

From: [John Tomlinson](#)
To: [SizewellC](#)
Subject: Fw: Proposal for Sizewell C & Effect on Environment.
Date: 11 October 2021 16:21:32

Sizewell 'C' Planning Inspector,
Dear Sir or Madam,

The New Power Plant Proposed for Sizewell 'C' and its Effect on the Environment

I understand the proposed power plant will be of similar design and specification to the HPC plant currently being constructed here on the Somerset coast. I have worked in the nuclear industry as an engineering technician for many years, including Hinkley Point with the CEGB. Now retired I continue to take a close interest in future developments. There are many local environmental consequences resulting from Sizewell C's development, but my main concern is about the enormous amount of heat it would be discharging into the sea, at a time when the world is already warming dangerously.

The fundamental problem with nuclear generation is that it is **a thermo-electric device**. It produces enormous quantities of heat just like a conventional plant, for raising steam to a high temperature about 500 C at high pressure to drive steam turbines. The laws of thermodynamics dictate that only half the heat can be converted into mechanical energy, so the exhaust steam has to be condensed by cooling so it can be pumped back into the reactor's boiler. With coastal plants, cooling is done by sucking in seawater from the deepest and coldest part of the seaway and fed to the condensers. The water is returned to the sea about 12C warmer. A 3 Gigawatt plant like HPC needs a colossal amount of cooling water to keep the temperature rise below 12.5C; the maximum permitted. Something over 100,000 litres per second is needed, which equates to a power of **over 6,000 Megawatts going directly into the sea**.

It is not easy to calculate the effect this rate of heating has on the North Sea, along with many other contributors, and I am not aware of any measures to mitigate it. However, the German environmental monitoring station on Heligoland has reported that average North Sea temperatures had risen by 1.7C during the past 45 years and could reach 3C by the end of the century. This is already above the UN's 1.5C target, and is twice the rise in ocean temperature. Warm surface water tends to drift north-eastward around Norway towards the Arctic. We know that Arctic ice is melting, and that a reduced area of ice cover will increase warming by the sun. The catastrophic consequences of melting permafrost and release of methane gas are well known.

EdF evades questions about *thermal emissions* and publicises the notion of '*low-carbon*' emissions (to the *atmosphere*) by comparing nuclear with convention fuels like coal, oil and gas which do pollute. But these high-carbon fuels are due to be phased out (in the UK), anyway by 2030. EdF cannot avoid the fact that their plant(s) will be directly warming the sea. So by the time the plant is finished and working, this argument will be irrelevant. The sea, land and atmosphere are all part of the Earth's ecosystem and cannot be separated, so arguments for the future should be about **hot nuclear** or **cool natural power**. The distinction is clear; nuclear is neither '*sustainable*' nor '*green*'.

The plant's carbon emissions can't be very low if all the carbon arising during its construction and eventual de-commissioning are taken into account. Mining uranium, refining and enriching it into a fissionable fuel are carbon intensive processes. The dangerous spent fuel has to be stored, transported and re-processed along with stringent safety and security measures. These hazardous processes require a high standard of administration and management. Finally after its 60 years life the de-commissioning work, and cleaning up the site will be an unwelcome task for our grandchildren's generation to deal with. The £20 billion construction cost of the plant gives an indication of its carbon debt before it starts generating.

These large-scale plants are expected to be in operation and warming the sea for 60 years. This will not matter much for older people living today, but young people and children being born now will have to live with and deal with the consequences of decisions being made now. Our policy-makers have great responsibility and need to think well beyond of their own life times and current political influences.

In the long run it will be the **cost per kWh** generated which will determine the future of nuclear power. All financial forecasts indicate falling prices for sustainably generated power. Consumers, especially the young, are turning away from nuclear, and will prefer to buy their electricity from green sources. This seems to be the trend in Europe. The technical and financial risks associated with the type of reactor used are not encouraging, which means the financial risk will have to be borne by consumers or through taxation. We have a **free energy market in UK where consumers can choose their supplier**, so on balance the economic prospects for the plant look poor, and I think they are unlikely to reach their designed life - while ever Arctic ice melts.

I would advise the planning committee **not** to approve the construction of this particular plant, and that a more *economical* and **climate-sustainable** design should be considered to replace the existing 'B' station when it retires.

Yours faithfully,
John Tomlinson,

