



Meeting Our Energy Needs

This leaflet can be viewed at: <http://www.tasizewellc.org.uk/index.php/leaflets>

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Before We Begin

- Electricity is less than 20% of our energy needs – we use oil for transport, gas for heating etc. So if we had 20% of our electricity produced from nuclear (or wind) it would amount to less than 4% of our energy needs¹.
- Production of electricity from 'thermal plants' such as gas, coal or nuclear is extremely inefficient. Only 34% for coal and nuclear or 47% for gas of the energy used gets turned into electricity¹. The rest goes up the cooling stacks or is pumped out to sea. Overall this amounts to more heat wasted than is needed to heat every home in the UK².
- Government research has suggested that "Overall, using available technology Britain could have the same level of warmth, light and other sources whilst consuming only 55% of our current energy production³"
- The UK's electrical system needs renewing and upgrading. This is not just new power plants but the way in which we distribute electricity. We will have to pay for this through our taxes/electricity bills but will result in large savings in energy and cost⁴.

Combined Heat and Power

Instead of wasting the heat that is generated when making electricity it could be used to heat homes and offices. This is called *Combined Heat and Power*. It can be done on a small scale with a house having micro-CHP units or on larger scales supplying district heating. The waste heat can also come from large industrial plants. It is a technology that is already available and even Buckingham Palace and Windsor Castle have units installed along with many hospitals, universities and large businesses

Denmark already produces over 50% of their electricity from CHP and is one of the cheapest ways of cutting CO2 emissions⁵.

Energy Efficiency

At least 40% of our present electricity demand could be eliminated by 2030 according to research carried out for the Department for Energy and Climate Change⁶. However, current government policy is based on an increased demand⁷ – an assumption that has been disputed⁸

Renewable Energy

First of all it is important to get some of the facts right about wind. Studies by the London School of Economics⁹ and the Institute for Public Policy Research¹⁰ have shown that wind is cost effective. "What happens when the wind does not blow?"

the UK Energy Research Council looked at 200 scientific studies and their own analysis did not find any problems with producing at least 20% of our electricity from wind¹¹.

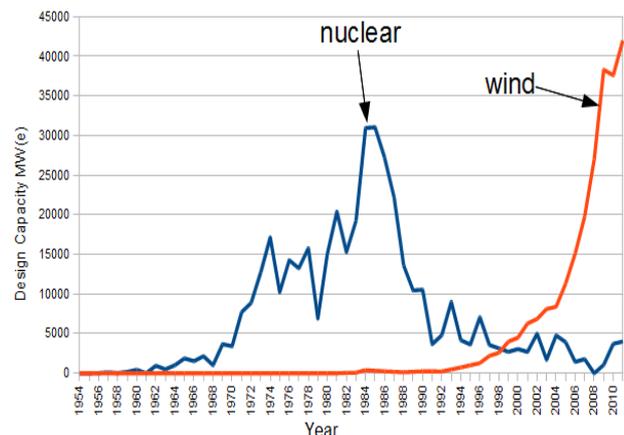
Worldwide far more wind capacity is added each year as compared to nuclear (see graph above).

Putting It Together

To meet our energy needs in a cost effective way a number of actions need to be taken. If you want to find out more about how this has been done then here are some examples:

Woking Council – 51% cut in energy demand by the council and energy efficiency savings of 33% in residential homes. This led to large savings for both the council and the local residents¹².

Beddington, London Borough of Sutton, Beddington Zero-Energy Development (BedZED)¹³



Cities with sustainable energy plans include:

Sydney, Australia “The City has an ambitious plan to reduce greenhouse gas emissions by 70 per cent and for the city to have capacity to meet up to 100 percent of electricity demand by local electricity generation and 10 percent of water supply by local water capture by 2030.”¹⁴

Copenhagen Carbon Neutral 2025 Copenhagen will become the first carbon neutral capital by 2025¹⁵.

Rizhao in China, Arendal in Norway, Vancouver in Canada; and Växjö, Sweden are to become some of the worlds first carbon neutral cities¹⁶

Here are some further studies on how the UK and the world can meet its energy needs:

- Mark Z. Jacobson and Mark A. Delucchi, Evaluating the Feasibility of a Large-Scale Wind, Water, and Sun Energy Infrastructure
<http://www.stanford.edu/group/efmh/jacobson/WindWaterSun1009.pdf>
- A plan for Clean British Energy Powering the UK with renewables – and without nuclear, Friends of the Earth, 2012 (http://www.foe.co.uk/resource/briefings/plan_cbe_report.pdf)
- 100% Renewable Energy by 2050, WWF, 2011
(http://assets.wwf.org.uk/downloads/2011_02_02_the_energy_report_full.pdf)

- 1 *Digest of UK Energy Supply (DUKES)*, Department of Energy and Climate Change 2012
(<http://www.decc.gov.uk/assets/decc/11/stats/publications/dukes/5949-dukes-2012-exc-cover.pdf>)
- 2 Total energy lost in conversion is 457TWh (from *DUKES* – see ref 1). Total energy used in domestic heating in the UK is about 324TWh (Energy Consumption in the UK, DECC,
<http://www.decc.gov.uk/assets/decc/Statistics/publications/ecuk/4186-ecuk-domestic-2010.xls>)
- 3 *Power to the People*, Institute of Public Policy Research <http://books.google.co.uk/books?id=CrdhLzE74sUC&printsec=frontcover#v=onepage&q&f=false>
- 4 *Smart Grid: a race worth winning?*, Ernst and Young 2012 ([http://www.ey.com/Publication/vwLUAssets/Smart_Grid_a_race_worth_winning/\\$FILE/Smart%20Grid%20-%20a%20race%20worth%20winning.pdf](http://www.ey.com/Publication/vwLUAssets/Smart_Grid_a_race_worth_winning/$FILE/Smart%20Grid%20-%20a%20race%20worth%20winning.pdf))
- 5 *Cogeneration and District Energy*, International Energy Agency 2009 <http://www.iea.org/media/files/chp/CHPbrochure09.pdf>
- 6 *Capturing the full electricity efficiency potential of the U.K.* Department for Energy and Climate Change, July 2012
<http://www.decc.gov.uk/assets/decc/11/cutting-emissions/5776-capturing-the-full-electricity-efficiency-potential.pdf>
- 7 More than a 25% increase by 2025. 90GW current (ref 1) with predicted 113TW by 2025 *Overarching National Policy Statement for Energy (EN-1)* para 3.3.22 <http://www.decc.gov.uk/assets/decc/11/meeting-energy-demand/consents-planning/nps2011/1938-overarching-nps-for-energy-en1.pdf>
- 8 *A corruption of governance?*, Unlock Democracy and The Association for the Conservation of Energy, January 2012
[http://www.ukace.org/publications/ACE%20Campaigns%20\(2012-01\)%20-%20Corruption%20of%20Governance%20-%20Jan%202012](http://www.ukace.org/publications/ACE%20Campaigns%20(2012-01)%20-%20Corruption%20of%20Governance%20-%20Jan%202012)
- 9 *The Case For and Against Wind Power In The UK*, London School of Economics, 2012
<http://www2.lse.ac.uk/GranthamInstitute/publications/Policy/docs/PB-onshore-wind-energy-UK.pdf>
- 10 *Beyond the Bluster*, Institute for Public Policy Research, 2012
http://www.ippr.org/images/media/files/publication/2012/08/beyond-the-bluster_Aug2012_9564.pdf
- 11 *The Costs and Impacts of Intermittency*: UK Energy Research Centre, 2006
http://www.uwig.org/0604_Intermittency_report_final.pdf
- 12 *The Merton Rule & Beyond*, Ray Morgan Chief Executive Woking Borough Council
http://www.merton.gov.uk/environment/planning/planningpolicy/mertonrule/district_heat_and_power_the_working_model_rm.ppt
- 13 *BedZED – Beddington Zero Energy Development*, Sutton
http://www.bioregional.co.uk/files/publications/BedZEDBestPracticeReport_Mar02.pdf
- 14 *Development in 2030: Energy Master Plan* <http://www.sydney2030.com.au/development-in-2030/city-wide-projects/powering-sydney-allan-jones>
- 15 *Copenhagen Carbon Neutral 2025*,
<http://www.kk.dk/sitecore/content/subsites/cityofcopenhagen/subsitefrontpage/livingincopenhagen/climateandenvironment.aspx>
- 16 *Sunrise on China's First Carbon-Neutral City*, Scientific American August 2008 <http://www.scientificamerican.com/article.cfm?id=sunrise-on-chinas-first-carbo-neutral-city>