Written evidence submitted by Mr Colin Megson (CGE0082)

The renewables-tainted CCC are demonstrably anti-nuclear and wilfully ignoring burgeoning developments in advanced nuclear power plants (npps).

The comments below are taken from a lengthy synopsis of the CCC's 02 May 2019 report (*Net Zero – The UK's contribution to stopping global warming*) published by two professional energy correspondents:

The CCC make this all-encompassing statement: "…We think the renewables, wind and solar, are going to be the cheaper technologies, and the more we have of them the cheaper [it is] going to be."…""

They also say:

"…In a net-zero UK, the electrification of sectors such as transport and heating would result in a doubling of electricity demand…".

"…a large, reliable supply of electricity is vital to power everything from cars to heat systems……. achieved primarily through an enormous rollout of offshore wind and other renewables…".

"…Such deployment could include at least 75 gigawatts (GW) of offshore wind…".

"…The CCC took a "cautious approach" in its projected scenarios, limiting the share of these variable renewable energy sources [wind and solar] to 60%...".

This simple arithmetic below proves what utter misleading nonsense those CCC's statements about the cheapness of wind and solar are:

In 2028, the first of GE-Hitachi's BWRX-300 Small Modular Reactor (SMR) will be available at a cost 60% below the cost of our 'New Nuclear'. 3 or 4 years later, this 300 MW nuclear power plant (npp) will cost just £452 million each and generate 24/7, low-carbon, pollution-free electricity for a design life of 60 years.

The UK uses 340 TWh of electricity each year. Double that would be 680 TWh, of which 408 TWh [60%] would be allocated to wind and solar. 75 GW of offshore wind would deliver 262 TWh and would cost £142 billion for a lifespan of 25 years – that's equivalent to £340 billion for 60 years.

Of the remaining 146 TWh, it would be reasonable to suppose 60% of that would go to onshore wind – that requires 33 GW, generating 88 TWh per year, for 25 years and costing £37 billion – that's equivalent to £89 billion for 60 years.

Solar pv generating the remaining 58 TWh per year would require 47 GW of installed capacity, lasting 30 years and costing £54 billion – that's equivalent to £108 billion for 60 years.

Meeting the CCC's stated recommendations with wind and solar for 60 years of electricity generation would cost £537 billion.

It would require 173 BWRX-300 SMRs to generate the very same 408 TWh of 24/7, low-carbon, pollution-free electricity for 60 years at a cost of just £78 billion – that's less than 15% of the cost of wind and solar.

So, the bare cost of 166 GW of installed wind and solar is almost 7X more than 52 GW of nuclear power; unarguably, the transmission and distribution costs for wind and solar are also significantly higher. In winter, when solar generation is zero, wind can be generating below 5% of installed capacity on average, for days or even weeks and dedicated, low-carbon, backup technologies will be required. This adds yet again to the higher costs of wind and solar.

The tragic explanation of the enormous cost of renewable technologies is the 10X to 20X wasted use of precious material resources over and above that used by nuclear power. Add to this the attendant wasted, mainly fossil-fuelled, energy consumed at every stage, from mining to installation. Of enormous environmental concern is the hundredfold increase in the areas occupied by renewables, meaning 100X more scenic desecration, ecosystem destruction and species wipe-out.

It would not be unreasonable to suppose the reality is that wind and solar will cost us 10X more than nuclear power and recent USA regulatory decisions regarding SMRs are sure to increase SMR competitiveness even more.

A recent Forbes article clearly makes the case. It shows SMRs can be sited close to centres of population and states:

"…the United States Nuclear Regulatory Commission just agreed that any emergencies that could possibly occur at a small modular nuclear power plant probably won't even get past the fence…….No need to come up with huge evacuation plans for nearby cities or anyone living near the plant, like we did for older plants. You can just stand there at the fence and watch what's going on…".

This opens up the opportunity for some, maybe many, of the BWRX-300 sites to use the 'waste heat' from electricity generation to supply heat and hot water to buildings.

The provision of heat and hot water to buildings is the most problematic sector to decarbonise and accounts for some 40% of the UK's GHG emissions. The CCC's contorted combination of 'solutions' involves firstly turning down building thermostats and then using hugely expensive technologies such as electrical heat pumps, hydrogen from methane reforming and biogas – added to which is the 'necessity' of having to deploy the fledgling technology of carbon capture and storage (CCS). A 'necessity' or not, CCS is a technology that will never see the light of day at industrial scale.

The BWRX-300 is rated at 950 MWth and using it as a Combined Heat & Power (CHP) plant might well reduce the numbers needed down to 150 or so and a cost of just £68 billion. Used in CHP mode, BWRX-300 plants would provide a second revenue stream for investors which, along with the low cost, would be an investment capable of draining all financial interest in wind and solar.

The BWRX-300 is a uniquely simple and therefore cost-effective SMR design and is targeted to be competitive to gas. At a predicted cost of $2,000/kW, no other SMR design can possibly compete with it and there are no technological, infrastructure, logistical or environmental reasons why this npp could not become the UK's standard power station. On brownfield sites or out-of-town industrial parks, they could so easily supply the vast majority of the UK's energy needs in a not too dissimilar way that coal-fired power stations did in the polluted past.

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