

NO NEED FOR  
NUCLEAR POWER  
— AND IT'S  
EXPENSIVE!

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# NO NEED FOR NUCLEAR POWER IN THE UK

- There are more than enough renewables to meet UK energy needs, not just electricity.
- Nuclear power is one of the most expensive ways of generating electricity.
- There are many other headaches with nuclear power.
- **We don't need it!**

# CLEAN POWER FOR THE UK

Electricity generation and conservation	% UK demand
Concentrating solar power	( 100+ ) 15
Wind power	( 100+ ) 20
Wave power	25
Tidal streams	( 20 ) 3
Photovoltaics	( 66 ) 20
Micro-wind	6
CHP and fuel cells	16
Low-energy bulbs	2
Eliminate 'stand by'	2
More efficient motors	6
Other sources	(at least) 5
<b>Total (% UK demand)</b>	<b>120</b>

## WORLDWIDE POTENTIAL OF RENEWABLES

- Renewable energy technologies can provide 100 percent of the world's energy (not just electricity) and it is technically feasible to make the transition by 2030. See "A path to sustainable energy by 2030" by Mark Z. Jacobson and Mark A. Delucchi in the November 2009 issue of *Scientific American*.
- Using renewables, total world demand for power in 2030 would be 11.5 terawatts compared with 16.9 terawatts with conventional sources of energy.
- In the JD scenario, wind supplies 51 percent of the demand worldwide, provided by 3.8 million large wind turbines. For comparison, the world manufactures 73 million cars and light trucks every year.



# WIND POWER 1

A network of land-based 2.5-megawatt (MW) turbines restricted to nonforested, ice-free, nonurban areas operating at as little as 20% of their rated capacity could supply more than 40 times current worldwide consumption of electricity and more than 5 times total global use of energy in all forms. There is additional potential in offshore **wind farms**. See “Global potential for wind-generated electricity”, Xi Lua, Michael B. McElroya, and Juha Kiviluomac, *Proceedings of the National Academy of Sciences of the United States of America*, June 22, 2009.



## WIND POWER 2

The "economically competitive potential" of wind power in Europe is 3 times projected demand for electricity in 2020 and 7 times projected demand in 2030. Offshore wind power alone could meet between 60% and 70% of projected demand for electricity in 2020 and about 80% of projected demand in 2030. See "Europe's onshore and offshore wind energy potential", European Environment Agency, 2009.

# MATCHING VARIABLE DEMANDS WITH VARIABLE SUPPLIES

- The variability of sources such as wind power is much less of an issue than is sometimes suggested. See “Managing Variability” by independent consultant David Milborrow, July 2009.
- Electricity transmission networks in the UK are *already* designed to cope with unscheduled outages of power stations and variations in consumer demand.
- For a small additional cost, wind power could provide up to 40% of the UK's electricity—and more is possible.
- There is a range of techniques for matching variable demands with variable supplies.

# PHOTOVOLTAICS



Photovoltaics (PV) could generate about 266 TWh/yr in the UK—about 66% of the UK's present electricity demand. See “Renewable energy and combined heat and power resources in the UK”, Tyndall Centre, 2002.

# CONCENTRATING SOLAR POWER



- Using the proven technology of CSP, less than 1% of the world's deserts could meet world demand for electricity.
- Using low-loss HVDC transmission lines, it is feasible and economic to transmit electricity for 3000 km or more.
- 90% of the world's population lives with 2700 km of a desert.

# THE HIGH COST OF NUCLEAR POWER

- **Nuclear power is heavily subsidised** (see the *Nuclear Subsidies* report from the Energy Fair group):
  - It pays a small fraction of the cost of insurance against a Chernobyl-style accident or worse.
  - It pays much less than the full cost of disposing of nuclear waste.
  - And there are several other subsidies.
- Without those subsidies, nuclear power would be hopelessly uncompetitive.
- A report from Citigroup, and several other sources, confirm the high cost of nuclear power.

# THE LIBCON COALITION

- The Government says that new nuclear power stations can be build — but without public subsidies.
- **IF** they mean what they say, **none of the existing subsidies should be available for new nuclear power stations.** That would mean that no new nuclear power stations will be built.
- Let's try to keep them to their word!

# FURTHER INFORMATION

- Why we don't need nuclear power:

[www.mng.org.uk/gh/nn.htm](http://www.mng.org.uk/gh/nn.htm)

- The potential of renewables:

[www.energyfair.org.uk/pren](http://www.energyfair.org.uk/pren)

- Clean power from deserts:

[www.desertec-uk.org.uk](http://www.desertec-uk.org.uk)

# THE MYTH OF THE 'ENERGY GAP'

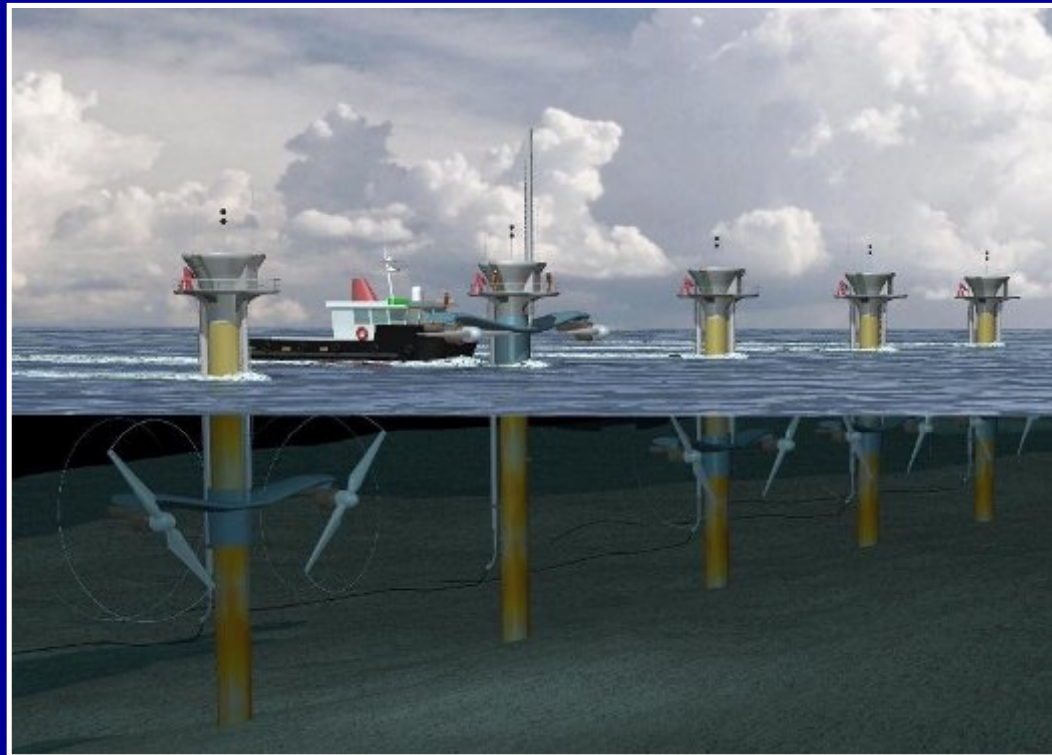
- Vigorous development of renewables should be sufficient in itself to maintain electricity supplies.
- As 'insurance' against any possible shortfall:
  - "Zero-carbon" eco-renovation of Britain's housing stock could save at least 50% of the energy used for space heating.
  - The resulting savings in gas may be used to generate electricity.
  - CHP would ensure efficient use of gas.

# WAVE POWER



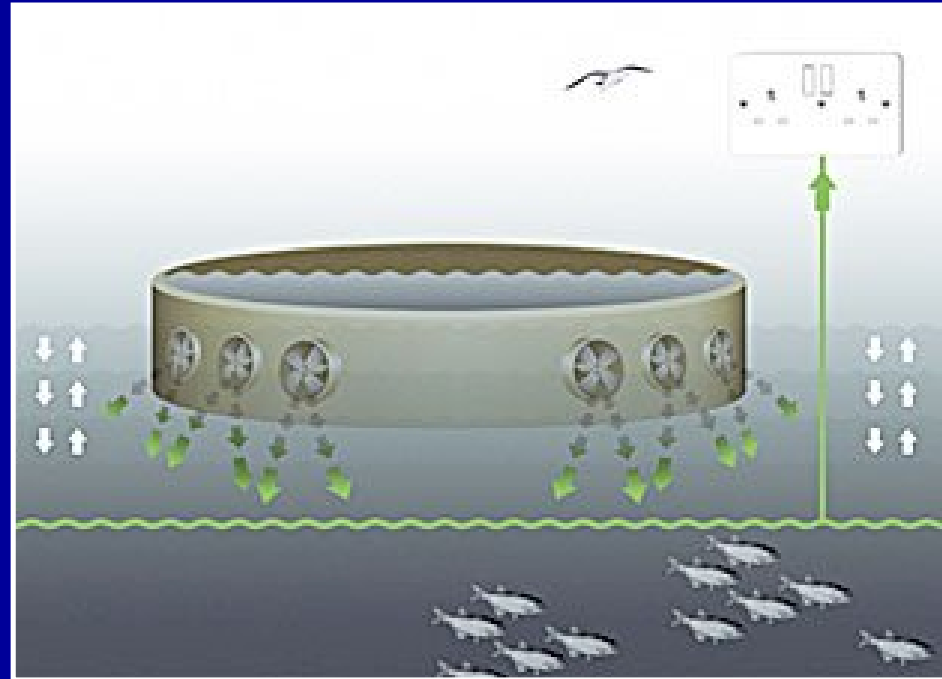
- The Pelamis wave energy converter (above) is already in commercial production. Other systems are also well advanced.

# GENERATING ELECTRICITY FROM TIDAL STREAMS



- The SeaGen system (above) is now being installed in Strangford Lough in N. Ireland. It has been estimated that as much as 20% of the UK's electricity could be generated from tidal streams.

# TIDAL LAGOONS



- Tidal lagoons generate electricity as the tide rises and as it falls. They have several advantages over the proposed Severn barrage. The UK resource is about 8% of UK demand.

# TIME NEEDED TO ACHIEVE ANY CUTS IN CO<sub>2</sub> EMISSIONS

**Yellow** = lead time

**Pink** = building time

**Red** = energy payback time

