



Nuclear Industry Association

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### **Committee on Climate Change consultation: The Sixth Carbon Budget**

1. The Nuclear Industry Association (NIA) welcomes the chance to respond to the Committee on Climate Change's consultation on the Sixth Carbon Budget (covering the period from 2033-37), which will help advise UK Government on policies to cut emissions across the economy in pursuit of net zero by 2050.

#### ***What is the international signalling value of a revised and strengthened UK Nationally Determined Contributions (for the period around 2030) as part of a package of action which includes setting the level of the sixth carbon budget?***

2. In becoming the first major economy in the world to put a target of net zero carbon emissions by 2050 into law, at the advice of the Committee of Climate Change (CCC), the UK set a precedent for the rest of the developed world to follow.
3. Given the timing of COP26, revising and strengthening the UK's Nationally Determined Contributions (NDC) for the period around 2030 to reflect the Government's 2050 target will undoubtedly act as a further catalyst for others to set similar or more ambitious targets for decarbonisation.
4. Given the CCC's track record on influencing Government climate change policy, its recommendations for the sixth carbon budget will be of great importance to the updated NDC and therefore the UK Government's credibility, and concomitant ability to influence at COP26.

#### ***What are the most important uncertainties that policy needs to take into account into thinking about achieving net zero? How can Government develop a strategy that helps to retain robustness to those uncertainties, for example low-regrets options and approaches that maintain optionality?***

5. While we must support the research and development of innovative new technologies, such as nuclear fusion, to see real changes in the short period of time we have before 2050, and the even shorter period before the years covered by the CCC's sixth carbon budget, we must invest in proven technologies.
6. Nuclear provides safe, low carbon, non-weather dependent, constantly available electricity which can support a decarbonised electricity mix in the UK, alongside the expansion of intermittent and variable low carbon sources, such as wind and solar. With the technologies



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available, it is not possible to achieve net zero by 2050 without nuclear forming part of the generation mix, and the CCC should be explicit about that.

7. Reports from MIT (2018), EIB (2019) and IEA (2019) confirm that nuclear is an integral part of global low carbon electricity generation and without it, we are likely to see a huge increase in CO<sub>2</sub> emissions and in electricity bills for consumers.
8. It is essential that going forward we put more emphasis on commercially viable, proven technologies, such as nuclear power, in order to meet our targets and ensure security of supply through the clean energy transition.
9. The UK should capitalise on proven low carbon methods deliverable at scale today, and from that platform explore further innovations to meet its climate change goals.

***The fourth and fifth carbon budgets (covering the periods of 2023-27 and 2028-32 respectively) have been set on the basis of the previous long-term target (at least 80% reduction in GHGs by 2050, relative to 1990 levels). Should the CCC revisit the level of these budgets in light of the net-zero target?***

10. Yes, the CCC should revisit the level of these budgets. By the CCC's own admission, the UK must reduce its carbon emissions each year by 30% more on average compared to its current progress. Understandably, previous carbon budgets set by the CCC have taken a measured approach, finding a balance between motivating Government but also allowing time to develop new policies and for consumers to adapt.
11. However, given the legal commitment to net zero by 2050, and lack of progress in meeting even short-term targets, early action should be prioritised. We agree with the CCC in its last progress report to Parliament that targets are not enough, and that the policy gap must be met and decarbonisation projects delivered as a matter of urgency.
12. This sentiment should be translated into setting the level of the sixth carbon budget to help transition the UK into a net zero economy as putting the right policies in place today will help benefit the UK in the long run.



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***What evidence do you have of the co-benefits of acting on climate change compatible with achieving Net Zero by 2050? What do these co-benefits mean for which emissions abatement options should be prioritised and why?***

13. The transition to a net zero economy has the potential to create thousands of new skilled jobs in the UK, helping to fuel economic growth across the country. The development and success of the nuclear industry will only help to drive the economy.
14. The NIA's detailed 2019 survey of its members shows consistent employment levels between 55,000 and 65,000 over the past five years, spread across the UK in both urban and rural regions. Indirect employment in 2016, in an Oxford Economic study for the NIA, rises to 155,000. Nuclear power is the strongest example of creating widespread, long term, skilled jobs and prosperity – both directly and in the supply chain – whilst helping meet 2050 net zero policy objectives.
15. The development of new capacity to replace our ageing current fleet is critical to ensure the growth of low carbon electricity as the primary source of energy, including in heat and transport. This will require proven large-scale nuclear reactors to be developed, progress on small modular designs and, looking ahead, the development of fusion technology.
16. The focus on a zero carbon economy is creating excitement and interest in the nuclear industry for a new workforce coming into the sector via apprenticeships and graduate schemes, but it's critical we establish the conditions for further new nuclear power station projects quickly to maintain this positive momentum.

***Carbon targets are only credible if they are accompanied by policy action. We set out a range of delivery challenges/priorities for the 2050 net-zero target in our Net Zero advice. What else is important for the period out to 2030/35?***

17. Upgrading of our national grid infrastructure and distribution network is required to meet an expected increased demand from electric vehicles and heating. An increase of renewables in the system must be complemented by more 'firm' power in the form of nuclear, the only proven low carbon, 'firm' electricity generator. Using proven technology for this purpose in the period out to 2030/35 is particularly prudent given the essential need for immediate action.
18. It is imperative that the necessary financial frameworks are put in place urgently to enable the further development of new nuclear power stations at an acceptable cost to the consumer, and in a way that will attract investors. This is required to allow delivery in time to address the retirement of the majority of our current fleet by 2030. We should aim for nuclear to provide an



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overall share of the low carbon electricity mix which is at least equal to its percentage share today, or we will risk placing reliance on currently unproven or unavailable technology.

19. The priorities include an unambiguous commitment to new nuclear and the implementation of an appropriate financing model – such as the Regulated Asset Base (RAB) the UK Government is consulting on or alternative – to bring down the cost of capital for nuclear new build, and subsequently bring down the cost of clean power for consumers.
20. A long-term programme of political and financial support for upcoming technologies, such as small reactors and nuclear fusion, is also needed. The former requires clarity over site assessments and a down-selection from the Government's AMR competition, which will help the industry determine how serious the UK Government is about pursuing this promising technology.

***Can impacts on competitiveness, the fiscal balance, fuel poverty and security of supply be managed regardless of the level of a budget, depending on how policy is designed and funded? What are the critical elements of policy design (including funding and delivery) which can help to manage these impacts?***

21. The carbon budget, coupled with an unambiguous policy framework, will enable accelerated investment in technology critical to deliver the zero emissions power, and enabling net zero to be achieved. Reducing the cost of capital through successful policy is key to ensuring major infrastructure projects are built at a rate needed to keep the lights on during the period of the sixth carbon budget and in the transition to net zero.
22. Utilising an appropriate financing model for new nuclear is an example of this within our sector. Successful implementation of a RAB or alternative similar approach for this purpose could lead to the model being used in other low carbon infrastructure projects, further enabling net zero.

***Think of a possible future power system without Government backed Contracts for Difference. What business models and/or policy instruments could be used to continue to decarbonise UK power emissions to close to zero by 2050, whilst minimising costs?***

23. The nuclear industry believes the UK Government has already identified the priorities for a different funding approach in its consultation on the RAB model, which makes it possible to significantly reduce the cost of capital by offering investors secure and early revenues at a lower



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rate of return, avoiding rolled up interest costs. Consumers would be protected from cost overruns through robust regulation requiring appropriate qualifying criteria.

24. Under the RAB, investors would see a return at earlier stages of the project in a more regulated fashion which would address many of the risks faced by investors under the Contracts for Difference (CfD) model. Securer payments would encourage a wider pool of investors, for example pension funds and the insurance sector.
25. The RAB is particularly suitable for proven technologies, which do not bear heavy research and development and associated licensing costs. If implemented in a timely manner, the model could have a positive effect across the UK nuclear supply chain through continued business for SMEs.
26. If a RAB or similarly robust financing model were to achieve a low cost of capital while assuring investors guaranteed rates of return of 6%, projects would need to overrun by approximately 75-100% before the cost would be higher than under the CfD model. If Government were to finance the project and required a 2% return, cost would have to overrun by 400-600% for it to be more expensive than the CfD model that was used for Hinkley Point C.
27. The timescale of implementing a new financing model is crucial in ensuring industry can capitalise, for example by transferring the workforce between existing projects and restarting dormant ones. In the case of Sizewell C, the current business case relies on a specific timetable, with a Final Investment Decision at end of 2021 or early 2022. This would allow for the smooth transfer of the skilled workers and supply chain from HPC to Suffolk. A smooth transition would maximise the benefits of the repeat-effect. Such a transfer depends on the willingness of Government to facilitate a new financing arrangement to meet the above timetable.
28. The suspended Wylfa Newydd project meanwhile has retained the capability to ramp back up again, with the main dependency being the establishment of more favourable funding arrangements than the CfD model. Maintaining nuclear supply chain confidence and stability is also essential for the future of a UK fleet, with several promising sites having been identified.

***Which low-carbon technologies could play a greater/lesser role in the 2050 generation mix? What about in a generation mix in 2030/35?***

29. To meet the growing demands for electricity, nuclear must play an integral role in a future decarbonised energy mix. Nuclear is a proven, dependable, technology with lower lifecycle CO<sub>2</sub> emissions than solar power and the same as offshore wind.



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30. The countries and regions which have most successfully decarbonised, like Sweden, France and Ontario in Canada have done so by relying on nuclear as a significant component of their energy mix, both for power and enabling heating where electricity is the primary energy. It is also an important economic engine for the UK, creating high quality direct and indirect employment for around 155,000 people (Oxford Economics, 2016).
31. Nuclear currently provides 20% of all the UK's electricity but all but one of our existing fleet will close over the next decade. To maintain this share in a growing market for clean electricity would require a large-scale new nuclear build programme followed by the deployment of small reactors and then Advanced Modular Reactors, in total representing around 40-60GW of capacity. This would enable the country not only to keep up with current demand but to help meet future demand where electricity is increasingly the primary energy source for heating, transport and industrial processes.
32. The CCC's 2019 Net Zero report advised that a future energy mix should include 38% low carbon 'firm' power. It would be prudent for this to be proven new nuclear capacity to provide resilience and assurance in the event that Carbon Capture and Storage (CCS) is not deliverable at the scale and in the timescales required.
33. Given the impending closure of the majority of the UK's operating nuclear sites, and that new site Hinkley Point C and other potential sites Sizewell C and Bradwell would only amount to 11% of generation, there is a significant gap to fill in a short timeframe if we are to avoid increasing, rather than reducing, emissions.
34. The NIA believes that nuclear – the only proven low carbon 'firm' power – plays a vital role in meeting this demand, which should be recognised by the CCC and the UK Government. To capitalise on nuclear's proven track record we need positive policy decisions in 2020.

***The Committee has recommended the Government support the delivery of at least one large-scale low-carbon hydrogen production facility in the 2020s. Beyond this initial facility, what mechanisms can be used to efficiently incentivise the production and use of low-carbon hydrogen? What are the most likely early applications for hydrogen?***

35. We believe that nuclear power will be important in the production of hydrogen. High temperature electrolysis, of which nuclear is capable, has been proven to be the most economic choice for production overall and has the ability to use surplus electricity as a way of providing grid flexibility. Hydrogen produced by electrolysis, either from nuclear or renewables, will also



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have significantly less lifecycle emissions than hydrogen produced from steam methane reformation.

36. Therefore, nuclear should be seriously considered as a contributor to hydrogen production as the hydrogen economy continues to grow.