Respondent Details	
Name:	Prof Graham Fairhall
Organisation:	National Nuclear Laboratory

Please select the category below which best describes who you are responding on behalf of.

☐	Business representative organisation/trade body
☐	Central Government
☐	Charity or social enterprise
☐	Individual
■	Large business (over 250 staff)
☐	Legal representative
☐	Local Government
☐	Medium business (50 to 250 staff)
☐	Micro business (up to 9 staff)
☐	Small business (10 to 49 staff)
☐	Trade union or staff association
☐	Other (please describe):

The consultation document sets out the Government's proposed approach to the longer term management of the UK's plutonium stocks for public scrutiny and consultation. Comments on any aspect of this issue are welcome, but the key questions posed in this consultation are:

No	Question
Q1	Do you agree that it is not realistic for the Government to wait until fast breeder reactor technology is commercially available before taking a decision on how to manage plutonium stocks?
Response	Yes. Whilst many countries around the world have active development programmes for fast breeder reactor technology, it is realistic to assume that it will be many decades before there will be commercially available fast reactor (either breeder or burner) technology. A preferred policy option should be defined now, based on currently available technologies (e.g. utilisation as MOX fuel in PWRs), rather than wait for fast breeder reactor technology. The disposition of Pu will be a long term undertaking, thus the option to adapt policy to changing circumstances can be kept open, including the supply of some Pu to prototype or commercial scale fast reactors in the future. Waiting for fast reactors to be developed is not an appropriate policy for the Pu stockpile. However decisions should not be taken now that rule out fast reactors in the future in the UK as these advanced systems offer the best option in the long term for either Pu destruction or nuclear fuel resource utilisation. It is probable that advanced reactors and their associated fuel cycle will be required in the future in the UK, particularly in the context of a significant new build programme, and therefore the UK should consider involvement in international Gen IV R&D activities as part of its overall nuclear energy strategy.
Q2	Do you agree that the Government has got to the point where a strategic shift of the options can be taken?
Response	Yes.

	A number of key decisions on the future of facilities at the Sellafield site are required in the short to medium term; such as the future of reprocessing in THORP and the rationalisation of storage. These decisions must be taken with a clear view of the UK policy on Pu disposition in order to prevent any perfunctory foreclosure of options. We believe that sufficient analysis has been completed so far to allow Government to make a strategic assessment of the viable options for Pu disposition. The choice is between reuse, disposal as a waste, or a combination of these options. There is an option to defer a decision into the future and to continue to store the Pu safely and securely. However this does not constitute an end point and in effect only postpones the decision.
Q3	Are the conditions that a preferred option must in due course meet, the right ones?
Response	Yes. The consultation paper recognises the maturity level of the use of thermal MOX fuel internationally, and the need for implementation in a UK regulatory framework and commercial environment. Whichever disposition option is selected, safe storage and further analysis will be needed. This should include an appropriately funded national research and technology development programme to enable Government to make an informed final decision and to fully underpin implementation. Other countries including France have already implemented Pu reuse as MOX fuel and the USA is starting down the road to convert weapons Pu into thermal MOX fuel, both for economic reasons, but also to enhance proliferation resistance and security. There is a good consensus within bodies such as the IAEA that Pu in the form of spent fuel provides more of a barrier to diversion than safely stored separated Pu. A UK equivalent programme would meet the conditions related to non-proliferation and security objectives. The consultation paper presents the argument clearly where it states that conversion of civil Pu to thermal MOX fuel will be expected to generate an income. All other options will result in cost only and we agree with the analysis that they will be overall more expensive to implement than reuse. In addition, the policy of reuse will provide benefit to the UK by converting an under utilised material into a

	valuable resource for generating very low carbon electricity.
Q4	Is the Government doing the right thing by taking a preliminary policy view and setting out a strategic direction in this area now?
Response	Yes. With the advent of new build in the UK, a policy view now on reuse of Pu in thermal MOX is a prerequisite to initiate the necessary preparatory development and licensing work. The consultation rightly makes reference to the value to decision makers of certainty in strategy. Currently no end points have been identified for Pu in the Lifetime Plans of the NDA sites. There are national and international concerns regarding safety, security and non-proliferation to which the UK should respond. Failure to adopt a preferred policy view could undermine the UK's international position over non proliferation and safeguards. There is a significant body of knowledge within UK industry and academia to support a policy view in this direction. Whilst a preliminary policy is expedient, there must be room to accommodate a shift in position to another strategic option, should conditions change. .
Q5	Is there any other evidence government should consider in coming to a preliminary view?
Response	Yes. Government should consider the availability of the technical skills and research infrastructure in the UK; specifically Category 1 Pu research facilities needed to support Pu management and disposition. The UK has developed subject matter experts in a range of Pu management activities through historic programmes. Due to the long term nature of the disposition of Pu it is essential that this expertise is maintained. An appropriately funded strategic, UK based, research programme will be imperative to underpin policy as well as develop the next generation of experts. Government should also keep abreast of international developments in Europe and elsewhere which may affect its policy or present new opportunities before Pu disposition is completed. The European Sustainable Nuclear Energy Technology Platform (SNE-TP) which describes a path to the development of sustainable nuclear energy in Europe up to ~2050 is one example. UK involvement in European and

	international research programmes should be supported by Government. The acceptability of the final form for disposal in a Geologic Disposal Facility (GDF) will need to be considered in more detail. Irradiated MOX fuel presents similar challenges to disposal of irradiated UOX fuel, which must be dealt with in much larger quantities from current and new build reactors. The reuse of Pu also does not foreclose the option of further recycling for burning in fast reactors should they eventually become available. Therefore, long term storage of spent MOX fuel should be investigated to allow this route to remain a viable future option. The alternative to reuse, immobilisation of 100te of Pu into a wasteform, would present a significant challenge to the GDF, both on technical grounds and with regards to public acceptability.
Q6	Has the Government selected the right preliminary view?
Response	Yes. The combination of international experience and the technical maturity of thermal MOX technology coupled with the UK new build programme provide an overwhelming case for reuse. Reuse and storage of spent MOX fuel is feasible and would allow the fast reactor option to remain open for the future. Thus reuse of Pu in MOX fuel is a more attractive option than the alternative of bulk immobilisation and disposal as waste.
Q7	Are there any other high level options that the Government should consider for long-term management of plutonium?
Response	No. The consultation paper describes the only credible options available to the UK; reuse, immobilisation or deferred decision of long term storage. Out of these adopting a preliminary policy of reuse is compelling and we support the Government view this should be the preferred way forward.