



UNIVERSITY
of
GREENWICH

Date: 12th September 2019

To
Committee Secretariat
PO Box 6021
Parliament House
Canberra ACT 2600

Dear Secretariat,

Re: Inquiry into the prerequisites for nuclear energy in Australia

The Environment and Energy Committee was asked by the Minister for Energy and Emissions Reduction to conduct an inquiry into the prerequisites for nuclear energy in Australia. We have recently completed a rigorous review of the prospects, worldwide, for Small Modular Reactors (SMRs), a technology specifically mentioned in the terms of reference, which is relevant and which we attach.

Our research over several decades into the UK's nuclear power programme, especially the current attempt to launch a programme of 16GW (11 reactors) to be in service by 2030, is highly relevant to the issues of energy affordability, reliability and economic feasibility mentioned in the terms of reference. Despite concerted effort by all UK governments since 2006, the first reactor is not expected to be online until 2025 at the earliest, and nine of the 11 reactors planned have been abandoned or are in serious doubt. We attach a paper on the latest model proposed by the British government to finance new nuclear plants, the Regulated Asset Base (RAB) model, that identifies serious issues this model raises, and also shows why two previous finance models will not be suitable for further projects.

Based on the material on the UK financing models and on SMRs, we come to the following conclusions.

1. The record of the new large reactor designs in all the countries they have been ordered in the USA, France and China (the world's most experienced nuclear nations), and also in Finland, is so poor that these designs cannot be considered as a sensible option for Australia to launch a reactor programme.
2. SMRs have been widely promoted as potentially solving the problems associated with new large reactors, which have led to a sharp decline in the prospects for new large plant nuclear power orders. Their main somewhat implausible rationale is that building SMRs factories as modules, leaving just assembly on-site, will produce savings from use of production-line techniques that will more than counter-balance the lost scale economies of building large reactors. However, although current SMR

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designs based on existing reactors are nearer to commercial deployment than those based on radical new designs, the first demonstration plants are unlikely to be online before 2030. Whilst SMR demonstration plants will show whether the designs are technologically viable, it will take a further decade or more (only if production lines have been set up and large numbers of reactors have been pre-ordered and produced) before their economic viability is tested. Based on past experience with new nuclear technology, there is a high probability that this line of technology development will fail. At most, SMRs are distant and very costly experiment, and Australia should focus on the very wide range of fully mature and commercially viable renewable, energy management, distribution and storage technologies for reducing emissions.

3. British experience in the 13 years since the new nuclear programme was announced is salutary. It will be at least 20 years from the announcement of the UK nuclear programme to first power from the first reactor, despite the determined efforts of all governments since 2006 - and this is for a country with 60 years of experience of building and operating nuclear power plants. Options such as onshore and offshore wind, solar and energy efficiency can be up and running in no more than a handful of years and, unlike nuclear power, their costs are continuing to fall sharply. The climate crisis is too urgent to contemplate the delay that relying on nuclear power would entail.
4. The poor record of existing designs and the unproven nature of SMRs means financing nuclear will be impossible via normal project finance and will require all major risks to fall on the public, either as tax-payers or electricity consumers.

With best wishes



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