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SONI's draft transmission development plan consultation

Understated risk exposure

The estimates of climate change and risk produced by the UN Intergovernmental (scientific) Panel on Climate Change are moderated by a consensus including nations dependent on fossil fuel exports, and are likely to be understating our risk exposure. A rise in global temperatures and increased risk of positive feedback creating even more heating is already 'baked in' by the accumulation of previous emissions, so emissions need to stop sooner to reduce risks of flooding, sea level rise, crop failure, and of massive population displacements and distress.

Decisions are already taken, risks must be reduced

In both the UK and the EU, the decision has already been taken to achieve zero net carbon emissions by 2050, but progress in meeting this target needs to accelerate due to the risk of heating feedback mechanisms in the global climate, even before predictable project delays in grid reinforcements are considered. ref:

<https://www.carbonbrief.org/analysis-how-carbon-cycle-feedbacks-could-make-global-warming-worse>

Efficient leadership

The Island of Ireland has a large and productive wind energy resource that can be exploited at lower cost than in many other areas in the world, achieving very high renewable energy usage and exporting learning that can inform global decarbonisation. But only if we develop exploitation of this variable resource early. e.g. Mass thermal storage using water is relevant to low carbon heating here, but is also relevant to the much larger cooling demands in metropolises in the tropics, where there is also large solar energy resource. The need for early action is not only true for the electricity distribution industry and local manufacturers, but for smaller SMEs active in installing heating and hot water systems and home insulation, and for consultants trainers educators and for thousands of future workers.

Increasing demand for renewable electricity and transmission capacity

We need to progressively increase the amount of installed wind generation, to provide power for fast developing technologies such as electric vehicles, Green Hydrogen produced by hydrolysis, synthetic fuel manufacture, storage in flow batteries, for community heating using hot water produced by electric heat pumps and stored for winter use. Local supplies of biomass are limited and will be in demand for making synthetic fuels, industrial products, foodstuffs, and for export, so the electricity grid must meet most future energy needs.

Opening the larger heat market to electricity, lowering CCGT, any CfD costs

Sales of low cost power for hot water or heat can utilise most available transmission capacity in any case, and ensure that more power produced in 'good' wind years is sold, with less curtailment. More power sold supports the more efficient CCGT generation, underpinning investment and also lowering the costs of any "Contracts for Difference" renewable energy

support. Wind energy production is greater in winter and can happen at any time of the night and day, so additional markets for any spare wind energy must be opened up to finance the required expansions in renewable generation capacity.

Without new transmission development, grid constraints limit wind supply and keep power prices higher than they need to be, preventing the installation of systems providing a demand 'turn-up' response to low market prices for heat and power. Before new battery and EV technologies mature, reduce in cost, receive incentives, and achieve mass roll-out, there are already alternative bulk markets for cheap power at different times of the day and night. e.g. In using direct electric resistance heating to displace the combustion of fossil fuels for hot water and heat, and for other materials processing applications. There is thus little reason to delay an expansion in transmission capacity.

#### Direct electric heating and low cost renewable electricity

The low and falling cost of renewable electricity has made direct electric resistance heating, with its higher grid capacity requirements, more attractive for many use cases than heat pumps, and a useful step towards the electrification of most heating and especially all-year round hot water loads. Early extra grid capacity can be used for this reliable and proven technology until electricity storage technologies, electric vehicles, and heat pumps become more affordable reliable and sustainable. Consumers need to be introduced to renewable heat in a convenient and accessible form, and to power prices that vary in time, if we are to transition to zero CO2 affordably.

#### Expanding renewable generation as a more sustainable alternative to battery storage

Batteries remain expensive relative to the falling cost of renewable generation, often with unsustainable supply chains and a short life, and with seasonal costs increased for other grid users. It will often be more economic and fair to expand renewable generation and alternative markets for power, reducing the time that storage is required and the amount of storage needed for existing power applications, but increasing the need for transmission capacity.

#### Raw materials and economic demand

Investment in grids now to allow more wind generation can provide an economic demand stimulus to overcome economic inertia after the Covid 19 pandemic, before global demand for low carbon infrastructure increases commodity metal prices again.

#### Facilitating needed change

If reasonable requirements for competitive secure and environmentally sustainable electricity supplies for decarbonised heating are to be met in the long term, systems must be set up so that barriers to renewable energy supply are minimised or removed. The status quo, represented in tariff structures, legacy metering technologies, and constraint of low cost power, also provides unreasonable incentives or subsidy for unsustainable and unaffordable increases in the use of electricity generated by fossil fuels at peak times. It does not systematically promote a Demand Side Response of demand 'Turn-Up' enabling more clean renewable electricity to be used to displace the use of dangerous fossil fuels over days and years.

## Removing unnecessary or counterproductive bottlenecks

Actions consistent with the legally mandated transition to zero carbon need to proceed now in parallel for all sectors, rather than to introduce extra sequential dependencies and bottlenecks such as waiting for the detail of energy strategies, revised tariff cost recovery strategies, Smarter grid controls, and grant or incentive schemes. This not least to reduce the likelihood of sea level rise caused by others, but which will impact this Island particularly. When limiting a building accumulation of CO<sub>2</sub> emissions, delay can bring both drastic consequences and costs that are unaffordable. Increasing grid capacity early may be cost-neutral when the displacement of fuel imports and avoided opportunity costs are considered. i.e. Early episodes of very low power prices are likely to bring forward appropriate private investment in displacing fossil fuel use in different sectors, for a range of possible policy scenarios.

## Limiting opportunity costs

Exposing industry to larger power price differentials earlier incentivises the installation of long lasting flexible plant that can utilise more renewable electricity closer to 2050 and beyond it. Industry, SMEs, and householders need shorter payback periods, especially for unfamiliar systems, than utilities. As their loan finance is more expensive, they need to see periods of low retail power prices now before investing. There are large opportunity costs if heating, hot water, and heating distribution systems are not installed now that can utilise variable wind energy. Systems installed now in 2020 will often still be in place at 2050. Electricity inputs for hot water and heat can be accepted at most times of the day and night, displacing fossil fuel use directly without the use of expensive batteries.

The Utility Regular should promote an expansion in transmission capacity while promoting its effective utilisation by a 'demand turn up' response at different times of the day and in different seasons. e.g. Oil boilers are usually inefficient when producing hot water in summer, and some home heating at night can limit humidity or prevent the lighting of a polluting fire in the morning. It may be appropriate to introduce negative pricing of transmission and distribution capacity at particular blocks of time at night and in afternoons now, using existing 'Powercode' meters, to achieve the investments in demand flexibility that property owners and industry need to make.

## Energy and Carbon Efficiency

Increasing regional transmission and cross-channel interconnection capacity helps to reduce the operational constraint of having to keep an extra large fossil generator running locally in case of the failure of another.

In peak demand periods when grid resistance losses increase, the electricity being distributed is more likely to be produced inefficiently using fossil energy, so that increased transmission capacity is also an effective energy and carbon efficiency measure.

Low potential for regret in upgrading transmission capacity.

The need for a substantial reinforcement of the electricity transmission grid is unavoidable. It is also an investment opportunity with a low potential for regret, however much power is used for new electric vehicles and heat pumps, because more power can also be used with

existing heating systems and immersion heaters to displace imported heating oil and polluting coal. Heating oil/ kerosene, used by 68% of NI homes, is a high carbon fuel likely to attract taxation in future. The wholesale price of electric power in the first three months of 2020, at 3.65 Eurocents/Kwh, was well below the cost of heat or hot water from heating oil. Oil will continue to be in demand as aviation fuel, so may be reserved for essential aviation by government, by introducing electric heat pumps sooner.

"Give me a crisis and I will manage it" may be an instinct familiar enough to energy industry executives, but it is not a viable strategy for dealing with ecological collapse.

Yours Faithfully