UK most expensive place to develop nuclear power, report says

Hinkley Point C in Somerset is under construction

Risk aversion because the system punishes failure

Priority for **process over outcome** using complex procedures as protection

Lack of incentives aligned with the public interest

The reactors EDF constructs in France cost per GW half those in UK

A fragmented regulatory system has led to conservative and costly decisions not proportionate to the actual risk being managed

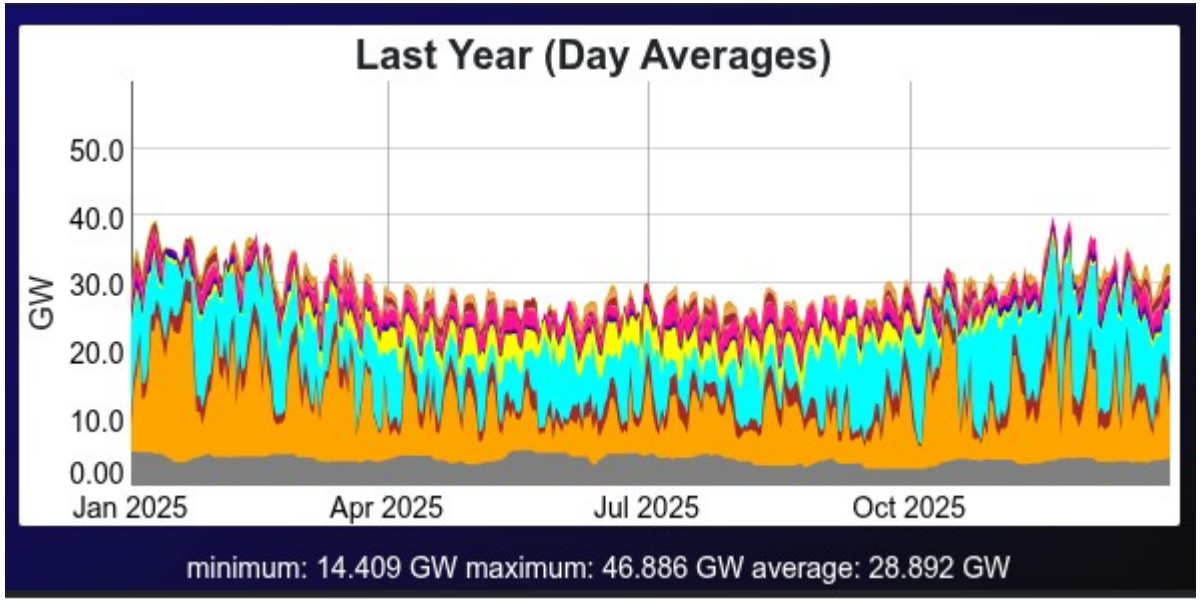
The planning system needs to be streamlined and the risks associated with nuclear energy should be brought into line with the rest of the world

Government will overhaul “overly bureaucratic” regulations within 3 months

Allow nuclear plants closer to urban areas

Allow more harm to the environment and compensate by paying into a nature fund to be used elsewhere.

(EDF has spent £700m to prevent a very small number of fish being sucked into Hinkley Point.)



https://gridwatch.co.uk/

Imports
Solar
Wind
Biomass
Gas
Nuclear

8 of the 9 existing reactors are due to close by 2030

On days with little wind gas supplies 2/3 of our electricity, but the plants are ageing

2025 budget: 25% of UK electricity from nuclear by 2050

Hinkley Point C in Somerset: approved 2016, expected early 2030s. Building largely complete, now installing pipes, cables and reactors. Privately funded, with guaranteed price of elecricity for 35 years.

Sizewell C approved 2022, expected late 2030s. About half the funding from government.

Each at least 5 years later than expected

Each about 3 GW

Each original cost £20bn, now doubled. Partly inflation, also challenging ground conditions and other technical issues.

(The Infrastructure and Projects Authority notes that all UK “mega-projects” since the 1980s have ended up over budget, and most were late)

Small modular reactors: first just approved for Anglesey, expected mid 2030s.

Built by Rolls Royce, each 470MW, cost about £2bn -- less than £4bn per GW

Half the funding from government

Aims to deploy 3 reactors initially, with potential for up to 8 at the site

(The existing nuclear power station on the site will not be fully demolished till the end of the century)

Several other sites being examined

Radioactive waste

Electricity from gas about half the cost per GWh compared with nuclear

In addition there is the cost of nuclear waste disposal

UK planning to dispose deep underground. First site not yet selected. Unlikely to be ready before 2050.

Building and maintaining these facilities is extremely expensive and time-consuming because they must withstand geological changes, groundwater intrusion, and human interference

Initial construction cost £12-20bn

Nuclear fusion

Fission: heavy nucleus breaks up into two lighter ones

Einstein's equation: $E=mc^2$ If mass *m* disappears energy *E* is released.

Fusion: Two nuclei fuse into one of lower mass, difference in total mass appears as energy. TOTALLY CLEAN.

First announced (wrongly) by Harwell in 1958. Till now has always been 30 years away. Still the realistic view, though some private companies hope to achieve it in half that time.

Global investment so far: private $10bn public $30bn

UK government planning £2.5bn investment over 5 years

Nuclear-powered ships

significant potential to decarbonise shipping

higher speeds than conventional boats

produce no carbon emissions

no need for refuelling stops

International Maritime Organisation beginning to draft standards

at present uninsurable

but 6 countries already have nuclear-powered submarines