

**The action needed from Dorset  
to achieve the state of Zero Carbon  
Based on the report from  
The Centre for Alternative Technology  
“Zero Carbon Britain”**

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**SUSTAINABLE  
DORSET**



**Connecting Communities  
and Nurturing Resilience**

The action needed from Dorset to achieve the state of Zero Carbon is based on a report from the Centre for Alternative Technology (CAT) with its project "ZERO CARBON BRITAIN" (ZCB). Work on this started in 1977 under the title of "An Alternative Energy Strategy" for the United Kingdom. Over the following 33 years it has evolved into the current "ZCB" which takes 2010 as its base.

Its simple concept is that the UK can play its part to the full in the fight against global climate change in three ways –

- 1 reduce the 2010 energy consumption level by 60%
- 2 replace the use of fossil fuels for the remaining 40% by renewable energy sources
- 3 only use completely tested and tried sources, in particular, resist the development of nuclear energy.

Against the UK national target of a reduction of greenhouse gas emissions by 80% by 2050, the ZCB scenario is for the UK to achieve the status of zero carbon by 2030.

### **Stage 1 Powering Down (Using the ZCB report referred to above as a basis)**

Powering down is the reduction of our energy demand using efficient technologies and making changes to the way we live.

It has been stated that the UK needs to reduce its total energy consumption from 1750 TWh/yr to 665 TWh/yr, i.e a 60% reduction plus the new requirement for ambient energy bring the total to 770 TWh/y

**In applying the ZCB scenario to Dorset, the population of the county is very close to representing 1% of the UK total; so the U.K. energy requirement of 770 TWh/y would be 7.7 TWh/yr or 7700 in GWh/r terms.**

The implications for Dorset are no different than for the rest of the U.K. so the measures to reduce energy consumption to this level, already outlined in the national context of the PART 2 analysis, need to be considered by the people of the county.

## Stage 2 Powering Up (Using only Renewable Energy)

In terms of the South West Region, Dorset is generating 500 GWh/yr (RegenSW - 679.6 GWh per the Dorset Energy Partnership) compared with Devon at 1200 GWh/yr and Cornwall at 1075 GWh/yr, and is 5<sup>th</sup> out of the 7 counties in the region. Dorset's level of 500 GWh/yr is against its own target of 1200 GWh/yr, being 50% of the national target of 15% by 2020 (note the European target is 20% by 2020). This cannot be considered as in any way satisfactory

Using the ZCB national assessment, the mix of renewable energy demand in the UK by the 'powering-up' process is 770 TWh/yr. Applying the 1% applicable to Dorset in comparative population terms would result in an energy supply for the country of 77,000 GWh/y, i.e (770 x 1000 to convert from TWh/ys to GWh/ys = 770,000 / 100, the 1% proportion = 7700). The ZCB scenario mix would be as follows –

	GWh.yr
Electricity	4040
Synthetic Biogas	610
do Liquid	1100
Biomass	360
Hydrogen	140
Solar	250
Geothermal	150
Ambient	<u>1050</u>
	<u>7700</u>

**However, taking into account the natural losses in the processes of all energy generation, the Renewable Resources needed to supply 7700 GW for Dorset is 11,5700 GWh/yr**

Extrapolation from the Zero Carbon Britain Report (i.e 1/100<sup>th</sup>) the above total for energy generation in Dorset from the mix of renewable resources outlined in the ZCB report would be-

	National*	County	
Mix	GWh/yr		Detail of generation
Electricity wind off-shore	5300		140 turbines rated 10MW-1.4 max.
on shore		510	100 do 2 MW- .2 do
Wave	250		10 GW maximum power
Tidal	420		20 GW do
Solar PV		580	75 GW max. covering 10-15% roof area
Geothermal	240		3 GW max. power
Hydro	80		do
	-----	-----	
<b>Total Electricity</b>	6290	1090	
Heat – Solar Thermal		250	Covering around 3% of Dorset roof area
Geothermal	150		
Ambient		1050	Extracted from air/ground/ water by heat pumps
	-----	-----	
<b>Total Heat</b>	150	1300	
<b>Biomass</b>		2740	From waste(380) AD (590) Miscanthus
	-----	-----	& SCR (1490) 380 (SCR & SRF)
	6440	5130	
	= 11570 GWh/y		

\* National denotes that these sources of renewable energy are dependent on action by the UK Government

The question is therefore, can 5130 GWhs/y be generated from within the County from the mix as shown above.

## Final Comment

RegenSW is monitoring the progress of the UK and the South West in achieving renewable energy supplies but we now need an in-depth exercise to assess whether we in Dorset have the physical capacity to achieve the levels required for the various mixes of energy and more importantly, do we have the public motivation to get on with it. However, political will is considered by many to be the most constraining barrier to the deployment of renewable energy. RegenSW observe that the falling costs of technology and installation have driven a remarkable surge in renewable energy investment since 2010; regrettably this has started to slow down as the 2015/16 Government support cuts took effect.

The need for a concerted effort to be made to reduce global greenhouse gas emissions is real, is now and is urgent. As a country we are lagging behind other countries, especially in Europe. The same is also the case as regards Dorset's success within the SW Region.

There would therefore appear to be an urgent need to examine the Zero Britain Report – ZCB, and its implications for both the reducing demand and generating the residual from renewable resources within the County of Dorset. Would it be physically possible to achieve a zero carbon level from any mix of resources? There are other reports, e.g that from the Resilience Centre, also based in the South West that proposes a powering down of 40% of current demand and a consequential powering up from renewables of 60%.

On a more positive note, Dorset County Council is undertaking a three year Low Carbon Economy Programme funded by the European Regional Development Fund. It is essential that this is not just 'top-down' programme, but seeks bottom-up involvement. In this respect it is hoped that da21 Sustainable Dorset will be able to assist in the invaluable communication process.

Mention should also be made of the UK government's publication in October of its 'Clean Growth Strategy' [www.gov.uk/government/publications/clean-growth-strategy/cleangrowth-strategy](http://www.gov.uk/government/publications/clean-growth-strategy/cleangrowth-strategy). After the recent years of backsliding on climate change this document is encouraging but it is marred by its emphasis on growth. There is a growth/carbon emissions connector, the Emissions Intensity Ratio (EIR) but no apparent recognition that the exploitation of the scarce earth resources is in itself one of our major problems

To enable you to calculate your own carbon footprint, see the following Appendix

# Appendix 1 Carbon Footprint Self-Calculator

**Da21 Carbon Emissions Calculator One-Off Event or Annual Period.....**

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**AIR TRAVEL**

**(figures supplied by ClimateCare.org)**

Destination or nearest	miles	grams/mile	tonnes CO2	
1 Glasgow	684	219	.15	-----
2 Europe – Salzburg	1303	189	.25	-----
3 – Rome	1791	183	.33	-----
4 - Malaga	2044	181	.37	-----
5 Medium haul – Moscow	3117	176	.55	-----
6 – Tenerife	3641	176	.64	-----
7 Longer haul – New York	6885	222	1.53	-----
8 - India	8363	225	1.88	-----
9 - Orlando	8654	225	1.95	-----
10 - Los Angeles	10862	230	2.51	-----
11 - Bangkok	11861	234	2.78	-----
12 - Singapore	13513	239	3.23	-----
13 - Sydney	21140	266	5.62	-----
14 - Auckland	22798	271	6.19	-----
15 Any of above flights taken more than once	No ( ) above (X )			-----
16 do	No ( ) above X )			-----

**Total CO2 emissions for AIR TRAVEL – 1-16 above -----A**

**Multiply A above by number of other family passengers travelling ( ----) -----A1**

**Please Note – if the number of family passengers varies for each flight you may**

**care to make a separate calculation for each one – FAMILY TOTAL -----A2 Travel**

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			Units kWhs kgs	CO2 emissions tonnes
Electricity	Green Tariff	-----	Nil	Nil
		-----		-----
or	<b>1</b> Units (if known)	-----	x .527	-----
		-----		-----
or	<b>2</b> Small House	3000	"	-----
	Medium	4800	"	-----
	Large	7000	"	-----
		-----		-----
Gas	<b>1</b> Units (if known)	-----	x .203	-----
		-----		-----
or	<b>2</b> Small House	12000	"	-----
	Medium	18000	"	-----
	Large	27000	"	-----
		-----		-----
Heating Oil		----- litres	x 2.96	-----
		-----		-----
Bottled Gas		----- kgms	x 1.95	-----
		-----		-----
Emissions Total <b>HOME A2</b>				----- <b>B</b>
LESS –own renewable energy exported		----- kWhs	x .527	----- <b>B1</b>
<b>HOME Net Emissions</b>				----- <b>B2</b>
<b>CO2 Emissions from HOME AND FAMILY AIR TRAVEL (A or A1 or A2 + B2)</b>				-----