

# South Gloucestershire Renewable Energy Progress Report

2019-20



---

This report was produced for South Gloucestershire Council

---

Issue date 14/04/2021

---

Version Draft 2

---

Written by: Grace Millman  
Analyst

---

Approved by: Joel Venn  
Head analyst

---

Regen, Bradninch Court. Exeter, EX4 3PL  
T +44 (0)1392 494399 E admin@regen.co.uk www.regen.co.uk  
Registered in England No: 04554636

---

All rights reserved. No part of this document may be reproduced or published in any way (including online) without the prior permission of Regen

---

## Table of contents

South Gloucestershire Renewable Energy Progress Report .....	1
2019-20 .....	1
1. Introduction .....	4
2. Methodology.....	4
2.1 Data collection and verification .....	4
2.3 Assumptions.....	5
3. Findings .....	7
3.1. Total installed capacity by renewable energy technology.....	7
3.2. New capacity installed between September 2019 and September 2020.....	8
3.3. Energy consumption in South Gloucestershire.....	10
3.4. Renewable energy generation in South Gloucestershire .....	10
3.5. Consumption met by local renewables.....	11
3.6. Progress towards net zero .....	12
4. Reconciliation to the 2019 report.....	14
Appendix 1 – Map .....	16
Appendix 2 – Table of projects over 0.5 MW .....	17

# 1. Introduction

South Gloucestershire Council declared a climate emergency in July 2019, pledging to provide the leadership to enable South Gloucestershire to become carbon neutral by 2030. The Council’s Climate Emergency Strategy is available to download [here](#).

In addition, the Council is a signatory to the UK100 pledge. The revised UK100 pledge (signed November 2020) commits the Council to net zero council emissions by 2030 and net zero area-wide emissions by 2045. As part of that pledge, the Council is committed to maximising the generation of renewable energy from installations located within South Gloucestershire. To monitor progress against the area’s net zero ambitions, this report analyses South Gloucestershire’s renewable energy generation and compares it to local energy consumption.

This report covers the period of September 2019 to September 2020. The analysis follows on from the previous South Gloucestershire Renewable Energy Progress Report.

## 2. Methodology

### 2.1 Data collection and verification

Data on renewable projects and capacities has been collected, cleansed, verified, and analysed from a range of sources including:

- Feed in Tariff (FIT) installation reports
- Renewable Energy Guarantee of Origin (REGO) register
- Renewable Energy Planning Database
- Renewable Heat Incentive installation (RHI) reports
- Renewables Obligation (RO) register.

The data collected was totalled for each technology type, giving an installed capacity total (in MW) and the total number of projects. These totals were compared to the Department of Business, Energy and Industrial Strategy (BEIS) Renewable Electricity by Local Authority database, which allows for partial verification<sup>1</sup>. However, a number of potential errors in these databases were identified this year, as discussed in Section 4: Reconciliation to the 2019 report.

### 2.2 Calculating generation and progress towards the target

Total renewable generation can be estimated for each technology type by multiplying installed capacity and an average load factor.

---

<sup>1</sup>[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/920656/Renewable\\_electricity\\_by\\_local\\_authority\\_2014\\_to\\_2019.xlsx](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/920656/Renewable_electricity_by_local_authority_2014_to_2019.xlsx)

### Notes on load factors used:

- Load factors for each of the electricity generating technologies were calculated as an average of the five previous years' regional standard load factors for that technology<sup>2</sup>.
- In the case of biomass electricity projects, the load factor was also averaged with the Digest of UK Energy Statistics (DUKES)<sup>3</sup> figure.
- For landfill gas, the capacity factor was calculated from the number of Renewable Obligation Certificates awarded to the projects.
- Load factors for low carbon heat technologies were sourced from RHI load factors<sup>4</sup>, with an average used for biomass of 35%.

The capacity totals and load factors were used to calculate local renewable generation for South Gloucestershire.

Finally, the equivalent proportion of South Gloucestershire's annual energy consumption that is currently met from local renewable generation was calculated. To do this, the calculated local renewable generation results were compared to the South Gloucestershire annual consumption data, sourced from BEIS sub-national consumption data from 2018 (most recent data available)<sup>5</sup>.

## 2.3 Assumptions

Duplicate projects were removed where possible. However, in some instances, multiple installations were recorded at the same location at a similar time. The assumption was made that these were not duplicates but a project involving multiple installations, such as multiple homes in a housing development or campus installation.

When national renewable energy datasets are updated, they can sometimes add, delete, or update data from projects completed in previous years, due to new information. These updates have been incorporated where possible and can lead to differences in data between each year's progress report (see Section 4: Reconciliation to the 2019 report).

The RO and REGO datasets are checked against the Renewable Energy Planning Database with additional online research and stakeholder engagement to verify large-scale projects.

The Feed in Tariff closed for new projects on 31 March 2019. As a result of the scheme's closure, there is no longer a public dataset available for small-scale electricity projects. The analysis assumes that

---

<sup>2</sup>[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/920660/Regional\\_renewables\\_2009-2019\\_-\\_Std\\_Load\\_Factors.xls](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/920660/Regional_renewables_2009-2019_-_Std_Load_Factors.xls)

<sup>3</sup>[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/904826/DUKES\\_6.5.xls](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/904826/DUKES_6.5.xls)

<sup>4</sup>[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/929968/rhi-nd-monthly-forecast-september-2020.xlsx](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/929968/rhi-nd-monthly-forecast-september-2020.xlsx)

<sup>5</sup>[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/926465/Subnational\\_total\\_final\\_energy\\_consumption\\_statistics.xlsx](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/926465/Subnational_total_final_energy_consumption_statistics.xlsx)

the number of small-scale electricity projects installed in this period is in line with the BEIS Renewable Electricity by Local Authority database<sup>6</sup> in both number and capacity.

It is assumed that a portion of energy generated from energy from waste (EfW) plants is unlikely to be renewable. According to the Severnside EfW plant, 60% of the waste is biodegradable and once calorific values are considered, 50% of the plant's generation can be considered biodegradable and renewable<sup>7</sup>. To account for this, only 50% of the capacity of EfW plants has been included in this report.

---

6

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/920656/Renewable\\_electricity\\_by\\_local\\_authority\\_2014\\_to\\_2019.xlsx](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/920656/Renewable_electricity_by_local_authority_2014_to_2019.xlsx)

<sup>7</sup> [Defra, 2014. Energy from waste A guide to the debate.](#)

## 3. Findings

### 3.1. Total installed capacity by renewable energy technology

In September 2020, South Gloucestershire had 152.4 MW of installed renewable energy capacity, across 4,727 heat and electricity projects, shown in Table 1. The top ten largest capacity projects remain the same as the previous year, with the largest commissioned project in the past year being a 1.25 MW solid biomass boiler.

*Table 1 - Summary of total installed capacity in South Gloucestershire*

Technology	Total electrical capacity (MW)	Total thermal capacity (MW)	Number of projects	Percentage of installed capacity
Biomass	9.5	7.4	86	11%
Energy from waste	16.0	-	1	10%
Heat pumps	-	5.6	385	4%
Landfill gas <sup>8</sup>	7.6	-	4	5%
Onshore wind	8.3	-	12	5%
Solar PV – ground mounted	74.5	-	8	49%
Solar PV – rooftop	23.3	-	4,128	15%
Solar thermal	-	0.3	102	0%
Hydropower	0.001	-	1	0%
<b>Total</b>	<b>139.1</b>	<b>13.3</b>	<b>4,727</b>	

Solar PV projects, including both rooftop and ground-mounted solar, represent around two thirds (70.3%) of renewable electricity capacity in South Gloucestershire and 99.5% of installed renewable electricity project numbers. They also account for 87.5% of all renewable projects in the local authority area. Severnside Energy Recovery Centre remains the largest capacity renewable site within the area at 32 MW, with 16 MW of this assumed to be renewable.

Biomass heat projects comprise 56% of renewable heat capacity with a total capacity of 7.4 MW, as seen in Figure 1. Heat pumps represent 67.4% of renewable heat projects by number, with 27 projects being commissioned between September 2019 and September 2020.

---

<sup>8</sup> The amount of methane gas captured from decomposing waste is decreasing due to greater proportions of organic waste being diverted away from landfill sites

## Renewable capacity in South Gloucestershire (MW)

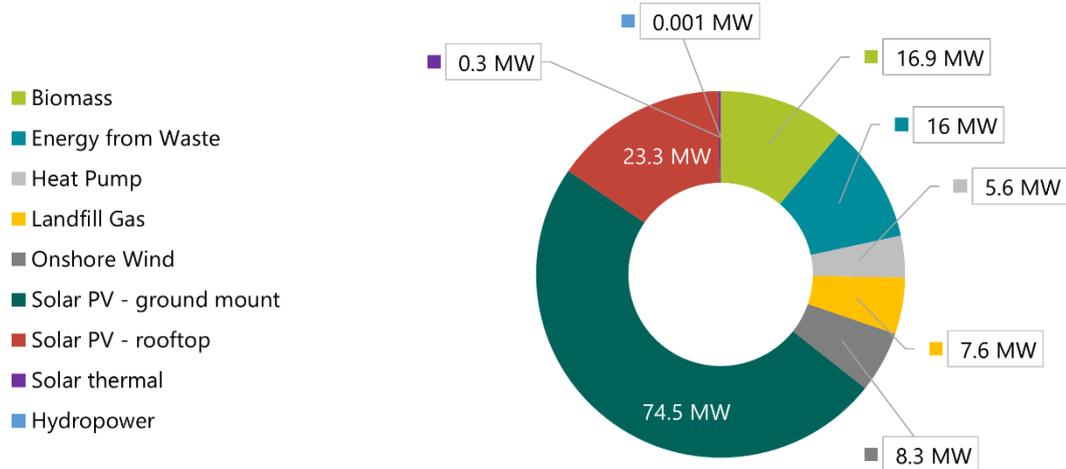


Figure 1 - Total installed capacity in South Gloucestershire by technology

### 3.2. New capacity installed between September 2019 and September 2020

Between September 2019 and September 2020, 100 new commissioned renewable energy projects have been identified. The total capacity of renewable generation projects in South Gloucestershire increased by 3.24 MW, which is almost five times the previous year's increase (0.7 MW). This period only saw three types of renewable technology commissioned: biomass boilers, heat pumps, and rooftop solar PV projects. The number and capacity of new projects is explored in Table 2 and Figure 2.

Table 2 – Summary of new capacity and projects installed in South Gloucestershire between September 2019 and September 2020 by technology

Technology	Total electrical capacity (MW)	Total thermal capacity (MW)	Total capacity (MW)	Number of projects
Biomass	0.24	1.97	2.21	2
Heat pumps	-	0.55	0.55	27
Solar PV - rooftop	0.47	-	0.47	71
<b>Total</b>	<b>0.71</b>	<b>2.52</b>	<b>3.24</b>	<b>100</b>

New renewable projects installed between Sept 2019 and Sept 2020 by capacity (MW)

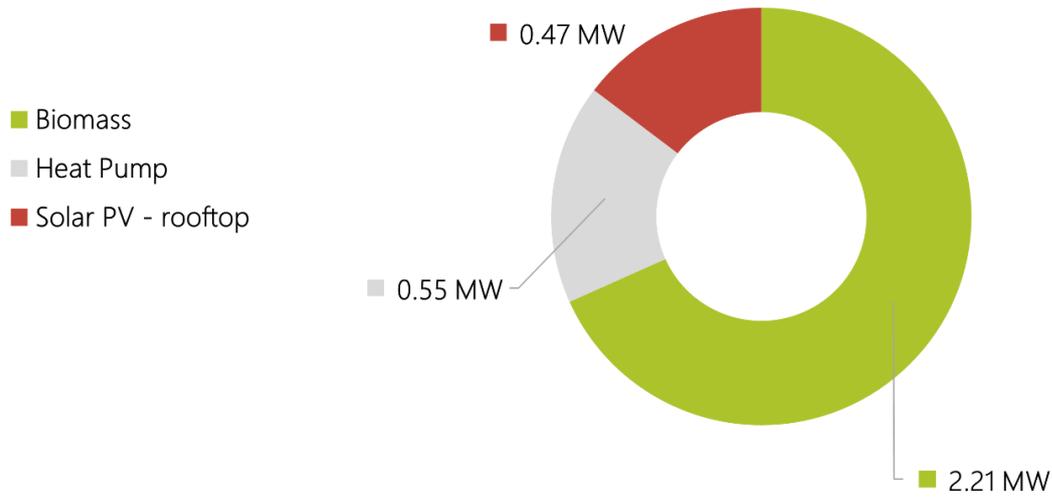


Figure 2 – Capacity installed between September 2019 and September 2020 by technology in South Gloucestershire

There are two stand-alone battery storage sites that were granted planning permission in 2017 and are still awaiting construction according to the REPD. In order to construct a battery storage site, planning permission, grid connections, an asset and a business model are all required. These sites are likely to be either awaiting a grid connection or a business model to continue forward. There is also a solar farm with associated battery storage that has been granted planning permission in January 2021 and is now awaiting construction.

Renewable capacity has been increasing over the past decade, although the rate of increase in renewable capacity has slowed in recent years. This trend can be seen across the UK, as seen in Figure 3 which depicts the annual rate of renewable electricity capacity installed in South Gloucestershire and the UK.

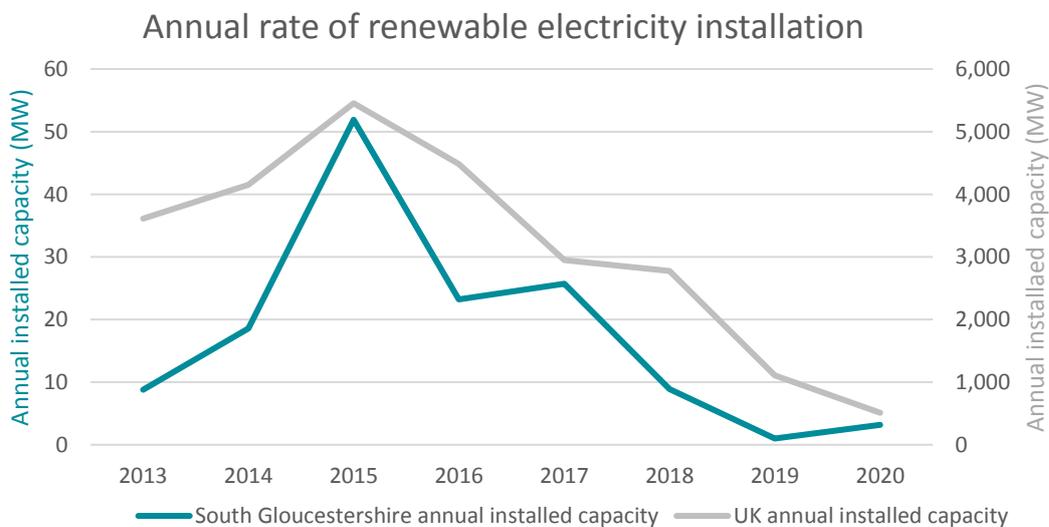


Figure 3: Annual rate of renewable electricity installation

### 3.3. Energy consumption in South Gloucestershire

South Gloucestershire has seen a decrease in total energy consumption from 7,843 GWh in 2005 to 7,069 GWh in 2018. Figure 4 shows that this has not been a linear progression: consumption was lowest in 2011 at 6,810 GWh.

Domestic bioenergy consumption increased by the greatest amount since 2008, with an additional 74.6 GWh of demand, whilst domestic gas consumption decreased the most by 167.3 GWh.

Industrial and commercial energy consumption has reduced by the most, reducing by 349 GWh between 2005 and 2008. Much of this reduction occurred rapidly between 2007 and 2008 during the economic recession.

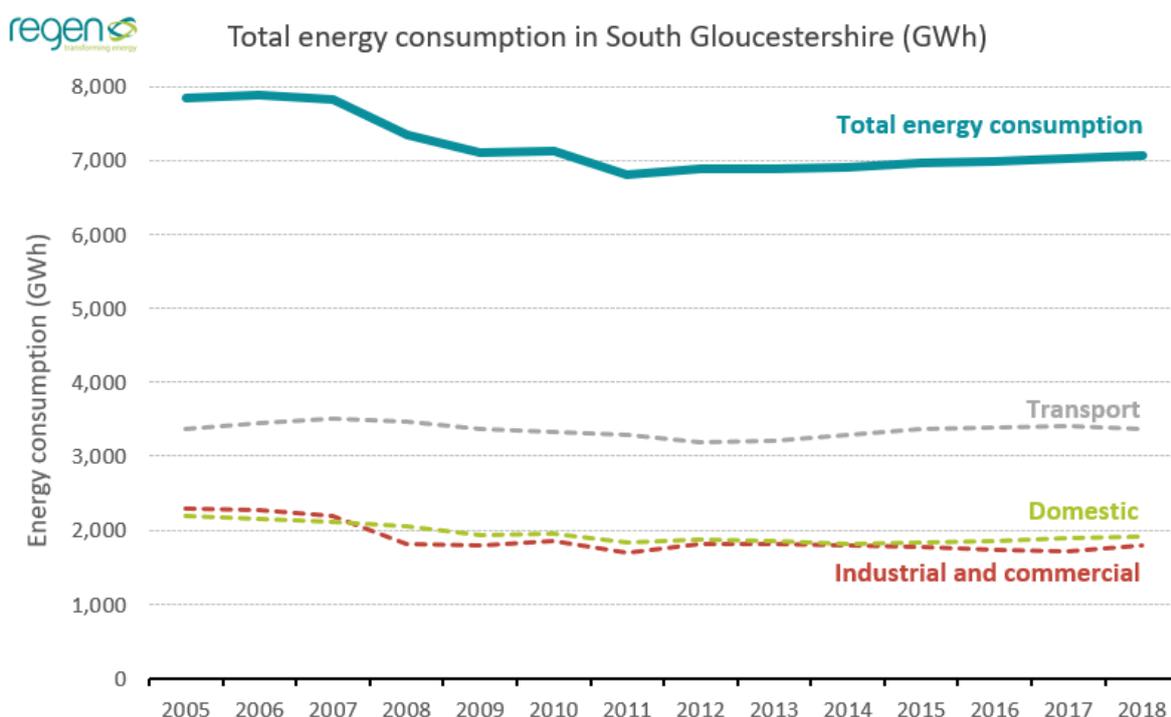


Figure 4 - South Gloucestershire total fuel consumption<sup>9</sup>

### 3.4. Renewable energy generation in South Gloucestershire

In September 2020, estimated annual renewable generation in South Gloucestershire was 260 GWh, as detailed in

Table 3. This estimated figure is lower than the figure recorded in the 2019 report, due to updated load factors coupled with low growth in installed capacity and the adjustment to the renewable proportion of generation at Severnside EfW plant. Figure 5 shows that Solar PV projects were the most significant contributors to renewable energy generation in the area, generating an estimated 94.1 GWh.

<sup>9</sup> Source: <https://www.gov.uk/government/statistics/total-final-energy-consumption-at-regional-and-local-authority-level-2005-to-2018>, 2018 is the most recent data available.

Table 3 - Summary of total renewable energy generation in South Gloucestershire (September 2020).

Technology	Total electrical generation (GWh)	Total thermal generation (GWh)	Total generation (GWh)
Biomass	41.7	22.9	64.6
Energy from waste	49.4	-	49.4
Heat pumps	-	9.2	9.2
Landfill gas	23.8	-	23.8
Onshore wind	18.4	-	18.4
Solar PV – ground mounted	71.7	-	71.7
Solar PV – rooftop	22.4	-	22.4
Solar thermal	-	0.1	0.1
Hydropower	0.002	-	0.002
<b>Total</b>	<b>227.4</b>	<b>32.2</b>	<b>259.6</b>



Annual renewable energy generation in South Gloucestershire

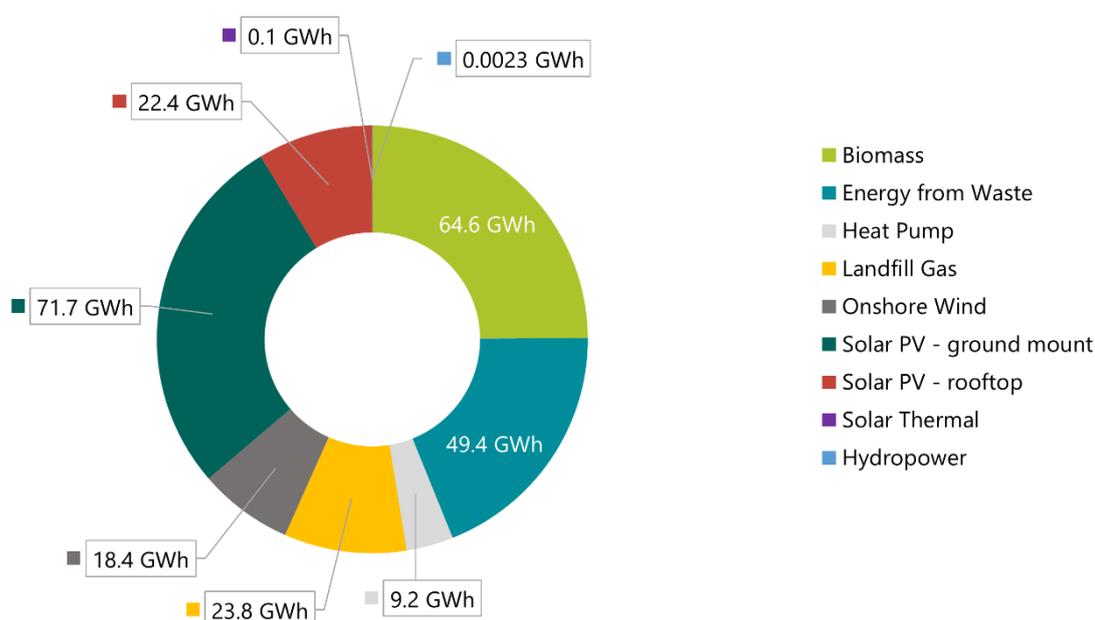


Figure 5 - Total renewable energy generation in South Gloucestershire by technology as of September 2020

### 3.5. Consumption met by local renewables

The equivalent of 3.7% of South Gloucestershire’s total fuel demand was supplied by local renewable energy generation in September 2020. It is worth noting that total generation was lower in 2020 than was recorded in the 2019 report due to updated load factors. Table 4 shows that renewable electricity supplies 19.4% of South Gloucestershire’s total electricity demand. Currently, renewable heat production in the region is significantly lower than renewable electricity generation.

Table 4 – Summary of consumption met by local renewable energy generation in South Gloucestershire

Energy type	2018 total demand <sup>10</sup> (GWh)	Current annual renewable energy generation <sup>11</sup>	2018 consumption met by local renewable generation
Electricity	1,174	227.4	19.4%
Heat (based on gas consumption only)	1,866	32.2	1.7%
Transport	3,377	-	-
Other	652	-	-
<b>Overall<sup>12</sup></b>	<b>7,069</b>	<b>259.6</b>	<b>3.7%</b>

It should be noted that a percentage of transport energy consumption is met from renewable fuels due to the government’s Renewable Transport Fuels Obligation. However, it is difficult to track this locally. There are currently 4,835<sup>13</sup> electric vehicles in the area, as of September 2020.

### 3.6. Progress towards net zero

The Council is a signatory to the revised UK100 pledge, which commits the Council to net zero council emissions by 2030 and net zero area-wide emissions by 2045. As part of that pledge, the Council is committed to maximising the generation of renewable energy from installations located within South Gloucestershire.

In September 2020, local renewable energy generation accounted for the equivalent of 3.7% of South Gloucestershire’s total fuel consumption or 9% of total electricity and gas consumption.

This report has not produced an estimate of future energy demand. Future energy demand will affect progress towards South Gloucestershire’s 2030 net zero target. A number of factors should be noted:

- As electric vehicles start to play a stronger role in the area’s transportation, the impact will be to increase electricity demand whilst decreasing fossil fuelled transport demand. However, electric vehicles are significantly more efficient than fossil fuelled vehicles and coupled with demand reduction through increased use of public transport, there should be an overall net reduction in energy demand in the area.
- The decarbonisation of heat in the area is likely to be predominately through electrification, such as the installation of individual heat pumps or district heat networks using shared ground loops. This will decrease the area’s gas/fossil fuelled heat demand, but increase electricity demand – as with transport, heat pumps are considerably more efficient than fossil fuelled heating and so the increase in electricity demand will be lower than the comparative decrease in gas/fossil heating demand.

<sup>10</sup><https://www.gov.uk/government/statistics/total-final-energy-consumption-at-regional-and-local-authority-level-2005-to-2018>

<sup>11</sup> As of September 2020.

<sup>12</sup> Not including bioenergy and waste.

<sup>13</sup>Source:[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/853462/veh0131.ods](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/853462/veh0131.ods)

- Energy efficiency measures should lead to an overall reduction in demand, although this will be offset to a certain extent by new developments in the area. The energy standards required of these new developments will also impact on future energy demand.

An ongoing study, the Renewable Energy Resource Assessment Study (RERAS), is looking to provide estimates of future energy demand and guidance on what an appropriate target for renewable energy could be in South Gloucestershire. The findings of the RERAS will be reflected in next year's annual progress report.

## 4. Reconciliation to the 2019 report

The 2019 progress report published in 2020 showed a total of 170 MW of installed capacity, which is greater than the 152.4 MW total now calculated for this 2020 report. Due to data refinements, the 2019 total has been recalculated and is now 149.2 MW. This means that there was a capacity increase in 2020 of 3.2 MW, but that it does not show up when the total is compared to last year’s report. The main reasons for the reducing the 2019 capacity total are:

- It has been identified that 50% of Severnside EfW plant’s generation is from biodegradable waste and, therefore, only 50% of Severnside’s capacity and generation can be classified as renewable. This is based on the DEFRA definition of EfW as a partially renewable energy source<sup>14</sup>. This same percentage has been applied to previous years’ EfW generation and capacity, in addition to this report’s generation and capacity.
- A number of ground-mounted solar PV sites have been identified as likely duplicates in the BEIS Renewable Energy Statistics database and the BEIS Renewable Energy Planning Database. These assumed duplicates totalled 11.9 MW and are centred around the Oakham Farm project. We have contacted the developer several times and are awaiting confirmation from them that Oakham Farm’s capacity is 4.6 MW, rather than over 16 MW. These duplicates have been removed from previous years’ capacity and generation.

The revised annual capacity increases are illustrated in Figure 6 below.

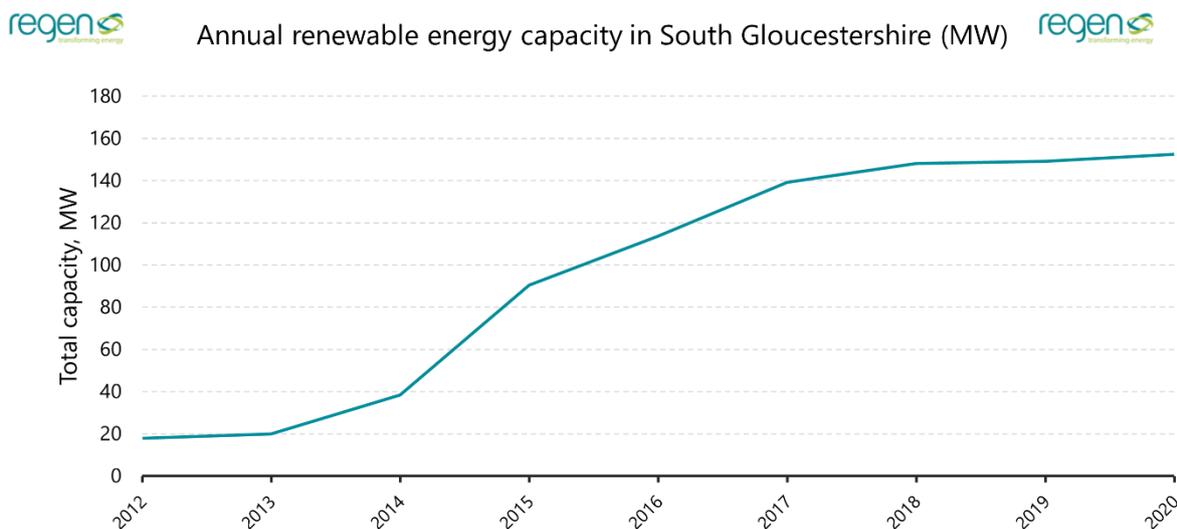


Figure 6: Revised annual renewable energy capacity growth in South Gloucestershire

Table 5 shows the impact of this capacity revision on both the generation total and the comparison with the consumption figure.

<sup>14</sup> [Defra, 2014. Energy from waste A guide to the debate.](#)

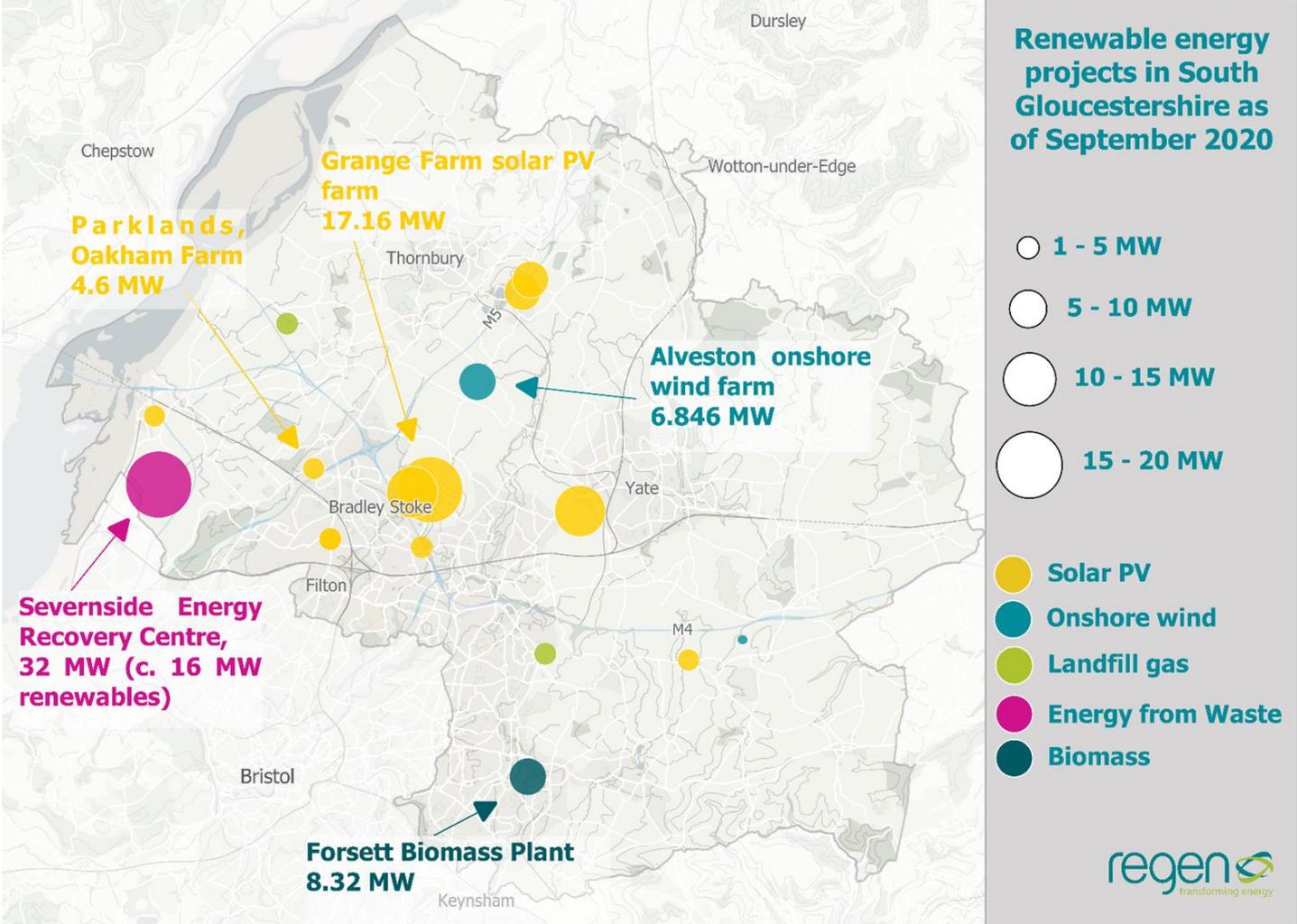
Table 5: Reconciliation between 2019 and 2020

	As calculated for 2019 in 2019 report	As calculated for 2019 in 2020 report	As calculated for 2020 in 2020 report
<b>Installed renewable energy capacity (MW)</b>	179	149.2	152.4
<b>Total energy consumption (GWh)<sup>15</sup></b>	6,894	7,069	7,069
<b>Renewable energy generation (GWh)</b>	329	257	260
<b>% consumption met by local renewable generation</b>	4.8%	3.6%	3.7%

---

<sup>15</sup> The latest available authority energy demand statistics are for the calendar year 2018. Therefore, South Gloucestershire’s energy consumption figure for 2018 (7,069 GWh) has been used for recalculating the percentage of consumption met by local renewable generation in 2019, in addition to in the latest 2020 calculations.

# Appendix 1 – Map



## Appendix 2 – Table of projects over 0.5 MW

Technology	Project name/site	Capacity (MW)	Commissioning date	Estimated generation (GWh)
Solar PV – ground mount	Grange Farm Coenergy	17.2	11/12/2014	16.5
	Hammond Court Farm	15.0	31/03/2015	14.4
	Says Court	14.9	31/03/2014	14.4
	Tower Hill Farm	8.1	30/03/2015	7.8
	Tower Hill Farm	7.1	30/03/2015	6.8
	Parklands	4.6	15/02/2016	4.4
	Solar Farm Ring O Bells	4.1	17/08/2016	3.9
	Severn Beach	3.5	29/03/2016	3.4
Solar PV – rooftop	Rolls Royce Filton Campus building 185	1.8	15/08/2016	1.7
	Ancor Flexibles	1.7	01/11/2015	1.6
	Rolls Royce Filton Campus building 184	1.4	15/08/2016	1.3
		0.8	18/12/2015	0.7
Biomass	RLGS – 308	8.3	23/04/2017	36.0
	-	1.3	31/10/2019	3.9
	-	0.9	21/12/2015	3.0
	Avonmouth RSU	0.9	24/09/2010	4.2
	-	0.7	31/10/2010	2.2
Landfill gas	Shortwood Landfill gas	3.4	15/07/2010	11.0
	Harn Hill Quarry landfill site	2.6	01/10/1996	8.5
	Harn Hill Quarry landfill site	0.9	01/12/1996	2.7
	Berwick Farm Power Plant – A	0.6	01/08/2005	1.6
Onshore wind	Alveston Wind Park Limited	6.8	30/11/2017	15.3
	-	0.5	04/12/2014	1.1
Energy from Waste	Sevenside energy recovery centre*	16.0	14/12/2016	49.4
Heat pump	-	1.3	14/05/2018	2.2

\*Sevenside’s total capacity is 32 MW, however, only half of its generation is renewable. For further information see the note on Sevenside in Section 4 of the report.