



BANNG
Blackwater Against New Nuclear Group



RAB Model for Nuclear: consultation on a RAB model for new nuclear projects.

Response to the consultation from the Blackwater Against New Nuclear Group (BANNG)

(BANNG Paper No. 41)

Context

In this response we set out why we do not think RAB is necessary for new nuclear (Part 1) and why its application would be unfair to consumers and taxpayers and communities close to new nuclear projects (Part 2). In a final section (part 3) we demonstrate why RAB should not be considered for the Bradwell B project in particular.

In brief we have the following concerns about RAB:

- RAB is under consideration for the financing of new nuclear power stations. If applied it could perpetuate the generation of nuclear energy in the UK for which there is no demonstrable need in the future;
- RAB is a process that shifts some of the financial and other risks of developing new nuclear power stations from developer to consumer and taxpayer;
- RAB confirms a policy of UK public subsidy to new nuclear projects to foreign firms and governments who would be the beneficiaries from financial and other risks being borne by the UK;
- the opportunity costs of RAB are high in relation to alternative possibilities of investment in much cheaper renewables;
- RAB encourages investment in projects that place burdens of cost, effort and risk on vulnerable communities and future generations;
- in the case of Bradwell, RAB would provide an unnecessary, unwanted and unethical transfer of investment resources from the UK to China, a potentially hostile power.

The latter point is especially concerning to BANNG for it envisages a levy on taxpayers and consumers to desecrate precious environments and presents dangerous risks to local communities.

This response is not framed in terms of the six questions posed which are, we feel, both too vague and too specific to capture our concerns. Our comments do bear upon questions 1, 3 and 6, which cover the issues of need, distribution and equity which are at the heart of our concerns.

Part 1 No need for more new nuclear

It has become clear beyond reasonable doubt that there is no need for new nuclear power in the UK and certainly not at the level of 16GW which appears to be the aspiration of present policy. The consultation repeats the Government's persistent and perverse view that nuclear power 'plays an important role in our current energy mix' (Consultation Document, para.1) needed 'to ensure a low cost, stable, reliable low carbon system' (para. 21). In terms of cost, nuclear has continued to increase while renewables have been in a downward spiral. Hinkley Point C has been hideously expensive, the most recent project completion estimate has risen to £21.5 - £22.5bn up from the approved plan cost of £18bn in 2016. Further delays to completion are anticipated. Meanwhile, the latest contracts for wind power are £39.65 per MWh, a 74% drop on 2012, while Hinkley Point C stands at £92.50 per MWh (index linked) for power to be delivered for 35 years from whenever it comes on stream.

In the wake of the high cost and contract price experienced at Hinkley Point C, an effort was made to reduce investors' risks and costs for the next project, Wylfa B. Here direct investment by Government was proposed to attract investment but the developer Hitachi still backed off and the project is now suspended. This has left the Government searching for ways to encourage the EDF/CGN partnership building Hinkley Point C to sustain their commitment to subsequent projects, Sizewell C and Bradwell B.

The search has come up with RAB which combines a pay-as-you-go philosophy with developers getting a return on investment during construction and operation and consumers taking on some of the risk for the putative benefit of a lower price for electricity to future consumers. This is against a background of the Government's Nuclear Sector Deal¹ which aspires to lower the cost of nuclear projects by 30%. In view of recent experience of cost escalation, this must be regarded as a pipe dream. The Consultation Document now rather grudgingly concedes that nuclear may struggle to be competitive concluding that 'a RAB approach could present a sustainable and value for money model for funding new nuclear projects' (Consultation Document, para. 18).

Over recent years the case for nuclear providing low cost electricity able to compete with renewables has evaporated. The case for new nuclear has fallen back on the argument that, as coal-fired and nuclear plants are retired, there will emerge a hole in energy supply which can only be filled adequately by new nuclear power. The National Policy Statement on Nuclear Energy (EN-6) set out the claims for new nuclear energy: it is low carbon; contributes to energy security; enhances generation diversity; and is proven technology (although the Hualong 1 reactor currently proposed for Bradwell B is not in operation anywhere). Moreover, the clinching argument was that new nuclear is essential for providing baseload (now referred to as 'firm') energy to compensate for intermittency of renewables. All these virtues have been

¹ *Industrial Strategy: Nuclear Sector Deal*, HM Government

challenged by critics who have firmly established that low carbon energy will be available from other technologies; that nuclear power, post-Fukushima, cannot claim to be secure or safe from physical and cyber attack; and that it is a technology that has proved to be vulnerable to failures, delays and interruptions during construction and operation. As for firm power it has become clear that storage technologies (especially batteries and hydrogen gas) will be at scale and a key part of the mix by the next decade. And, though downplayed by policy makers and the nuclear industry, nuclear has a major drawback compared to rival technologies in that it leaves a legacy of waste that presents risk to communities and a continuing challenge to societies down the generations. Moreover there is, as yet, no credible and acceptable long-term solution for this.

The Government's nuclear policy has privileged nuclear energy at the (literal) expense of cheaper, safer and more secure alternatives. It must be allowed to 'contribute as much as possible' and has been encouraged by subsidies that discriminate against its competitors. Despite this, deployment of nuclear has been glacially slow and the market has signally failed to rise to the challenge. The government is currently left with only one possible new nuclear station, Hinkley Point C, that, if finally commissioned, may come anywhere close to the 2025 aim for deployment of a new fleet of reactors. If all obstacles fall away and subsidies entice state-backed EDF and CGN to come through with the investment, it will be surprising if Sizewell C is operating before 2035 (the revised target date for new nuclear) and Bradwell B later. By that time it will be too late for nuclear to plug the energy gap (if it arises). Instead, nuclear stations, if they become available, will compete in what could become a crowded market and, in the process, may displace cheaper alternatives at cost to consumers and taxpayers.

It is, therefore, unambiguously clear that nuclear power will not be necessary nor available to plug any energy gap. The cost of cancelling Hinkley Point C would prove far less than the costs of the contract lasting 35 years which prices electricity at £92.05p.per MWh, more than twice the price for offshore wind at the last auction.

BANNG concludes that:

- ***New nuclear power stations, other than possibly Hinkley Point C, are unlikely to be available for deployment much before 2035 by which time any rationale for new nuclear will have totally disappeared.***
- ***Future electricity supply by the middle of the next decade will be amply fulfilled by existing renewable technologies and the introduction at scale of large-scale storage systems, including batteries and hydrogen.***
- ***In view of the high costs of nuclear technology and the inherent risks and long-term dangerous legacy of radioactive waste, further investment in new nuclear cannot possibly represent value for money and, therefore, should not be considered for future projects including Sizewell C and Bradwell B.***
- ***Recent experience indicates that private investors are unwilling to put up the massive investment cost even with incentives and subsidy and RAB would merely***

redistribute the investment risks, not make projects able to compete in the market place.

- ***Therefore, RAB, if applied to new nuclear, could prolong commitment to an expensive, dangerous and unnecessary technology. Therefore, further consideration of RAB should be abandoned.***

Part 2 Unfair and Unnecessary

RAB should be abandoned on the grounds that it is inequitable in the following respects:

Nuclear power is unsuitable for RAB

Nuclear power is a very long-term project. At minimum, it may take up to a decade to design and permit a new nuclear power station, a further decade for construction, around sixty years for operation and an indeterminate time for decommissioning and waste disposal (if achievable). Over such time-scales, costs and operational and societal conditions are unknowable. While RAB is based on pay-as-you-go and a levy on present consumers and taxpayers, it cannot realistically take care of costs and risk burdens of the legacy of nuclear power in the far future.

Nuclear technology is complex and cost overruns and time delays caused by technical problems are an almost routine feature, as has been experienced at Flamanville and Okiluoto. As Nick Butler (*Financial Times*, 9 Sept., 2019) observes, ‘the construction risks are high and to place them on the shoulders of consumers is unfair’. He goes on, ‘Under the RAB funding system, consumers would have been paying a surcharge on their bills since 2007 (for Flamanville) with nothing to show for it. They would have no leverage over the company building the plant and no scope for compensation’. In addition to the technological risks are political risks that plants may never be completed as is the case in the USA (in South Carolina, Alabama, Washington state) and could be at Hinkley Point. The situation may arise where consumers are paying up front for a project that may be uncompleted or not even started. In the present delicate economics of nuclear power the risk to consumers and taxpayers is intolerable.

RAB transfers costs to consumers

RAB is a levy on all consumers of electricity. Its rationale is that private investors are unable or unwilling to bear certain risks and that it is right for the burden to be shared. These risks include: low probability/high impact risks; risks of cost overruns and debt market disruption; uninsurable risks; and political risks. These risks, the argument goes, should be borne, in part at least, by consumers and, in some aspects, by Government, i.e. taxpayers. This proposition amounts to an unquantifiable and possibly substantial subsidy to lever private investment in nuclear; a subsidy which, to our knowledge, is not on offer to any other energy supplier. By treating nuclear as a utility in this way the market basis for energy supply is distorted to privilege nuclear and disadvantage other forms of supply.

Under RAB it is consumers who pay a premium to encourage private investors. It is a levy on consumers regardless of whether they are consumers of nuclear electricity and is a penalty on those consumers who deliberately choose 'green power' or who live where nuclear energy is unavailable.

It is taxpayers who pay to take on the risks that are unacceptable or unaffordable by private investors including the risks of mega accidents and the political risk of nuclear plans being stalled or scrapped.

RAB transfers payments from UK to foreign governments

The UK Government has sought foreign investment to develop its nuclear programme. This has the advantage of keeping the bulk of the costs off the UK's balance sheet but the disadvantage of profits and subsidies being paid to foreign companies and/or governments. Typically, investment proposals have been through multinational consortia and, over time, these have reformed with new entrants and some dropping out. There is now only one active partnership, that of the French company EDF and the Chinese operator CGN, developing three sites at Hinkley Point, Sizewell and Bradwell. In terms of financing, only Hinkley Point C has secured a deal, albeit high cost and unrepeatable. Hence, alternative arrangements are being contemplated, in the form of RAB and have been welcomed by EDF as a way of financing Sizewell B. The aim is to reduce the cost of capital to investors by consumers paying up front for future electricity supply. This amounts to a kind of reverse intergenerational equity with the present paying for future benefits.

Although the costs of nuclear plants might be reduced by RAB, there is zero prospect of nuclear power becoming cost competitive. Considerable financial benefits accrue to foreign companies and governments, specifically French and Chinese. In sum, under RAB UK consumers and taxpayers would be subsidising foreign investors and governments.

RAB imposes disbenefits on local nuclear communities

Communities around nuclear power stations gain the presumed benefit of local jobs, wealth and investment in local infrastructures and facilities and in the local supply chain. But these benefits, if they come at all, do so at a cost, in terms of disruption, noise, congestion, pollution, accommodation for and assimilation of the workforce. More significantly, especially in the long term, are the disbenefits of environmental degradation, danger of accidents with radioactive releases into the environment and impacts on public health and well-being, as well as the on-site management of long-lived, highly active wastes, especially spent fuel, often on fragile and vulnerable coastlines. The environmental problems, emergency planning and management of radioactive waste on-site are especially acute issues in the context of Hinkley Point and at the remaining sites at Sizewell and Bradwell.

These costs are imposed, of course, under any financial arrangement that produce a nuclear power station. But, in so far as RAB is geared towards encouraging specific developments and involves public as well as private finance, it potentially contributes to environmental degradation of nuclear communities. Specifically, French and Chinese state-backed investors are being paid by UK consumers and taxpayers to develop potentially dangerous and

environmentally destructive mega power stations on the fragile East Anglian shores. We elaborate on this point in section 3 below.

On the issues of suitability, applicability and equitability, BANNG concludes that:

- ***The very long time-scale and significant risks in construction, operation and waste management makes RAB an unsuitable financing mechanism for new nuclear power projects.***
- ***The unpredictable and unquantifiable nature of some of the risks places unknowable burdens of cost on consumers and taxpayers. All consumers of electricity bear the risk including those who do not consume nuclear electricity and all taxpayers will bear the risks that the private sector is unable or unwilling to bear.***
- ***RAB is a method designed to lower investment costs and future electricity prices by consumers paying as development proceeds and taxpayers taking on some of the risk of projects. This amounts to a transfer of some of the benefits from UK consumer and taxpayers to foreign state-backed companies.***
- ***RAB is specifically under consideration for financing Sizewell C and potentially Bradwell B. It amounts to an encouragement for French and Chinese state-owned companies to inflict danger and devastation on communities and environments in Suffolk and Essex.***

Part 3 RAB and Bradwell B

Financial considerations

Bradwell B is the third UK project of the EDF/CGN Partnership. It is the outcome of the so-called 'Golden Partnership' between China and the UK sealed during the State Visit of the Chinese President, Xi Jinping, in October 2015. The Blackwater communities have become the hapless victims of an agreement whereby the China General Nuclear Corporation (CGN) with a two-thirds share of the partnership with EDF was granted the opportunity to develop its own reactor technology (Hualong 1) at the Bradwell site adjacent to the closed Bradwell A. The project is in the early stages of development with site investigations and is midway through its GDA which is expected to be completed in 2021. All the signs are that CGN is proceeding apace. Robert Davies, CGN's Chief Operating Officer declared at the Nuclear Energy Association conference in London in 2018: 'Today we bring expertise, capability and money. In simple terms, we have ramped up. We are bringing forward [the Bradwell project]'.

CGN seized the opportunity to expose their reactor design to the UK's 'strong and world-renowned nuclear regulatory regime' which could provide its imprimatur for the company's world-wide nuclear ambitions. Its strategic aim and financial resources were spelled out in its submission to the Business Energy and Industrial Strategy Committee of Inquiry into financing of energy infrastructure:

'CGN has the financial strength and the industrial vision to fulfil the role of strategic promoter, and believes the UK could host a number of HPR 1000 reactors as part of a worldwide fleet of this technology; an international fleet which is likely to number around 20 by the mid-2030s.'² (para. 15).

It is clear that CGN has the resources to develop at Bradwell and elsewhere. Furthermore, it is more concerned with achieving the go-ahead than in securing favourable financial conditions or subsidies from UK consumers and taxpayers. CGN and the Chinese Government have a clear strategy: 'to dominate the world nuclear market with their own reactor design'³. From their viewpoint it makes sense to gain UK regulatory approval and lower costs through support from UK consumers and taxpayers. RAB would, no doubt, be attractive to the Chinese but CGN has declared 'it is open-minded about funding mechanisms and risk sharing' (para. 21). Indeed, it underlines its relative indifference to additional financial support by stating that it 'does not see such additional financial support a long term prerequisite for its own financial investment' (para. 23).

Given that the Chinese investment in Bradwell is not conditional upon the introduction of RAB, it would be perfidious of the UK to present CGN and, ultimately, the Chinese state with a gratuitous handout from UK consumers and taxpayers. This could be construed as a transfer of resources to a foreign, potentially hostile power. Thus, it becomes not merely a financial issue but an issue of security.

Security considerations

The point was made graphically by Prime Minister May's joint Chief of Staff who declared, 'The Government is selling our national security to China'. Fears that a critical part of sensitive infrastructure could be open to control by a potentially hostile power have continued to cloud the project. The fact that China, like the UK, is a military as well as civil nuclear power makes the issue of security and control especially worrying. As China seeks to assume the role of a dominant world trading power, commercial and military roles become deeply intertwined. Tensions in the South China Sea indicate a determination to protect and expand the Chinese sphere of influence.

The UK is pretty desperate for Chinese investment, the more so now when Brexit requires us to look for close trading relationships. China and the USA are presently engaged in a trade war which could inhibit the UK's prospects for trade and investment with either country. The US has forbidden its Nuclear Regulatory Commission from issuing any licence 'to an alien or any corporation or other entity if the Commission knows or has reason to believe it is owned, controlled, or dominated by an alien, a foreign corporation, or a foreign government'⁴. Further in August, the USA placed CGN on its export blacklist, over accusations of stealing US technology for military use. Concerns have been backed by evidence of cyber espionage,

² BEIS Committee of Inquiry into Financing of Energy Infrastructure, Written evidence submitted by CGN UK (FW100114)

³ Dieter Helm, 'Nuclear lessons for energy policy', January, 2019.

⁴ Statement of US Nuclear Regulatory Commission. Section 103 of the Atomic Energy Act 1954

information transfer as well as a deep suspicion of the security experts who believe the intelligence services of China continue to work against UK interests.

It must be said that CGN are aware of and sensitive to these security concerns. They are confident in the Office for Nuclear Regulation (ONR)'s role in protecting the plant from cyber or other forms of attack. 'CGN understands that there are sensitivities relating to investment from overseas and has said that it is happy for reactors it develops to be independently operated and to take whatever other steps are needed to meet UK safety and security requirements' (Evidence to Inquiry, para. 20). Nonetheless, security concerns remain an important factor. It would be unwise, to say the least, on grounds of national security to harbour a Chinese-built and -run nuclear reactor in the UK and to develop it with taxpayer and consumer support as envisaged in RAB financing would be against the UK's strategic interests.

Environmental considerations

The company recognises that trust must be built and already public relations are being geared up through publicity and investment in small local projects. There is an emphasis on the positives claimed for the project such as jobs, skills and investment. The company's idea of a 'Bradwell B Community' is intended to convey a sense of partnership and well-being issuing from the Bradwell project. Zheng Dongshan, former Vice-president of CGN, has said: 'We understand the political and local sensitivities.... we know we must take time to show the public, the Government, they can trust us'.

In all this there is no hint of the significant downsides which include years of disruption, noise and environmental destruction followed by decades of operating a potentially dangerous and vulnerable facility within a couple of miles of a large population and with half a million people within a twenty mile radius. The environmental impact is likely to be destructive, especially the impact on marine life in the surrounding Marine Conservation Zone. Designated areas, national and international, cover the marshlands and coasts and wildlife will be disrupted and wetlands compromised. The whole area will be converted from a tranquil and abundant ecological zone to a raucous, polluting, gigantic industrial complex. The Bradwell site is on a sinking coast with rising seas and, with climate change, increasingly subject to flooding, storm surges and coastal processes. The ultimate scenario could well be a deteriorating nuclear complex with its stores of highly active nuclear wastes which will be strewn on a disappearing coast for the indefinite future.

Such a portrayal is neither fanciful nor improbable but, in the light of trends in forecasting, realistic and likely. The Bradwell site is simply too vulnerable in the long-term for any proposals of 'managed adaptation' to be credible in the medium- term let alone for the unforeseeable environmental and societal conditions in the far future. It is quite conceivable that the Bradwell project will fail on grounds that the site is unsuitable, unacceptable and too expensive to deliver. This is all the more reason not to perpetuate the project by offering favourable investment terms and subsidies for a project that is environmentally destructive and carries a high level of risk into the far future.

In terms of the relationship between RAB and the proposed Bradwell B nuclear power station BANNG has the following observations:

- ***CGN's key objective is to secure UK regulatory approval for Chinese- designed reactors. To this end it is willing to deploy the necessary financial resources and has declared it is open-minded about financial arrangements. RAB is neither necessary nor required to support the Bradwell B project and, therefore, there is no case for offering UK consumer and taxpayer support for investment and risk sharing.***
- ***The possibility of a Chinese-designed reactor developed in the UK has aroused strategic security concerns. China's increasing economic and military strength as a nuclear power raises issues of cyber espionage and physical sabotage. The application of RAB financing might be seen as an encouragement to a potentially hostile power to invest in sensitive UK infrastructure.***
- ***Bradwell is an inappropriate and unacceptable site. New nuclear reactors will destroy and undermine important amenity and environmentally protected areas, most notably a critical marine environment designated as a Marine Conservation Zone. The site is low- lying and vulnerable to flooding, storm surges and erosion which will render it unavailable in the long-term. Managed adaptation will prove increasingly difficult in the short run and, in the unknowable conditions in the longer term, it becomes increasingly difficult to sustain a nuclear complex on such a vulnerable site. RAB financing would be tantamount to UK taxpayers and consumers, including those around the Bradwell site, paying up front to support nuclear activities that devastate the environment and imperil present and future communities.***

For these and other reasons BANNG concludes that RAB should not be considered as a method of financing for the Chinese-designed reactors that are proposed for Bradwell B.

***Prepared on behalf of BANNG by
Prof Andrew Blowers, OBE,
Chair of BANNG***

10 October, 2019

Note

BANNG is primarily concerned with opposing the development of Bradwell B in Essex. Our approach to this necessarily involves concern with the broader context of new nuclear development in the UK. Over the past decade or so we have covered a wide range of issues relevant and related to the Bradwell case. These have included, *inter alia*; decommissioning and radioactive waste management, geological disposal, national policy statements, justification proposals, generic design assessments, nuclear disaster and climate change. We have also commented specifically on the related nuclear projects, Hinkley Point C and Sizewell C. Hitherto we have not entered the vigorous debates about financing new nuclear although we have commented on financing and funding of decommissioning and waste (for further information, see BANNG.info which lists the BANNG Papers).