Dear National Grid

I would advocate that dynamic tariffs that change prices over 24 hours, and which support switching to use the cheapest electricity available in this period, are introduced now to stimulate the development of systems to make best use of these tariffs. This way we raise the amount of low or zero carbon generation that can eventually be economically connected to the grid without stressing the supply and distribution system. Security of energy supply would also be improved.

I am a specialist in Domestic Energy Efficiency in Northern Ireland, where we depend on oil boilers for domestic heating. As the oil price rises it is likely that oil heating may become unaffordable. Over time the performance of heat pumps is likely to improve, as new rotary compressors can recover the energy of compression. Overall, and also in Britain, it is likely that more heat pumps will be installed. This will increase the amount of electricity flowing through the grid, and unless steps are taken to control this, the amount of electricity flowing in the critical winter evening peak will increase, stressing it.

It is advisable to introduce dynamic tariffs now that can incentivise load shifting away from peak periods and towards periods of high wind availability. e.g. Heat can be stored in hot water tanks, or as melted waxes. Excess wind in summer evenings can also be used to displace water heating by oil or gas boilers when their efficiency is lowest.

It takes time to develop and install equipment that can work with dynamic tariffs, so introducing them early will speed development and mass deployment. e.g. Electric cars are being developed that could also contribute to rational use of grid resources by being charged when the grid is underused, or by contributing to backup capacity. Heating systems are routinely only replaced in response to failure so a better alternative needs to be available immediately or an opportunity is lost. New household equipment can be economically and quickly assembled from available technologies to work with dynamic tariffs, but makers need the certainty of an available market now.

Using wind energy with electric heat pumps for space heating instead of heating oil displaces more carbon than using this energy to displace general electricity use. There is a correlation between available wind energy and heating load, due to draughts.

Oil heating tends to be installed in rural areas where there is spare capacity in lower voltage lines at most times. With smarter grid controls, this local capacity can also be used to transfer local wind energy or microgeneration output for local use without overloading the national grid.

Electricity prices are already dipping in times of high wind availability. Smart grid controls and dynamic tariffs can help create a floor for the value of wind or nuclear electricity by opening new markets for it as a substitute heating fuel. This would help sustain the pace of investment needed in new forms of low carbon generation.

Best regards

Andrew Frew BSc

I am grateful for the insights of Dr Neil Hewitt (UU) on heat pumps and Dr Brendan Fox (QUB) on electricity prices with wind.