NUCLEAR OR NOT? CAN SCOTLAND SURVIVE WITHOUT IT?

The UK and Scottish governments are on divergent courses on the source of new electricity generating capacity. Future electricity generation needs to meet two fundamental objectives: security of supply and carbon emission reduction. What does this mean on practice?

All of Scotland's large-scale electricity generating plant will close within 20 years. If present trends continue, the UK and Scotland will be largely dependent on imported gas by 2020, much from politically unpredictable sources, and probably in an environment of strongly increasing demand competition and rising prices. In such an uncertain scenario, closing the door to a major source of baseload electricity generation threatens security of supply to consumers. Domestic and commercial consumers require security of supply from a diversity of fuel types, and geographical sources using a variety of technologies.

There is a consensus that the UK should be changing the balance of its electricity generation from fossil fuels to less environmentally damaging renewable sources. This is essential to reduce the emission of greenhouse gases. However, in the development of renewables technologies, realistically at present largely onshore wind, there are a number of unfounded assumptions. Renewables are not carbon neutral and all have some other environmental impacts, for example on landscape and on wildlife. Renewables are not cost neutral. All attract a subsidy under the government's Renewable Obligations Certificates (ROCs). Nick Hanley, Stirling University economist, calculates this to cost around £6 billion over ROCs lifetime. The assumption that the installed capacity of a wind farm will provide electricity for "100,000 homes" or "a town the size of Dunfermline" is wrong. Most wind turbines operate at one third of installed capacity. The challenges of managing a grid-connected system of wind turbines and other renewables to provide continuous supply of electricity are not yet resolved.

If an electricity supply crisis is to be avoided and ensure that 'the lights do not go out' what needs to be done?

Neither new nuclear generating capacity, nor reliance on renewables can be the sole solution. Reducing greenhouse gas emissions and ensuring security of supply means that a mix of technologies and fuel sources is essential. Nothing ought to be ruled out. The equation is complex as consumers require a certain level of supply all of time- baseload - and access to additional capacity which can be called upon at peak periods during winter and at peak periods during the daytime. What are the ingredients to meet these demands? Existing nuclear stations in Scotland must continue to be operated for as long as it is safe to do so. This is not a political decision but rests with the UK Nuclear Inspectorate.. Given their safer technologies, and lower capital and operating costs, there is a case for supporting the commissioning of new nuclear stations At the same time, work should continue to transform existing coal-fired stations in England and Scotland to lower greenhouse gas emissions. New gas stations should be built, preferably fuelled by secure supplies recently negotiated with Norway, Finally, the national electricity grid throughout the UK must be re-enforced to network supply sources with consumers. The lines

connecting England and Scotland need to be substantially upgraded. Within Scotland, it is essential that the government take strategic approach to the transmission system to connect emerging sources of renewable energy from Orkney, Shetland and the Western Isles into the national grid through major undersea lines. It makes no democratic or financial sense to spend a year debating the merits or otherwise of a 137-mile power line up-grade between Beauly and Denny, when the whole infrastructure needs upgraded and there are less environmentally damaging and more operationally efficient routes.

Scotland cannot operate in isolation from the rest of the UK electricity market as in future Scottish supplies could be inadequate to meet Scottish demand.. It has traditionally exported electricity to England and to Northern Ireland, and, occasionally imports electricity from England and France. It is hoped that the Scottish Government will not refuse to import electricity from a new generation of English and French nuclear-powered stations.

A more effective way for the Scottish Government to prove its climate change credentials would be for it to introduce a carbon tax rather than using taxpayer's money to subsidise hundreds of onshore wind turbines. And, to achieve economic dynamism, it must ensure security of electricity supply to consumers from a variety of new generation, low carbon large-scale combustion plants as well as a dispersed network of renewable sources. All of this should be set within the context of a comprehensive strategy for electricity to benefit Scotland's people and economy.

Professor Roger Crofts, CBE, FRSE
Secretary, Royal Society of Edinburgh Inquiry into Energy Issues for Scotland