A Brief Guide to Renewable Energy

April 2009

Everyone talks about “renewable” and “sustainable” energy but ever since we realised that vast tracts of virgin rainforest were being cut down to feed the demand for palm oil, it is important to know where energy really comes from. Well first of all, it seems coal fired power stations are just about the worst of everything, polluting, inefficient and with a worrying carbon footprint - but of course coal is plentiful and cheap. So what are the alternatives? Here is our brief guide:

Energy from the sea and rivers

Tidal energy: this involves using large movements of oceanic water to generate energy. This can be split into **tidal flow**, where turbines in barrages or lagoons harness energy from the ebb and flow of water and **tidal stream** where horizontal turbines are mounted on the seabed to harness energy, similar to giant windmills. Tidal flow barrages have been criticised by some conservationists because of damage to the ecology of wild plants and wildlife.

Wave power: involves using the movement of waves on the surface of the sea to harness electricity using wave generators which sit on the surface of the sea, often looking like giant snakes.

Hydroelectricity: both on a commercial scale and on a micro scale energy can be produced by harnessing the power of rivers and falling water. Here turbines are used to create electricity. There are issues concerning the building of dams and the destruction of environments and with fresh water being a finite resource with effects of climate change, fresh water supplies will be more precious, and some current hydroelectricity plants may find difficulties with the changing flow of water.

Wind Energy

Generation of electricity from the wind is now one of the fastest growing sources of renewable energy. Its not new – the wind has powered sailing boats, windmills and wind pumps for hundreds of years. Recently the EU Council of Ministers lent their support for a EU super grid in the North Sea to generate electricity. However there have been concerns about the negative impact of wind farms on the landscape, particularly in areas of outstanding natural beauty.

Solar Power

Solar power converts sunlight into electricity or heat energy.

Solar Photovoltaic's: (PV) uses photovoltaic cells to convert daylight into energy - electricity.

Solar thermal: uses energy from the sun to create hot water to use in buildings and homes. New developments include solar heated ventilators which use the sun's energy to circulate warmed air through buildings.

Biomass, Biogas & Bioliquids

These are terms for organic substances or gases derived form non-fossil animal or vegetable matter – food and farm waste is one source. They are accepted as 'carbon neutral' as the carbon released in the burning process is equal to that which is absorbed when the biomass is grown (for plants and vegetation). The most common form of biomass is wood which can be burnt in the form of logs, pellets or woodchip. At present the UK's biogas industry is small but estimates say that they offer a major opportunity for dealing with the millions of tonnes of organic waste produced each year and green gas could provide an important future source of gas heating and can be used to generate electricity. Bioliquids can. be used in heating oils.

Biofuels: this has caused much heartache and clearly the production of biofuels has an impact on local agriculture, local food sources and the environment. At the moment we can say that the only acceptable source of biofuel is "already used" cooking oils.

Ground Source Heat Pumps

Described as a 'fridge in reverse' taking heat from underground and releasing this into a building. Whilst an electric pump is needed to run the system it will provide a fourfold energy 'return' on the electricity used.

And remember, a starting point is often energy **efficiency** – and this can be done before or at the same time as looking for clean energy sources. Insulating buildings, promoting energy efficiency and reducing waste will all provide immediate financial returns and a reduction in greenhouse gas emissions.

Source: The Times (Raconteur on Clean Technologies)
Source: CAfS/SusKes