

Future of low carbon energy

Challenge Overview Sheet

It is impossible to live in today's world and not come across the phrases 'low carbon energy' 'carbon footprint' and 'carbon emissions'. As our awareness of and concern for climate change grows, the issue of carbon, and more importantly low carbon energy, is very much a 21st century challenge. Every aspect of our daily lives, from heating our homes, driving our cars, transportation of our food and manufacture of our clothes, involves the burning of fuels and therefore the emission of carbon into the atmosphere, but does it have to be this way? Are there cost effective, sustainable and viable alternatives that will support economic and social development without compromising the environment? This module focuses students to look at the energy possibilities and suggest strategies to tackle this very real 21st century challenge.

In his speech, **Malcolm Wicks**, Minister for Energy, highlights three main themes of the low carbon energy debate: energy security, climate change and social justice for climate and energy. He believes that climate change is a global problem which demands global solutions and although decisions need to be made now, they must be made with one eye on the future, considering immediate impacts as well as impacts in fifty years and beyond. With geopolitics being central to the debate he goes on to say that "The energy revolution of the 21st century must not be allowed to create a new underclass of energy poor, either people, often the most elderly in our own society who could become priced out of the previous warmth they need to survive, or in developing nations having in order to complete to accept high levels of pollution or to replace the food crops they need with biomass for export to the richer parts of the world."

In the UK there is generally an acceptance that the climate is changing and that we need to act. Effects become more severe when temperatures rise by more than 2 degrees so the current prediction that much of the world faces temperature rises greater than 4 degrees if we fail to act, could be catastrophic. The other acceptance is that carbon emissions are largely to blame for this and that these emissions are mainly attributed to the burning of fossil fuels. At present, the World Energy Outlook Report from the International Energy agency predicts that under current policies, global carbon dioxide emissions will rise by nearly 60% by 2030 and the Minister cites Sir Nicolas Stern's report as highlighting the economic need to address this very quickly.

Between 2005 – 2030 it is predicted that the world's energy needs will need to grow by 55% with fossil fuels accounting for 84% of this. By 2020 Wick predicts that the UK will be importing 50 – 60% of its gas; figures which could rise to 80%. He discusses the need to avoid overdependence on any one region, but alongside this are the twin challenges of climate change and energy security. The UK must therefore move quickly to become a successful low carbon economy by cutting carbon emissions while still powering the economy and taking action to replace secure energy supplies.

Energy efficiency is vital and should be the first part of any strategy. He suggests individual measures for example insulating homes better, replacing light bulbs with energy efficient ones and not leaving electrical items on standby, as small actions that can make a big difference. With an EU target of 20% of all energy coming from renewable by 2020, he also recognises the need for greater use of renewable and nuclear energy as alternative energy sources. The reality however is that fossil fuels will continue to be burnt so there is also a need to look at how to make them cleaner. Technological advancements have led to the UK supporting the world's first demonstration project for post combustion carbon capture and storage on a coal fired plant. Technology has the potential to capture 90% of carbon emissions which could be a vital tool in the fight against lowering carbon emissions.

In his summary, Wick calls for the bringing together of government and personal action. He puts forward that renewable alone will not solve the problems of the current energy challenges but that a combination of renewables, nuclear, carbon capture and personal action (recycling waste, choosing low carbon products etc) will start to lead the way to lowering carbon emissions.

Lord Browne, the former Chief Executive of BP, opens his speech with the fact that “practical and affordable carbon measures exist today, the challenge is to deploy them at scale.” In order to do this, collaboration will be essential and although progress is being made, there’s the need for “stronger political leadership in so many parts of the world.” To avoid worse consequences of climate change, carbon emissions need to be reduced by 8 to 12 gigatonnes per year by 2058; an amount greater than the total global emissions today. He refers to this as an enormous challenge, especially when considering the predicted 50% population increase and standard of living increase expected in the same time period.

Browne suggests three strategies which could be adopted

1. “Take energy out of GDP through a revolution in energy efficiency
2. Take carbon out of energy through fundamentally changing the mix of energy we use
3. To halt destruction of carbon rich assets notably the world’s forests”

He also recognises that investments are being made with \$150billion being put into lowering carbon emissions and energy efficiency last year, but for improvements to continue there needs to be a partnership between governments, business, engineers and NGOs. This partnership will need to focus on a combination of measures for example cap and trade schemes, taxes and regulations to promote energy efficiency at the consumer level and a new financial framework to encourage the preservation of forests. “Transitional technology incentives in addition to carbon pricing, with the purpose of accelerating development and deployment of low carbon technologies, decreasing their costs to the point where they can compete on a level playing field with a carbon price.” In addition, barriers to low carbon energy must be removed globally.

In conclusion Browne returns to his idea that “sustained, outward looking political leadership” remains the greatest challenge. Strong leadership is needed to manage the trade off between climate change and promoting energy security and maintaining low cost supplies. The other leadership challenge will be sustaining climate policies over time; an essential feature of lowering carbon emissions and developing low carbon economies.