

**CoRWM informal comments on DECC pre-consultation discussion paper on  
decision methodology and timetable for decision making  
on long-term plutonium management**

Compiled by Marion Hill

***Introduction***

1. These are informal comments from some members of CoRWM on the DECC pre-consultation discussion paper (DECC, 2009a). They have not been discussed by the full committee and do not represent an agreed CoRWM view.
2. CoRWM is interested in the long-term management of plutonium because one of the options being considered is to treat it as a waste, that is to immobilise the plutonium in a suitable medium and emplace it in a geological disposal facility (GDF). Another option, reuse, would produce spent fuel that would be waste and would require geological disposal. The third option mentioned in the paper, indefinite storage, is one that CoRWM considered for the long-term management of higher activity wastes (HAW) (CoRWM doc. 700).
3. These comments cover the two main issues raised in the DECC discussion paper, namely the timing of decisions on long-term management of plutonium and the methodology for decision making. They begin with the issue of the long-term management options to be considered.

***Options for the Long-Term Management of Plutonium***

4. It is important to distinguish between strategic options for the long-term management of plutonium and the detailed options that could be used to implement the strategy. The discussion paper seems to mix the two. As a result, it does not set out clearly the decisions required or the issues about the timing of these decisions.
5. In our view there are only two strategic options for the long-term management of plutonium. In the terminology of the discussion paper these are: "reuse" and "treat as waste". We do not believe that the third option mentioned in the paper, "indefinite storage" should be considered as strategic option in its own right. What is meant by this option is either:
  - delaying a decision on whether to take forward reuse or treatment as waste, or
  - long-term storage prior to reuse or treatment as waste.
6. Our comments on delaying a decision are given below (para 8). Neither reuse nor treatment as waste could be implemented immediately. Both involve some continued storage of plutonium until a detailed option is chosen and appropriate facilities are constructed. Long-term storage is thus simply a variant in which the start of reuse or conditioning as waste is substantially delayed. In essence this is the approach taken in the NDA Topic Strategy for plutonium (NDA, 2009a).
7. As well as being clear about strategic options in the planned public consultation, it is also important to identify all the detailed options that could be used to implement them. In its recent work (NDA, 2009a, b, c, d) has dismissed as not credible a number of options that would probably be viable but on a long timescale (eg reuse of plutonium in fast reactors). This approach has the potential to lead to confusion and dissatisfaction amongst stakeholders, who could wonder why apparently feasible options have been rejected. It is also essential to be clear about common features of detailed options. For example, whichever reuse option is chosen there will be some plutonium that has to be treated as

waste. Table 1 lists the detailed options that come to mind as needing to be identified. There may be others.

### ***Timing of Decisions***

8. In the light of the points above about strategic and detailed options, we consider that the phases in decision making are as shown in Table 2. The question now is whether the UK should decide soon between reuse of plutonium and treatment as waste or delay that decision until more information is available about the detailed options that could be used to implement the strategic options.
9. In our view it is desirable to decide fairly soon between reuse and treatment as waste. However, it will take time to assemble the information about the two strategic options into an appropriate form and to compare the options using an appropriate methodology (see below). It is therefore unrealistic to plan for a public consultation on the long-term management of plutonium in 2009 or early 2010.

### ***Decision Making Methodology***

10. Based on CoRWM's experience for HAW (CoRWM doc. 700), we would advise DECC to use both quantitative and qualitative methods to compare plutonium reuse with its treatment as waste. The quantitative comparison should be a multi-attribute method, making use of appropriate tools (eg Analytica, VISA, GMAA). It should include sensitivity analysis for the quantification of key factors and the weights assigned to them (CoRWM doc. 2690). The qualitative comparison should be a holistic one and ethical issues should be explicitly included.
11. We believe that stakeholders should be involved in both the quantitative and the qualitative comparison. We suggest that this is best achieved by means of workshops, with independent facilitators. There would probably need to be at least two workshops: one to frame the comparisons and one to carry them out.
12. DECC will need expert support to prepare for and carry out the comparisons. We suggest that this be provided by a contractor, not by NDA. One reason for this suggestion is that NDA is an important stakeholder in the context of plutonium management. As such it should be encouraged to express its views, not kept in the background as an adviser to DECC. The other reason is that there is a need for a fresh approach to comparing plutonium management options, from a contractor with considerable expertise in option comparisons in the nuclear field.

### ***References***

CoRWM doc. 700. CoRWM's Recommendations to Government, November 2006.

CoRWM doc. 2690. CoRWM informal comments on DECC pre-consultation discussion paper on key factors that could be used to compare one option for long-term plutonium management with another, September 2009.

DECC, 2009a. Long term plutonium management: pre-consultation discussion paper covering decision methodology and timetable for decision making, October 2009.

DECC, 2009b. Pre-consultation discussion paper on the key factors that could be used to compare one option for long term management of plutonium with another, July 2009.

NDA, 2009a. Plutonium Topic Strategy Summary, Version 1.0, August 2009.

NDA, 2009b. NDA Plutonium Topic Strategy – Credible Options Summary, January 2009.

NDA, 2009c. NDA Plutonium Topic Strategy – Credible Options Technical Summary, January 2009.

NDA, 2009d. NDA Plutonium Topic Strategy – Credible Options Technical Analysis, January 2009.

**Table 1 Detailed Options for Long-Term Management of Plutonium**

<i>Reuse</i>	<i>Treatment as Waste</i>
Sell plutonium to another country for reuse (with no return of any waste to UK)	Immobilise as low specification MOX (existing or new plant)
Lease plutonium for reuse in another country (with return of waste to UK)	Immobilise in ceramic matrix
Make MOX fuel in UK (existing or new plant), sell fuel to another country for use (with no return of spent fuel for disposal)	Vitrify
Make MOX fuel in UK (existing or new plant), lease fuel to another country for use (with return of spent fuel for disposal in UK)	Immobilise in cement
Make MOX fuel in UK (existing or new plant), use in UK reactors, dispose of spent fuel in UK	
Use plutonium in fast reactor in UK, dispose of waste in UK	
Common features of options: <ul style="list-style-type: none"> <li>• interim storage prior to implementation</li> <li>• plutonium unsuitable for reuse to be treated as waste</li> </ul>	Common features of options: <ul style="list-style-type: none"> <li>• interim storage prior to implementation</li> <li>• depending on timing, storage after immobilisation and before disposal</li> <li>• dispose in GDF, with all HAW or with some HAW (depending on number of GDFs)</li> </ul>

**Table 2**      **Phases in Decision Making on Long-Term Management of Plutonium**

<i>Past Work</i> (2008 & 2009)	<i>Phase 1</i> (2010-11)	<i>Phase 2</i> (2011-?)	<i>Phase 3</i> (?)
<p>NDA development and analysis of            “credible options”            (NDA, 2009a-d)</p>	<p>Comparison of strategic options            (reuse and treatment as waste)</p> <p>Selection of and consultation on            strategic option</p>	<p>R&amp;D on detailed options to            implement chosen strategic            option</p>	<p>Comparison of detailed options</p> <p>Selection of and consultation on            detailed option</p>