

Long term Plutonium management:

Pre-consultation discussion paper  
covering decision methodology and  
timetable for decision making

October 2009

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## Section 1: Introduction

- 1.1 The Government has decided, in light of the security and proliferation risks relating to plutonium currently stored in the UK, 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.”<sup>1</sup>
- 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 2009<sup>2</sup>, 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 later in the year.
- 1.4 This is the second 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 decision-making methodology and issues relating to when is the right time to make a decision on selecting a preferred option.
- 1.7 The first paper considered the factors which could be important when judging one potential option for long term plutonium management against another.
- 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 later in the year.

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

<sup>2</sup> <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: Decision Methodology  
Dean Gallacher  
3 Whitehall Place  
London  
SW1A 2HD  
[dean.gallacher@decc.gsi.gov.uk](mailto:dean.gallacher@decc.gsi.gov.uk)

1.10 It would be helpful to receive comments before **30 November 2009** 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 later in the year.

## 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 identified by the 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 engagement with stakeholders**

- 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 later in the year. 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:  
[http://decc.gov.uk/en/content/cms/what\\_we\\_do/uk\\_supply/energy\\_mix/nuclear/issues/plutonium/plutonium.aspx](http://decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/nuclear/issues/plutonium/plutonium.aspx)
- 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. As part of those discussions, stakeholders asked about our methodology for deciding on a way forward. Discussions also focused on when was the right time to take a decision. Our thoughts on these issues are set out in section 3 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: Decision Methodology and Timing of Decisions**

### **Taking forward a strategy**

- 3.1 The NDA have carried out a considerable amount of work on options for the UK's civil plutonium stocks. This work culminated in the publication, in January 09, of their credible options summary paper. It is for the Government to consider these options and to set in motion a strategy for the medium to long term management of the UK's civil plutonium.
- 3.2 A consultation on plutonium management which we propose to launch later in the year will take over from the NDA's earlier work and progress the medium to long term management of the UK's civil plutonium.

### **Key issues: (i) timing of decision**

- 3.3 In the light of the points made above, the Government believes that it is important to come to a conclusion as to which of the credible options should be pursued. We are therefore inviting comments on whether we have reached the point at which it is sensible to select a preferred option, or if not, what further work or information is required before we reach that position.
- 3.4 At this point, none of the options has been worked up in complete detail. This is particularly true of disposal options.
- 3.5 In determining whether we have reached the point at which we should select a preferred option, we need to avoid two extremes of, on the one hand, leaping to a decision before sufficient information has been secured to be able to assess the full implications of that choice, or on the other hand spending many years assessing the options, delaying implementation, but without improving the quality of the decision then taken. Accordingly, there is a balance to be drawn between deferring the need to decide on a way forward in order to gather all the necessary information, and showing resolve to address the problem and take forward a solution with the available information. Some protection from making an incorrect choice can be afforded by reaching a preliminary view on an option rather than making an irrevocable decision. As this option is further worked up, should insoluble problems arise, then the option may need to be amended or abandoned.
- 3.6 To help strike the best balance between these factors, the Government envisages three sequential phases in the decision making process and anticipates that progress towards the latter phases will proceed at a rate which is determined by policy considerations and by the adequacy of the information available. Table 1 illustrates the phases for a likely way forward for selecting an option for plutonium strategy.
- 3.7 The first phase involves the development and testing of the credible options up to the point at which one or more can be regarded as credible for implementation. During this first phase we must establish arrangements for commissioning the required work and scrutinising the results. The Government believes that a considerable amount of work is required during this phase before a decision on the option to be implemented can be taken.
- 3.8 In order to inform our thinking, we must:
  - Identify options

The NDA have already identified the credible options set out in section 2.3 but we recognise that advances in technology or breakthroughs in research and development mean that the availability of options may change or new options may emerge.

- Screen options

While the NDA credible options paper has effectively screened for options that are credible, we intend to use an initial screening process that will determine which of these options can satisfy policy goals.

- Analyse options

Options will be assessed using a series of factors, such as those described in our first discussion paper. While there are many factors against which options can be measured, not all are immediately or easily quantifiable. Even if we assess the options against some of these factors to determine a preliminary view, it will be necessary to repeat the options analysis process when more information is available. Our public consultation will provide an opportunity for stakeholders to nominate additional factors against which options could be assessed. How the options perform against a series of factors will, after weighting for significance and probability, allow us to determine a view for each option.

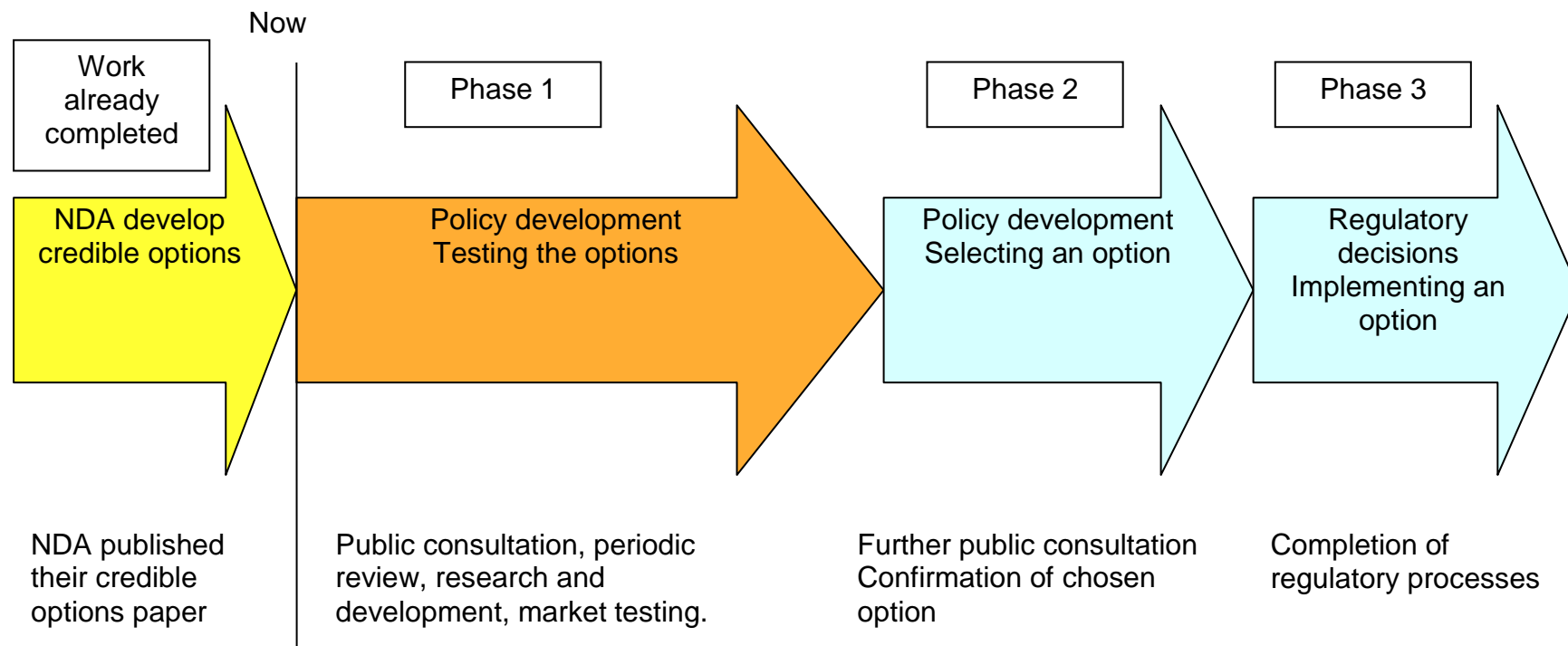
3.9 The second phase can only commence when Government is satisfied that sufficient is known about each option to make it sensible to reach a preliminary decision, or preferred option. This does not mean that all detailed questions need be resolved, but that sufficient is known for rational decision ma



- adding up the overall marks, appropriately weighted to determine the overall best option.

3.13 A less formalised approach would involve the setting out of the relevant factors, a qualitative rather than quantitative assessment of each option against each of the relevant factors and an overall, holistic, judgement.

**Table 1: Decision-making Phases**



## **Section 4: Conclusion and next steps**

### **Summary**

- 4.1 Subject to comments received on this paper, Government considers that focusing our efforts on a preliminary view of the most appropriate long term solution will give us the best prospect of success as we seek to progress towards a final solution that is practicable, affordable and offers value for money.
- 4.2 The Government believe that a three phase approach that will test, select and then allow the implementation of a strategy is the most appropriate way to make progress on medium to long term plutonium management.
- 4.3 Decision making techniques will be considered as part of the process for Government to take a view on potential options for plutonium management.

### **Next Steps**

- 4.4 This is the second of two informal discussion papers being issued by the Department, intended for discussion with stakeholders during summer 2009.
- 4.5 The first paper considered the key factors that are important when judging one option against another.
- 4.6 The Government intends to launch a formal consultation of the management of plutonium later in the year. The form of this consultation, including whether it should identify a preliminary view of the most appropriate long term solution, 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.