The energy review: priorities for action

Scottish Parliamentary Debate 26 January 2006

1.0 Introduction

Scotland's energy future is intrinsically linked to the rest of the UK, since energy policy is a reserved matter. However, the Executive has considerable control over renewable energy, energy efficiency and will oversee planning permission for any new nuclear power stations to be built in Scotland. In this briefing, we examine some of these issues.

2.0 Waste not, want not

Rightly the energy review considers the demand side of the energy equation, recognising that past government policy has failed to adequately address this issue, despite the fact that:

- Energy efficiency could reduce UK energy demand by 30% at no net cost (i.e. energy efficiency measures pay from themselves through savings) according to a Downing Street unit.[1]
- It is estimated that £1.3bn of energy is wasted annually in Scotland.[2]
- According to the Royal Commission on Environmental Pollution, half of the recommended 60% cut in greenhouse gas emissions by 2050 will come from energy efficiency. This target is achievable, but requires a step-change in energy efficiency standards[3].
- Investing in energy efficiency has wider economic and social benefits: it contributes to reducing fuel poverty, and leads to greater business efficiency and economic competitiveness. Indeed, the Executive is in danger of missing their target to end fuel poverty by 2016 unless a step-change in energy efficiency is delivered.
- The required step-change can be delivered through serious improvements in building standards (review starts in March 2006); through setting targets for energy efficiency improvements and through a well-resourced action plan to deliver those targets.
- Pound for pound, investment in energy efficiency displaces up to seven times more CO_2 than in nuclear.[4]

3.0 Tapping Scotland's renewable potential

The UK and Scotland in particular has a fantastic renewable energy potential.

- A study for the Scottish Executive estimated that Scotland could produce enough renewable energy to meet 75% of the UK's electricity needs[5] and the Government's Energy Technology Support Unit

[1] Performance and Innovation Unit (2002) – "The Energy Review. A Performance and Innovation Unit Report"
[2] Choosing Our Future: Scotland's Sustainable Development Strategy 2005, Scottish Executive
[3] Energy: The Changing Climate: Royal Commission on Environmental Pollution 2000
[4] Rocky Mountain Institute
[5] Garrad Hassan (2001) "Scotland's Renewable Resource"

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suggest that two-thirds of the UK's electricity could be produced from renewables by 2025.[6] This would suggest that the Executive's target of 40% of electricity produced from renewables by 2020 is insufficiently ambitious.

- Against current demand of 50 TWh[7], in Scotland there is the realistic potential to tap into 216 TWh of renewables from a wide range of sources most notably wind, wave and tidal (See appendix)[8].

- The problem of climate change is an urgent one: we need the swift responses that renewables can provide. The UK's offshore 60 MW windfarm at North Hoyle, off the coast of North Wales took 8 months to build. In comparison the last nuclear reactor built in the UK (Sizewell) took 100 months to build.

- A new focus on Micro-renewables could enhance energy security, and can assist in shifting public awareness, attitudes and behaviour[9]. It would take only 2% of Scottish households to install photovoltaics to provide 8% of our electricity needs, which is the projection for solar PV by 2050, in the Dti Renewable Innovations Review[10]. Many other micro-renewable technologies are at or close to market-readiness.

4.0 Dangerous distractions

Despite Scotland's world class renewable potential and the massive scope to actually use less energy, the focus of the policy review seems to be skewed to giving the nuclear industry a second chance. This is a dangerous distraction because:

- There is as yet no proven long-term solution for the UK's nuclear waste legacy. Deep storage looks like the only practical option but a suitable site is likely to be at least 20 years away. The cost of disposing of this waste is on top of the £56bn baseline cost of decommissioning the UK's existing nuclear sites.

- Given a combination of the time needed to license new nuclear facilities by the Nuclear Installations Inspectorate (NII), identify appropriate sites, secure planning permission and then construct a nuclear facility it is unlikely that any new reactor would be ready before 2020. In contrast, our Kyoto commitments demand a 12% cut in greenhouse gases by the average of 2008-2012. Yet even doubling nuclear power generation in the UK would achieve a reduction in CO_2 emissions of no more than 8%.[11]

- The nuclear industry's estimated costs for building a series of AP1000 reactors have been challenged by the US Congressional Budget Office (CBO) as being overly optimistic. Whilst the nuclear industry estimates costs of £0.6bn-£0.8bn the CBO has challenged these figures, saying that construction costs would be £1.2bn-£1.7bn per reactor. [12]

- The Government's Performance and Innovation Unit (PIU) examined the industry estimates and concluded that electricity costs of 3-4 p/kWh would be a realistic estimate.[13] In comparison the PIU suggests that in a similar timescale onshore and offshore wind has the potential to become among the cheapest low carbon options: around 1.5-2.5 p/kWh for onshore wind; and 2-3p/kWh for offshore wind.

- A recent US study put the potential impacts of a terrorist attack on a nuclear reactor at 44,000 immediate fatalities with 500,000 suffering long-term ill-health effects, such as cancers[14].

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[6] http://www.dti.gov.uk/renew/condoc/support.pdf
[7] Figure taken from *Review of the Climate Change Programme: A Consultation* Scottish Executive 2004
[8] *Scotland's Renewable Resource 2001* Garrad Hassan & Partners Ltd. Scottish Executive 2001
[9] Sustainable Development Commission (2005)
[10] Renewables Inovation Review, Dti2004
[11] Calculated by Greenpeace from DTI Energy Paper 68 Energy Projections for the UK.
[12] http://www.cbo.gov/showdoc.cfm?index=4206&sequence=0
[13] Performance and Innovation Unit, "The Energy Review" February 2002, para 6.48 p103 and Annex 6 para 44, p195
[14] Chernobyl-on-the-Hudson?: The Health and Economic Impacts of a Terrorist Attack at the Indian Point Nuclear Plant. 2004. Edwin Lyman, Global Security Program, Union of Concerned Scientists

Appendix 1 The Available Resource[15]

The Scottish Executive commissioned work on renewable opportunities demonstrates the following opportunities:

- Onshore wind resource is widespread and cost-effective, even after excluding environmental and cultural sensitive areas (60% of Scottish land area) and MoD low flying areas (26% of Scottish land area), transmission limitations from North-South bottlenecks, and the social constraint of too many wind farms in one area.
- Marine technologies, including offshore wind, wave and tidal, have very large potential resources, equating to well over the total Scottish electricity demand.
- Other resources individually offer relatively small but potentially cost-effective resources, with the opportunity of substantial benefits locally

Scotland's Renewable Resource Potential – utilisable by 2020[16]

Technology	Capacity (GW)	Energy (TWh)
Offshore wind	25.00	82
Onshore wind	11.50	45
Wave	14.00	45.7
Tidal stream	7.50	33.5
Small hydro	0.30	1
Energy Crops	0.14	1
Agricultural Wastes	0.40	3.5
Forestry residues	0.4[17]	3.1
Landfill gas	0.07	0.6
TOTAL	**59.00**	**215**

[15] Based on *Scotland's Renewable Resource 2001* Garrad Hassan & Partners Ltd. Scottish Executive 2001
[16] Ibid: Assumes that existing network constraints are managed. With no upgrade, renewable capacity is 3.1GW for onshore wind, 2.5GW for offshore wind, 0.3GW for wave, and 0.4GW for tidal stream.
[17] Based on recent FREDS analysis of biomass potential in Scotland