

been used in civil reactors on proliferation grounds. This cautious restriction means that every nuclear core has to be large. Much smaller reactor cores become viable with HALEU fuel which is 5-20% U-235. Its political acceptability is a hurdle. Its advantages would be considerable, for instance as a fuel for ocean going shipping, as has been used to power naval submarines and aircraft carriers since the 1950s. We should watch this development with interest.

The world knows how to do nuclear power <https://nuclear-economics.com/24-government-support/> but it needs to do it in every country around the world wherever electricity, desalinated water and energy for transport are needed in quantity. This calls for a change in political mindset. Nuclear energy should not be a restricted commodity, granted to certain countries and overseen by the few whose rights in the matter date from the cold war. All countries should be encouraged to use it in place of fossil fuels. If climate change is for real, that is the direction from which disasters will come in the next few years, not from any nuclear risk. One can only hope that the wake-up call from nature will be small and early, rather than large and late – too late.

Obituary

Joan Margaret Pye (1916-2019)

The development of nuclear power in the UK has had a long history but few members of SONE have encouraged it so actively and for as many years as Joan Pye who died on January 17. She read Greats at St Hugh's College Oxford and served in MI5 during the War. In 1952 she was appointed Personal Assistant to Sir John Cockcroft, Nobel Laureate and Director of AERE, Harwell. She retired from AERE in 1976. In 2004 she founded the Joan Pye Project, dedicated to the peaceful use of nuclear energy. At the age of 88 she was elected to an Honorary Fellowship by the Institute of Nuclear Engineers. In 2009 she published her autobiography "Atoms for Peace", with a foreword by Sir Christopher Audland. (It is available on Amazon.) It is a charming and spirited account of her life including sailing, mountaineering, art appreciation and her dedication to nuclear power.

Wade Allison
Hon. Secretary

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NOTICES

You can help spread information about the benefits of nuclear energy by **asking for a talk**. Any audience: educational, political or general interest. Email sec@sone.org.uk to fix an occasion.

Visit to Hinkley C. We intend to organise a visit, now that there is substantial on-site activity. EDF have said that they would be very happy to give us a tour, with wheelchair access if required. Please email sec@sone.org.uk to register interest. When we have an idea of potential numbers we will arrange a firm date.

WE NEED THE GOVERNMENT TO SHOW MORE CONFIDENCE

So the NuGen Moorside project is cancelled and Horizon Wylfa project is "suspended" – and with it the Oldbury project too. This state of affairs does nothing to encourage foreign confidence in the UK's integrity. The UK Government needs to act soon if the widespread support for nuclear power in the community is not to feel cheated too, especially among those of the younger generation who have already set their career ambitions on an exciting expansion of the nuclear industry. Their investment is as important as any financial commitment. This concern is shared by the Japanese owners of Horizon <https://www.jaif.or.jp/en/hitachi-president-alarmed-about-future-human-resources-as-company-freezes-project-in-britain/>. The ball is in the UK Government's court. There is a petition soliciting signatures and urging the Government to support Wylfa. Here is the link: <https://petition.parliament.uk/petitions/238022>

But the UK Government needs to show confidence in other projects too. The first of the two 1750 MWe EPR at Hinkley C is under construction and on 14 Dec 2018 the first EPR reactor was connected to the grid at Taishan in China. The same team, EDF and CGN, are also partners in the Sizewell C EPR project. Another joint

French/Chinese project at Bradwell B with UKHPR1000 began the GDA approval process in Jan 2017. But to respond sufficiently rapidly to the climate change agenda worldwide, such protracted approval processes will have to be pruned dramatically in future.

The Government has not yet made its policy clear on Small Modular Reactors. Those SMR designs that are based on light water (PWR and BWR) could be available earlier, but newer designs using molten salt (SMR) are not far behind being based on practical experience dating back to the work of Alvin Weinberg at Oak Ridge in the 1960s. The UK can only engage in one or two of these. Many options are being discussed around the world, but if the UK is to play a significant part a realistic commitment is needed soon.

Competition from Renewables

How much time do we have to cease our use of carbon fuels before large parts of the environment become uninhabitable? In truth we do not know. A few people remain unconvinced that there is a problem with human influence on the climate. We should hope that they are right. But even if the chance is less than 100% we should take action to mitigate the possible effect, especially as it is clear what should be done.

https://www.researchgate.net/publication/330757080_Nuclear_energy_sufficient_for_modern_life_in_the_era_of_climate_change

The so-called “renewables” desecrate the environment today, they failed to provide the energy required before the industrial revolution, and are failing investors and consumers again now. The German Energiewende experiment has demonstrated that a heavy reliance on these renewables does not work <https://www.ft.com/content/887637e8-2085-11e9-b126-46fc3ad87c65> . This conclusion is supported by a recent OECD report <http://www.oecd-nea.org/ndd/pubs/2019/7299-system-costs.pdf> that summarises:

“Based on the cost assumptions used in the main scenarios of this study, results show that a mix relying primarily on nuclear energy is the most cost-effective option to achieve the decarbonisation target of 50 gCO₂ per kWh.”

It goes on to say what happens to utility price if more renewables (VRE) are included in the mix:

“Modelling results indicate that electricity generation costs increase by 17% with respect to the base case scenario when a 30% VRE penetration is reached. Imposing higher VRE targets of 50% and 75% of the total electricity generation increases generation costs by 33% and by more than 70%, respectively.”

Of course not all situations are the same but their general conclusion is that nuclear power is the basic solution for an electric grid and that renewables do not help to reduce costs or emissions.

Society may still be fearful of nuclear technology in spite of its safety record being second to none. As a result a significant effort is needed to explain the truth. In a recent article I tried to put the popular misapprehension in a simple perspective https://www.researchgate.net/publication/330638908_Nature_and_Nuclear_Power_the_hills_and_valleys_will_be_thankful_and_every Creature_rejoice Nevertheless financing and construction timescales today are still burdened by an extraordinary preoccupation with risk in the form of unscientific regulations, restrictive working practices and over-cautious design. It will take time for these to find new levels as public confidence grows. In the meantime costs will remain higher and time scales longer than necessary. Countries that adopt reformed standards early will be at a significant competitive advantage. The UK should strive to be one of those.

Behind the scenes in USA

In spite of the theatrical performances in the White House, two important developments are underway elsewhere in Washington. The first is that Brant Ulsh has been appointed by the Acting Head of the US Environmental Protection Agency as chairman of its Radiation Advisory Committee. Dr Ulsh is a prominent member of the SARI group (Scientists for Accurate Radiation Information). This international group was set up by a number of us in order to press for radiation and nuclear protection regulations to be brought into line with scientific evidence, instead of policies of appeasement and safety precaution dating from the Cold War. With the demise of the bogus science known as the LNT Model, much of the expense of nuclear power from over-regulation to over-design would be unnecessary. The limiting factors are public education and obstruction by vested interests. Solving these will take some time of course – time that we may not have. Anyway, Brant Ulsh can be relied upon to put the straight science first <https://abcnews.go.com/beta-story-container/Technology/wireStory/skeptic-radiation-limits-head-epa-radiation-panel-60780912>

Excessively cautious safety regulation is not the only restriction that might be rolled back. The second development is more tentative. There is new discussion of High Assay Low Enriched Uranium (HALEU) as an acceptable fuel for new advanced reactors <https://neutronbytes.com/2019/01/27/doe-takes-divergent-paths-to-fabrication-of-high-assay-fuels/> In the past no uranium fuel enriched to more than 5% uranium has