

Radical energy technologies

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A radical energy technology is one that is not classed as “business as usual” and takes a different approach, such as renewable resources, for instance using solar cell technology instead of traditional fossil fuels. It could be a wide range of different technologies, including nuclear, wind, and other fuels. A policy regarding energy or energy consumption reduction could be a target to reduce consumption over the next decades, such as seen in the Kyoto protocol. It could also be more local or domestic such as recycling targets.

With the world’s primary energy needs set to grow by 55% by 2030, and electricity consumption to double over the next few decades, managing future need is a global challenge, and one of the most significant of our time. The International Energy Authority (IEA) estimates that \$22 trillion of new investment will be needed by 2030. At the same time, there is the global challenge of climate change and the need to develop cleaner sources of energy in order to improve the health of our environment.

There are two main ways of achieving this; measures such as emissions controls, carbon trading and green taxation to encourage a reduction in energy consumption and an increase in energy efficiency, this known as a ‘carrot and stick’ approach. The alternative to this is to develop new and radical technologies that are sustainable and bring energy security. An example of a stick and carrot approach would be through ‘green axes’. In some countries taxation measures, known as green taxes, have been introduced with the aim of cutting the use of natural resources and encouraging waste recycling.

In the UK these include new vehicle excise duties (VED) that tax vehicles according to their level of carbon dioxide emissions. Owners of so called ‘gas-guzzlers’ pay more, as do those with older, less fuel-efficient vehicles. Other ideas for taxes aimed at reducing energy consumption include removing stamp duty on the sale of carbon neutral homes, raising the duty on petrol and diesel, and raising air passenger duty on flights out of the UK.

Greater use of renewable energy and advances in energy technology may be one answer to a more secure energy future. However, all the new technologies that have emerged so far have their own advantages and disadvantages. Offshore wind turbines for instance costs at least 50% more than on land, but wind speeds at sea are generally double those on land, so offshore turbines can generate more electricity. The fact that offshore wind turbines cannot be seen nor heard from land

communities, this being a massive advantage, as proposal to build inland wind farms have been strongly opposed by those who claim they are visually unappealing and far too noisy. Horns Rev, in the North Sea off Denmark is one of the world’s largest offshore wind farms. It opened in October 2002, covering an area of 20 km², and costing in excess of ? 220 million to build. It generates 160MW through its 80 turbines. A prime factor in the selection of the site was the strength of the winds from all points of the compass.

This will make the future of Denmark’s energy much more secure because they know they are guaranteed this supply of energy. Geothermal energy is a new radical technology becoming popular in areas of the world geographically suitable to do so. In the Philippines, 25% of the electricity supply is generated from an underground supply of heat. This renewable

geothermal heat is free, inexhaustible and available day and night, due to local geology. The heat is used to turn water into steam, which generates electricity in turbines.

Geothermal energy has significant advantages over other renewable resources. There is no need to cover several square kilometres of land with wind turbines or solar panels, when certain parts of the world (main areas include Iceland, the USA and south Australia) have the 'hot rocks' that make recoverable heat possible. However, extracting this heat is not easy. In many locations the heat is too deep to be extracted economically, and the local geology can create problems.