

Low Carbon Board

15 May 2014



How to achieve a lower carbon Winchester District: targets and sample action plans

RECOMMENDATION

It is recommended that the Low Carbon Board:

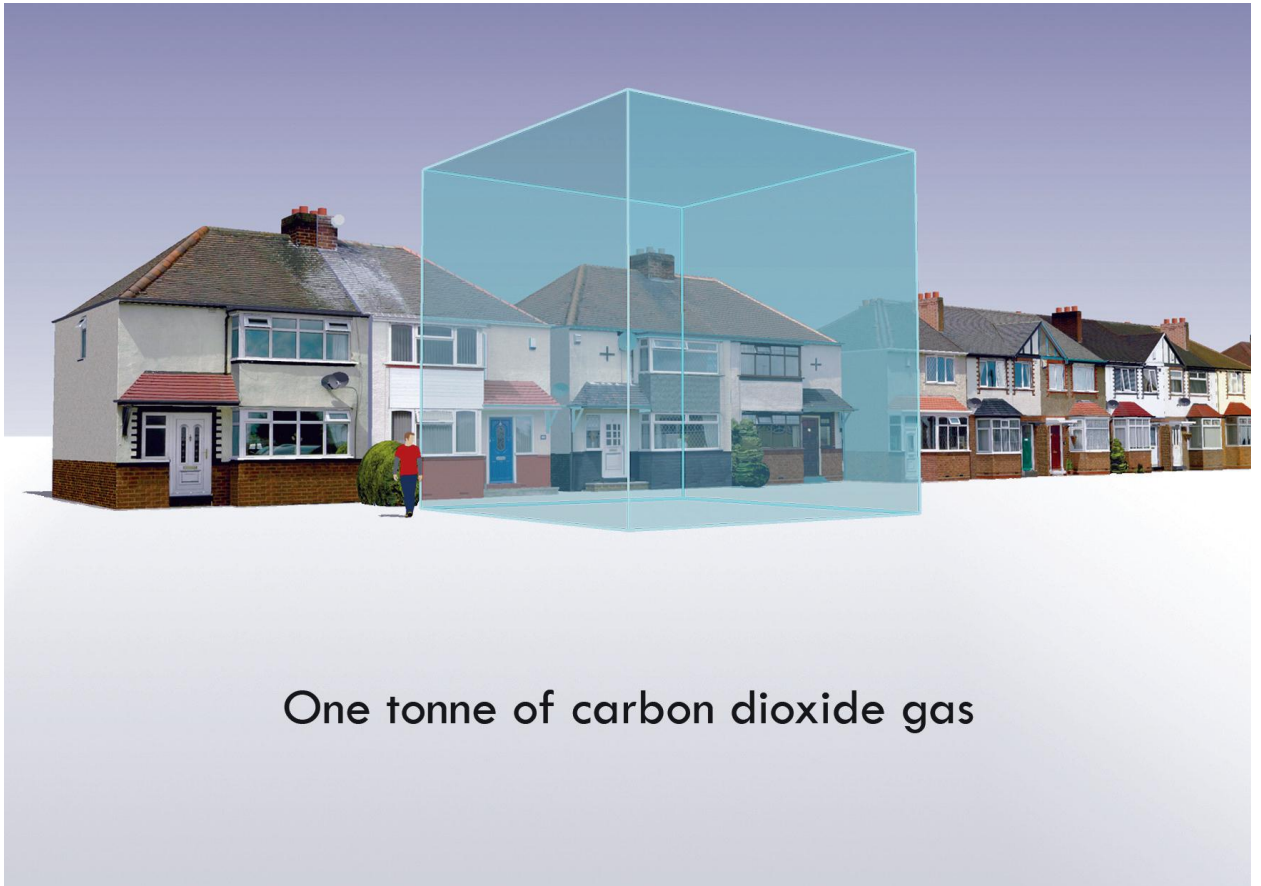
1. Agree in principle to stimulate local discussion about the best way to achieve a lower carbon Winchester District, in line with the Community Strategy and the European and Government targets.
2. Note the greenhouse gas emissions reduction targets and renewable energy generation targets for Winchester District which result contributing our share towards known or predicted European and UK targets.
3. Support WinACC in launching the discussion on 7 June, using the examples in the report to stimulate debate.

Purpose

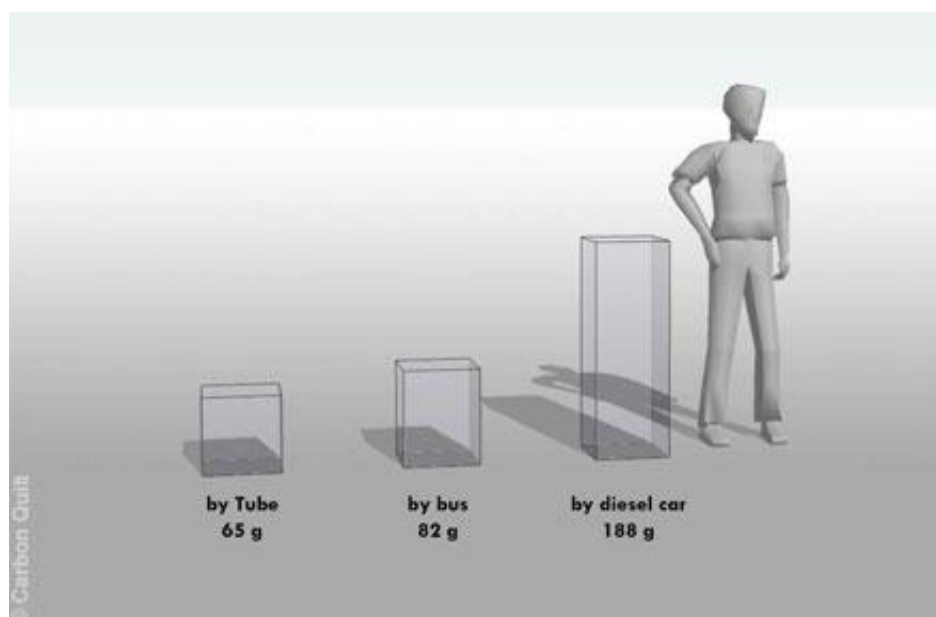
This report sets out the implications for Winchester District of existing UK and EU greenhouse gas emission and renewable energy targets, and demonstrates how to achieve a lower carbon Winchester District, thus making an appropriate contribution to the UK response.

Stimulating local discussion

1. Very few people have any idea what Winchester district's emissions are, nor what would be involved by any percentage of cut. It is means nothing to them to talk about cutting greenhouse gas emissions by x%.
2. It is slightly better to talk about cutting emissions in amounts e.g. x tonnes of CO₂ equivalent (e), but this still means little to most people. Few people have any idea what 1 tonne of CO₂e is, nor how that relates to (for example) driving their car or heating their house.
3. The same problem applies to talking about generating megawatts of renewable energy to replace fossil fuels. People may know roughly what 1 watt is, but not what's involved in generating megawatts.
4. To start a debate, we need to:
 - Describe what we are aiming to achieve in a way that makes sense to people, that they can visualise and understand



5. Describe what it might actually mean, so that people can choose the best way forward for the district.
6. Unless our communications about greenhouse gases and renewable energy make sense to people, it is hard to convince them that action is important, and impossible to engage them in rational discussion about preferences. People need to understand the relative impact of (for example) one wind turbine to solar panels on one home, or insulating their roof to flying to New York, before they can make sensible choices between options.



7. This report recommends that the Low Carbon Board ask WinACC to produce simple materials that can inform and stimulate local discussion about the best way to achieve a lower carbon Winchester District in line with the Winchester Community Strategy and the European and Government targets.

Greenhouse gas emissions

8. The discussion has to include the implications for Winchester District of existing UK and EU greenhouse gas emission and renewable energy targets, and has to demonstrate options for achieving a lower carbon Winchester District as an appropriate contribution to the UK response.
9. The Climate Change Act 2008 requires the UK to cut emissions by 80% by 2050 relative to 1990. Winchester District Strategic Partnership supported by Winchester City Council set itself the target of a 30% cut in emissions in Winchester District by 2015 relative to 2004 in February 2009.
10. As 2015 approaches, we need to consider the next 5 years, from 2016 to 2020, in the light of the UK and EU commitments.
11. WinACC's Science and Technology Advisory Panel report that Winchester District needs to cut emissions by 25,000 tonnes of CO₂e a year over the 5 years 2016 to 2020 to put the District on track to join the national path to the legally binding target of 80% by 2050.
12. 25,000 tonnes of CO₂e is about 2.3% of WD's annual emissions in 2011 (the latest year available) and corresponds to just over 200 kg CO₂ per person each year.
13. 25,000 tonnes would deliver a cut of 40% by 2020 relative to 2004.
14. This assumes that the District will cut its emissions, as hoped, by 30% by the end of 2015. Should this not happen, more than 25,000 tonnes of reductions will be required.
15. Appendix 1 sets out the reductions so far achieved and more details on why the Panel recommends 25,000 tonnes a year.

Increasing renewable energy

16. Currently there is almost no renewable energy generation in Winchester District, yet there are natural resources for low carbon energy which could contribute to the overall targets. For instance, Winchester District has good resources for generation from solar, wood fuel and anaerobic digestion as well as wind.
17. In line with existing or predicted UK and EU targets, the WinACC Renewable Energy Action Group believes it is practical to generate 30% of our non-transport energy locally from renewables by 2030.
18. This would mean:
 - 15% of energy consumption to be generated within the District from renewable sources by end of 2020. This is the existing UK national target^{1,2}. (The existing

¹ DIRECTIVE 2009/28/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23rd April 2009

combined EU target of 20% is preferred but this is not credible given our disproportionately low starting point)

- By end of 2025, 25% of energy consumption to come from local renewable sources (this is also the existing target for decentralising energy for London³).
- By end of 2030, 30% of energy consumption to come from local renewable sources (this reflects the EU recommended target per country for 2030, not yet formally ratified, of 27%⁴.)

Table 1: Winchester District Energy Targets from Renewables

Baseline: Non-transport energy use 2013	Share from renewables 2013	Target for renewables 2020	Target for renewables 2025	Target for renewables 2030	Realistic technical potential (with current technology)
100%	1.8%	15%	25%	30%	85%
1735 GWh	32GWh	260 GWh	434 GWh	520 GWh	1500 GWh

Greenhouse gas emissions: how to cut 25,000 tonnes of CO₂e

Table 2: Potential emissions savings by sector

Sector	Annual emissions savings (kt CO₂e)
Domestic buildings	10,832
Commercial buildings	3,586
Public buildings	792
Private cars	6,839
Commercial vehicles	2,935
Total	24,984

² EU: The 2020 climate and energy package. http://ec.europa.eu/clima/policies/package/index_en.htm

³ Greater London Authority: <https://www.london.gov.uk/priorities/environment/tackling-climate-change/energy-supply>

⁴ EU: 2030 framework for climate and energy policies. http://ec.europa.eu/clima/policies/2030/index_en.htm

Table 3: Potential annual savings

Item	Sub-sector	Tonnes CO ₂ e
	<i>From domestic buildings</i>	
1	4000 homes change to condensing boiler saving 20% gas	2,145
2a	Home insulation - 2000 lofts (from scratch)	557
2b	Home insulation - 4000 lofts (top up)	152
3	Home insulation – 3000 cavity walls insulated	1,394
4	8000 turn down thermostat by 1°C	2,480
5	Install smart gas and electricity meters in all homes by 2020; 20% each year	800
6	Install voltage optimisation	208
7	Cool Communities behaviour changes (will include some transport savings too)	1,500
8	3500 homes replace all halogen downlighters with LED alternatives	468
9	Solar thermal (domestic hot water)	69
10	WCC homes (social housing) insulated	1,000
11	PV panels on WCC homes (social housing)	59
Total		10,832
	<i>From commercial buildings</i>	
12	Install PV on roofs. 20 sites each at 200kWp	1,116
13	10% of businesses install voltage optimisation	2,470
14	There are certainly other ways energy can be saved in commercial buildings from lighting, refrigeration, IT equipment and heating.	
Total		3,586
	<i>From public buildings</i>	
15	CHP scheme A in Winchester	547

16	Assume new Leisure Centre has 20% of current emissions from 2017	245
Total		792
	From private cars	e
17	4000 cars save 1000 miles per year (20 miles per week) and maintain saving in all subsequent years	1,251
18	Reduce number of cars in 2- or 3-car households. 2-car reduce by 5% and 3-car by 7.5% each year	1,740
19	Average car emissions decline as EU regulations bite	2,069
20	Ecodriving ⁵ cars, adopted by 5000 drivers/year saving 12.5% of emissions	1,779
Total		6,839
	From commercial vehicles	
21	2200 vans save 1500 miles per year (30 miles per week) and maintain saving in all subsequent years	1,166
22	Average van emissions decline as EU regulations bite	0
23	Ecodriving vans, adopted by 3000 drivers/year saving 12.5% emissions	1,769
Total		2,935

Renewable energy: how to get 30% of energy used in Winchester District from renewable sources

19. Each community has its own characteristic natural resources and should contribute to the overall target accordingly (and also directly benefit from such local projects). Local generation also has the benefit of creating jobs, keeping revenues local and supporting the local economy.
20. The table below shows one practical mix of solutions built from the bottom up, which approaches the recommended targets, and compare this to the technically feasible capacity for each technology⁶. Details of these figures is in appendix 2.

⁵ Eco-driving involves driving in a more efficient way in order to improve fuel economy. Examples of eco-driving techniques include driving at an appropriate speed, not over-revving, ensuring tyres are correctly inflated, removing roof racks and reducing unnecessary weight.

⁶ Based on the ESD's Renewable Energy Study for Winchester District Development Framework (Dec 2008) and other data.

Table 4: Summary of proposed targets for share of energy use by locally generated renewables to 2030

Renewable generation technology	% Share from renewables 2013	Identified % renewables share 2020	Identified % renewables share 2025	Identified % renewables share 2030	Identified % technical potential
Anaerobic Digestion	0	1.6	3.3	3.3	9.9
Landfill Gas	0	0.9	1.4	1.4	1.4
Biofuels	0	1.9	4.0	6.4	20.2
Solar PV	0.6	5.8	11.1	11.2	28.8
Solar thermal	0	0.1	0.3	0.3	1.3
Municipal Waste	1.2	1.2	2.5	3.7	4.0
Wind	0	2.4	3.7	3.7	18.7
Identified share %	1.8%	14.1%	26.3%	30.2%	84.3%
Target share %		15%	25%	30%	

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Appendices Attached:

1. Setting and meeting a greenhouse gas emissions target for Winchester District 2016-2020 (WinACC Science and Technology Advisory Panel, 28 April 2014)
2. Setting a target for local generation of renewable energy in Winchester District (WinACC Renewable Energy Action Group, April 2014)