

Pre-consultation discussion paper on the key factors that could be used to compare one option for long term plutonium management with another.

July 2009

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Section Introduction

- 1.1 The Government has decided, in light of the security and proliferation risks around plutonium to develop further our medium and long term strategy for this material. The need to make progress in this area forms part of a comprehensive strategy covering civil nuclear power, security of nuclear material, non-proliferation and disarmament and international governance. This strategy is set out in the document “The Road to 2010: Addressing the Nuclear Question in the Twenty First Century.”¹
- 1.2 The UK Government wants to develop proposals for plutonium management in a way which engages stakeholder groups and the public, and balances the need for action with the need to ensure that the correct provisions are put in place.
- 1.3 Following the publication of the NDA plutonium credible options summary paper in January 2009², in May this year the Government met with some stakeholders for a preliminary discussion on the ways forward. As a result of the feedback from that meeting the Government decided that, because of the many differing views expressed, some of the key issues should be worked through in more detail and set out in publicly available discussion papers so that a wider audience can contribute to the development of Government thinking in this area, prior to the Government launching a public consultation in the autumn.
- 1.4 This is the first of two informal discussion papers to be issued by the Department during summer 2009.
- 1.5 Each of these papers addresses a specific issue concerning the long-term management of the UK’s civil separated plutonium.
- 1.6 This paper considers the factors which could be important when judging one potential option for long term plutonium management against another.
- 1.7 The second paper will consider the decision-making methodology and issues around when is the right time to make a decision on selecting a preferred option.
- 1.8 These papers are intended as a pre-consultation phase of discussion with stakeholders during summer 2009. Although this is not a formal consultation we would welcome views from any interested parties. These papers are being made available on the Department’s website and if comments are made during the summer, they can be taken into account by Government when it decides how to proceed with the formal public consultation in the autumn.

¹ <http://www.cabinetoffice.gov.uk/reports/roadto2010.aspx>

² <http://www.nda.gov.uk/documents/upload/NDA-Plutonium-Topic-Strategy-Credible-Options-Summary-January-2009.pdf>

1.9 Comments can be sent by email or letter to:

Long Term Plutonium Management: Key Factors Discussion Paper
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1.10 It would be helpful to receive comments before **3 September 2019** so that they can be taken into account in the preparation of the formal consultation document. It may be possible to take account of comments received for a short period after this date, but there will, of course, be an opportunity to comment during the formal consultation due to be launched in the autumn.

Section 2 Background

NDA option paper

- 2.1 In January 2009 the NDA published a paper which identified credible options for long-term management of the UK's civil separated plutonium.
- 2.2 The NDA credible options summary paper is available at:
<http://www.nda.gov.uk/documents/upload/NDA-Plutonium-Topic-Strategy-Credible-Options-Summary-January-2009.pdf>

A technical summary and technical analysis of options can be found at:
<http://www.nda.gov.uk/documents/upload/NDA-Plutonium-Topic-Strategy-Credible-Options-Technical-Summary-January-2009.pdf> and
<http://www.nda.gov.uk/documents/upload/NDA-Plutonium-Topic-Strategy-Credible-Options-Technical-Analysis-January-2009.pdf>

Options currently in NDA

- 2.3 The three main options for plutonium can be summarised as follows:
- Reuse - The plutonium could be reused in the manufacture of Mixed Oxide (MOX) fuel, burnt in a reactor, put in interim fuel storage before eventual disposal as spent MOX fuel. This option would require a new MOX fabrication plant and would raise complex issues, especially in terms of commercial viability. New nuclear build in the UK will deliver reactors that are able to burn MOX but it is not certain that the ability to use MOX in the future would be sought by potential operators. There is also the potential to sell MOX fuel to overseas utilities.
 - Treat as waste. The plutonium could be immobilised in a safe and secure form before being disposed of as waste material. Again the issues are challenging as immobilisation techniques have yet to be demonstrated outside the laboratory. Putting plutonium into a safe and secure form will produce a product with at least three times the storage volume requirements of the current plutonium stores. New interim stores would be needed before the immobilised plutonium could be disposed of. These are very likely to require the highest security standards, which would mean very high costs.
 - Indefinite storage. Safe and secure storage is the only option available for the short term while thinking around the reuse or waste options is developed. A new storage facility is currently under construction. Storage beyond 30 to 50 years is likely to require a new plutonium store and probably a new treatment plant. It is known that the plutonium and the can in which it is contained degrade over time and packages will need to be reconditioned to allow continued safe storage.
- 2.4 It is proposed in the short-term to continue storing the plutonium until a decision on whether to treat it as waste or an asset has been taken. We are satisfied that the plutonium will continue to be stored both safely and securely.
- 2.5 It should be noted that for technical reasons at least a small percentage of the material is unlikely to be suitable for recycling and will therefore need to be disposed of. Interim storage will also be an important component of any future strategy. The relationship

between the need to develop a disposal option for some proportion of the existing plutonium stockpile and the possibilities of developing different options for the remainder needs to be clearly understood.

DECC and the Environment

- 2.6 The Department is currently considering the options set out in the NDA's paper with a view to launching a formal public consultation in the autumn. The form of this consultation, including whether it should identify a lead or preferred option, will be determined in the light of further work over the summer and in the light of comments made in response to our discussion papers.
- 2.7 On 21 May we held a meeting with invited stakeholders from NGO's, local authorities, industry associations and foreign governments to assist us in our consideration of these options and in preparing the consultation. We wanted to hear their views on the NDA options at an early stage, their views on what was important when considering the options and whether they had a preference for any particular option.
- 2.8 Overall the aim of the meeting was to get their views on what they thought the Government should do with the UK's accumulated separated plutonium to help us take a view on how best to take the issue forward.
- 2.9 A full transcript of that meeting and a summary report are available at:

The full transcript - <http://www.berr.gov.uk/files/file52079.pdf>
The summary - <http://www.berr.gov.uk/files/file52080.pdf>
- 2.10 The Department also held a breakout session at the NDA's National Stakeholder Group meeting in June, where we presented a summary of our earlier meeting. Those taking part in the session were given the opportunity to comment on what factors would be important to them in a decision on the long-term management of plutonium.
- 2.11 This pre-consultation discussion paper has been produced in light of feedback from our earlier engagement with stakeholders at these events. The factors that can be used to judge one option for plutonium management against another was a key topic of discussion at the meeting in May. The factors that we used to prompt the discussions and many of the factors that came out of those discussions are set out in section 3. They are set out in this paper to allow the opportunity for wider comment from interested parties to further inform development of the public consultation to come later in 2009.

Section 3 Key Factors

- 3.1 There are many different factors that will need to be used to judge one option against another and they will vary in significance and importance from stakeholder to stakeholder. For that reason we are not aiming or intending to achieve a consensus on all key factors but are working to ensure that all factors have been identified.
- 3.2 As part of the recent discussions, stakeholders were asked to consider which factors were important to them and why. The conclusion of these discussions was to identify the following factors, set out below. These are arranged in alphabetical order rather than in an order which reflects their relative importance.
- 3.3 Key questions for Government in determining the framework for decision making are:
- Which factors are the most important?
 - Why are they important?
 - How should they be weighted?
 - Are there additional factors missed out?
 - Are the relevant factors adequately described?
- 3.4 Factors

Availability When can the option be delivered?

Coherence Decisions on plutonium needs to be part of a coherent, strategic approach to all matters nuclear

Cost effectiveness Is this a cost-effective, affordable way forward?

Energy resource Should the energy value of the plutonium be considered as a valuable resource?

Environmental Some options present more challenge than others; it's more than technical maturity. Having done something before doesn't guarantee success next time.

Environmental What effect will the option have on the environment?

Europrotection Need to consider how far each option might be affected by foreseeable future energy and waste policy demands.

International perspective What are other countries doing regarding plutonium? What are the current and emerging technological options? What do other countries around the world feel about what the UK should be doing, including non-nuclear states?

International Conventions/requirements What do International Treaties and Conventions require the UK to do.

Practicality Is this an option that can realistically be employed over a suitable time frame?

Proportionate response How does the option reduce the value of plutonium to terrorists / proliferators? How easy is it to get to the material in a useful form?

Broader on Impact of policy on nuclear non-proliferation policy and materials creation.

Implementation .

Reversibility Does the option foreclose other options?

Safety What are the risks / dangers posed by an option? What additional worker dose or risk of public exposure would the option entail?

Security How well is the material intrinsically protected by this option? What additional levels of protection would be required?

Social Including impact on local communities

Technology How mature is the technology that the option relies on?

Transport Plutonium, MOX and spent fuel specific transport issues have to be considered, including environmental, safety and security aspects.

Section 4: Conclusions and next steps

Summary

- 4.1 Identification of the factors which are relevant to judging between options is an important building block for taking decisions in due course. This paper sets out early thinking on these factors, including initial stakeholder suggestions.
- 4.2 The factors described in this paper are not an exclusive list and views are welcome both on the factors listed and on any further factors that might be used, and why they are considered to be important, in order to inform the development of a public consultation to be held later in 2009.

Next steps

- 4.3 This is the first of two informal discussion papers being issued by the Department, intended for discussion with stakeholders during summer 2009.
- 4.4 The second paper will consider the decision-making methodology and issues around when is the right time to make a decision on selecting a preferred option.
- 4.5 The Government intends to launch a formal consultation of the management of plutonium in the autumn. The form of this consultation, including whether it should identify a lead or preferred option, will be determined in the light of further work over the summer and in the light of comments made in response to our discussion papers.