

# Renewable energy generation target for the Chichester District

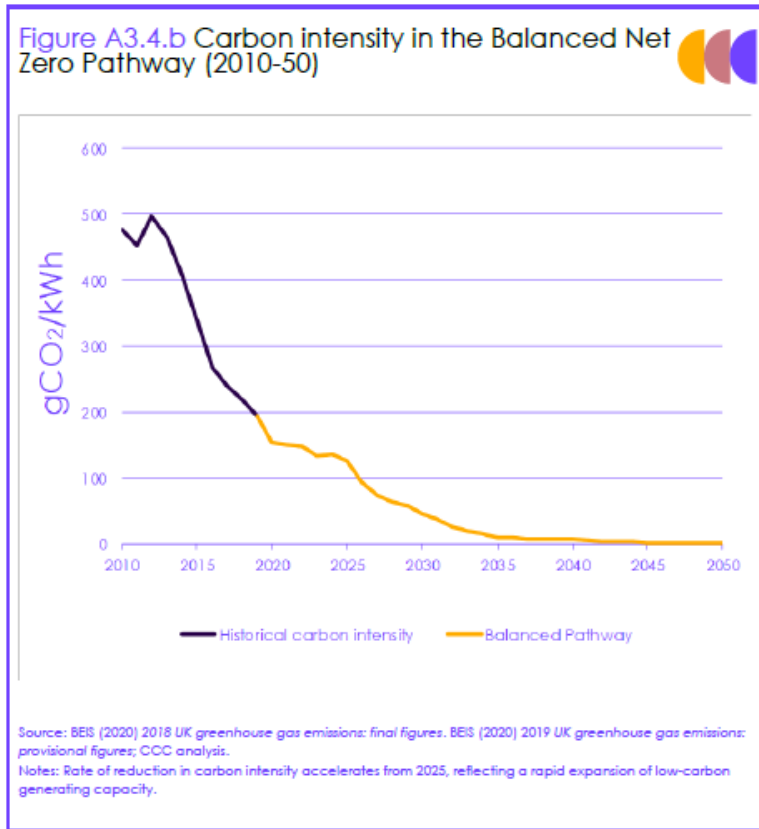
u3a Climate Change Group

Wednesday 6th December 2023

Tom Broughton

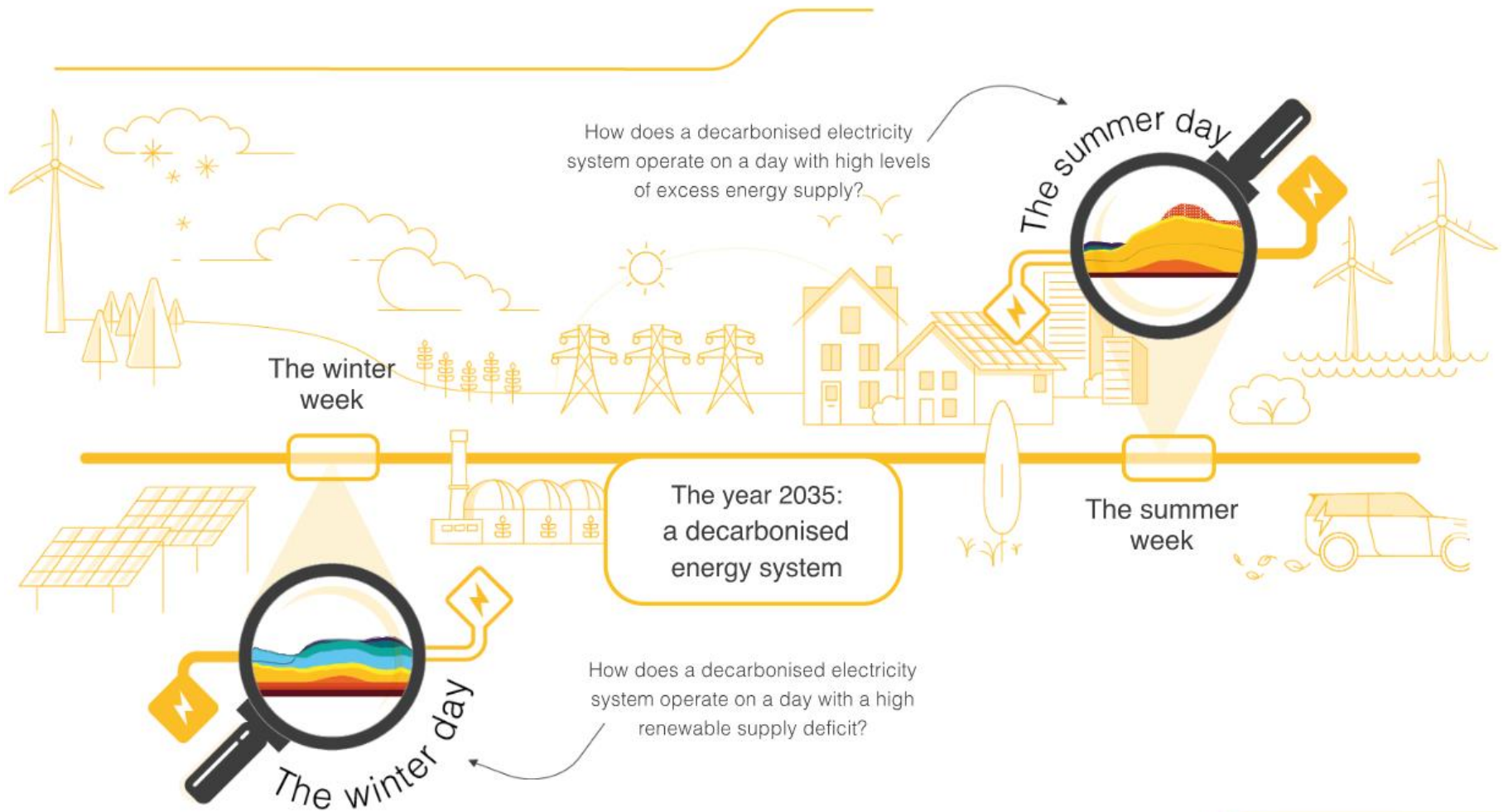
# Good News!

- Decarbonisation of Electricity



2012 - 496g/kWh  
2019 – 193g/kWh  
2035 – 10g/kWh  
2050 – 2g/kWh

<https://www.theccc.org.uk/wp-content/uploads/2020/12/Sector-summary-Electricity-generation.pdf>



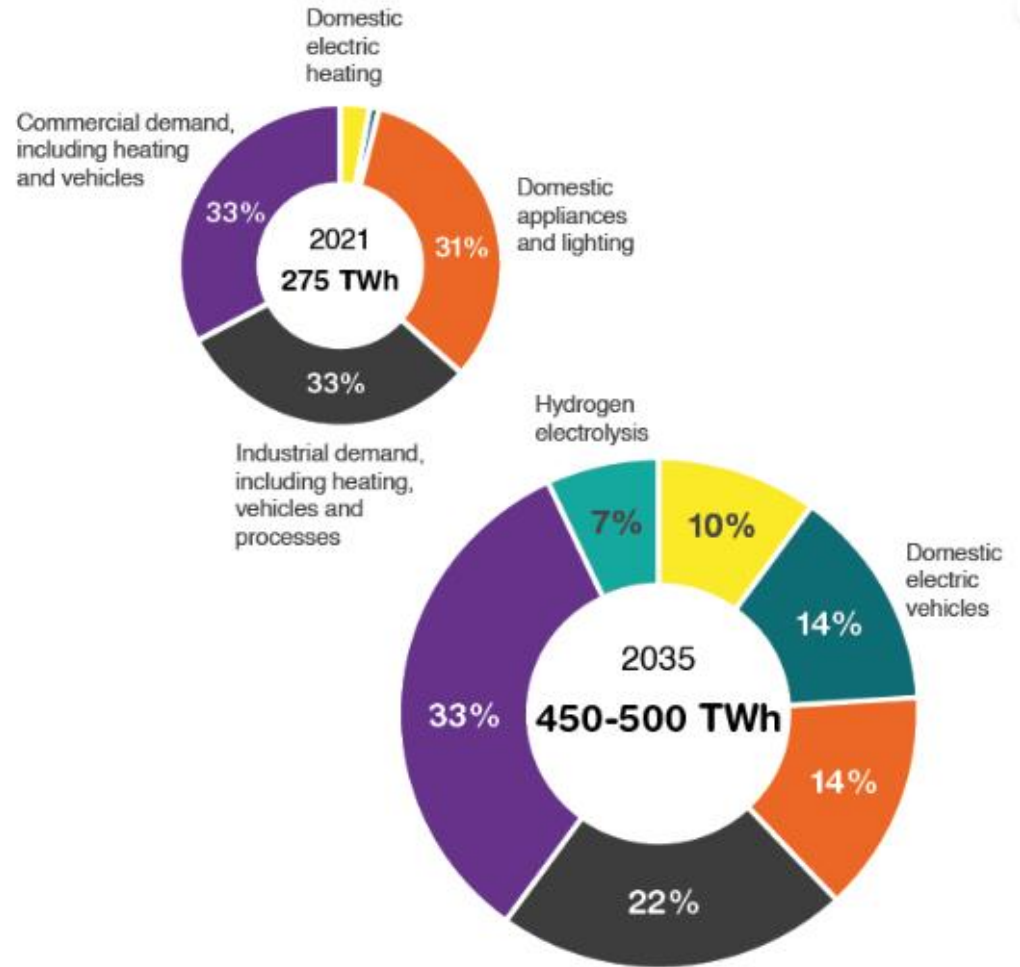
regen  
transforming energy

nationalgridESO

<https://reports.nationalgrideso.com/bridgingthegapdayinthelife/>

## Electricity consumption in the 2035 net zero system, compared to 2021

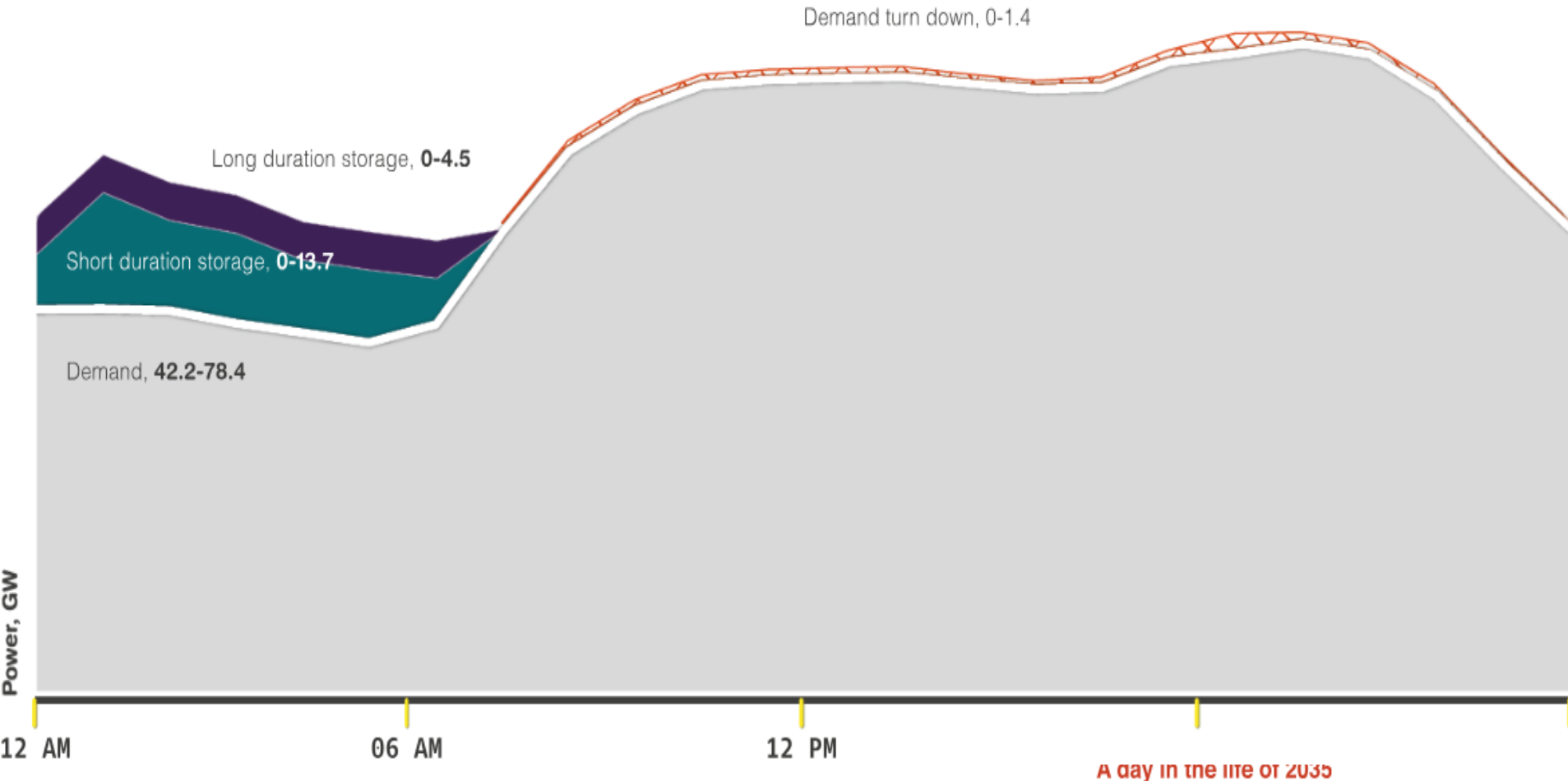
A  
decarbonised  
electricity  
system



<https://reports.nationalgrideso.com/bridgingthegapdayinthelife/>

# A day in the life – Winter day

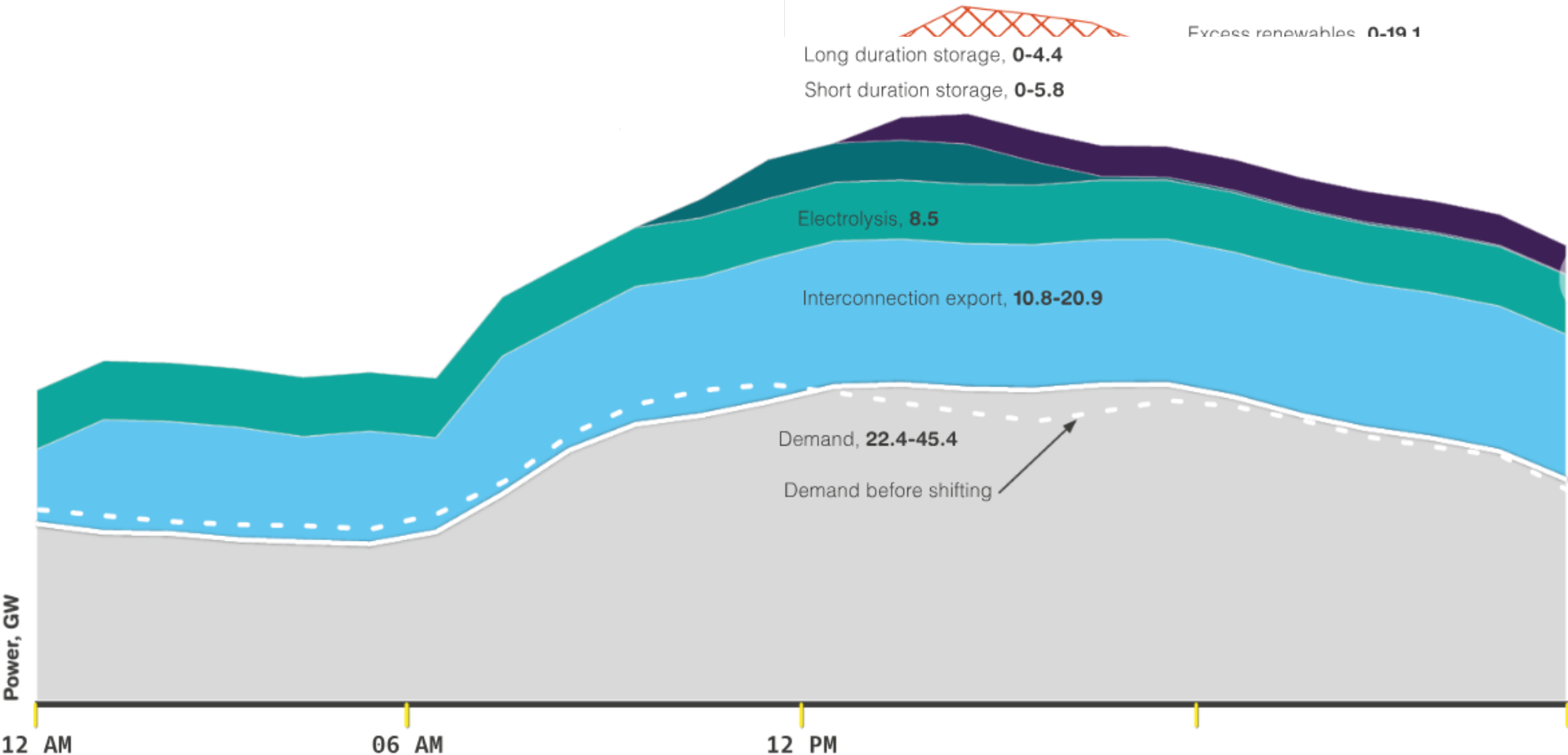
Nuclear: 8-10 GW installed capacity from large nuclear power stations



A day in the life of 2035

<https://reports.nationalgrideso.com/bridgingthegapdayinthelife/>

# A day in the life – Summer day



<https://reports.nationalgrideso.com/bridgingthegapdayinthelife/>

# What's needed and what can be sited in Chichester District?

**Long duration storage:** 4-5 GW installed capacity of pumped storage hydropower

**Short duration storage:** 19-21 GW installed capacity of battery storage and 1-2 GW of other energy storage like compressed fly wheel

**Hydrogen:** 10-15 GW installed capacity of hydrogen-fueled generation. A combination of blue, (natural gas with CCS) and green (electrolysis).

**Interconnection import:** 18-22 GW installed capacity of interconnection via multiple connections across Europe

**Other renewables:** 6-10 GW installed capacity of a combination of marine, hydropower, energy from waste and geothermal energy

**Wind:** 25-35 GW of onshore wind capacity, and 55-65 GW of offshore wind capacity

**Solar PV:** 40-50 GW installed capacity of solar photovoltaic, including large sites and roof top installations

**CCS gas:** 4-5 GW installed capacity of gas fired power plants with carbon capture and storage

**CCS biomass:** 6-7 GW installed capacity of bioenergy with carbon capture and storage

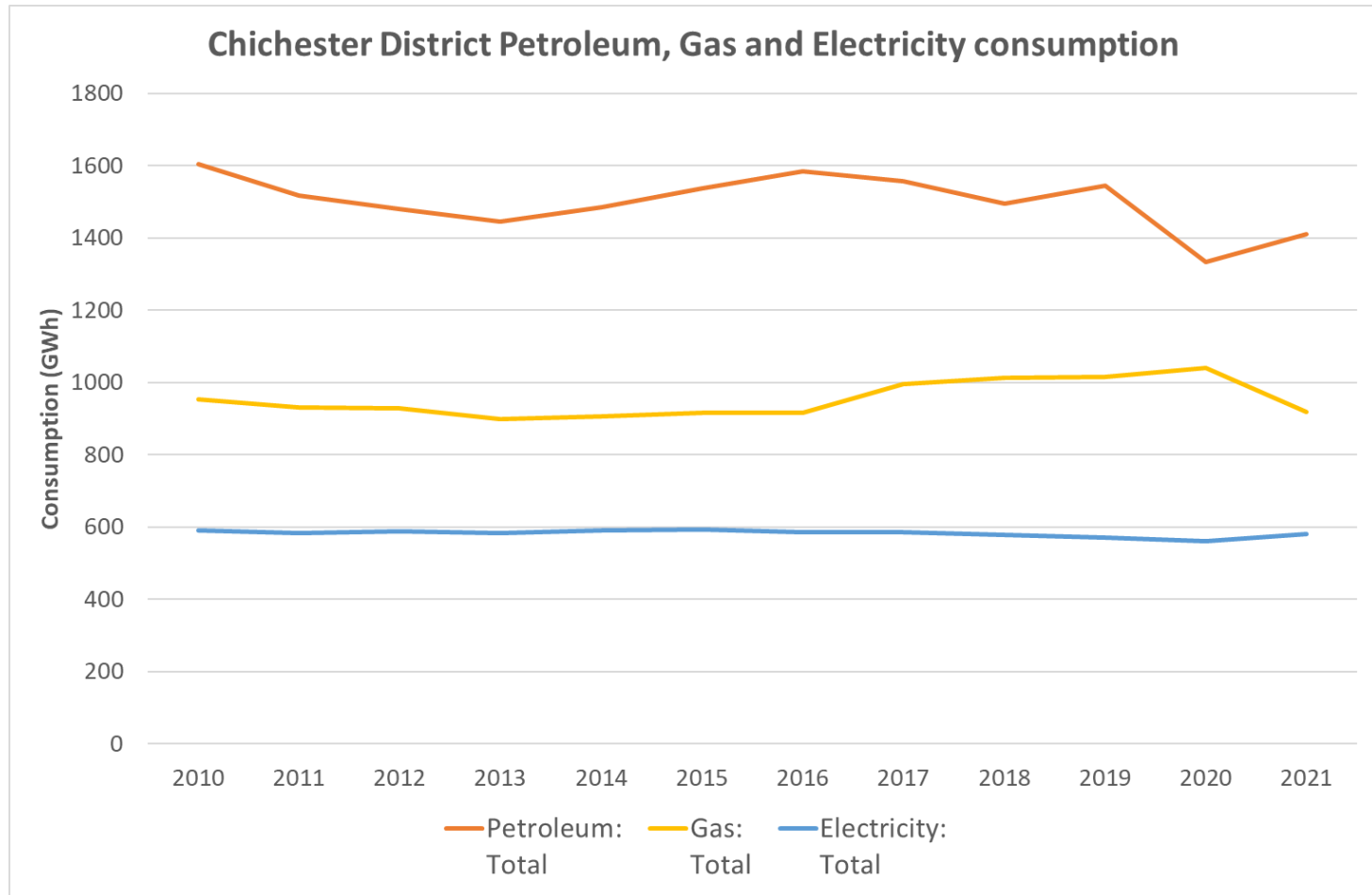
**Nuclear:** 8-10 GW installed capacity from large nuclear power stations

# What target for Chichester District?

- Meeting entire energy demand with renewable energy within district borders
- Allocation of Climate Change Committee's 6<sup>th</sup> Carbon Budget renewable energy target based on:
  - Area
  - Grandfathering



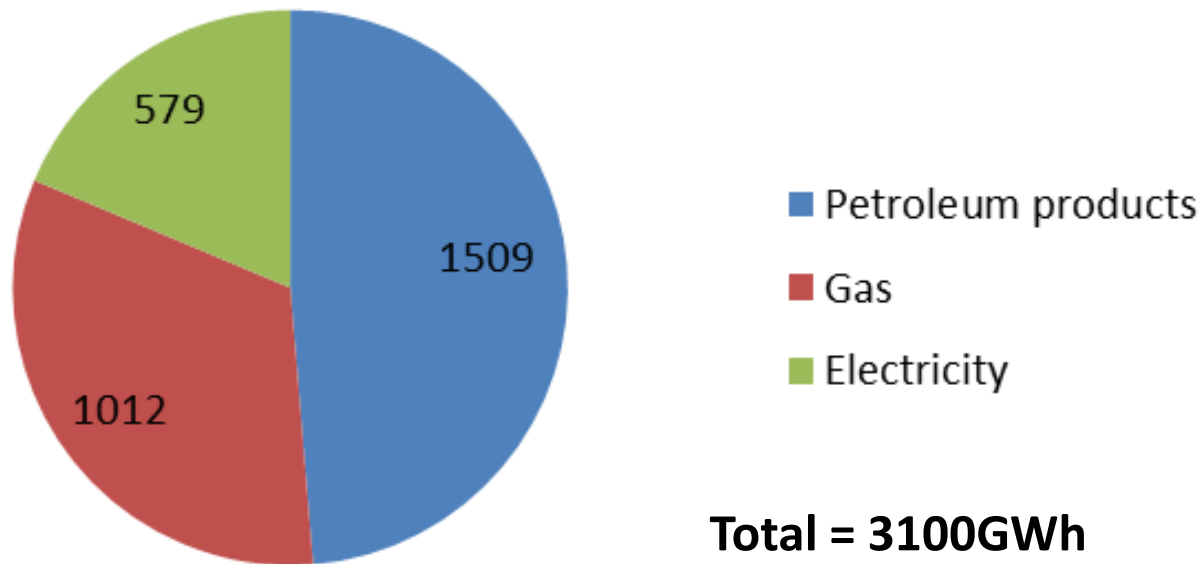
# What is energy demand?



<https://www.gov.uk/government/statistical-data-sets/total-final-energy-consumption-at-regional-and-local-authority-level>

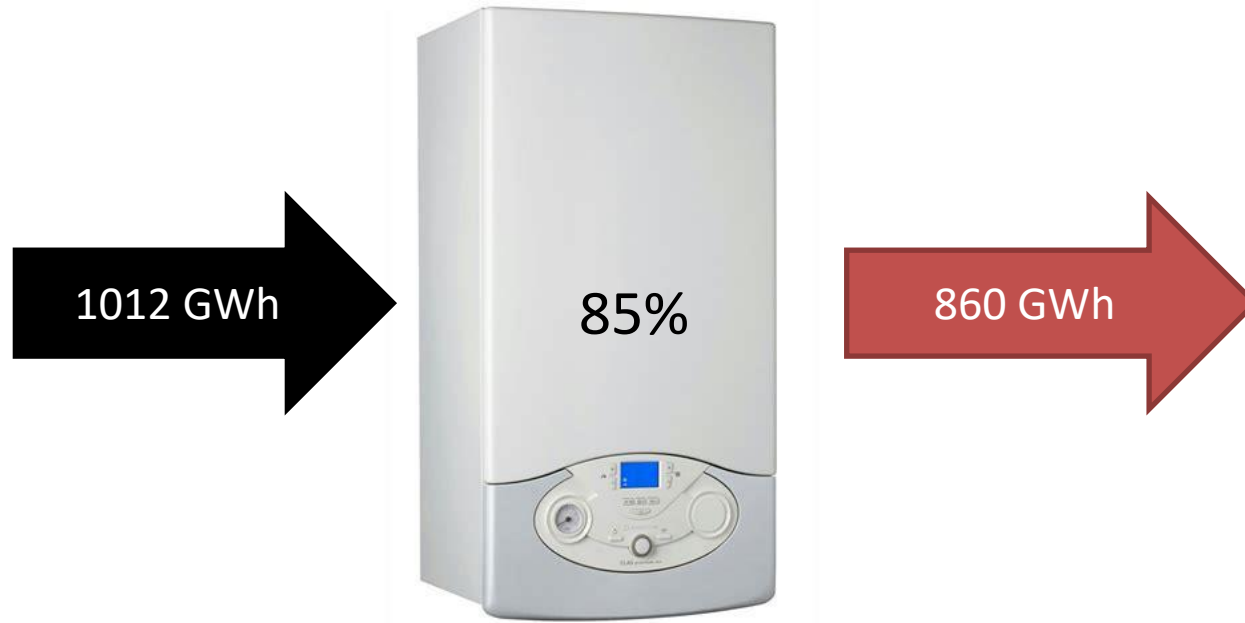
# What is energy demand?

## Chichester District Energy Consumption 2018 (GWh)



<https://www.gov.uk/government/statistical-data-sets/total-final-energy-consumption-at-regional-and-local-authority-level>

# Gas demand



# Meeting Heat Demand

573  
GWh



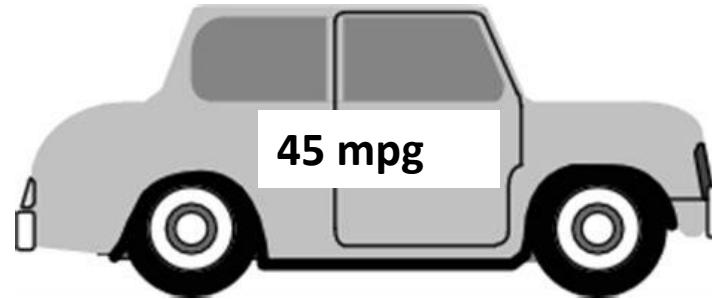
287 GWh

860 GWh

**1:3**

# Meeting Transport demand

1,509 GWh

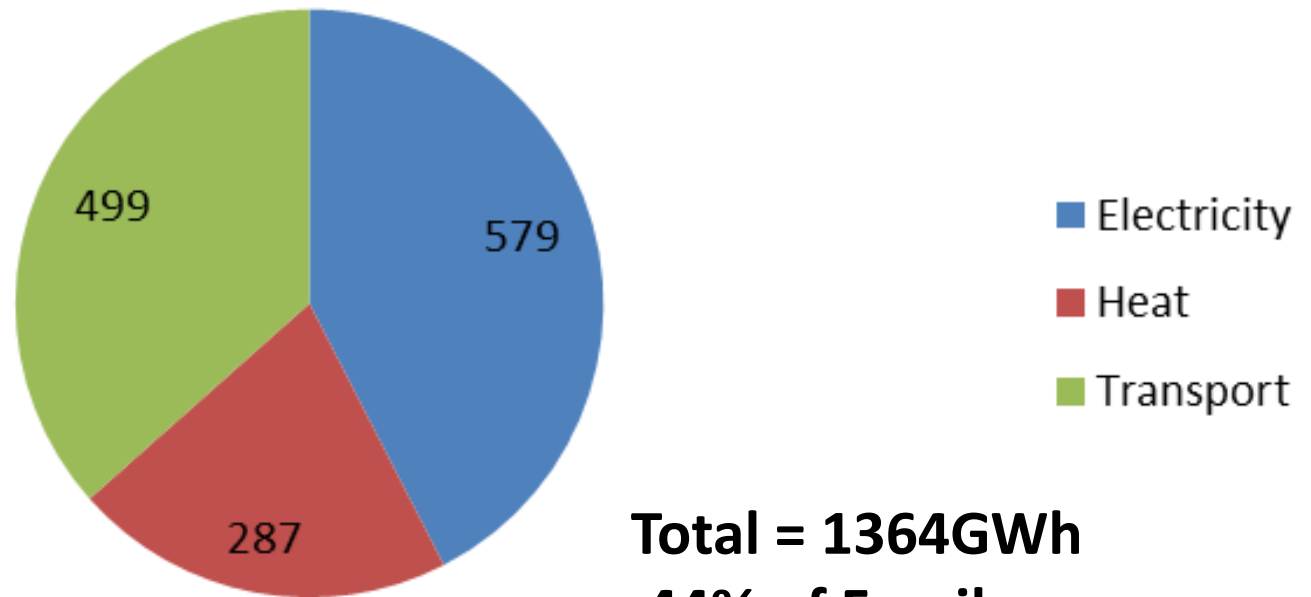


1,500,000,000 miles

499 GWh

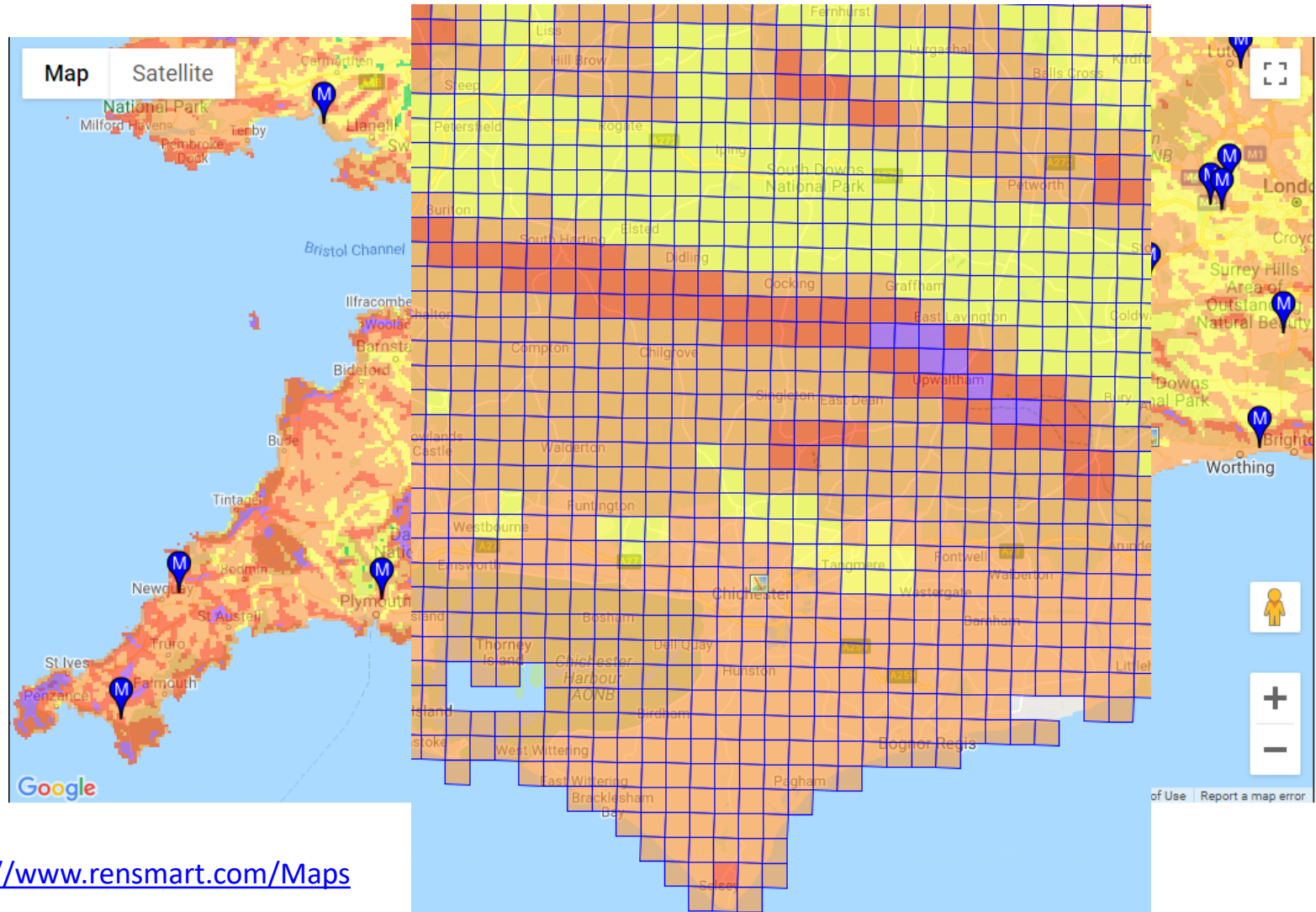


# Chichester District Electricity Demand (GWh)



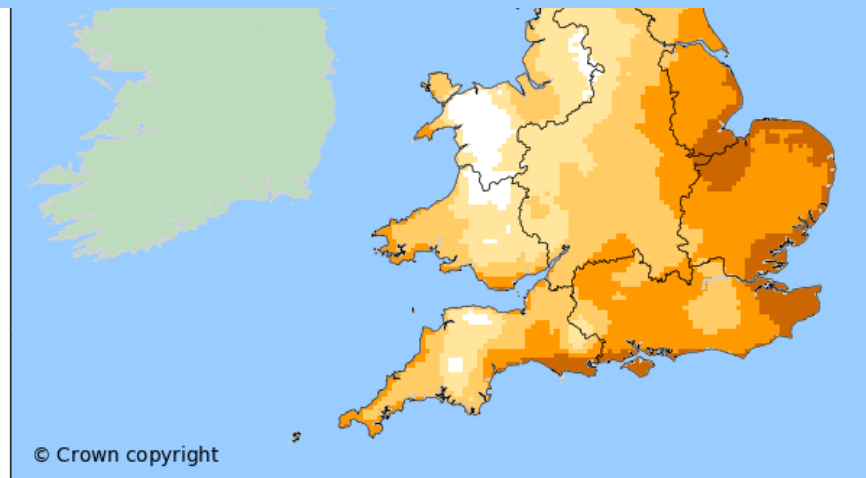
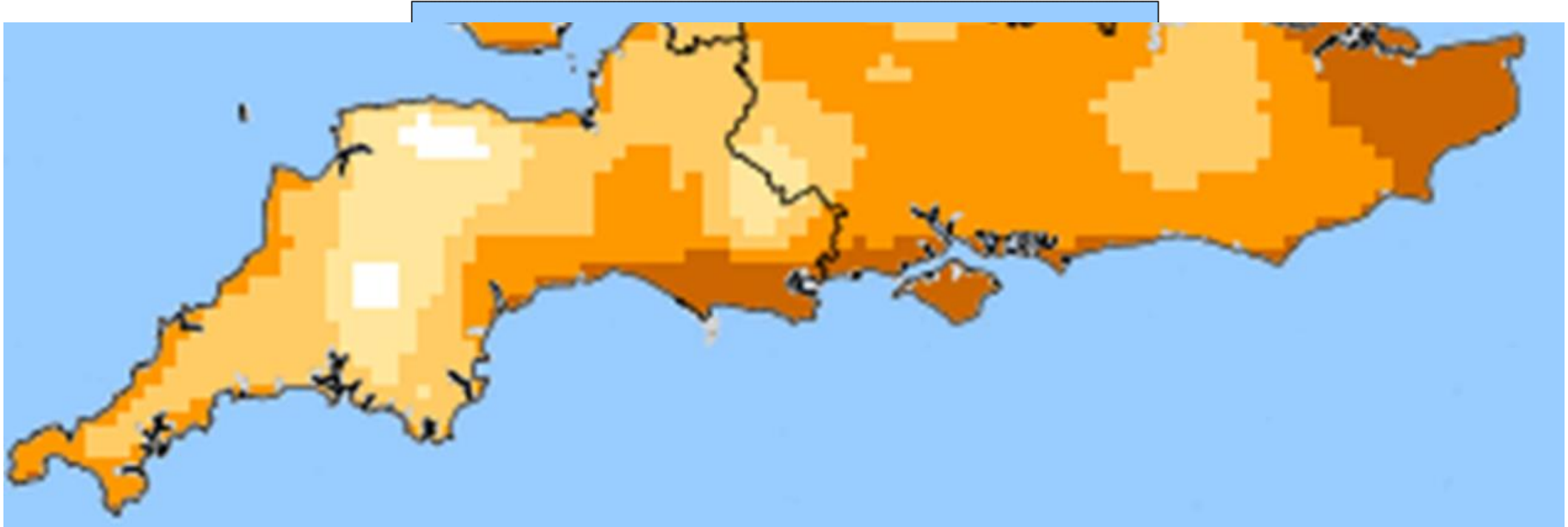
**Total = 1364GWh**  
**44% of Fossil energy**

# What's target for Chichester District – Wind resource?



<https://www.rensmart.com/Maps>



# What's target for Chichester District – Solar resource?



<https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-actual-and-anomaly-maps>



# What's target for Chichester District - Area?

	Based on Area		
		UK	Chichester District
	Area (km2)	248,532	786
Onshore wind (GW)		30	0.095 (95MW)
Solar (GW)		85	0.269 (269MW)
Load factors	Onshore wind (GW) - 26%, Solar (GW) - 13%		
Solar only (GW)	0.459 (459MW)		

# What's target for Chichester District – Current large installations?



- Hunters Race Solar Park – 9.3MWp
- Strettington Solar Farm – 5MWp
- Former Westhampnett Landfill – 7.5MWp
- Tangmere Airfield – 5MWp
- Oving Solar Farm – 5MWp
- Decoy Farm House – 6MWp
- Merston - 2 x 5MWp
- Bakers Farm (solar) – 12MWp
- Ferry Farm – 2 x 5MWp
- Non Solar Farm – 3MWp

TOTAL – 73MWp

<http://www.mygridgb.co.uk/map/>

# What's target for Chichester District - Grandfathering?

	Grandfathering				
	UK			Chichester District	
	2019	2050	Ratio	2019	2050
<b>Onshore wind (GW)</b>	14	30	2.14	0.000017 (17kW)	0.000036 (36kW)
<b>Solar (GW)</b>	13	85	6.54	0.073 (73MW)	0.475 (475MW)

<https://www.gov.uk/government/statistics/regional-renewable-statistics>

# Solar power to generate entire consumption?



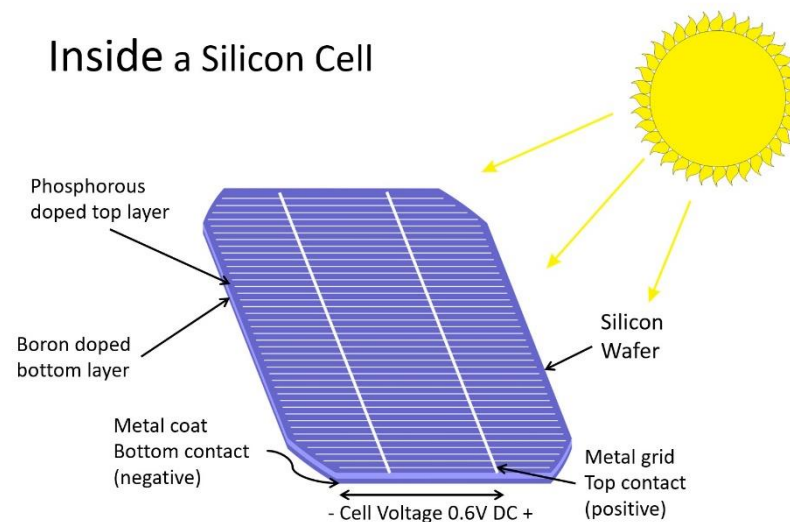
	Power (MW)	Electricity (GWh)	Yield (GWh/GW)	Required Electricity (GWh)	Power (GW)
Meadow Blue	5	5.7	1140	1364	1.20

<http://meadowblue-energy.org/>

# What's target for Chichester District?

- Based on entire consumption – 1200MW
- Based on area – 459MW
- Grandfathering – 475MW

**Choose 500MW solar! (0.5GW)**



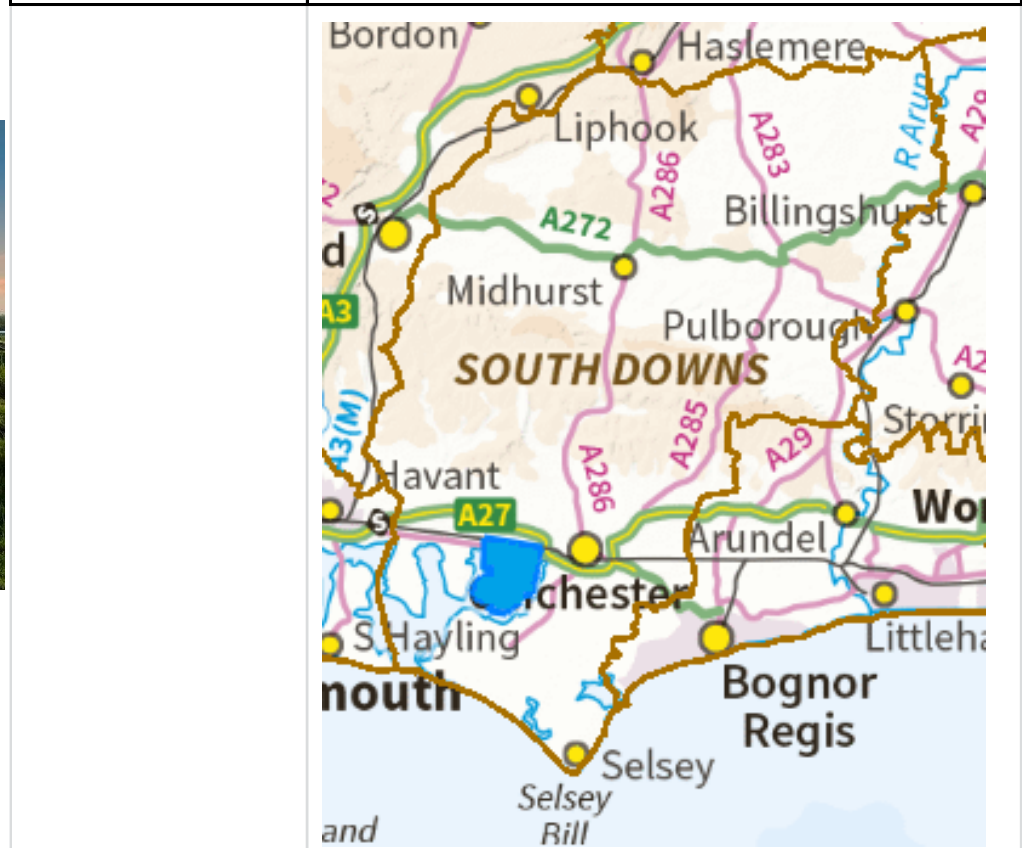
# What's target for Chichester District – Solar area?

	<b>Solar (MW)</b>		
<b>2019</b>	<b>73</b>		
<b>2050</b>	<b>500</b>		
<b>Annual build rate (MW)</b>	<b>13.8</b>		
<b>Area for target (km<sup>2</sup>)</b>	<b>11.1</b>	<b>45</b>	<b>Area (MW/km<sup>2</sup>)</b>
<b>Proportion of CD area</b>	<b>1.4%</b>	<b>786</b>	<b>Area CD (km<sup>2</sup>)</b>

# What's target for Chichester District – Solar area map?

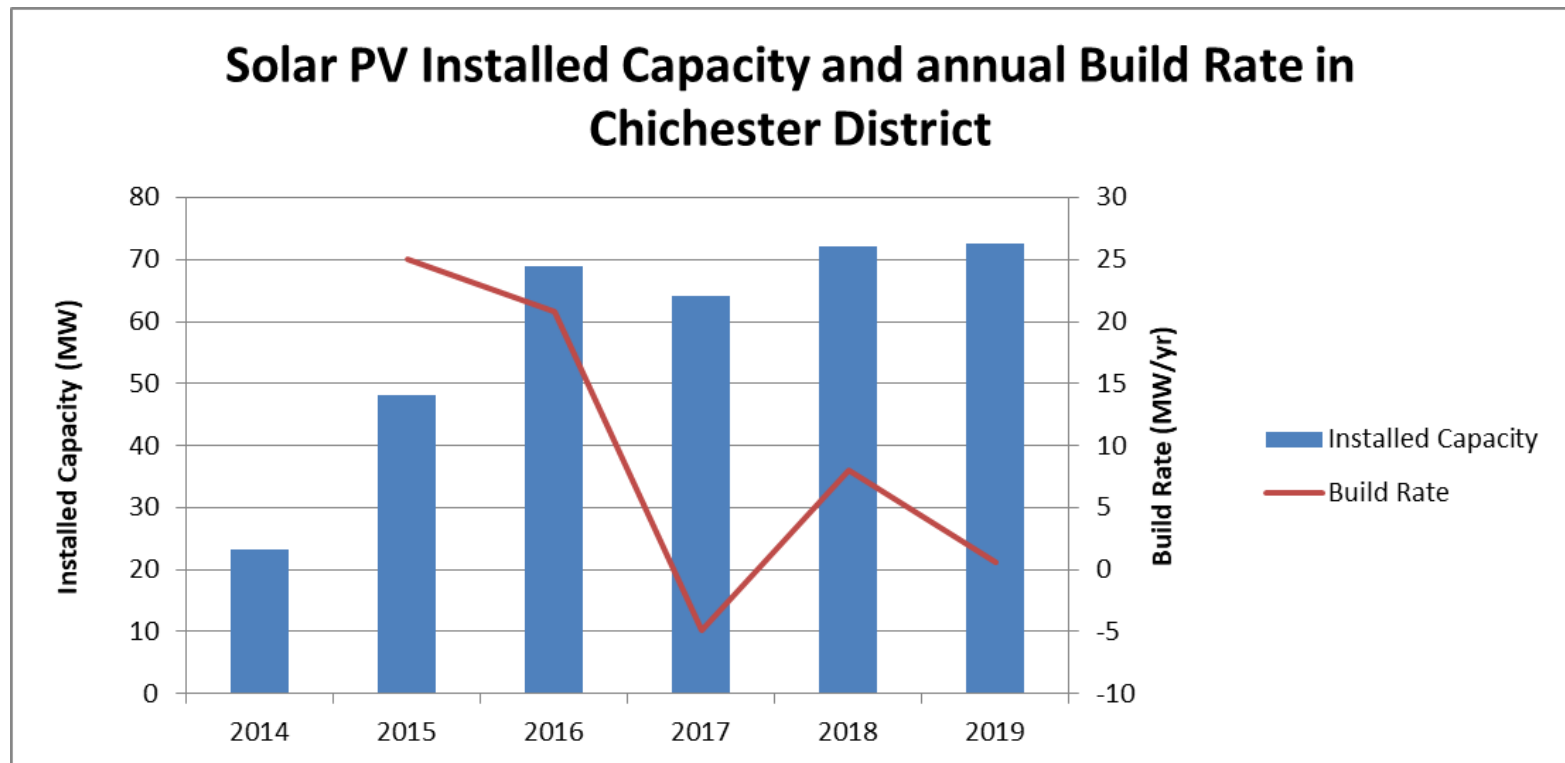


Power (MW)	500
Area (km <sup>2</sup> )	11.1



# What's target for Chichester District – Solar PV annual Build Rate?

For 500MW by 2050 required annual Build rate:  
14MW/yr





# What about building mounted solar?

	Number	Solar per premises (kW)	Array area (m2)	Proportion	Total Solar (MW)
Domestic	59000	3.0	15.0	100%	177
Commercial & Industrial	7000	30.0	150.0	100%	210
					<b>387</b>



<b>Target (MW)</b>	<b>500</b>
<b>Proportion</b>	<b>77%</b>
<b>Not on buildings (MW)</b>	<b>113</b>

<https://www.gov.uk/government/statistical-data-sets/regional-and-local-authority-electricity-consumption-statistics>

# What about building mounted solar?

	Number	Solar per premises (kW)	Array area (m <sup>2</sup> )	Proportion	Total Solar (MW)
<b>Domestic</b>	59000	3.0	15.0	50%	89
<b>Commercial &amp; Industrial</b>	7000	30.0	150.0	20%	42
					<b>131</b>



<b>Target (MW)</b>	<b>500</b>
<b>Proportion</b>	<b>26%</b>
<b>Not on buildings (MW)</b>	<b>370</b>

<https://www.gov.uk/government/statistical-data-sets/regional-and-local-authority-electricity-consumption-statistics>

# Agricultural land?

## Agrivoltaics



# Biodiversity

Meadow Blue - SU 902 018 Water Vole & Botanical Survey May 22



## Water Vole & Botanical Survey

Location:  
Meadow Blue Community Energy  
Near Runcton  
PO20 1EE  
Proposed Strategic Wildlife Corridor  
(Easthampnett to Pagham)  
Grid Reference (central point): SU 9022

Author: Sarah Hughes

Version 001

Issued By:  
Sarah Hughes (Strategic Wildlife Corridor Project 0)  
Chichester District Council  
East Pallant House  
Chichester  
West Sussex  
PO19 1TY

Tel: 07765 175494

Email: [shughes@chichester.gov](mailto:shughes@chichester.gov)

May Botanical list - 2022 05 21 - Grid Ref.: SU 90240 01844

No	Latin Name	Common Name	Additional Info.
1.	<i>Achillea millefolium</i>	Yarrow	Yarrow is used in a host of remedies, from healing wounds to colds and fever, stomach ulcers and rheumatism.
2.	<i>Anagallis arvensis</i>	Scarlet pimpernel	Scarlet Pimpernel's vivid flowers close in bad weather - a trait that led to it being known as 'shepherd's weatherglass' or 'old man's weathervane'.
3.	<i>Bryonia dioica</i>	White bryony	Our only native member of the cucumber family, White bryony is highly poisonous.
4.	<i>Cardamine pratensis</i>	Cuckooflower	Young leaves of the Cuckooflower have a rather peppery taste and can be a useful substitute for cress in sandwiches and salads.
5.	<i>Centaurea nigra</i>	Knapweed (common)	It is in bloom from June to September and is a huge favourite of all kinds of butterflies, including common
		campion	the Mediterranean where it grows much more abundantly.
41.	<i>Stachys sylvatica</i>	Hedge woundwort	The Bronze shield bug can often be found feeding on Hedge woundwort.
42.	<i>Stellaria holostea</i>	Greater stitchwort	Greater stitchwort is visited by bees, butterflies and hoverflies looking for spring nectar.
43.	<i>Tamus communis</i>	Black bryony	Our only native member of the yam family, Black Bryony is highly poisonous.
44.	<i>Trifolium pratense</i>	Red clover	The nectar-rich flowers of red clover are a favourite of many species of bee, including the common carder bee, honeybee and red-tailed bumblebee.
45.	<i>Urtica dioica</i>	Stinging nettle	Stinging nettles are great wildlife attractors: caterpillars of the small tortoiseshell and peacock butterflies use them as foodplants; ladybirds feast on the aphids that shelter among them; and seed-eating birds enjoy their autumn spoils.
46.	<i>Veronica chamaedrys</i>	Germander speedwell	An excellent nectar source for solitary bees.
47.	<i>Vicia sativa</i>	Common vetch	It has been used medicinally to treat eczema and skin irritations.



Thank you! Any questions?