

Royal Society of Edinburgh Inquiry into Scotland's Energy Supply

A submission by Orkney Islands Council

1. Introduction

Orkney is both a major consumer and producer of energy. It is a major consumer in the sense that its climate necessitates more space heating than on average in Scotland, and its industries, such as farming and fishing, and its transport needs (ferries and air services) are energy-intensive. It is a major producer through the millions of tonnes of crude oil flowing through the Flotta terminal, and through the potential of the wind, waves, and tides on and around Orkney to generate significant amounts of renewable energy. At the same time Orkney is at the forefront of energy conservation issues through the work of the Northern and Western Isles Energy Efficiency Advice Centre, which is based in Orkney. It also recognises that climate change caused by the burning of fossil fuels, is likely to have serious consequences for Orkney, and that this has important implications for future energy supply policy

All of this gives Orkney an important interest in, and perspective on, the issues for Scotland's Energy Supply. A considerable amount of work has been done, and continues to be done, in auditing energy usage in Orkney, estimating energy supply potential from renewable energy in particular, and preparing a strategy for Energy Sustainability in Orkney. This is greatly assisted through the existence of the Orkney Renewable Energy Forum, which brings together all the private and public sector and academic interests in the subject.

The Council welcomes this RSE inquiry into Scotland's Energy Supply, because it considers that greater strategic direction and planning, led by the Scottish Executive, is required in order to meet the energy challenges which are likely to arise over the next 20-50 years.

2. Future Needs

The first three Royal Society questions relate to the macro issues of Scotland's future energy supply. The Council's perspective on these issues is based on a recognition in Orkney of the heavy dependence, for the continuing economic and social sustainability of Orkney's communities, on secure and affordable energy supply.

Security of supply implies diversity of sources, both in terms of types of energy, and in terms of geographic areas. Imported energy carries political risks in addition to technical and financial risks; in terms of long term energy planning, maximising domestic energy production will tend to minimise that risk, as will diversifying the geographic origin of imported energy.

The Council believes that Orkney has a major contribution to make to renewable energy generation. This contribution would come not just from onshore wind power

(which in the island situation can be 30% more efficient than wind generation on the Mainland), but from a complete mix of wave and tidal power, and offshore as well as onshore wind power. The establishment of the European Marine Energy Centre will allow wave and tidal power to be developed around the islands. There is enormous potential for both of these areas, perhaps especially for tidal power, given the tidal streams between the islands, and of course in the Pentland Firth itself. A Resource Study undertaken for Orkney Enterprise by Aquatera has gone some way to quantify the potential. Orkney's role will be enhanced by the research and teaching interests of Heriot Watt's International Centre for Islands Technology, based in Stromness.

3. Energy Supply

3.1 Energy Sources

The Council does not have any special expertise on the technical issues relating to energy generation technologies (question 4). But a requirement for a diversified supply, and for maximisation of domestic resources, clearly indicates that all the potential UK energy sources, whether these are fossil fuel or renewables, should be developed. The current high cost of fossil fuels is seen by most commentators as a permanent, rather than a transitory, phenomenon of energy markets. Of itself this will make renewable energy a more attractive financial proposition, increasing the place of renewables in the energy mix, and stimulating technical development to allow wider usage of renewable energy.

The Council sees a clear economic benefit to Scotland as a whole, and to the islands in particular, in development of renewables, in terms of generating local employment and income. Whist in terms of numbers, employment generation will not be large, the employment will require specialist skills and therefore offers reasonably well-paid opportunities for Orkney's skilled workforce. There is potential, which is already being realised, for exporting this expertise not just to the rest of the UK but abroad as well. Orkney firms have already undertaken work in the US and elsewhere in this field.

In addition, there could be income generated for Orkney residents, as individual landowners, but also as communities with a stake in particular projects. The extent of this depends on the model adopted for development. Development of renewable energy could be mainly through large-scale development by commercial companies, bringing external capital into Orkney and taking the profits out of the County. There is limited local support for this kind of development, although this model may have a part to play. There is greater interest in a development model involving some community benefit, which could take a variety of forms.

The development of Orkney's marine energy potential holds out the possibility of large scale power generation in the islands, with the possibility of power being exported to the Mainland of Scotland. In the long term, widespread use of hydrogen fuel cells could make the production of hydrogen in Orkney an attractive prospect and offer an alternative method of export. In the immediate future, before this becomes a reality, reinforcement of the grid link between Orkney and the Mainland is essential.

3.2 Grid Reinforcement.

Large scale production of renewable energy in Orkney, and initial development of Orkney's marine renewables potential, can only take place if there is grid reinforcement, in particular additional capacity across the Pentland Firth through the laying of a new cable, or cables. The existing capacity of the two cables under the Pentland Firth is almost exhausted, to the extent that developers in Orkney can now only be offered 'non-firm' connections to the grid. Grid reinforcement is only likely to happen if the costs are absorbed by the nation as a whole, rather than by consumers or producers in the North of Scotland. It should be noted that, with the southernmost point of Orkney located only 7 miles from the National Grid in Caithness, grid costs should be reasonable in relation to the potential in Orkney.

Orkney could make a disproportionate contribution to the national targets for renewable energy, and this is the basis for the case that grid reinforcement costs should be absorbed by the country as a whole. The present regulatory regime, combined with the operation of market forces in a privatised industry, make it difficult to provide advance infrastructure in the expectation that renewables generation will expand to use that capacity. A long-term view of the sources of energy supply needs to be taken if this problem is to be overcome - in other words, a strategic view of energy supply and demand in Scotland.

4 Energy Demand

It is clear that the price elasticity of demand for energy is very low - energy is such a basic commodity in people's lives, and in a modern economy, that demand is likely to remain high, and even continue to increase, as prices rise. Energy price rises are likely to be a more powerful market signal to the development of new sources of supply, than to the demand side.

Nevertheless, there is much that can be done in relation to energy conservation, and this is an area to which the Scottish Executive has devoted considerable resources. Orkney has participated in this effort through the Northern and Western Isles Energy Efficiency Advice Centre, which runs a full programme of energy conservation activities. More can be done in relation to improving the energy efficiency of domestic dwellings. This is an important component of the Council's Fuel Poverty Strategy.

Other sectors of consumption are likely to increase their demands, including their demands for fossil fuels. Transport is the foremost example of this. As an archipelago, Orkney has extensive transport networks, both by sea and air, between the islands, as well as between Orkney and the Mainland of Scotland. Demand for transport, particularly business and social travel, is increasing. Internal ferries require to be replaced in the next few years, and new models are likely to be capable of higher speeds, to meet public demands, and will consequently consume more fuel. Video-

conferencing is becoming an alternative to some business travel, but the technology needs to improve further.

The impact of rising fuel prices on fuel poverty, already a serious problem in Orkney which has the highest level of fuel poverty in Scotland, is a matter of serious concern. The Council's Fuel Poverty Strategy sets out some means of mitigating this, but against a background of rising prices, a solution becomes more urgent as well as more difficult.

5 Environment and Social Issues

5.1 The Environment

Large scale production of renewable energy, especially by on-shore wind turbines, will impact on the landscape, and change the visual appearance of those areas where turbines are grouped. The experience to date in Orkney, whilst admittedly limited, is that the impact is not necessarily an adverse one. On the whole, there is an acceptance, particularly of the more recent designs which are much more slender than the prototypes. There is no real evidence of an adverse impact on tourism, indeed there is a high degree of interest in renewable energy from visitors to Orkney.

Large groups of wind turbines, i.e. a large-scale wind farm, would be a different matter. There are very few places in the Orkney landscape, if any, which could accommodate a large-scale wind farm without serious impacts on the lives of residents. By the same token, the cumulative impact of smaller turbine groupings, such as Orkney has seen to date, could also become a problem. Broadly, it is for this reason that the Resource Study carried out in Orkney suggested limited potential for on-shore wind generation in Orkney. A Planning Framework for Renewable Energy is currently at an advanced stage of development by the Council.

Planning legislation gives the local authority a degree of control over these developments. There is some concern that there is no equivalent local control over developments offshore, which may in some cases have a lesser visual impact (especially if they are underwater devices), but can potentially conflict with other maritime users, including fishermen and fish farmers. The Council believes that there is a case for the extension of planning control to development in coastal waters generally, rather than just to marine fish farms, as is planned at present.

At a broader environmental level, the problems caused by climate change will increasingly reinforce the move away from fossil fuels and towards renewables. Global environmental problems will come to weigh more heavily in the balance than the local environmental disbenefits of renewables projects. We may in future years have to accept more substantial changes to the landscape than some people are prepared to countenance today.

5.1 Community Benefit

There is a strong desire in Orkney to see the community benefit from the development of renewable energy, especially in the case of on-shore wind turbines. To some extent this is a question of landowners deriving benefit through rental agreements with developers. Orkney's fragmented land ownership pattern, based around owner-occupied farms, lends itself to a wide dispersal of rental benefits, and indeed offers farmers a diversified income stream. Small scale development, with limited groups of wind turbines, is the natural pattern for Orkney.

Orkney Renewable Energy Forum has undertaken considerable work into the development of a community renewable energy model, which would allow the community at large to take shares in a renewable energy company registered under the Industrial and Friendly Societies Act, to develop one wind turbine in each community. This is another means by which a dispersed pattern of development can be achieved.

A further model is for a community as a whole, through a collective vehicle such as a Trust, to take a stake in a local renewable energy project, or indeed to instigate such a project, so that the financial surplus flows back to the community. The Development Trust on the island of [Westray](#) is pioneering such a development at the moment.

The Council itself could become an investor in one or other of the above community models - an option which has been discussed, but not yet formally considered by the Council.

6 Conclusion

The present rise in the price of oil, and the increasing evidence of global warming, underline the growing need for a change in approach to the planning of the country's energy supplies. Diversity of energy source, and development of domestic sources, especially of [renewables](#), are becoming more important. Orkney is prepared to play its part in this - and sees itself as potentially a major player, especially in relation to marine [renewables](#). The Council believes that to enable this to happen, and to ensure the [sustainability](#) of Scotland's communities in the future, more long-term strategic planning of energy supply and distribution, led by the Scottish Executive, is required.

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