Nuclear power

No easy answers in the generation game

Roger Crofts
Analysis

The UK and Scottish governments are now on divergent courses regarding the source of new electricity generating capacity. Both, however, need to meet two fundamental objectives: security of supply and reduced carbon emissions. As the Scottish Government has set its face against a new generation of nuclear power stations, the questions it has to confront are these: how will the energy gap be filled when the existing ones are closed, and what is the answer to the uncomfortable truth that renewable energy is neither carbon neutral nor free of environmental impact?

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 of it expensive and from politically unpredictable sources. In such an uncertain scenario, closing the door to a major source of baseload electricity generation threatens security of supply. Domestic and commercial consumers require security of supply from a range 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. Renewables are not carbon neutral, however, and all have some other environmental impacts, for example on landscape and on wildlife. Neither are they cost neutral — all attract a subsidy under the Government's Renewable Obligations Certificates.

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 problems of managing a grid-connected system of wind turbines and other renewables to provide continuous supply are not yet resolved.

So what needs to be done to prevent the lights going out?

Neither new nuclear capacity nor a 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 the time — baseload — and access to additional capacity which can be called upon at peak periods during winter and during the daytime.

Existing nuclear stations in Scotland must continue to be operated for as long as it is safe to do so. This decision is not for the politicians but for the UK Nuclear Inspectorate. Given their safer technologies, and lower capital and operating costs, there is a case for commissioning new nuclear stations. At the same time, work should continue to transform 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 reinforced. The lines connecting England and Scotland need to be substantially upgraded. Within Scotland, it is essential that the Government takes a 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 powerline upgrade between Beauly and Denny, when the whole infrastructure needs upgrading 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 insufficient to meet Scottish demand. It has traditionally exported electricity to England and Northern Ireland, and occasionally imports electricity from England and France. The irony for a future government is that, having turned down nuclear stations in Scotland, it may have to import electricity from a new generation of English and French nuclear-powered stations.

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Rather than using taxpayers' money to subsidise hundreds of onshore wind turbines, a more effective way for the Scottish Government to prove its credentials on climate change would be for it to introduce a carbon tax. And, to achieve economic dynamism, it must ensure security of electricity supply to consumers from a variety of new 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.

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Operators of plants will have to pay for decommissioning