

Just how dire EDF's financial situation is is illustrated by a report by Bloomberg's financial services, dated 18<sup>th</sup> February, which informs us, "The French state will inject about 2.1 billion euros...into [EDF] as the combination of reactor shutdowns and a government power-price cap batters the utility's finances.

"The value of EDF has already slumped this year, with its French atomic output set to drop to the lowest in more than three decades due to repairs and maintenance at its reactors. The situation has been made even worse for [EDF] after the government of President Emmanuel Macron...forced it to sell more power at a steep discount, to protect consumers and businesses from soaring energy prices.

"EDF's core earnings could plunge by as much as 70% in 2022 as those two factors more than offset the gains from higher electricity prices. Shares of the company fell 4.9% to 7.93 Euros as of 10.53am in Paris. As it grapples with these short-term financial challenges, EDF also needs to spend 'considerable amounts' on new reactors and renewables...

"While the Paris-based utility reported an 11% increase in 2021 earnings before interest, taxes, depreciation and amortisation [the writing off of assets due to depreciation] to 18 billion Euros, the outlook for 2022 was significantly worse. Government policies could reduce Ebitda [earnings before interest, taxes, depreciation, and amortisation] this year by about 8 billion Euros, with a further 11 billion-euro hit from the decline in its electricity output. Those factors will more than offset the anticipated 6 billion-euro gain from higher power prices, EDF said."

The case with Sizewell C is a little different. The current investment of CGN in the project is "only" 20% (upwards of £4bn), and the government has shown itself willing to invest in the project to the tune of the £1.7bn they pledged in December 2021 to "support at least one large-scale nuclear project by 2025 (which can only be Sizewell C). But this would clearly not be enough to bridge the gap left by the removal of the CGN investment, and on 27<sup>th</sup> January the government announced it would invest £100m "to help develop the project while the company courts private investors" and that it would "maximise investor confidence in the project".

But this is nonsense: how can the fact that the UK government is only willing to invest £100m in a £20bn project (that is 0.5%) give any confidence to potential investors? It is more likely to have the opposite effect.

Another problem is that if, as it seems to want to, the UK government wants to kick CGN off any involvement in building Bradwell B and Sizewell C then this will involve breaking a tripartite treaty it signed with EDF and CGN, and there are surely penalty clauses in the treaty for unilaterally breaking it. Derek Wyatt MP in a letter to *the Guardian* suggested this penalty might amount to £100m.

And what about Hinkley C? Here CGN's stake is 33.5% and the current overall cost of building Hinkley C is projected as £23bn, so the CGN stake is some £7.7bn. How are the Government and EDF to find the funds to cover this enormous gap, assuming the government wants to remove CGN from this project, or CGN wants to remove itself?

The other serious problem with both Hinkley Point C and Sizewell C is that the European Pressurised Reactor (EPR) design that EDF is building at the former and plans to build at the latter has been a great failure commercially and technically. Only five reactors of this design have ever started building; apart from Hinkley Point C these are one in France, one in Finland and two in China. The ones in Finland and France, which started building in 2007 and 2009 respectively, are still not delivering electricity to the grid. The Finnish one was started up in December 2021, after over 14 years in construction, 10 years longer than originally announced, and it is claimed will start delivering electricity to the grid next October. The French one is now due to start operating in 2023, also 10 years later than originally announced.

The two EPRs in China, Taishan 1 and 2, started up in 2018 and 2019 respectively, also after delays in construction, but "only" of 5 years each.

But, as I reported in the January newsletter, one of these [Taishan 1] was shut down in July 2021 after fuel rods had become damaged causing the accumulation of radioactive gases. A whistle-blower claimed that the damage was caused by "abnormal vibrations", which indicated a possible design fault in the reactor pressure vessel. If this is so then the reactor being built at Hinkley to an identical design might well have to be adapted to eliminate this fault, which would mean further delays in the project and increased cost.

The French *Commission de Recherche et d'Information Indépendantes sur la Radioactivité* [CRIIRAD] issued a statement calling on the French nuclear authority *l'Autorité de Sûreté Nucléaire* [ASN] to issued a statement saying [my rough translation] "the information gleaned [suggests?] that the damage to the nuclear rods was the result of a fault in the design of the EPR pressure vessel: it brought about a bad distribution of the hydraulic flux and in consequence very serious vibrations in the

fuel rods leading to their ruptures, abnormal wear and tear to [the structure holding the fuel rods?], [and] the dispersal of radioactive debris in the heart of the reactor, with serious consequences in terms of safety and protection against radiation regarding workers and local residents. If this turns out to be the case, they will affect the all EPRs (Taishan 2, Flamanville 3, Olkiluoto, Hinkley Point)...CRIIRAD awaits [from the companies involved with the Taishan 1 reactor?] the greatest transparency regarding the technical information they have [relating to the causes of the accident at it] and from the ASN the greatest determination to obtain all the information required from the Taishan Nuclear Power Joint Venture [which owns Taishan 1 and 2 and in which EDF owns a 30% stake and CGN the rest] and the French firms concerned. It is essential that that the nuclear safety authorities of the countries concerned [with EPR reactors] should carry out a rigorous analysis of what happened at Taishan 1 and what this means for the safety of the EPR design...It remains to verify and validate the above [account of what happened at Taishan 1], but it appears sufficiently solid and coherent to justify, considering the stakes at issue regarding the safety of the EPR design in general and for Flamanville 3 [EPR] in particular, the sending of a letter demanding precise responses and in-depth investigations to ASN.”

The response of ASN to the accident was indeed to order a halt to the construction of Flamanville 3 and recommend that Finland stopped the imminent start-up of its EPR. Finland ignored this recommendation, as reported above, saying that they would await the results of the enquiry, though surely the precautionary principle would suggest that the plant should be shut down *until* and unless the enquiry finds the EPR design safe.

In the UK, the Chair of the UK Nuclear-Free Local Authorities Cllr. David Blackburn, wrote to the Minister of State for Energy, Clean Growth and Climate Change and to the CEO of the Office of Nuclear Regulation requesting an indefinite halt to developments at Hinkley (and Sizewell) while a thorough review of the Taishan 1 accident is conducted to ascertain whether the EPR design contains a fatal design flaw, and, if it was found to do so, to establish whether there is any technological solution that could be implemented to remedy it before the Hinkley Point C plant is finished building and comes on line?

This request was refused, again with the rider that the result of the Chinese enquiry into the malfunction at Taishan 1 would be awaited before it was decided whether to halt construction of Hinkley C.

# KICK NUCLEAR

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We hold “**Remember Fukushima – End Nuclear Power**” vigils in London **on the 2<sup>nd</sup> and last Fridays of each month**, from 11am to 12.30pm outside the Japanese Embassy at 101-104 Piccadilly, followed by from 1 to 1.30pm outside the offices of the Tokyo Electric Power Company at Marlborough Court, 14-18 Holborn.

All anti-nuclear people invited to join us.

## FINNISH EPR REACTOR STARTS-UP AMID FRESH EPR SAFETY DOUBTS

In the January newsletter I hazarded that Sizewell C and Bradwell B, as planned, would probably never be built.

The case, as far as Bradwell B is concerned, is a no-brainer, with the UK government having decided to stop allowing investment from the Chinese state-owned company, China General Nuclear (CGN) in UK nuclear projects and particularly not to allow it to build a Chinese-designed nuclear plant at Bradwell C. Since CGN was the lead company in the Bradwell project with an 80% stake in it, for the project to be carried out would require starting afresh with another design for the reactor and finding some other company or companies willing to cover the 80% investment in the project for which CGN was previously responsible. This is extremely unlikely, since, for many years, no new companies have shown any interest in investing in large nuclear power projects in the UK, and there is no chance that the near-bankrupt Electricité de France (EDF), which has a 20% stake in the Bradwell project, or indeed the UK government, would be interested in making up the difference (some £15bn?)

