



**Business Environment™**  
Partnership

## **RSE inquiry into energy issues for Scotland**

Response from:

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**Business Environment Partnership**

The Business Environment Partnership (BEP) was established in 1998 to provide free and subsidised assistance with environmental management to small to medium sized businesses throughout Scotland. The principle aim is to make the Scottish economy more competitive by allowing companies to realise cost savings, reduce commercial risks and achieve competitive advantage through improved environmental performance.

See [www.thebep.org.uk](http://www.thebep.org.uk) for further information.

The BEP is also developing a hydrogen powered office building to prove that renewable and hydrogen energy can meet the energy needs of a modern office building. See [www.thehydrogenoffice.com](http://www.thehydrogenoffice.com) for further information.

The breadth and depth of the questions raised within the RSE energy inquiry are significant. The following aims to give a brief response to some of the issues. Should additional information be requested, the BEP will be very happy to assist where possible.

*1) How should Scotland provide for its energy needs over the next 5, 15, 30 and 45 years, in the context of the likely UK, European and global energy environment?*

In the light of increasing global demand for oil and gas, widely fluctuating oil costs, and an increasing reliance on imported energy, it would be prudent to invest in independent energy sources.

In assessing the cost of energy projects, the long-term economic and environmental costs of carbon dioxide emissions should be factored into all economic assessments, including the generation costs for existing carbon based power stations.

After significant investment and development nuclear energy has yet to prove the economic case when consideration is given to the long term storage of nuclear waste, the decommissioning of the power stations, and the insurance costs currently underwritten by the government.

Renewable technology is predominantly modular technology, which with the exception of the high voltage transmission network can be commissioned and decommissioned relatively quickly compared to traditional power stations.

Scotland has an abundance of renewable energy resources, a strong engineering and manufacturing base, and some exciting new renewable energy technology developers. It is well positioned to benefit from the current developments in renewable energy technologies which are seeing promising improvements in performance, and reductions in cost.

Onshore wind energy is currently cost competitive in the market place, and a number of other renewable sources have significant long term potential.

With early support to the off shore renewable technologies and bio fuels the 40% target by 2020 is achievable. To ensure scalability of these younger technologies, they need additional tapering support to attract development, and stimulate learning. Extensive evidence from similar modular technologies indicates that the experience curve reductions and economies of scale can enable new technologies to become competitive in relatively short time frames.

The development of key Scottish technologies (wave, tidal, etc) can not only ensure energy independence and long-term sustainability and security, but also see significant potential for global technology exports.

*2) Should Scotland aim to be self-sufficient in energy in general, and in electricity in particular, despite trends towards interdependence with Europe.*

Yes, increasingly energy is becoming concentrated within fewer countries located further from Scotland. Within 20 years Europe as a whole will be largely dependent on Russia and the Middle East for the majority of its energy needs. With steadily increasing energy demand, increased reliance on those few countries with the majority of the world's remaining oil and gas supplies will create significant economic risk.

*3) With over 65% of the worlds remaining oil reserves found in 5 Middle Eastern countries, and the majority of the world's gas supplies in Russia, the UK will find itself at the end of a long and vulnerable supply chain. Against a backdrop of: increasing global energy demand, global terrorism, religious fundamentalism and concentration of traditional energy resources, the global energy markets will become increasingly unstable. The inability to protect energy supplies, and control energy prices has potentially huge economic consequences for any economy.*

4) *What are the feasibility, availability, reliability, sustainability, efficiency, capacity and risks of the different generating technologies?*

Green Hydrogen technology (i.e. hydrogen generated through electrolysis, using renewable energy.)

Feasibility	Technology moving forward quickly. Performance, improving, needs support to reduce costs through economies of scale and the experience curve.
Availability	Using electrolysis, the availability of hydrogen is significant and wide spread. Its key limitations are the availability of renewable energy and water.
Reliability	Emerging technology is developing rapidly, supported by significant global interest and funding. Performance and reliability is improving. Further projects are required to improve understanding of integrated energy systems.
Sustainability	The generation of hydrogen from Renewables is a sustainable energy system that produces no pollutants or carbon dioxide. The process involves splitting and reforming water, with the end product being pure deionised drinking water.
Efficiency	The generation of energy from hydrogen using hydrogen fuel cells is highly efficient. Further development is required to improve the end-to-end efficiency of the process. The economics mean we are unlikely to see hydrogen competing with the national grid, but renewable and hydrogen energy systems have the potential to be commercial competitive in premium niche energy markets in the short term. Early premium niche markets include remote or off grid buildings where power supplies are either limited or need upgrading.
Capacity	Limited only by availability of renewable energy inputs. Scotland has significant capacity.
Risks	Lack of public and stakeholder understanding. Shortfall of public support to facilitate learning and technology development, driving down the cost of the technology.

Hydrogen fuel cells have huge growth potential, and world fuel cell demand is forecast to reach \$2.6B by 2009.

8) *What will the impact of energy availability and price be on the demand for energy by commerce and industry in Scotland?*

*Energy availability*

Security of supply already represents a major issue for many businesses, particularly those in the ICT industry, manufacturing and food sectors. Many small businesses manufacture to tight deadlines (especially those serving supermarkets and national 'chain' stores) and operate 24 hours a day – making loss of primary power a significant risk. Many businesses who cannot afford to lose production have already made investments in backup up generation equipment. We are likely to see more of this in future. In the ICT sector many businesses are investing in UPS technology and technologies such as hydrogen fuel cells are starting to find a niche application, providing dependable power for communications systems.

*Price*

Businesses have already witnessed significant increases in energy prices, particularly during the last 2 years. Many larger businesses have responded by introducing energy management programmes to reduce these costs, as well as renegotiating energy tariffs.

Small businesses, however, are more likely to change suppliers as a first means to reduce costs – though this tends to result in errors in billing and wasted staff time. Many small businesses have a very poor understanding of their actual utility costs. Smaller businesses – such as those supported by BEP – are also much less likely to attempt to reduce their demand as they:

- lack time to address this issue;
- have less well developed financial monitoring systems to identify utility costs;
- lack expertise to manage energy consumption;
- cannot afford to pay for advice on managing energy use;
- have less incentive to manage these costs as they are likely to be a smaller cost issue on their balance sheet.

The overall impact is likely to be that larger businesses (and hence larger users of energy) will react by adopting new technologies and attempting to reduce demand. Smaller businesses, however, are less likely to take action. The overall reduction in demand is therefore likely to be small.

*11) What are the environmental concerns that need to be taken into account, in terms of the impact on ecological and other natural resources, as well as waste management and impacts on the landscape?*

The easy answer to this question is to highlight the opportunity presented by clean, renewable and locally embedded generation. This avoids many of the key environmental impacts (landscape, carbon emissions and transport) associated with centralised, fossil fuel based generation. Thermal treatment of waste offers a solution, but not if the distances the waste is transported (often by road) outweighs the benefit (in carbon terms).

Scotland is extremely well placed to move towards a more localized system of energy generation, with an unrivalled wind resource, vast quantities of biomass, a strong wave resource and a thoroughly impressive technology base. However, significant investment is required to make this transition.

The key environmental concerns that should be taken into account are:

- the need to reduce carbon emissions;
- the immediate effect of generation on the local environment;
- the need to reduce the transmission of energy over long distances;
- the need to reduce the distance that fuels travel.

*12) Can the objectives of environment improvement and economic growth both be met without a major increase in energy costs ?*

Yes. Increased reliability on imported fossil fuels will lead to much greater increases in energy costs (longer term) than a short term transition to cleaner, renewable forms of energy which we can control ourselves.

*What steps should be taken to enable an informed debate on the issue?*

In order to have an open and informed debate the public require:

- realistic, full costs on varying methods of generation (fossil, nuclear and various renewables). The public debate has been constrained thus far by a lack of information on the true costs of generation, especially from nuclear power. When the Government finally comes clean on the true cost of nuclear generation, including storage of waste and decommissioning costs – the general public is likely to become much more accepting of clean renewable technologies;
- a concerted campaign to provide the general public with *facts* about various technologies, especially wind, biomass, geothermal, heat pumps etc;
- Reliable, unbiased predictions for future energy needs;
- leadership from the UK Government and from the Scottish Parliament – powers relating to energy policy need to be devolved.

*13) What are the social values and consequences of energy generation and distribution on employment opportunities, health and energy affordability?*

*Employment opportunities*

Scotland has an opportunity to become a world leader in clean, renewable energy technologies, building on the strong engineering base developed through the exploitation of North Sea oil. These technologies (rather than nuclear) offer greater opportunities for employment in remote rural areas,

which are more accessible to local communities. The nuclear industry, on the other hand, offers concentrated sources of employment which often require high levels of training.

### *Health*

Clean, renewable energy technologies have a clear advantage over conventional generation through:

- lower emissions;
- fewer health and safety concerns;
- the lack of long term radioactive wastes.

### *Energy affordability*

Relying on imported energy clearly presents a long term risk in terms of energy affordability. Empowering communities, individuals and businesses to generate their own energy clearly reduces this risk, providing energy at a reliable fixed cost for a number of years. Whilst a number of renewable energy technologies are marginally more expensive than conventional generation, these will soon become cost competitive as energy costs from conventional sources rise. Many renewable energy technologies are already cost competitive in remote and off grid situations.