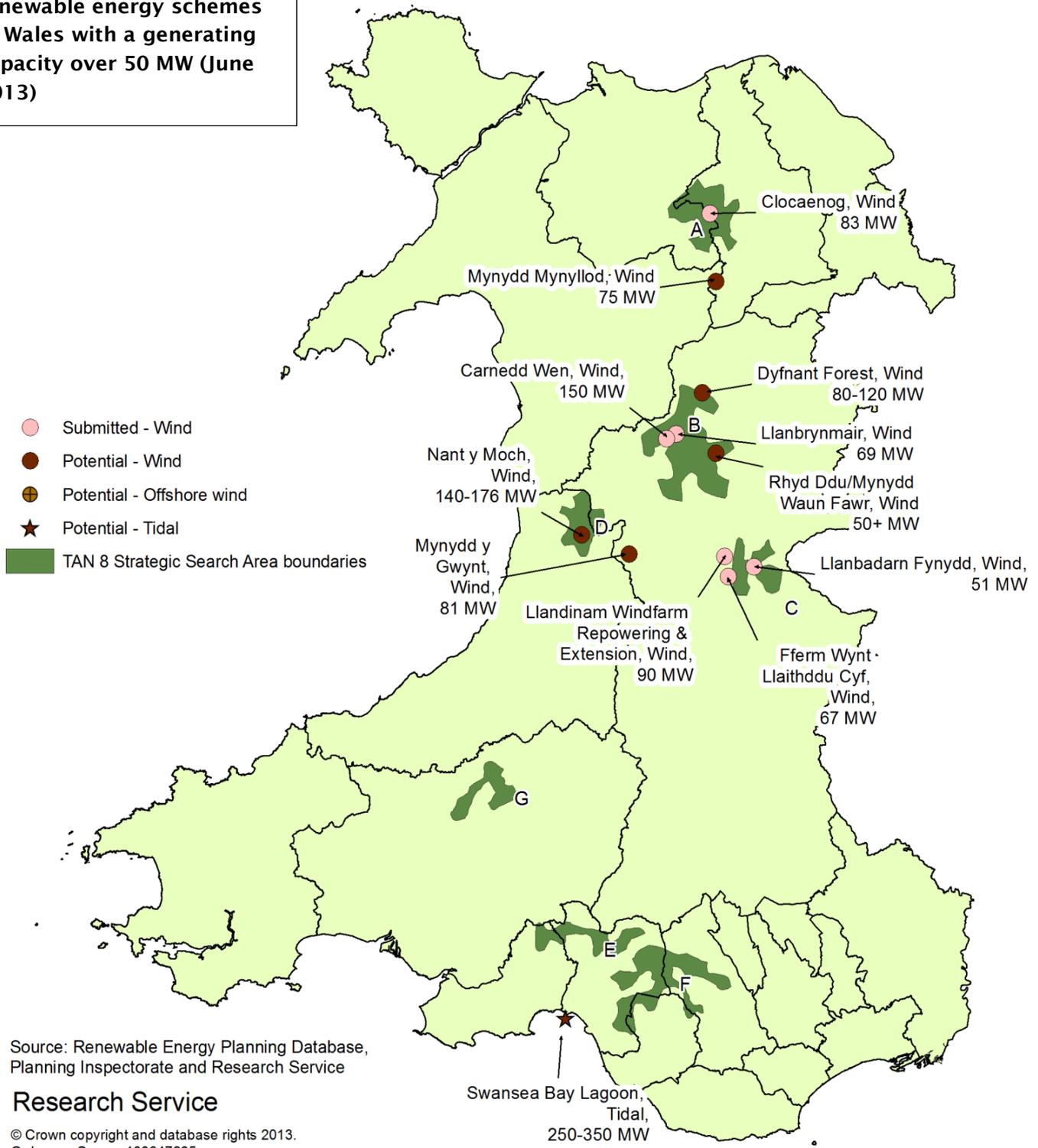
Figure 9: Location of operational and approved renewable energy schemes in Wales with a generating capacity over 50 MW (June 2013)



Notes: Technical Advice Note 8 (TAN 8)²⁷ is the Welsh Government's Planning guidance for renewable energy projects in Wales. The document recommends that onshore wind developments of 25MW or more are concentrated into seven defined Strategic Search Areas.

⊕ Rhiannon Round 3 Irish Zone,
Offshore Wind
2200 MW

Figure 10: Location of submitted and 'potential' renewable energy schemes in Wales with a generating capacity over 50 MW (June 2013)



Notes: Projects notified to the National Infrastructure Directorate at the 'pre-application' stage prior to formal submission are shown as 'potential' projects. The Atlantic Array windfarm (up to 1500 MW) in the Severn Estuary is not shown because it is in English territorial waters.

3.2.2. Projects with a generating capacity of 50 MW or less

3.2.1.1. Projects of between 25 and 50 MW

There are currently five ‘operational’ renewable energy sites in Wales that have been through the planning system with an installed capacity of between **25 and 50 MW**. Four of these sites are wind power and the fifth is biomass. In addition there are a further three hydro-electric power schemes each with an installed capacity of between 25 and 50 MW (Maentwrog, Rheidol, Dolgarrog High Head/Low Head) that are not included in the REPD but are listed in the Digest of United Kingdom energy statistics (DUKES)²⁸ also produced by the Department of Energy & Climate Change (figure 11).

A further ten schemes with an expected installed capacity of between 25 and 50 MW have so far been ‘approved’. Seven of these are wind power (figure 11).

There are also another nine ‘submitted’ schemes of this size, seven of which are onshore wind projects (figure 12).

3.2.2.2. Projects of between 5 and 25 MW

Welsh Government planning policy is that onshore wind projects of between 5 and 25 MW should also be concentrated in the Strategic Search Areas or on urban/industrial ‘brownfield sites’.²⁹

There are currently 25 ‘operational’ renewable energy projects in Wales with an installed capacity between **5 and 25 MW** (figure 13). Twenty of these projects are wind energy. There is also one hydro-electric power scheme of this size at Cwm Dyli that is not included in the REPD but is listed in the Digest of United Kingdom energy statistics (DUKES)³⁰

By local authority, Powys currently has the most ‘operational’ sites with a generating capacity between 5 and 25 MW (figure 13). A further 20 projects each with an expected installed capacity between 5 and 25 MW have also been ‘approved’ but are not yet ‘operational’ (figure 14). There are another 13 ‘submitted’ projects of this size, eight of which are onshore wind, three are solar and two are wave/tidal (figure 15).

²⁸ Department of Energy & Climate Change, [*Digest of United Kingdom energy statistics, Section 5.11*](#)

²⁹ Welsh Government (2005) Planning Policy Wales, [*Technical Advice Note 8: Planning for Renewable energy*](#) [accessed 24 May 2013]

³⁰ Department of Energy & Climate Change, [*Digest of United Kingdom energy statistics, Section 5.11*](#)

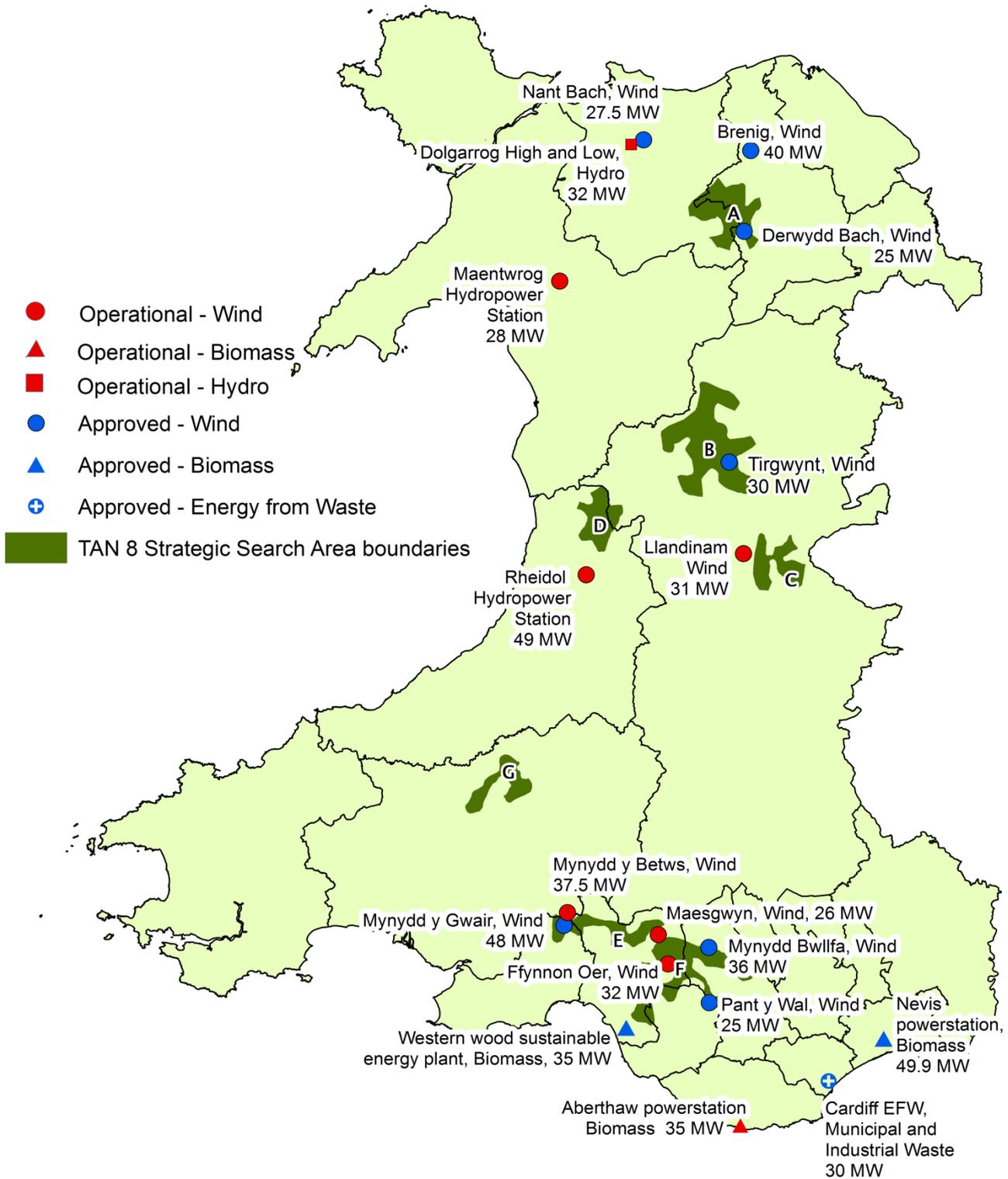
3.2.2.3. Projects of less than 5 MW

Renewable projects with an installed capacity **less than 5 MW** are considered to be small-scale projects and 5 MW is also the upper threshold for the Feed-in Tariff scheme (see Section 4).³¹ Some of the smallest schemes won't be captured by the REPD – but will be included in the Feed-in tariff statistics. Welsh Government planning policy is that applications for individual wind turbines and community-based wind farm schemes that are generally less than 5 MW should be decided using a set of local criteria to determine their acceptability.

In June 2013 there were 57 'operational' schemes of this size recorded on the REPD that have been through the planning system, predominantly onshore wind (21), landfill gas (16) and small-scale hydropower (14). Another 37 applications have been 'approved' but are not yet 'operational' and there were a further 20 'submitted' applications of this size.

³¹ [Ofgem, Feed-in Tariff scheme factsheet](#) [accessed 16 May 2013]

Figure 11: Location and type of operational and approved renewable energy projects with an installed capacity between 25 and 50 MW, in Wales (June 2013)

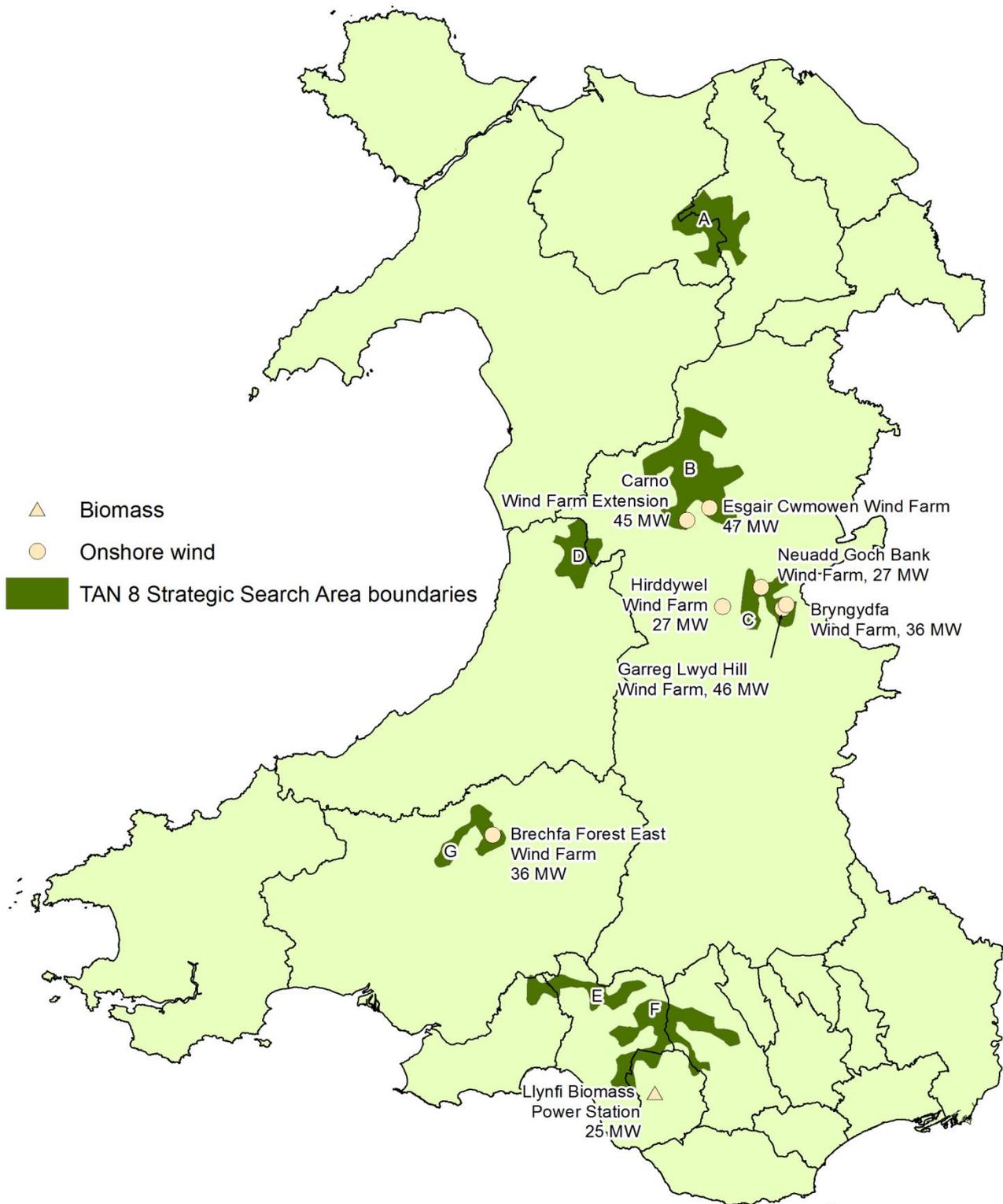


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Source: Renewable Energy Planning Database and DUKES

Figure 12: Location and type of submitted renewable energy projects with an installed capacity between 25 and 50 MW, in Wales (June 2013)

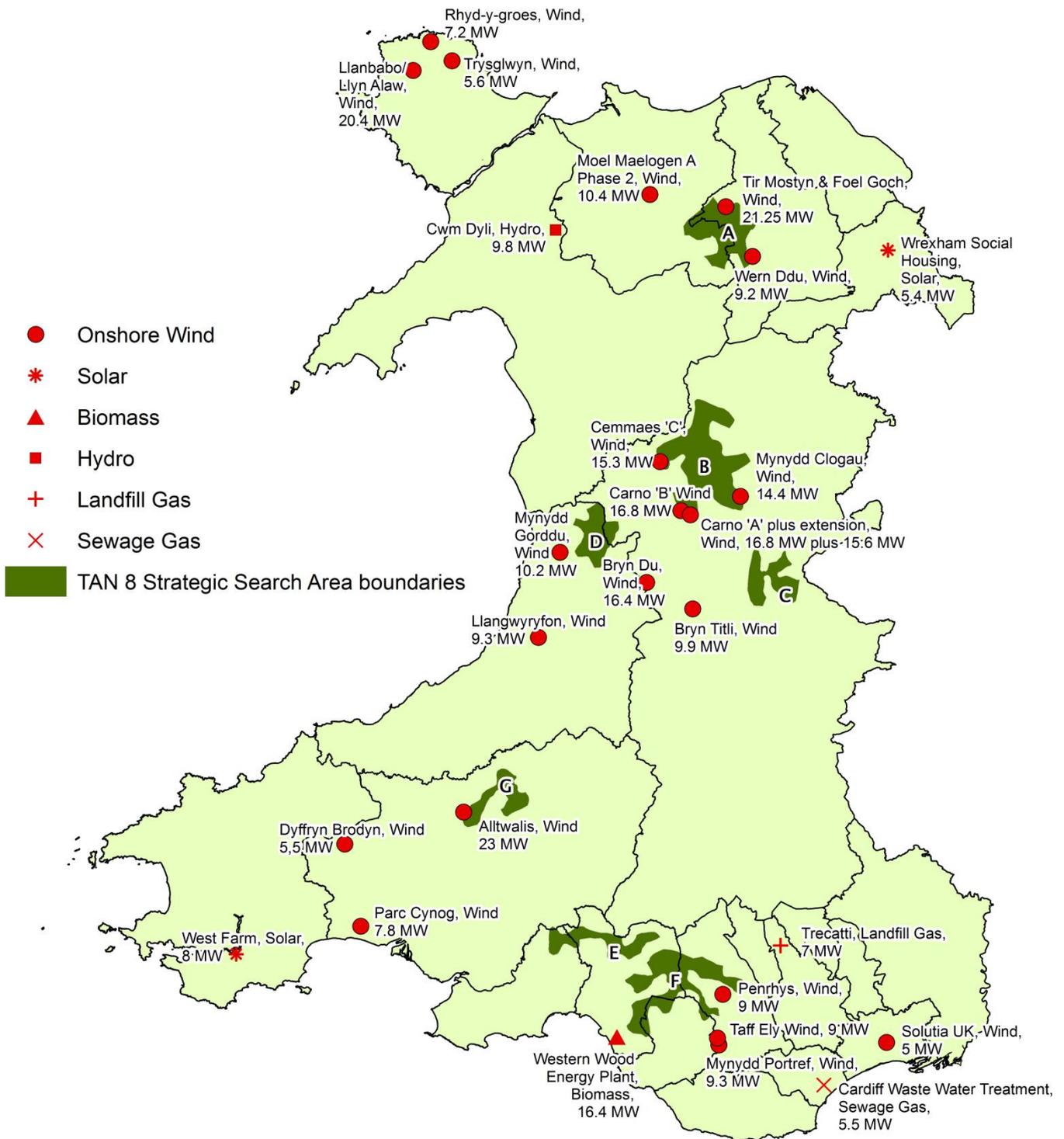


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Source: Renewable Energy Planning Database

Figure 13: Location and type of operational renewable energy projects with an installed capacity between 5 and 25 MW, in Wales (June 2013)

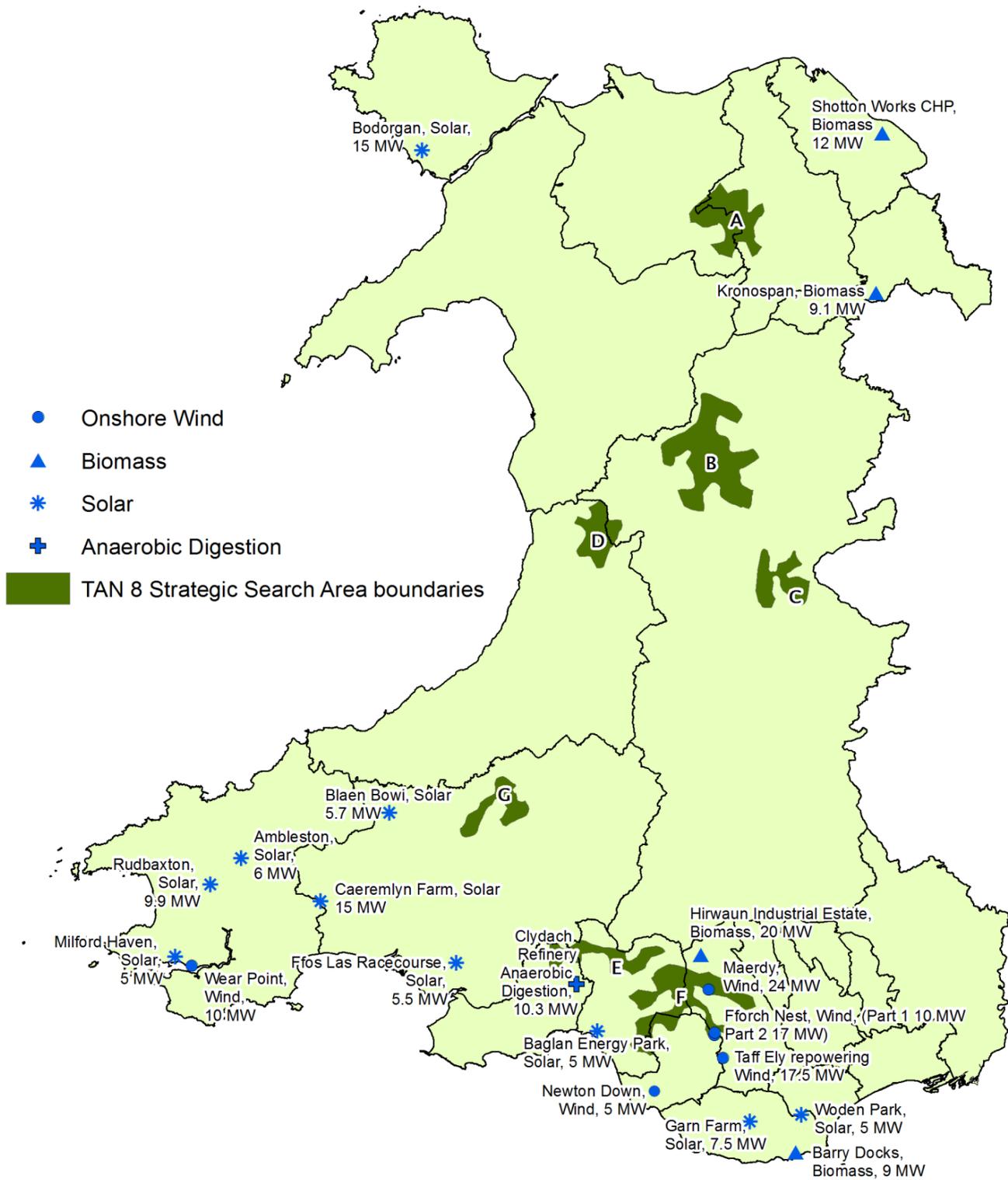


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Source: Renewable Energy Planning Database

Figure 14: Location and type of approved renewable energy projects with an installed capacity between 5 and 25 MW, in Wales (June 2013)

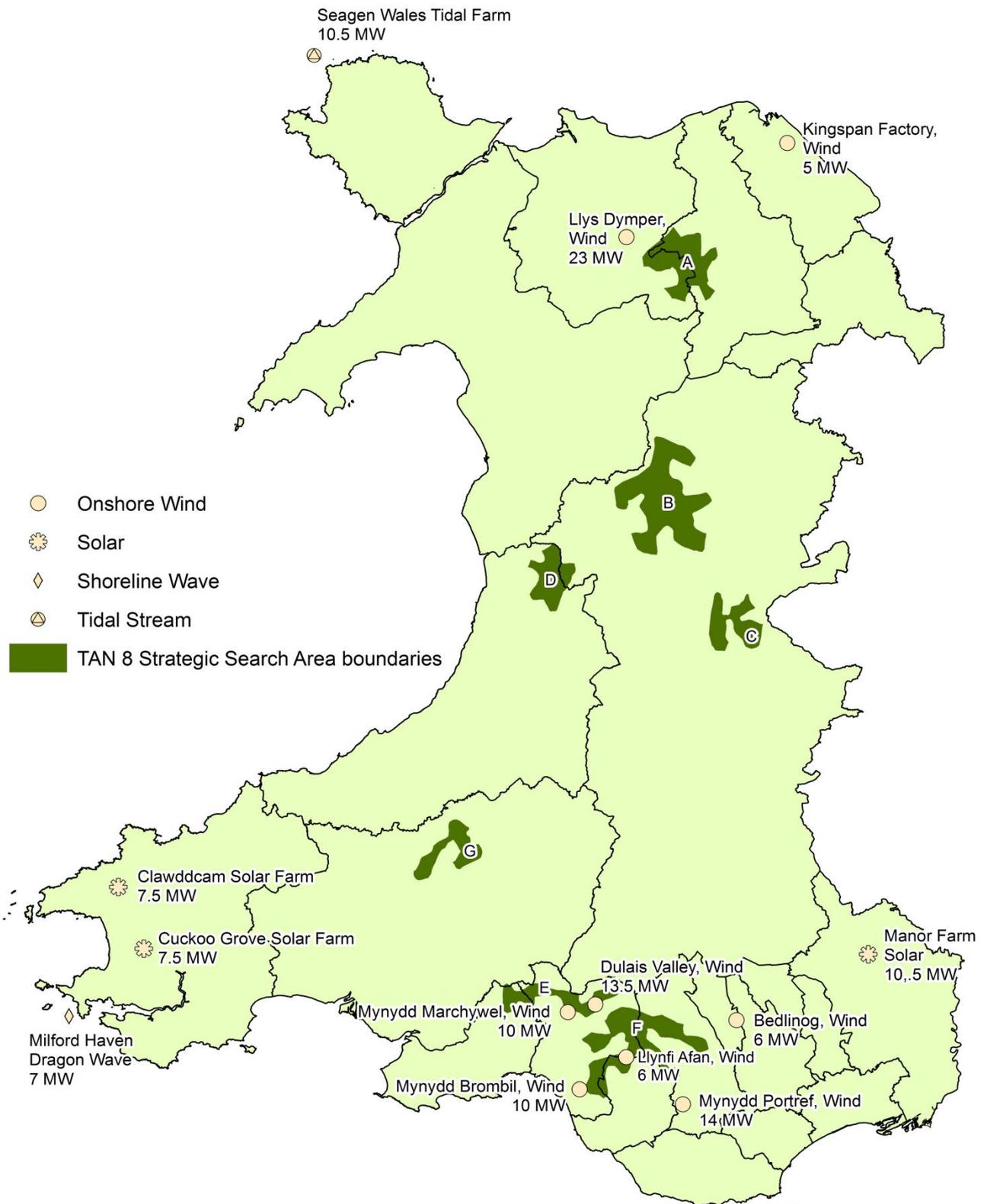


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Source: Renewable Energy Planning Database

Figure 15: Location and type of submitted renewable energy projects with an installed capacity between 5 and 25 MW, in Wales (June 2013)



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Source: Renewable Energy Planning Database

4. Micro-generation

4.1 *Micro-generation and feed-in tariffs*

Micro-generation is a term used for the generation of low carbon or renewable energy with a capacity up to 0.05 MW.³² A range of domestic micro-generation technologies are now allowed to be installed without planning permission under the 2012 amendment to the *Town and Country Planning (General Permitted Development) Order*,³³ subject to some exceptions such as listed buildings. A small number of larger projects in receipt of Feed-in Tariffs (FiTs) will also be included in the REPD figures presented in Section 3 of this paper.

Feed-in Tariffs (FiTs) were introduced by the UK Government in April 2010 to encourage the uptake of small-scale renewables and low-carbon electricity. Each unit of energy generated by micro-generators and each unit exported to the National Grid are financially rewarded for by the scheme.^{34,35} The FiTs scheme supports domestic, commercial, industrial and community installations for solar photovoltaics (solar PV), wind, hydro, and micro combined heat and power (microCHP) installations up to 5 MW, although almost all of the installations are micro-generation.³⁶

4.2 *Feed-in tariff statistics*

The energy aspirations set out by the Welsh Government in their 2010 Energy Statement identified local micro-generators as having the potential to contribute one gigawatt (1,000 MW) capacity to Welsh energy supply by 2020.³⁷ The total capacity of FiT registered units installed in Wales as of 12 July 2013 was about 96 MW.³⁸ The majority of FiTs installations are micro-generators (< 0.05 MW) with solar PV being the dominant technology type, accounting for 99 per cent by number and 97 per cent by capacity (table 3).³⁹

About 97 per cent (28,300) of the total installations are domestic and 99 per cent of these are solar. There are also about 700 industrial/commercial installations and about 70 community installations.

³² *Energy Act 2004*, Part 2, Chapter 1, Section 82 [Microgeneration](#) [accessed 16 May 2013]

³³ [The Town and Country Planning \(General Permitted Development\) \(Amendment\) \(Wales\) \(No. 2\) Order 2012](#) [accessed 16 May 2013]

³⁴ [Ofgem, Feed-in Tariff scheme factsheet](#) [accessed 16 May 2013]

³⁵ Research Service Publication, [Microgeneration Quickguide](#), June 2012 [accessed 16 May 2013]

³⁶ Research Service Research Paper, [Micro electricity technologies and the uptake of Feed-in Tariffs in Wales](#), July 2012 [accessed 16 May 2013]

³⁷ Welsh Government, [A low carbon revolution, the Welsh Assembly Government's Energy Policy Statement](#), 2010 [accessed 10 May, 2013]

³⁸ Ofgem (website) [Feed-in-Tariff reports](#) [accessed 8 May 2013]

³⁹ *ibid*

Table 3: Installed capacity of generating units in Wales eligible for Feed-in-Tariffs as of July 2013

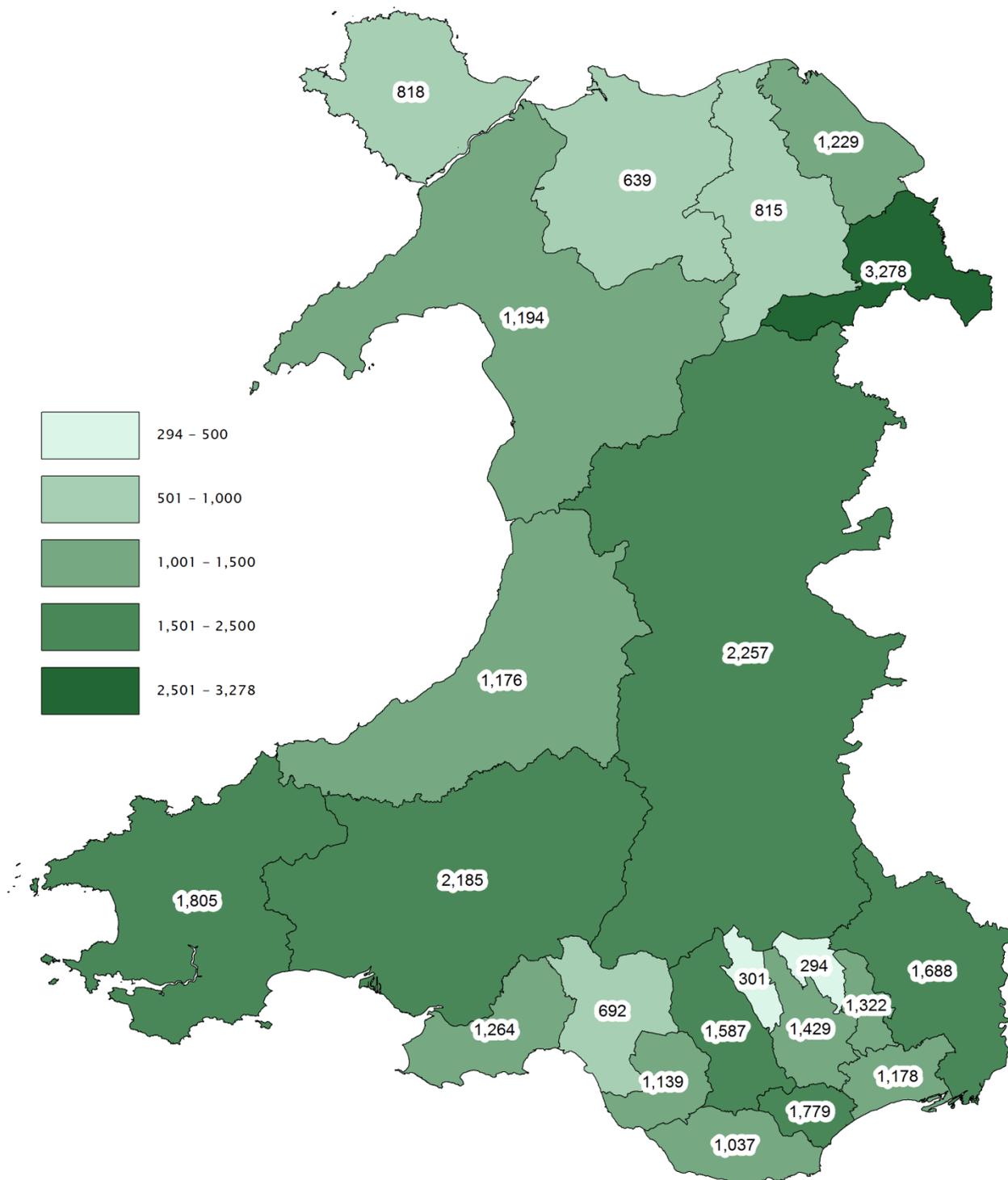
	Number of installations			
Technology	Domestic Installations	Commercial & Industrial Installations	Community Installations	Total Installations
Hydro	37	7	0	44
Micro CHP	18	0	0	18
Photovoltaic	27,992	736	68	28,796
Wind	209	34	2	245
Total Installations	28,256	777	70	29,103
	Installed Capacity (MW)			
Technology	Domestic Installations	Commercial & Industrial Installations	Community Installations	Total Installations
Hydro	0.3	0.4	0.0	0.7
Micro CHP	0.0	0.0	0.0	0.0
Photovoltaic	84.7	7.8	0.7	93.2
Wind	1.7	0.4	0.0	2.0
Total Installed Capacity (MW)	86.7	8.6	0.7	96.0

Source: Ofgem

In July 2013 Wrexham, Powys and Carmarthenshire have the highest number of FiT installations (figure 16). Powys, Carmarthenshire and Pembrokeshire have the greatest installed capacity in receipt of FiTs (figure 17).

The lowest numbers of FiT installations currently are in Blaenau Gwent, Merthyr Tydfil, Conwy, Neath Port Talbot, Conwy and Denbighshire.

Figure 16: Total number of installations receiving feed-in-tariffs by local authority (July 2013)

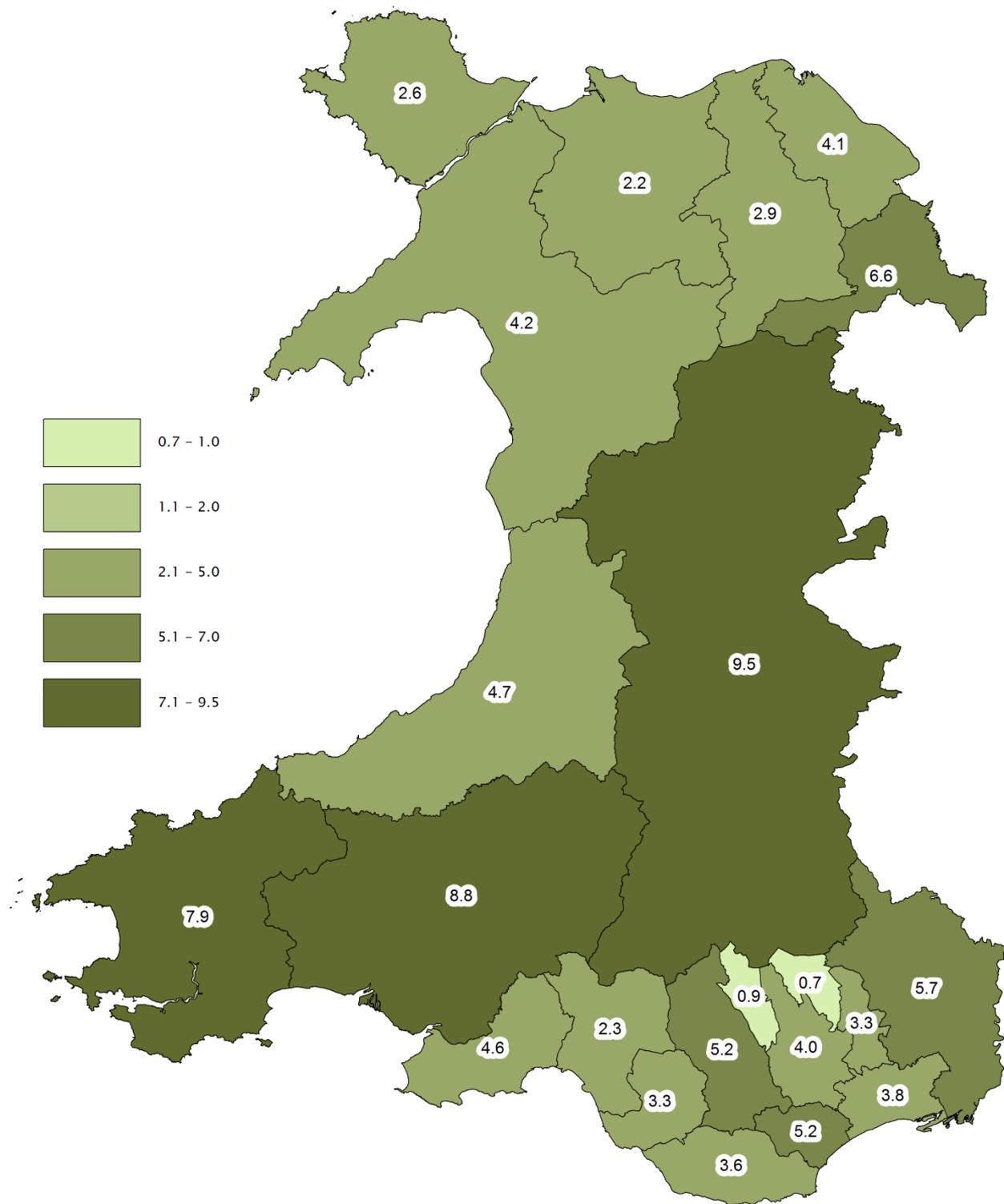


Source: Ofgem

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Figure 17: Total capacity (Megawatts) of installations receiving feed-in-tariffs by local authority (July 2013)



Source: Ofgem

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