

SUSTAINABLE SHETLAND

RENEWABLE ENERGY IN SHETLAND: SOME ALTERNATIVES TO LARGE SCALE INDUSTRIAL WINDFARMS

We consider that reduction of Shetland's carbon footprint should be the aim that underpins a renewable energy policy. However in saying that we should recognise that in reality there is no such thing as "clean, green energy"; all energy, however generated, comes at a cost to the environment. The trick will be to get an acceptable balance between renewable energy generation, fossil fuel generation and the environment. At the end of the day a zero carbon Shetland is unlikely unless there is a massive leap forward in energy storage technology, but that should not stop us working towards getting an affordable balance on Shetland.

Such a policy should be in tandem with or incorporate a policy on energy saving, in both the public and the private sectors, and in both business and domestic sectors. We believe that economic benefit to the community (especially if dependent on subsidies and cost to the consumer) should not be the *prime* aim of renewable energy policy.

To put this in the context of Scottish Government Renewable energy policy, the following extracts from the introduction to the '2020 Routemap for Renewable Energy in Scotland', published in 2011 are useful (<http://www.gov.scot/resource/doc/917/0118802.pdf>):

"We are aiming for an output equivalent to 100% of Scotland's demand for electricity to be met from renewables, but ***it will be very important to understand that this does not mean Scotland will be 100% dependent on renewables generation: renewable energy is part of a wider electricity mix.***

"Detailed plans are in place to make progress, ***particularly to realise our offshore renewables ambitions***, but this potential will need to be recognised in the regulatory framework being developed at a UK level;

- 11% heat demand from renewables by 2020
- New target of at least 30% overall energy demand from renewables by 2020
- New target of 500 MW community and locally-owned renewable energy by 2020

"Underpinning Scotland's ability to supply sufficient renewable electricity and heat to meet its targets in a cost-effective way is the principle of demand reduction....The Energy Efficiency Action Plan established a target to reduce total final energy demand in Scotland by 12% by 2020, covering all fuels and sectors. The actions set out in the full Renewables Routemap will be taken in tandem with our continuing drive to reduce demand.

"Public engagement – renewable energy targets cannot be met in the face of public opposition but only with the support and will of the Scottish public, gained through early and meaningful engagement on commercial schemes, and access to benefits – including the scope to develop community-owned schemes.

"Headline actions for heat-based technologies include ensuring best use of biomass, rolling out heat mapping, building on the current study on recovery of heat from fossil fuel power stations, ***and***

setting up an expert commission into the development of district heating. The Scottish Government is also committing, through the new Routemap, ***to develop new strategies for microgeneration*** and for agri-renewables, to reflect the growing significance of small scale generation and opportunities for local and rural ownership of energy. We will also work with investors to establish a new Green Equity Fund for community renewables to ensure that the potential transformation of the scale of local ownership can be realised.”

We note in particular that “renewable energy is part of a wider electricity mix”; there is a strong emphasis on the potential of offshore renewables; there are targets for heat demand, overall energy demand, including for their reduction; and crucially in our view, “renewable energy targets cannot be met in the face of public opposition but only with the support and will of the Scottish public.”

We believe there are alternative strategies to that of large scale, cumulative, commercial onshore wind energy development, that can be pursued in Shetland to help meet the above targets, with the willing consent of the Shetland community, without major adverse impact on the environment and the health and amenity of the public, and within the bounds of the Local Development Plan. These can involve the following, for example:

- Energy saving initiatives (beginning with identifying high-demand users – including poorly insulated housing stock)
 - *Embedded generation (involving “re-stringing” of the local electricity distribution network)
 - Small scale tidal power
 - Wind to heat schemes
 - Air and ground source heat pumps
 - District heating schemes using a mix of energy sources (e.g., wind, solar, biomass – such as have been investigated by SHEAP)
 - Vertically Aligned Wind Turbine (VAWT) generators (e.g., as researched by John Dabiri at CalTech): <http://www.caltech.edu/content/caltechs-unique-wind-projects-move-forward>)
 - Transport: possibilities of hydrogen and/or gas and/or electrically powered vehicles and vessels.
- A gas-powered power station will significantly reduce CO2 emissions.

An example of an isolated island moving towards producing 100% of its energy needs is given here: <http://www.npr.org/blogs/parallels/2014/09/17/349223674/tiny-spanish-island-nears-its-goal-100-percent-renewable-energy>

We are not suggesting that we should duplicate this by using pumped storage hydro power, but we do believe that a combination of - for example - wind, tidal, solar (in summer) and biomass power, together with energy-saving measures and micro-generation, could go a long way towards achieving a sustainable and self-sufficient Shetland, one of which the whole community could be proud.

(We are aware, however, that there have been major problems with the renewable energy scheme in Foula, but these have perhaps been caused by unsuitability of machinery and other infrastructure, compounded by physical communication difficulties. Naturally, the feasibility of any such project should be carefully researched before any commitment).

*“Embedded energy generation is often used to power local networks, such as in Shetland, where, in the light of planned commercial renewable energy developments, and in the absence of an inter-connector cable to the mainland, embedded generation offers the only means of establishing new renewable energy schemes on the island. Examples of the opportunities that exist for embedded

generation are renewable energy schemes which aim to meet the power requirements of schools, leisure centres, industrial estates, commercial premises or even single domestic properties. Such embedded generation systems can extract a higher return from the sale of electricity to their dedicated customers than from the sale of a limited amount of power to the Shetland grid...The construction of new embedded generators will necessitate a local upgrade of the distribution network. This process is not difficult technically, involving the 'restringing' or 'reconductoring' of wooden poles and/or the introduction of new distribution lines; it does however incur significant cost." (Briefing paper to Scottish Parliament, [page 7]2004:

<http://www.scottish.parliament.uk/business/research/briefings-04/sb04-07.pdf>)

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