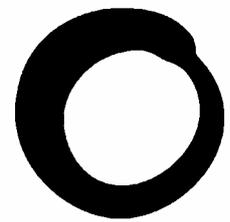


# Briefing Note

## A new energy revolution



**Friends of the Earth Cymru**

**Cyfeillion y Ddaear Cymru**

At the start of the twenty-first century the Swansea area finds itself on what could be the leading edge of new energy revolution - a climate friendly 'low-carbon' energy revolution.

A few decades ago coal was king. Now, devices called fuel cells invented in 1839 by Swansea-born William Grove are set to transform the future of electricity generation world wide. In a few years the shallow waters of Swansea Bay could be the location for the world's first electricity-generating tidal lagoon.

### What is climate change?

Top scientists agree that climate change is real, and it's happening. The world is getting warmer and the weather is getting more extreme. More droughts, storms and floods are on the way. It's a direct result of burning more and more fossil fuels for increasing energy use. The carbon dioxide (CO<sub>2</sub>) released traps the heat from the Sun in the atmosphere causing a greenhouse effect. CO<sub>2</sub> levels are now about a third higher than they were before the industrial revolution.

### The trouble with coal

Eighty years ago the south Wales coal industry was at its peak, producing 57 million tonnes of deep-mined coal. Today, the whole of the UK produces about 30 million tonnes of coal per year (deep-mined and opencast) and about 32 million tonnes are imported (net) mainly from Australia, South Africa and Russia. Around 35% of our electricity is generated by coal burning power stations.

Yet it has become clear that burning coal for electricity is a major cause of climate change. Per unit of electricity generated, coal burning releases over twice as much CO<sub>2</sub> as gas. There is an urgent need for us to use less coal and for us to change the way we use it.

Our use of coal doesn't just harm the climate. Much of our coal comes from opencast mining which scars the landscape, destroying important wildlife sites and obliterating cherished countryside. In 1994 the beautiful Selar Farm grasslands in the Swansea valley, a nationally important area for the marsh fritillary butterfly was completely destroyed by opencasting. The process is intrusive, noisy and dirty and can have a major negative impact on people's lives – particularly people living in some of the most deprived communities in Wales.

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**Friends of the Earth Cymru inspires solutions to environmental problems, which make life better for people.**

**Friends of the Earth Cymru:**

- is dedicated to protecting the environment and promoting a sustainable future for Wales**
- is part of the UK's most influential environmental campaigning organisation**
- is part of the most extensive environmental network in the world, with over 60 national organisations across five continents**
- supports a unique network of campaigning local groups, working in communities across Wales**
- is dependent upon individuals for over 90 per cent of its income.**

**To join or make a donation call us on 0800 581 051**

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## Can coal be clean?

We may still be able to burn some coal for electricity without adding to climate change. The industry is experimenting with technologies which would allow the carbon dioxide given off by power stations to be pumped underground instead of being released into the atmosphere. It may be possible for this technology to be applied to coal and gas fired power stations. While these ideas should be researched more it is important that they do not divert funding or support from renewable energy and energy efficiency.

## Alternative energy sources

There are potentially substantial renewable energy resources which can be tapped around south Wales and the Severn Estuary. A 30 turbine offshore windfarm, which could supply the electricity needs of all the households in Swansea, has already been approved at Scarweather Sands in Swansea Bay. Onshore, more wind energy could be generated on the surrounding hills.

Tidal energy could be harnessed by tidal lagoons and underwater 'tidal stream' turbines. A tidal lagoon is a rock-walled impoundment which generates electricity as the tide fills and empties the lagoon through a turbine system. The scheme proposed for Swansea Bay, enclosing an area of about 2 square miles would generate electricity for about 30,000 people. A small number of larger lagoons further up the Severn Estuary, which is famed for its tidal range, could potentially supply over 3 million people. Further west, underwater turbines could generate electricity from the strong currents in the Bristol Channel. Developing the area's renewable energy resources would likely attract large numbers of manufacturing and maintenance jobs to south Wales and its ports.

Finally, how can William Grove's 165 year old fuel cell invention help? Fuel cells are efficient, silent, electricity generating devices which run on hydrogen or indirectly from methane. Their only emission is drinkable water. They can be made very small or large for a variety of energy applications from 'battery-packs' and central heating boilers to vehicle engines and in efficient power stations. Alone, they will not answer our energy problems because energy is still needed to harvest the hydrogen. If this energy comes burning fossil fuels then greenhouse gases will still be generated. However, the fuel cells may provide a reliable way of storing and transporting the energy generated from renewable sources.

## What can be done about it?

There is much that can be done to halt and reverse the increase in the emission of the gases that are changing the climate. Far more emphasis has to be given to energy saving measures, renewable energy systems (such as wind, solar and tidal power) and good public transport systems. The planning system has a role to play in ensuring that climate change is addressed by, for example, ensuring that people can work, shop and enjoy recreation facilities near to their homes – reducing the need for excessive travel.

## Join the Big Ask

Friends of the Earth's new Big Ask campaign helps people who are concerned about climate change to press their MPs to pass a law that obliges the UK Government to make annual 3 per cent CO<sub>2</sub> emission cuts year on year.

- The UK government needs to act now to reduce carbon dioxide emissions – from electricity generation, from transport, and from industry. *Join the Big Ask Climate change campaign to ask the government to start acting on climate change [www.thebigask.com](http://www.thebigask.com).*
- You can also take action in your own home or office by saving energy and backing renewable energy initiatives, avoiding unnecessary flights and car trips and buying locally. *For further information visit our website on [www.foecymru.co.uk](http://www.foecymru.co.uk)*



The climate is changing it's time to ask questions  
Mae'r hinsawdd yn newid, mae'n bryd ofyn cwestiynau