

# *Nuclear Free Local Authorities* **new nuclear monitor**



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## **NO NEW NUCLEAR POWER STATIONS ... FOR NOW**

The Government has rejected the nuclear industry's case for large-scale intervention in the market to support the construction of new nuclear stations. The recent energy White Paper concludes that "the current economics of nuclear power make it an unattractive option for new generating capacity and there are also important issues for nuclear waste to be resolved."<sup>1</sup> Instead, the Government presents a vision of a low carbon energy future based on increased energy efficiency and a growing role for renewable energy. This vision accords well with NFLA priorities<sup>2</sup>.

Nonetheless, the White Paper also states that "we do not rule out the possibility that at some point in the future new nuclear build might be necessary if we are to meet our carbon targets." It then stresses that "before any decision to proceed with the building of new nuclear power stations, there would need to be the fullest public consultation and the publication of a White Paper setting out the Government's proposals." This commitment is essential because the public is likely to want much more information, further discussion and stringent conditions to be met before any decision to proceed with new build<sup>3</sup>.

This issue of *New Nuclear Monitor* asserts the case for openness and transparency, and public and stakeholder engagement, in any initiatives that might prepare the ground for new nuclear power stations. It reviews potential initiatives, including the role of the new Energy Research Centre, and assessment of what to do with the UK's plutonium stockpile. Finally, we highlight the opportunity for local authorities to contribute to achieving a sustainable energy future.



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**THE LOCAL GOVERNMENT VOICE ON NUCLEAR ISSUES**

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## NUCLEAR AS A “RESEARCH PRIORITY”

Although rejecting the case for new nuclear stations, the Government has endorsed the view from the Energy Research Review Group that nuclear power should feature amongst a group of six research priorities<sup>4</sup>. The White Paper states that “these have been identified as areas in which increased support for research and development is particularly likely to result in step-change breakthroughs which will contribute significantly to carbon reductions.”

Against this background, the Government explains that the Research Councils are developing a new Energy Research Network, which will involve interdisciplinary teams with expertise in scientific, social, economic and health impacts. In addition, the White Paper announces the creation of a new UK Energy Research Centre, which will:

.. act as the hub, providing a national .. focus to integrate and accelerate research in this priority area. It will play a key role in co-ordinating research, facilitating collaboration with industry and UK participation in international projects, as well as being a centre of excellence in its own right.<sup>5</sup>

At the time of writing, it is not clear what nuclear-related research will be carried out under the auspices of the new Energy Research Centre and Network. However, previous issues of *New Nuclear Monitor* have made a number of suggestions about the way in which research-related activities should be undertaken, if they are to engender public and stakeholder confidence.

In particular, previous consultation exercises show that members of the public prefer approaches which are open, transparent and critical, and involve a wide range of stakeholders<sup>6</sup>. This suggests that some form of mixed stakeholder panel should be established to oversee the Centre’s nuclear-related research, with a membership drawn from beyond the research community itself, for example, from local government, environmental NGOs, and public interest groups.

The *nature* of the research is also of significance to public and stakeholder confidence. In particular, the research should not be confined to technical issues, but encompass:

- public acceptability issues;
- economic and commercial issues; and
- international developments.

As argued in previous issues, work exploring public acceptability should cover:

- *What the public would consider to be a ‘solution’ to the long-term management of radioactive wastes.* This might be defined in terms of reaching a significant milestone in the implementation of policy, for example, securing planning consent for new facilities for long-term storage or disposal, or construction of the facility, or a period of successful operation.
- *What the public would consider to be adequate progress in putting the rest of the ‘nuclear house’ in order.* This might be defined in terms of reaching significant milestones in: (a) winding down reprocessing and the accumulation of separated plutonium and highly active liquid waste; (b) immobilising potentially mobile and hazardous materials, including separated plutonium, highly active liquid waste and challenging intermediate level wastes; and (c) demonstrating an ability to decommission and dismantle existing nuclear power stations.

- *What the public would consider to be an acceptable standard of safety for a new generation of reactors.* This might be defined, for example, as there being no physically credible events which could require off-site actions. This could require the development of reactor designs that could survive the total absence of coolant and withstand high impact external events, such as the deliberate crashing of a commercial jet airliner.
- *What the public would consider to be an acceptable level of expert agreement about the risks of low level radiation.* Much hinges here on the satisfactory conduct and outcome of the current review of the risks of low level radiation, and on the findings of any further research identified as necessary by that review<sup>7</sup>.

A good starting point for work on economic and commercial issues would be to review the outcomes of the current BE/BNFL and BE/AECL feasibility studies of new build in the UK. Although the companies concerned will plead commercial confidentiality, it is important to put the principles of openness and transparency into practice. As much detail from the feasibility studies should therefore be made available to the Energy Research Centre as possible.

The monitoring of international developments should cover the construction, licensing and operation of any new reactors. Indeed, it is likely that key uncertainties, particularly those inherent in estimating the costs of electricity from new plant, will only be significantly reduced through the construction and operation of demonstration or commercial plant. Developments in the US and South Africa could be of particular interest in this regard.

Overall, the stakeholder panel's role should include the publication of annual reports on nuclear-related research outputs.

## **NEW ARRANGEMENTS FOR DELIVERY AND REVIEW OF POLICY**

In addition to steps to enhance the UK's energy research capabilities, the White Paper announces new arrangements for delivery and review of commitments on cutting carbon dioxide emissions, maintaining reliability of energy supplies and competitiveness, and delivering fuel poverty targets.

These arrangements include:

- enhanced analytical and strategic capabilities in the DTI's Energy Strategy Unit;
- a Sustainable Energy Policy Network of departmental policy units and the regulators;
- a new, ad hoc, Ministerial group, jointly chaired by the Secretaries of State for Trade and Industry, and Environment, Food and Rural Affairs, to oversee the delivery of the White Paper's commitments;
- a new Sustainable Energy Advisory Board, made up of senior, independent experts and stakeholders, to advise the Ministerial group.

The new arrangements also include "annual public reports both on progress towards the aims we set out in this White Paper and the steps we are taking to ensure we remain on track".

In keeping with a commitment to openness and transparency, these annual reports should flag up any change of view within Government about the potential need for new nuclear build<sup>8</sup>. In such circumstance, the reports should also indicate how the Government intends to move forward with its commitment to the "fullest public consultation" before reaching a decision, and how such plans take into account the findings of nuclear-related research as discussed above.

## PLUTONIUM BURNING REACTORS THE FIRST IN LINE?

A recent article in *Nucleonics Week* suggests that if new build does re-emerge it will be to reduce stocks of separated plutonium:

The only new nuclear construction that could possibly be given the go-ahead by the UK Government over the next 10-15 years, according to well-placed sources, would be one or two reactors to absorb the country's massive stockpile of separated plutonium in the form of mixed-oxide fuel. The government would be able to justify such full-core MOX burners on environmental grounds, the sources said.<sup>9</sup>

This issue has been addressed in a recent report from the BNFL Stakeholder Dialogue<sup>10</sup>. The report was prepared by a Plutonium Working Group (PuWG), with membership from BNFL, the Sellafield trade unions, Copeland Borough Council, the regulators and the NGO community. The NFLAs sponsored the involvement of independent analyst, Fred Barker.

This report is notable for a number of reasons, not least because it has been agreed by a very diverse range of stakeholders. It also makes a series of recommendations which complement the case presented here for openness and transparency, and stakeholder engagement, in any further appraisals of the case for new build.

More specifically, the PuWG report recommends a series of explorations or studies which:

.. are necessary to reach an informed decision on the future management of the plutonium stocks owned by BNFL. The PuWG wishes to stress that these recommendations are interconnected, and should not be selectively implemented. Nor should they be read as endorsing or advocating any specific option. Members of the PuWG hold diverse views on these options.

The PuWG identified a number of reasons for moving away from the current storage of separated plutonium as a dioxide powder, including concerns that this storage form is insufficiently 'passively safe' for the longer-term, and that increasing international pressure could be applied in the future to reduce such stocks. The PuWG observed that "an alternative management approach therefore needs to be developed in a timely manner, in the form of a clearly defined disposition programme." In the PuWG's view, 'timely' means that disposition should be underway within 25 years and complete within around 50 years.

Overall, the PuWG concluded that a disposition programme should have two main objectives:

- plutonium should be converted to a 'passively safe' form, suitable for long-term storage or disposal, should the latter management route be chosen; and
- there should be a very high level of assurance that plutonium cannot be used illicitly outside the international safeguards regime.

After an initial assessment, the PuWG focused on four main options:

- immobilisation of plutonium as a ceramic waste form using a purpose-built plant
- immobilisation of plutonium as a 'low spec' MOX waste form in the existing Sellafield MOX Plant (SMP)

- manufacture of MOX fuel followed by use in existing UK reactors
- manufacture of MOX fuel followed by use in new build UK reactors

The PuWG then used a technique called ‘Strategic Action Planning’ to identify the explorations needed to reach an informed decision on the contribution each option should make to a disposition programme.

For potential immobilisation options, the PuWG recommends that: “the ‘plutonium owner’ should commit promptly to an immobilisation research, process development and design study to more fully establish the optimum technology for plutonium immobilisation.” The scope of the recommended study is set out in Box 1.

#### **BOX 1: PLUTONIUM WORKING GROUP RECOMMENDATIONS ON IMMOBILISATION**

The PuWG recommended that the research, process development and design studies should include:

- underpinning research on ceramic immobilisation matrices;
- consideration of possible plutonium loadings, inclusion of neutron absorbers, safety and safeguards requirements;
- assessment of possible product forms against waste specification requirements;
- design studies for process optimisation;
- consideration of low spec MOX as an immobilised plutonium product;
- a Best Practicable Environmental Option (BPEO) analysis, .. to establish the optimum process and waste form; and
- a comprehensive environmental impact assessment on the proposal .. This assessment should be conducted in consultation with stakeholders at national and local levels.

The aim should be to make sure that immobilisation can be made available within a reasonable timeframe, and that the merits or otherwise of this approach can be taken properly into account before decisions about plutonium management are made.

Specifically with regard to the potential ‘low spec’ MOX waste option, the PuWG recommended that to ensure the option is not foreclosed, the ‘plutonium owner’ should:

- undertake a more detailed assessment of the suitability of low spec MOX as a form of immobilised plutonium product, including consideration of security, safety, safeguards, waste form qualification and other relevant issues;
- undertake a design study to establish whether SMP could feasibly be modified to produce a more ‘optimised’ plutonium waste form, either in current or newly added production lines;
- review the use of SMP in the light of the above investigations and those on the other options as recommended above, once the future contractual commitments of SMP for overseas and domestic customers become clearer;
- include the ‘SMP option’ in the BPEO for immobilisation options recommended in respect of new build plant; and
- assess the findings of this investigation programme as part of the regular review of SMP operation alluded to in the White Paper ‘Managing the Nuclear Legacy’.

For potential reactor options, the PuWG recommended a number of explorations designed to establish their practicability or otherwise. The recommended explorations are set out in Box 2.

The PuWG then explicitly recommended that: “All the actions and explorations indicated above should be carried out to the point at which the ‘plutonium owner’ can make informed decisions (with stakeholder involvement) on the contribution each option should make to management of the plutonium stockpile.”<sup>11</sup>

These recommendations map out a clear way forward on plutonium disposition. They convey the important message that further assessment should not just focus on potential MOX use in new reactors, but encompass a range of options, including immobilisation of plutonium as a waste form.

There is also a potentially important overlap between implementation of the PuWG's recommendations, and any research that the new Energy Research Centre might undertake on new build, particularly on public acceptability, economic and commercial issues. There will therefore be a need for liaison between the 'plutonium owner'<sup>12</sup> and the new Centre on these issues.

#### **BOX 2: PLUTONIUM WORKING GROUP RECOMMENDATIONS ON MOX USE IN REACTORS**

In the interests of fully establishing the practicability or otherwise of using MOX fuel in Sizewell B, Heysham 2 and Torness, and before any decisions on implementation are taken:

- the 'plutonium owner' and BE (as the 'plutonium user') should enter into initial discussions to explore the financial basis for this option ...;
- the availability of capacity in SMP should be reviewed, taking account both of the duration and timing of fulfilling contract commitments to overseas customers and the feasibility of a life extension for the plant;
- should these explorations indicate that using plutonium in Sizewell B or either of the AGRs may be attractive from a liability management point of view, the 'plutonium owner' and 'user' should undertake a comprehensive environmental impact assessment, including the evaluation of transport, .. environmental discharge, public safety (including the risks from extreme core disruption events), and waste form storage issues. This assessment should be conducted in consultation with stakeholders at national and local levels.

To explore the feasibility or otherwise of utilising plutonium, in the event that any programme of new build reactors were to proceed, the PuWG recommended that before any decisions are taken:

- the financial basis on which plutonium might be utilised in new build reactors should be explored at an early stage between the 'plutonium owner' and the likely developer of any new build reactors. The existing collaborative agreement on new build between BNFL and BE may be a suitable vehicle for this.
- The availability of capacity in SMP should be reviewed, taking account of the feasibility of a life extension for the plant.
- Should these explorations .. be favourable to plutonium use in new build, the prospective developer should undertake a comprehensive environmental impact assessment on the proposal including the evaluation of transport, reactor safety (including the risks from extreme core disruption events), environmental discharge, and waste form storage issues. This assessment should be conducted in consultation with stakeholders at national and local levels.
- A detailed comparison on MOX, IMF and conventional uranium fuels should be undertaken prior to deciding which fuel type to use.

## **CONTRIBUTING TO A LOW CARBON ENERGY FUTURE**

The White Paper also highlights the role that local authorities can play in helping achieve a sustainable energy future:

“Local authorities and regional bodies are pivotal in delivering change in their communities ... Local authorities and other local bodies, regional chambers and Regional Development Agencies .. make decisions that are vital for energy policy - for example on planning, regeneration and development, procurement, housing, transport and sustainable development ... In future there will be greater emphasis on local and regional approaches in delivering our energy objectives... Several regions already have energy or renewables strategies. We propose to build on these by taking steps to ensure that a strategic approach to energy is developed and implemented in each region.”

The White Paper expects local authorities to have an important role in developing a strategic approach:

"We expect this strategic approach to be developed by a partnership of regional chambers, RDAs, Government Offices in the Regions, local authorities and other stakeholders ... Its objectives will need to be delivered by all these bodies working closely together. In the longer term elected regional assemblies will take responsibility for leading the work where they are established.

Finally, the White Paper contains a commitment to consult in the near future on detailed proposals. Supporting authorities are encouraged to respond to this further consultation.

## **SUMMARY**

This issue of *New Nuclear Monitor* has reviewed the nuclear-related aspects of the recent energy White Paper. It has argued that future research on nuclear issues carried out under the auspices of the new Energy Research Centre, should be overseen by a mixed stakeholder panel to engender public and stakeholder confidence. It has also highlighted that annual progress reports on achieving the White Paper's aims should flag up any change of view within Government about the potential need for new nuclear build.

The briefing also outlines the recommendations from the Plutonium Working Group of the BNFL Stakeholder Dialogue. These recommendations map out a clear way forward on plutonium disposition, and convey the important message that further assessment should not just focus on potential MOX fuel use in new reactors, but encompass a range of options, including immobilisation of plutonium as a waste form.

The briefing points to a potentially important overlap between implementation of the PuWG's recommendations, and any research that the new Energy Research Centre might undertake on new nuclear build. It therefore suggests a need for liaison between the relevant parties.

Finally, supporting authorities are alerted to the forthcoming Government consultation on developing a regional approach to achieving sustainable energy goals, and encouraged to respond.

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<sup>1</sup> DTI, 'Our energy future – creating a low carbon economy,' Cm 5761, February 2003

<sup>2</sup> NFLA, 'Government launches consultation on energy policy,' New Nuclear Monitor, No 4, June 2002

<sup>3</sup> NFLA, 'Government must listen to public views on new nuclear power stations,' New Nuclear Monitor, No 5 November 2002

<sup>4</sup> DTI, as above, February 2003, para 7.32. The other research priorities are identified as: carbon dioxide sequestration, energy efficiency, hydrogen production and storage, solar PV and wave and tidal power.

<sup>5</sup> DTI, as above, February 2003, para 7.34.

<sup>6</sup> See, for example, The Future Foundation, 'Establishing the Value of Wider Public Consultation', a report for UK Nirex Ltd, November 2000, p20-28, and the findings of the 'front end consultation' of the ISOLUS project (<http://www.lancs.ac.uk/users/csec/isolus/isolus.htm>).

<sup>7</sup> The review has been set up by the Government under the auspices of one of its advisory committees, COMARE, and is known as the Consultative Exercise on Radiation Risks of Internal Emitters (<http://www.cerrie.org/>).

<sup>8</sup> The reports should also clarify the position on pre-licensing reviews of new reactors by the Nuclear Installations Inspectorate. In autumn 2002, the NII anticipated asking the Government for resources to set up a new division for pre-application review of new reactors. The White Paper did not address this issue.

<sup>9</sup> Nucleonics Week, Vol 44, No 5, 30 January 2003. The Independent on Sunday (2 March 2003) has subsequently reported that Sellafield is the most likely site for new MOX burning reactors because this would remove the need to transport plutonium-containing MOX fuel off site. However, it states that other sites, such as Hinkley Point in Somerset and Sizewell in Suffolk might "still be in the frame" because of difficulties with grid connections to Cumbria.

<sup>10</sup> BNFL National Stakeholder Dialogue, Plutonium Working Group, Final Report, March 2003.

<sup>11</sup> Other recommendations were as follows. DEFRA should take the lead in establishing a waste form qualification system, which can be applied to potential plutonium waste forms, as a matter of urgency, taking into account the work currently being done for intermediate level wastes by the HSE, SEPA and the EA. The 'plutonium owner' should ensure that the development of detailed proposals for the management of separated plutonium, and the associated decision making, incorporate stakeholder engagement as an integral part of the process. Where appropriate, this should extend to the associated investigations. Research and process development for plutonium immobilisation should concentrate on those options which do not involve an added external radiation barrier. However, other means of increasing the intrinsic security of the product should be explored. At this stage, it is important to keep options open so that contingencies are available for each plutonium disposition option. In order to ensure this, in reaching these decisions, consideration should be given to: maintenance of contingency in the longer-term, community views on the long-term storage on site of plutonium waste forms, socio-economic factors including employment, and the impact of plutonium stockpile management options on the wider Sellafield clean-up programme. The 'plutonium owner' should then develop a more detailed plan which shows how the options could be used to convert the current and projected future stockpile of separated plutonium into a passively safe form suitable for long-term storage and, potentially, ultimate disposal. Such a plan should aim to achieve conversion to a timescale which would render construction of new plutonium dioxide stores, or refurbishment of existing stores unnecessary, except for compelling safety or security reasons.

<sup>12</sup> The bulk of the UK stockpile is currently owned by BNFL, but the Nuclear Decommissioning Authority is likely to take legal and financial responsibility for this plutonium.