

A Case for the Sizewell C (SZC) Nuclear Power Plant for Consideration by the Planning Inspectorate

Summary for the SZC case

I support the EDF planning proposal for SZC, which is of national importance. The planned retirement of the UK's ageing Advanced Gas Cooled (AGR) nuclear reactors gives rise to a daily loss of some 5GW of nuclear generating capacity. This lost capacity needs to be replaced with a reliable, stable energy source, i.e. nuclear power. This strategy follows the continuation of the "mix" of differing UK energy technology sources seen today. Further, it maintains the resilience of our UK power network, avoids putting "all ones' eggs in one basket" with a consequential risk reduction of over-reliance on one or more green energy sources.

Whilst nuclear generating costs are significant and deemed to be more expensive than green energy sources, these costs should be weighed against the risk of a loss of electricity supply arising from an over-reliance from green energy sources. Society should absorb these differential costs as part of its assurance to provide a guaranteed, uninterrupted electricity supply to UK homes.

The SZC case is further strengthened by the Government's declaration to become a net zero carbon emitter by 2050, the perspective being to halt carbon dioxide emissions from some power plant designs. It's *Ten Point Plan for a Green Industrial Revolution* should be endorsed.

Justification Details

- Our UK electrical energy supply with its daily summer demand of circa. 35 GW is primarily derived from the following energy sources, quoting the respective, approximate percentage proportions (shown in parenthesis), together with a commentary on the quality of that energy source.
 1. CCGT (45%) – a reliable and consistent energy source, but a carbon dioxide emitter
 2. Wind (c. 2 - 11%) – an inconsistent green energy source, subject to the vagaries of wind speed.
 3. Nuclear (20%) – a reliable, consistent, stable, non-fluctuating, base-load energy source.
 4. Solar (c. 8 - 16%) – an inconsistent green energy source, subject to the vagaries of the prevailing weather conditions
 5. Biomass (7%) – a reliable energy source, but a greenhouse gas emitter
 6. Coal (0%) – 9 UK power plants. Environmentally challenging, they are a major source of atmospheric pollution and carbon dioxide emissions.
- An energy shortfall will be created by the retirement of the ageing of EDF's Advanced Gas Cooled (AGR) nuclear power plants – 14 reactors at 7 sites from 2022 on a rolling basis to 2030. These reactors currently provide an average daily output of circa. 5GW. This loss of capacity reduces the UK nuclear base-load generating capability putting increased pressure on alternative forms of electricity generation. This highlights the importance of Sizewell B, Hinckley C (currently in construction) and Sizewell C to maintain the balance and "mix" of energy supplies, and thence assurance to the resilience of the UK power network.
- The Government's declared climate change target aims to cut carbon emissions to net zero by 2050, and this will inevitably impact the sources of our UK energy supply, namely
 1. CCGT plants to be either retired, or retained for emergency use only
 2. Coal generating plants to be decommissioned by 2025
 3. A retirement of Biomass plants
- The ensuing energy shortfall needs to be replaced, and according to the Government's *Ten Point Plan for a Green Industrial Revolution* includes;

1. Additional **Wind** Farms
 2. An increase in **Solar** energy
 3. An increase in **Nuclear** energy – including the so-called SMR technologies
 4. **Energy Saving** technologies
 5. **Emergent technologies**
 6. Tidal Power – a distant possibility. Many practical problems in UK waters. It has always been deemed to be too expensive in the UK.
 7. Wave power – a distant possibility. The technology has not progressed much beyond the experimental phase.
- A SZC nuclear power plant will fulfil part of that shortfall. Its design is advantageous to the environment in so far as it is a **non-emitter** of carbon dioxide, a greenhouse gas and major contributor to global warming and climate change.
 - The cost of nuclear energy is known to be higher than comparable green energy sources, with their vagaries of supply. Given the importance of having a resilient UK power network, plus having a “mix” of generating capacity to ensure the security of supply, the differential costs between green energy production and nuclear power production should be recognised as a necessity, in minimising the risk of interruption to energy supply. In consequence, these higher differential costs should be absorbed by Society.
 - The SZC power plant is proposed on a site adjacent to the existing Sizewell B nuclear power plant, with much of the infrastructure needs already catered for e.g., power grid, water supply, road and rail communications, albeit the latter needs enhancement during the construction phase. The proposed provision of a beach landing / marine berthing facility follows that deployed for the Sizewell ‘B’ construction phase, and should be maximised for SZC, possibly at the expense of fewer rail movements.
 - The much published, long term environmental concerns expressed during the planning phase of Sizewell B did not materialise. Whilst there was some disruption during the SZB construction phase the environment and ecology within the local area was not permanently damaged and it continues to thrive. Wildlife has a habit of bouncing back after adversity, and with the committed proposals being made in EDF’s SZC planning application i.e. to protect and mitigate any potential risk to habitats and ecologies during construction and subsequent plant operation, the same should be true for SZC.
 - Nuclear waste is an emotive topic and should not be used as an excuse to preclude nuclear power and SZC in particular. Spent, highly irradiated PWR fuel can be safely stored on site in radiation shielded containers for the duration of the power plant operating life. Thereafter the option and technology does exist to reprocess the spent fuel and separate the long-lived isotopes for eternal storage – a long outstanding political, engineering and technology problem. Nuclear proliferation used in the anti-nuclear lobby is a nonsense argument.

This case compiled by Peter Skeet, C.Eng., M.I Mech. E. (retired)

References:

1. National Grid Status – UK electricity generation @ <https://www.gridwatch.templar.co.uk/>
2. EDF – closure of the AGR fleet of nuclear power plants @ <https://www.edfenergy.com/energy/nuclear-lifetime-management>
3. UK Government publications / press releases:
 - a. [New climate target for reduction of carbon emissions](#)
 - b. [The Ten Point Plan for a Green Industrial Revolution \(bullet points\)](#)