



June 2010

***Greenpeace response to the Consultation on a methodology for determining a Fixed Unit Price for waste disposal and updated cost estimates for nuclear decommissioning, waste management and waste disposal***

Introduction

Greenpeace believes that the FUP scheme constitutes a current subsidy for new nuclear power. The proposals are part of a package made by the previous government to promote new nuclear and protect the industry from bearing the full costs of waste management and disposal from new build. They are totally inconsistent with a promise not to subsidise new nuclear power. The FUP must be scrapped because it risks leaving the taxpayer liable for potentially enormous costs in the future. Unless other more effective mechanisms governing the apportioning cost of new build spent fuel management and disposal are put in place the taxpayer will be at risk of footing the bill for new nuclear.

If the government is now proposing to subsidise new nuclear, a policy shift of fundamental proportion, it must publicly re-consult on the basic premise of whether to support new nuclear build or not. All previous consultations have been on the basis of no subsidies for nuclear. However, if the government intends to stick to a zero subsidy policy then it must abandon the FUP and revisit the entire policy to uncover where such potential loopholes for subsidies exist and close them.

Attached as part of this submission is a report written for Greenpeace by independent nuclear consultant Ian Jackson. This impartial assessment of the FUP scheme, using the government's own pricing methodology as set out in the consultation, examines where potential subsidies might lie and what the taxpayer exposure could be.

The government *must* take this report into account as part of its decision making process around the FUP.

Recommendations

The proposals outlined in the consultation<sup>1</sup> should be withdrawn for the following reasons:

- The basis of the Fixed Unit Price (FUP) is to allow mechanisms to be implemented which effectively set a cap on the disposal costs for new nuclear wastes and spent fuel. This will inevitably lead to a taxpayer subsidy for new nuclear. Setting an expected FUP (eFUP) does nothing to alter this. It simply delays the date when companies must commit to a FUP.
- The possibility of allowing early transfer of title and liabilities for intermediate level waste (ILW) and spent fuel from industry to government could undermine a zero-subsidy policy and should be rejected.
- Associated proposals for a lump sum payment for future waste and spent fuel management costs – at the time of transfer and liability – also represent a potential route for subsidies.
- Funding arrangements for waste are to be part of the Funded Decommissioning Programme (FDP) which cover both the plans and finances of decommissioning and waste management and disposal from new build. FDPs are meant to be finalised before construction begins, possibly as early as 2011. In reality there are too many unknowns to guarantee that the processes and schedules for waste management and disposal will be fully agreed before the FDPs are finalised and construction begins. Yet this is precisely what the consultation proposes.
- Potential modification to FDPs and funding arrangements in the future leave too many variables and risks (both technical, social and financial) to be incurred by current and future governments.
- The consultation process lacks transparency. It will allow the FUP, the FDP and all other issues to be agreed behind closed doors by civil servants and the industry. A brief overview of how the process

has failed to operate openly is given as part of this submission and explains why this situation cannot be allowed to proceed.

- If the government accepts the proposals in the consultation and agrees the principle of the FUP and FDP it risks making unsound decisions on linked processes e.g. Regulatory Justification, Nuclear National Policy Statement (NNPS), Generic Design Assessment (GDA) and Managing Radioactive Waste Safely process examining the possibility of a Geological Deep Facility (GDF). This is because the previous administration deliberately – and quite incorrectly – separated policy and decision making processes that are inherently linked.
- The regulations which are open for consultation on the FDP should also be scrapped as they are also part of an invalidated and unsound process.
- The overall FUP and FDP process has been an inappropriately timed and badly informed public consultation. For instance there have been no public meetings on the FUP despite promises from government.

#### Processes that must be considered along with FUP and FDP

These are:

- *Justification*: a high level strategic assessment in which the disadvantages of a 'practice' involving releases of ionising radiation are weighed against its potential benefits. This covers the economics of electricity generation from new build and waste disposal (which are linked through the FUP which proposes to base spent fuel unit disposal costs on p/kWh of generation).<sup>2</sup>
- *Nuclear NPS*: covers costs for waste management and disposal (and related facilities and planning issues) but to a very limited extent in terms of final decision making. Decisions made through the NNPS will impact on the FUP and FDP.<sup>3</sup>
- *Managing Radioactive Waste Safely*: a process considering the siting of a GDF, discussing issues of waste and spent fuel management and disposal but through very different mechanisms from other processes.<sup>4</sup> For example, the FUP proposal is predicated on co-disposal of legacy and new build wastes, yet this is pre-emptive of discussions with (and within) local communities and authorities over whether they will accept legacy waste disposal, let alone whether they will also take all new build wastes. There is no date for when the MRWS process will end.
- *Generic Design Assessment*: run by the Nuclear Installations Inspectorate (NII) and the Environment Agency (EA) covering the siting of reactors and associated waste facilities. Under the GDA decisions on where spent fuel may be stored and where encapsulation takes place is by no means settled, and may not be for some years after reactor operations commence. GDA will not be completed until June 2011 at the earliest.

#### Timing and content of FUP and FDP consultations

Two sets of guidance were consulted on in February 2008:

- *Decommissioning and Waste Management Plan (DWMP)*: sets out costing of the steps involved in decommissioning a new nuclear power station and managing and disposing of hazardous waste and spent fuel. The current draft guidance will include a Base Case that sets out a way to estimate the potential costs for decommissioning and waste management. Yet, as of June 2010, is it acknowledged many of the steps in the waste and spent fuel management plans will not be finalised until a reactor starts operations.
- *Funding Arrangements Plan (FAP)*: sets out acceptable financing proposals to meet the costs identified. The draft guidance outlines the principles by which the government would expect to assess the funding proposals submitted by operators as part of their FDP for approval under the provisions in the Energy Act 2008.

The proposed regulations under consultation are based on the Energy Act 2008.<sup>5</sup> This leaves a gap of two

years between the original debates and the draft guidance consultation and the present consultation on the regulations. Additionally, the FUP itself has been dealt with separately from the FDP guidance. When the consultation on the FDP was published in early 2008 a substantial proportion of it discussed the FUP, but this was not open for consultation. As was noted, "*this section is for information only and views are not sought on it as part of the consultation.*"<sup>6</sup> Views were however accepted on the FUP, although not as part of a formal consultation. When asked why there was no consultation on the FUP, Department of Energy and Climate Change (DECC) senior advisor Dr Tim Stone said that "we only want informed minds looking at it."<sup>7</sup> Subsequent to the non-consultation on the FUP, DECC appeared to do a u-turn and issued three pre-consultation papers on the FUP.<sup>8</sup>

None of these papers, published over a twelve month period, contained the necessary information on which to make a fully informed reply. The approach to the consultation papers was informal, with very few views being actively sought by DECC. Documents released to Greenpeace following a Freedom of Information request reveal only a limited gathering of views on the pre-consultation papers and even now DECC has not released all the relevant information, claiming commercial confidentiality as the reason for non-disclosure (see DECC consultation paragraph 5.1.4). Yet the public is being asked to give view on questions that cannot be fully answered unless all the information is known. The Government must rectify this by publishing all the relevant information.

To compound the problems surrounding the current consultation, it was launched two days before the recent general election, meaning that few people knew about it or were able to give it the attention it deserved, particularly in Parliament. Many of the local authorities and NGOs for whom this is an important issue had recently gone through a four month consultation on the long and complicated documents on Justification and six energy national policy statements. Stakeholder meetings promised on the consultation have not taken place. To be able to comment on the current consultation people would have to have read the FUP consultation (109 pages) as well as the regulations (44 pages). In the FUP consultation readers are directed to the 2008 consultation on the FDP (124 pages). Other related processes, such as the Nuclear NPS would have entailed reading an estimated 1674 pages<sup>9</sup> whilst understanding the series of lengthy and complex documents on Justification to gain an in-depth understanding of how all the processes related to the FUP fit together.

Greenpeace believes that under the current proposals there will be no way of knowing if a fair deal on funding and waste management agreements has been reached. Once the consultation is finalised, and depending on subsequent processes and decisions, the actual determination of the decommissioning programmes, the issues around financing for storage and packaging of spent fuel, as well as for the FUP itself, will likely be decided behind closed doors between industry and government officials! Public and Parliament will have no further say in the matter as it is then left to the Secretary of State to sign-off on the deals - unless of course the whole consultation and the proposals in it are scrapped and a new process started.

## Response to Consultation Questions

### *Chapter 3: The methodology to determine a Fixed Unit Price*

To explore the possible extent of the level of subsidy under the FUP arrangements, Greenpeace has commissioned independent nuclear expert Ian Jackson<sup>10</sup> to undertake an impartial assessment of the FUP scheme, using the government's own pricing methodology as set out in the consultation, to examine where potential subsidies might lie and what the taxpayer exposure could be. Ian Jackson's interactive Fixed Unit Price Simulation (FUPSIM) and the accompanying research report reveal the enormous level of subsidy likely to be required for nuclear waste and spent fuel disposal from new build. The FUPSIM model is unique in that for the first time it allows the public and MPs, free and open access to explore the true costs of disposing of radioactive wastes, based on the government's own figures and using the most accurate computer modelling programme currently available.

The report and model considers the proposals for the FUP, although the linked model can be adjusted to estimate the impact of an eFUP. It does not cover the potential for subsidy under the funding arrangements for waste and spent fuel funding management. It is wrong that it has been left to an NGO to commission and publish this detailed analysis. Greenpeace requests that the Secretary of State gives full consideration to the report and model and issues a full reply is made available. Ian Jackson's recent paper follows details of possible subsidies for waste management in a book published in 2008.<sup>11</sup> An article based on this appeared in an industry journal and was subsequently covered by a national newspaper.<sup>12</sup>

The issues raised by Jackson were also underlined in a response from Prof Gordon MacKerron, (former chair of the Committee on Radioactive Waste Management) to the FUP discussion in the FDP document. He too cautioned that the FUP effectively represents a subsidy to new build operators<sup>13</sup> as it caps the cost to the operator of nuclear waste disposal and transfers the risk of cost overruns to the taxpayer. We attach MacKerron's full submission from 2008 as it is worth reading this in the context of the current debate. We also note that independent analysis and criticism of the FUP proposals were then published two years ago, a point worth noting with regard to the current consultation, particularly in terms of whose views have prevailed in the present proposals.

Setting the FUP as constituted will break every promise successive government has made on there being no subsidies for new nuclear. In its consultation on *The Future of Nuclear Power*<sup>14</sup> the last Government claimed that:

*"Any private sector developers of new nuclear power stations would be required to meet their full decommissioning and full share of waste management costs."*

In this the government implies a potential windfall for the taxpayer under the proposed FUP. It failed to mention what will happen if additional costs are incurred. Further, it left the 'base case' on funding etc to be determined outside the scope of Parliamentary debate on the Energy Bill, meaning that any positive conditions laid out in the Energy Bill 2008 could be lost through the base case consultation. This seems to have been the case.

The Conservative-LibDem coalition has however recently strengthened the commitment that there will be no taxpayer support for new build and that "public subsidies include contingent liabilities."<sup>15</sup> In theory, the proposed method of ensuring no subsidy is for the FUP to be set high enough, and contain a sufficient risk premium, to guarantee that the public will not have to pay to deal or dispose of new build waste in the future.<sup>16</sup>

A FUP however is effectively a cap on liabilities which leaves the taxpayer at risk of having to find additional funds. Setting a FUP in the very near future is plainly not acceptable to the industry hence the proposal for an eFUP. Deferring a FUP is to give operators more time before a price for disposal is set. In theory, there will be greater certainty on disposal costs in the next 15-20 years, meaning that when the industry does set a price it won't have to pay such a big 'risk premium' to cover unforeseen price hikes. Can such certainty be gained within the proposed ten years after reactor operations commence? Increases to costs could, however, come much later than when a final FUP is actually set e.g. if a central legacy / new build spent fuel store needed refurbishing (which could be quite possible if disposal is delayed). Such cost increases could come after reactors have been built, operated and decommissioned!

There is certainly no guarantee the cost estimates used as the basis for a FUP decided in two, or even twenty, years time are going to be any more certain than any set now. DECC concedes that estimates for decommissioning and waste management, as well as disposal, have increased substantially since 2007. In fact they have virtually doubled because "important assumptions have been revised". DECC notes:

*"The scope of the costs covered by the 2007 estimate did not include all the aspects of waste management currently anticipated for new nuclear power stations in the UK. In particular the source data on which it was based will not have taken account of the requirement for an extended period of interim storage for spent fuel and ILW prior to disposal in a GDF, nor the costs of encapsulation of spent fuel for disposal."*<sup>17</sup>

The final amount in the funds to cover the FUP will be reliant on accurate predictions of the future performance of the stock market, since funds set aside at the start of reactor operations will need to be invested to make up the full amount needed. Up to 83% of the cash required is expected to come from interest payments.<sup>18</sup>

The eFUP however is also being promoted as an aid to earlier entrants in the new build market who perceive themselves to be disadvantaged against possible later entrants. Gordon MacKerron discussed this issue in his 2008 paper (Para 11). Reasonably enough, Government argues (paragraph 4.5.38) that cost uncertainties will probably reduce over time and this may allow the risk premium element of the price to fall. Government then draws an interesting implication from this – that operators of later new-build stations may be charged lower unit prices for waste than operators of early stations (paragraph 2.11). While this sounds superficially attractive, it will probably raise significant problems. Operators of early stations will undoubtedly object to paying a higher price than later investors for an identical service: disposal of a given unit of waste. They are likely to argue that such a practice is discriminatory – a penalty for being earlier risk-takers – and

lobby for reductions in unit prices. There is no easy resolution to this dilemma for Government. Giving in to such lobbying would be politically difficult and possibly risk private investors under-paying, while resistance may lead to discontent among nuclear investors. This is an issue that needs further consideration by government.

Clearly the government did consider the issue of when to finalise a FUP and appears to have given in to industry lobbying as evidenced by EdF's paper to DECC in July 2009 that was released under the FOI Act. Allowing deferral an eFUP gets round early entrant issues. The EdF paper exposes why a deferral on price is being offered and that this is not just about allowing the industry time to gain certainty on disposal costs, but also to make sure that those entering the new build market later do not gain advantage over earlier entrants. The risk however is not to the industry but to the taxpayer. It is clear from the documents that the changes made to the original proposals, lobbied for by the nuclear industry,<sup>19</sup> have been made because it claims without the changes new build may not be economically viable.

We disagree with the proposals for either an eFUP or FUP. The proposals, put forward by the previous government must be rejected. If the industry wants new build it should be made to pay the full price of waste disposal - up to the time of disposal - whatever the costs. The government must enact legislation on this. Instead of proceeding with this consultation the Government should re-examine waste funding arrangements. Operators should be made to put away the amount of money necessary to deal with the wastes and spent fuel as and when they are created. Operators must put waste funding before paying out dividends to investors. There does not seem to any guarantee against "the investor first, waste fund second" scenario happening again (as was with British Energy when it almost went bankrupt in 2002).<sup>20</sup> Funding cannot be allowed to be as dependent on accruing interest to make up the majority of the funds - as is currently proposed.

#### *Question 2*

The proposals on transfer of title and liability of the wastes means the industry gets to hand over the money - and its legal obligations - much sooner than under previous proposals. Originally the industry was to have handed over the funds when it transferred the wastes just before disposal. The consultation notes now that:<sup>21</sup>

*"The Government considers that it is better placed than an operator to manage the risk and proposes that the transfer of title and liability be brought forward (Early Transfer) and the Transfer Date be aligned with the operator's decommissioning timetable."*

Due to the very long timescales involved the government believes it is better placed than an operator to manage cost risks, so it will take title and liability earlier, so that it is aligned with the operators' reactor decommissioning timetable rather than waiting for a GDF to be available. If the government were to wait until the GDF is available this would mean the operator would be responsible for the on-site interim storage of waste and spent fuel for several decades after revenues from the nuclear power station had ceased, and potentially for many years after it has been otherwise decommissioned. The last government insisted in the consultation document, however, that *"operators will meet their full share of waste management costs. The government would therefore need to be compensated for the waste management costs that it would incur from Early Transfer."* Under this arrangement there is clearly a risk being transferred to the taxpayer.

Greenpeace disagrees with this proposal and the current government must reject it. Operators must remain financially and legally liable for their waste and spent fuel until such time as it can be disposed of - if and when that happens. That way if there are additional costs e.g. due extended storage, it is the industry that has to pay any extra monies needed. If government were to take title and liability to the wastes and spent fuel at the end of reactor decommissioning there is a risk that taxpayers will have to subsidise further care and maintenance of the wastes and stores. We note that transfer could take place in 2080, but even if a GDF is built to the current schedule, it will not take new build wastes until 2130 at least - this leaves a lot of time for costs escalation. Operators should be made to pay for all costs for waste and spent fuel management which fall outside of FUP funding. There is a risk that shared facilities for legacy and new build (e.g. for spent fuel encapsulation) could also lead to taxpayer subsidies - particularly if the monies for these are paid as a lump sum when title and liability is transferred.

#### *Other matters for consideration - unresolved waste management issues*

The FUP / eFUP is one part of the Funded Decommissioning Programme (FDP) the government has said new reactors operators are to have in place before construction can begin.<sup>22</sup> In addition to the FUP monies,

under the FDP operators will also have to accumulate funds separately to cover some parts of ILW storage/packaging as well as storage, transport and encapsulation (packaging prior to disposal) for spent fuel. This money, from an independent fund, will be handed over as part of lump sum to government. As with the FUP, it is assumed the money handed over for further management (if early transfer takes place) will be enough to cover any additional costs which may arise. As discussed later in this paper, there are uncertainties over encapsulation costs too (see DECC paragraphs 32.2. and 5.3.6). The case for government and taxpayer taking on any risk for any of the waste and spent fuel management and disposal costs from new build has not been made. It is likely uncertainties over costs for management and disposal of waste and spent fuel will continue for many decades. Either way, all risks should continue to reside with the operator and the government should regulate to ensure that sufficient funds are set aside for all activities with no chance of any risk being transferred to the taxpayer.

#### *Question 3*

It is not possible to determine if the proposed methodology to determine a FUP is correct. The consultation did contain all the relevant information to determine whether DECC's calculations are correct. Too many uncertainties remain. This consultation is just one of many actions taken to facilitate new build rather than stopping the process to allow for a full examination of the costs and the uncertainties. It is clear the benefit of this exercise, by the previous government, was to favour potential new build operators over the interests of taxpayers. As has been noted, the idea of the taxpayer "facilitating new nuclear build" by accepting the risk that cost estimates made now about something which will not happen until 2130, in order to provide "certainty to operators" verges on the reckless. If utilities are not prepared to accept the risks and the uncertainties associated with all waste management and disposal costs they should opt for other forms of low carbon generation or efficiency measures with lower risks.

#### *Question 4*

The consultation makes it clear there are many uncertainties over the GDF. Apart from the issue of the geology of any GDF, there are many other technical, social/political and financial issues around the GDF. For example, the issue of voluntarism for the GDF is barely mentioned in the document, yet there is an overwhelming assumption in the whole cost modelling that there is a community which will accept new build waste and that a second GDF would only be considered in light of a much larger than planned fleet of new reactors. What if no new build waste is accepted into the 'first' GDF? The issue of the inventory for a repository has not yet been discussed by the current Managing Radioactive Waste Safely Partnership in Cumbria. The result of any discussions, when they do take place, may be that they will not accept new build waste being disposed of with legacy wastes - or may do so only up to a certain point (in terms of volume or time). The actual community asked to host the repository (as opposed to those involved in the Partnership now) may object to taking legacy and new build wastes and spent fuel. The consultation makes too many assumptions about the GDF for any decisions now to be at all realistic or guaranteed. Work for the Managing Radioactive Waste Safely Partnership shows there is a significant difference of opinion within Cumbria on the issue of whether the county should accept a GDF.<sup>23</sup>

The NDA has openly admitted...."there is no guarantee that the process will succeed in Cumbria. We need to bear in mind that the community has the right of withdrawal at any time and they do not need to justify their decision."<sup>24</sup> Even if all matters were resolved - and they may not be for many years - the idea of new build operators possibly paying a relatively lower proportion of the costs, when their wastes could clearly contribute to a significant increase in the GDF costs, is not acceptable. The volume of new build waste in addition to that of legacy waste overall is estimated at 10%. Yet new build spent fuel could add 50-55% to the volume over that of legacy high level wastes and spent fuel - but there is no mention of the fact the new build waste will contain three-fold the amount of radioactivity of that in all legacy wastes. It is understood that new build operators may not pay towards any benefits package associated with the GDF (this cost will presumably be borne solely by the NDA / taxpayer).

The proposal that new build operators pay only for marginal, incremental costs additional to the whole GDF programme is not equitable. They should be made to pay the full amount, properly costed e.g. proper allocation for the all resources needed for construction, operation and any ongoing care and monitoring. In addition, they should make a contribution towards the estimated £1bn already spend on developing a GDF design under NIREX (it is understood this is not included in new build waste estimates).

Other points to note are:

- There is no currently no firm information on what combination of materials a GDF might need to house e.g. the combination of ILW, HLW, spent fuel, and possibly plutonium and uranium, nor how

much waste and radioactive inventory it could house to stay within radiological protection limits.

- There is no firm knowledge of the generic or local geology of a future repository's location. A repository will need to be designed around the specific local geology and this will affect costs significantly.
- Westinghouse has expressed concerns over whether the GDF plans will even work for new build (letter to the NII / EA's Joint Programme (19th October 2009) Westinghouse.<sup>25</sup>

#### Question 5

The consultation does not make it clear how operators will make up any shortfall in waste funds, and within what time frame, if there is any decrease in electricity prices. Presumably such matters will be dealt with under the annual or five year reviews of the FDPs. The consultation document does not make this clear. Unfortunately, due to the closed door nature of future deliberations on these matters (between industry, officials and with only 'advice' from the Nuclear Liabilities Financing Assurance Board) public and Parliament will have to take these matters on trust. Given the current all-time low in public confidence in how government takes care of financial monitoring and budgeting in almost every sector, it is hardly surprising that critical questions are being asked - and will continue to be asked - of the proposed arrangements.

Greenpeace warned in our May 2008 submission on the FDP consultation that flexibility in funding could potentially be linked to revenue streams, as opposed to monies in the fund. This could make some aspects of decommissioning or waste management reliant on the operators' performance (as is currently the case with British Energy) and is contrary to the White Paper's assertion that funding will not be reliant on company performance. Experience with the NDA has shown that relying on revenue to cover nuclear liabilities is a gamble. Instead this should only be done on known committed funds. That the current consultation bases its assumptions on p/kWh to cover waste disposal costs underlines the risk.

#### Question 6

There are too many unknowns for the government, industry, public or Parliament to sign off on this issue now. It may be thought the issues around the storage and management of new build waste has already been resolved. Yet in fact there are several scenarios for what might happen to ILW and spent fuel prior to disposal - all of these have financial and practical implications. The exact designs for spent fuel stores may not, according to the Committee on Radioactive Waste Management, be known until well after reactor operations have started. CORWM has warned on this matter:

*"In the GDA process it is envisaged that no decisions will be taken on how and where spent fuel will be stored until after consent for reactor construction has been given and possibly not until after construction has started. It is possible that store designs will not be finalised until after reactors have begun operating."*<sup>26</sup>

This makes the reactor application process (which is meant to cover all relevant facilities including stores) even more problematic for local people and their councils. It will impact on any organisation taking over the oversight of national planning issues (i.e. not knowing where spent fuel stores, conditioning and encapsulation will take place) as well as on the GDA process e.g. exactly what operations are the NII/EA actually looking to license for a specific site?

Many issues continue to remain unresolved. Although the consultation document refers to different options for the storage and disposal of nuclear waste from new build it does not adequately convey the level of uncertainty on these matters. These are:

- Spent fuel may be wet or dry stored (this has longer term management and disposal implications)<sup>27</sup>
- Spent fuel is to be kept on-site at reactors.<sup>28</sup> Or, it could, pending a period of on-site storage be moved to a regional or central store.<sup>29</sup> These stores could be company owned or - more likely - Government owned (and possibly taxpayer subsidised).
- Spent fuel may be stored for only 5 years (pending possible removal to a central storage facility) or 10 years<sup>30, 31</sup> but possibly up to 50 years,<sup>32</sup> 100,<sup>33</sup> or 160 years (on or off-site).<sup>34</sup>
- Spent fuel will be encapsulated (possibly on site by the operator) or at a central site by the NDA.<sup>35</sup>

- Stores may or may not need to be replaced.<sup>36</sup> Stores on-site may be above ground or underground.<sup>37</sup>
- Even if no GDF has yet been built, or ready to take new build wastes, the Government / NDA will probably take early title and liability to the wastes and spent fuel.<sup>38</sup>
- Spent fuel is stored, pending reprocessing and then disposal.<sup>39</sup> Or, it could even be stored in a repository pending reprocessing?<sup>40</sup>
- There may be one or two geological disposal facilities depending on the timing of availability of a repository (i.e. how long it is kept open) and also the amount of waste produced.<sup>41</sup>

Encapsulation is a particularly problematic step in the process, with both the technology and the financing unclear. It is specifically linked to the geology of whatever site is chosen for a GDF. In relation to costs, the consultation notes: *"this uncertainty is considerable, particularly around the costs of encapsulation, and hence the additional risk premium would be large."*<sup>42</sup> It is envisaged encapsulation will not take place until 2125 – 2129,<sup>43</sup> some 65-70 years after reactor closure which according to the DECC base case would be in 2060 (assuming forty years of operations, starting in 2020 and ending in 2060).

Greenpeace asked the Commons Energy and Climate Change Committee to examine whether the industry will share encapsulation costs with the NDA - in case this potentially constituted an indirect subsidy (as this depends on how costs for encapsulation facilities are allocated).<sup>44</sup> The various time lines and practicalities of managing wastes (on or off-site) and disposing of it could impact significantly on new reactor communities, and possibly the 'host' community for a GDF up to the end of the next century. Much depends on what happens and where e.g. whether a central store and/or encapsulation plant goes ahead and if it is sited near a repository (but that would have to follow a GDF community agreeing to take new build wastes). If not, longer-term storage and encapsulation will probably continue at reactor sites. The absence of a set plan - despite the indication for some government preference for certain activities at reactor sites (e.g. encapsulation) is very much due to industry lobbying so it can not be held to any commitments.

There is an implication that once title and liability is transferred to the NDA the spent fuel and waste be moved from reactor sites. This could give some comfort to local communities, but in truth no one knows what will happen. Transfer of legal responsibility and funds could entail only a paper transfer - it relates to when the reactor is decommissioned not all the buildings on site. It has been suggested in earlier government consultations that the ILW and spent fuel could remain in store at reactor sites for many decades after the transfer of title and liability to the NDA with the authority taking over operation of stores in-situ.

The NDA does even know yet how it will dispose of the spent fuel from current reactors. In a recent discussion document on how to manage spent fuel from UK reactors it noted:<sup>45</sup>

*"The NDA considers it very important to undertake work to understand the potential disposal and disposability of UK-owned spent oxide fuels. Constraints imposed by disposability aspects will have major impacts on the analysis and evaluation of the credible options. A description of the technical and engineering option for disposal of spent fuel is required. Projected costs for the disposal of spent fuel are required."*

*"The uncertainties around the disposal concept, the disposability and volumes of the different waste forms, including AGR fuel, are key aspects to making decisions on the project."*

There are many other issues which need close examination, which impact on decisions on whether if and when a FUP can be set. Below are some selected quotes from CoRWM's *Response from the Committee on Radioactive Waste Management to the Government Consultation on the Draft National Policy Statements for Energy Infrastructure*. This paper indicates the extent of ongoing concerns over new build wastes. We suggest the whole document is read in full.

*There are various options for conditioning and packaging ("encapsulation") of spent fuel for geological disposal. These involve canisters made of various materials, containing different quantities of spent fuel, with different filling materials. As with geological disposal concepts, it will be necessary to develop and compare options for UK spent fuels, including new build spent fuel. This need for optimisation of conditioning and packaging methods for spent fuel is not reflected adequately in the NPS documents.*



*There is uncertainty about where new build spent fuel would be encapsulated for disposal and by whom.*

*In the GDA process it is envisaged that no decisions will be taken on how and where spent fuel will be stored until after consent for reactor construction has been given and possibly not until after construction has started. It is possible that store designs will not be finalised until after reactors have begun operating.*

*It is also not known how long spent fuel will need to be stored for before disposal. NDA estimates of the storage time are 75-100 years after discharge from the reactor. These estimates are based on one option for conditioning and packaging spent fuel and one geological disposal concept.*

*CoRWM has concluded that there is a need for a comparison of options for the management of new build spent fuel in which fuel burn-up, store design, store location, storage period and geological disposal concept are all considered.*

*CoRWM is aware that there are stakeholder concerns about a potential 9/11 style attack on a spent fuel store..... The key point is that regulators will require a similar, high degree of protection for new spent fuel stores as they will for new reactors and fuel ponds.*

*CoRWM's understanding (CoRWM doc. 2767) is that applicants for development consent for new nuclear power stations will provide some clarification about where and how spent fuel will be stored when they consult local communities and other key groups, as they are required to do by the Planning Act 2008 before they submit applications to the Infrastructure Planning Commission (IPC). In CoRWM's view it is important that applicants provide as much clarification as is practicable before they finalise and submit their applications.*

On the issue of spent fuel reprocessing CoRWM notes:

*It is assumed in the draft NPS documents that new build spent fuel will not be reprocessed. While CoRWM understands the reasons for this assumption, it considers that it is important to recognise that policies and practices may change over the decades for which new build reactors will operate and spent fuel will be stored.*

Indeed reprocessing of spent fuel from new build has been left open for possible future discussion. The implications of such a possible change to spent fuel management, which would have massive financial and environmental impacts, should be part of discussions now before any further steps are taken to allow new build.

#### *Further background on costs capping and Government protection of industry on waste*

There is a real risk that unless, in addition to scrapping the FUP proposals, some part of earlier legislation is repealed to further prevent the taxpayer being at risk of finding the monies for wastes from new build. DECC's 2008 consultation on Funding Decommissioning Programmes acknowledged, that in the event of insolvency of a company, the government would be the call of last resort to cover liabilities.<sup>46</sup> However, few are aware the last government specifically enacting legislation (Energy Act 2004) which allows the Secretary of State to be able to direct the NDA to take over the financial and legal liabilities of future private nuclear operators in the event of a potential bankruptcy, as happened with British Energy in 2002. In fact the last government rejected amendments to the Energy Bill (2004) stating that there may be some liability to be borne by government<sup>47,48</sup>

*"But using the NDA as a conduit or interface for any future British Energy-type crisis should not be prevented by this legislation."*

Greenpeace called for the repeal of the relevant clauses of the Energy Act 2004 during the Parliamentary debates around the Energy Bill 2008.<sup>49</sup> We also cautioned that memo "a review of all relevant documents shows that there is a significant degree of policy slippage between the expectations raised in the White Paper, the provisions in the Energy Act (2008), to now show that risks are being taken which expose having to cover new nuclear liabilities in the future." An example of this is that the FDP and FUP were dealt with not through primary legislation, but guidance and regulations. Such matters should not have been left to guiding principles. The issue of guiding principles and the risks of how adherence to them might slip as a result of failings in the Energy Bill are highlighted in the Explanatory Notes which stated:

*"If the nuclear site operator does not follow the guidance in designing a funded decommissioning programme, this will not necessarily mean that the Secretary of State will reject the programme. Where a submitted programme does not conform to the principles set out in the guidance, the operator will have to demonstrate that the proposals meet the overall objectives of ensuring that the operator makes prudent provision to cover its costs of decommissioning and long term waste management and disposal, whenever these liabilities arise. As long as an operator can demonstrate this, a funded decommissioning programme could still be approved. The guidance will not prescribe the arrangements that operators must put in place, but rather it will set out principles to assist operators in understanding how these objectives could be met to the satisfaction of the Secretary of State."*

There are also other issues around Government control/intervention which could impact on costs for new build disposal. In response to a FOI request, the NDA replied:<sup>50</sup>

*"how the national repository will be funded and costs allocated is a matter for Government to determine."*

The Secretary of State will be able to direct the NDA to cover both the management and the financing of liabilities from future private nuclear operators. The government will decide on funding and cost allocation for a GDF. All of this will probably become increasingly important as the NDA develops the Site Licence Company (SLC) which will ultimately operate the repository. For, although the SLC will be a separate legal entity for regulatory purposes (reporting to the NII and EA on safety and waste matters etc) the NDA will retain the position of being the 'controlling mind.' Direction given by the NDA over pricing mechanisms may not fully reflect the real costs which should be paid by new build operators. The FUP ties the hands of any prospective Site licence Company operating the GDF - which could have costs and safety implications. As controlling mind the NDA - due to government policy and control - could influence pricing which in turn could influence operations. In fact under the earlier arrangements, a favourable means of allocating disposal costs by government could effectively mean a subsidy to the industry, even if they fully met their funding requirements. There will be a direct line of government control, through - guidance (not legislation) direction of the NDA and any SLC for a GDF on cost and allocation for disposal.

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1 [http://www.decc.gov.uk/en/content/cms/consultations/nuc\\_waste\\_cost/nuc\\_waste\\_cost.aspx](http://www.decc.gov.uk/en/content/cms/consultations/nuc_waste_cost/nuc_waste_cost.aspx)

2 [http://www.decc.gov.uk/en/content/cms/consultations/reg\\_just\\_cons/reg\\_just\\_cons.aspx](http://www.decc.gov.uk/en/content/cms/consultations/reg_just_cons/reg_just_cons.aspx)

3 <https://www.energynpsconsultation.decc.gov.uk/nuclear/>

4 <http://mrws.decc.gov.uk/>

5 [http://www.decc.gov.uk/en/content/cms/consultations/nuc\\_dec\\_fin/nuc\\_dec\\_fin.aspx](http://www.decc.gov.uk/en/content/cms/consultations/nuc_dec_fin/nuc_dec_fin.aspx)

6 Section 2: Fixing a price and schedule for the disposal of intermediate level waste and spent fuel (higher activity waste) from new nuclear power stations (Para 21)

<http://webarchive.nationalarchives.gov.uk/20080305120007/http://www.berr.gov.uk/consultations/page44784.html>

7 Exact quote from meeting with DECC, 16th April 2008 in meeting with Greenpeace UK

8 [http://www.decc.gov.uk/en/content/cms/what\\_we\\_do/uk\\_supply/energy\\_mix/nuclear/new/waste\\_costs/%20waste\\_costs.aspx](http://www.decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/nuclear/new/waste_costs/%20waste_costs.aspx)

9 <http://www.publications.parliament.uk/pa/cm200910/cmselect/cmenergy/memo/nps/m1202.htm>

10 <http://www.jacksonconsult.com/ianjackson.html>

11 <http://www.jacksonconsult.com/nukenomics.html>

12 <http://www.ft.com/cms/s/0/377b929c-fb9e-11dc-8c3e-000077b07658.html>

13 [http://www.sussex.ac.uk/sussexenergygroup/documents/decom\\_funding\\_consultation\\_gm.pdf](http://www.sussex.ac.uk/sussexenergygroup/documents/decom_funding_consultation_gm.pdf)

14 <http://www.berr.gov.uk/files/file39197.pdf>

15 <http://www.timesonline.co.uk/tol/news/politics/article7127202.ece>

16 <http://www.ft.com/cms/s/0/377b929c-fb9e-11dc-8c3e-000077b07658.html>

17 [http://www.decc.gov.uk/en/content/cms/consultations/nuc\\_waste\\_cost/nuc\\_waste\\_cost.aspx](http://www.decc.gov.uk/en/content/cms/consultations/nuc_waste_cost/nuc_waste_cost.aspx) Para 5.3.20

18 <http://www.slideshare.net/jacksonconsult/new-nuclear-reactor-buildat-sellafield>

19 <http://www.guardian.co.uk/business/2010/jun/02/edf-nuclear-waste-lobbying>

20 [http://www.nao.org.uk/publications/0506/restructuring\\_of\\_british\\_energ.aspx](http://www.nao.org.uk/publications/0506/restructuring_of_british_energ.aspx) Page 52

21 [http://www.decc.gov.uk/en/content/cms/consultations/nuc\\_waste\\_cost/nuc\\_waste\\_cost.aspx](http://www.decc.gov.uk/en/content/cms/consultations/nuc_waste_cost/nuc_waste_cost.aspx) Para 1.10

22 <http://webarchive.nationalarchives.gov.uk/http://www.berr.gov.uk/consultations/page44784.html>

23 Document 54, <http://westcumbriamrws.org.uk/cgi-bin/download.cgi>

24 Nuclear Decommissioning Authority, 8th National Stakeholder Group, 17-18 June 2009 13 A

[http://www.nda.gov.uk/documents/upload/NSG8\\_Meeting\\_Report.pdf](http://www.nda.gov.uk/documents/upload/NSG8_Meeting_Report.pdf)

25

[https://www.ukap1000application.com/PDFDocs/UN%20REG%20WEC%20000098%20DCP\\_JNE\\_000105%20Passive%20Pressurised%20Water/UN%20REG%20WEC%20000098%20DCP\\_JNE\\_000105%20Passive%20Pressurised%20Water.pdf](https://www.ukap1000application.com/PDFDocs/UN%20REG%20WEC%20000098%20DCP_JNE_000105%20Passive%20Pressurised%20Water/UN%20REG%20WEC%20000098%20DCP_JNE_000105%20Passive%20Pressurised%20Water.pdf)

26 <http://www.corwm.org.uk/Pages/e%20Bulletins/Forms/DispForm.aspx?ID=49>

27 Para. 27 <http://www.corwm.org.uk/Pages/e%20Bulletins/Forms/DispForm.aspx?ID=49>

28 Para 5.3.25 [http://www.decc.gov.uk/en/content/cms/consultations/nuc\\_waste\\_cost/nuc\\_waste\\_cost.aspx](http://www.decc.gov.uk/en/content/cms/consultations/nuc_waste_cost/nuc_waste_cost.aspx)

29 Paras 5.3.6 and 5.3.28 [http://www.decc.gov.uk/en/content/cms/consultations/nuc\\_waste\\_cost/nuc\\_waste\\_cost.aspx](http://www.decc.gov.uk/en/content/cms/consultations/nuc_waste_cost/nuc_waste_cost.aspx)

30 Para. 2.13, <http://www.berr.gov.uk/files/file49349.pdf>. See also para. 26

<http://www.corwm.org.uk/Pages/e%20Bulletins/Forms/DispForm.aspx?ID=49>

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31 Para. 5.43 <http://www.berr.gov.uk/files/file49231.pdf>

32 Email from NDA to Greenpeace, 9th January 2008.

33 Para. 4.2.42 <http://www.berr.gov.uk/files/file44486.pdf>

34 Para. 3.8.17 <http://data.energynpsconsultation.decc.gov.uk/documents/npss/EN-6.pdf>

35 Footnote 21, Page 23, Para 5.3.28 [http://www.decc.gov.uk/en/content/cms/consultations/nuc\\_waste\\_cost/nuc\\_waste\\_cost.aspx](http://www.decc.gov.uk/en/content/cms/consultations/nuc_waste_cost/nuc_waste_cost.aspx)

36 [http://www.decc.gov.uk/en/content/cms/consultations/nuc\\_waste\\_cost/nuc\\_waste\\_cost.aspx](http://www.decc.gov.uk/en/content/cms/consultations/nuc_waste_cost/nuc_waste_cost.aspx) Para 36

37 Para. F.30 <http://www.berr.gov.uk/www.berr.gov.uk/files/file47137.pdf>. See also <http://www.corwm.org.uk/Pages/e%20Bulletins/Forms/DispForm.aspx?ID=49%20Para%2027>

38 [http://www.decc.gov.uk/en/content/cms/consultations/nuc\\_waste\\_cost/nuc\\_waste\\_cost.aspx](http://www.decc.gov.uk/en/content/cms/consultations/nuc_waste_cost/nuc_waste_cost.aspx) Para 1.9

39 NIA Vol. 2 4.35

40 Email from NDA 8 July 2008. <http://www.greenpeace.org.uk/files/pdfs/nuclear/NDASTorage0608.pdf>

41 [http://www.decc.gov.uk/en/content/cms/consultations/nuc\\_waste\\_cost/nuc\\_waste\\_cost.aspx](http://www.decc.gov.uk/en/content/cms/consultations/nuc_waste_cost/nuc_waste_cost.aspx) Para 4.3.19

42 [http://www.decc.gov.uk/en/content/cms/consultations/nuc\\_waste\\_cost/nuc\\_waste\\_cost.aspx](http://www.decc.gov.uk/en/content/cms/consultations/nuc_waste_cost/nuc_waste_cost.aspx) Para 3.32.28

43 [http://www.decc.gov.uk/en/content/cms/consultations/nuc\\_waste\\_cost/nuc\\_waste\\_cost.aspx](http://www.decc.gov.uk/en/content/cms/consultations/nuc_waste_cost/nuc_waste_cost.aspx) Para 5.5.19

44 In reply to an FOI request the NDA has stated that: *"The operator of a new build power plant will be responsible for the cost of managing their waste pending disposal, which includes the cost of packaging spent fuel (SF). This does not necessarily mean that the operators will package the SF themselves. They may do so, or they may contract with a 3rd party to encapsulate their SF. In their Funded Decommissioning Programme (FDP) the operator must set out the steps they propose to take to manage their waste and have this plan approved by Secretary of State. These plans will be regularly reviewed and operators can submit modifications to their plans for approval. The Government might need to undertake the necessary steps to package the SF into a disposable form. The costs of encapsulation will be a cost for which the operator will have made provision in their independent Fund and in these circumstances the amounts that operators have budgeted for these costs (set out in their FDP and agreed with the Secretary of State) would pass to the Government when title to and liability for the waste transfers, to cover the costs of performing this."*

45 <http://www.nda.gov.uk/documents/upload/Draft-Oxide-Fuel-Topic-Strategy-gate-0.pdf>

46 Paras 3.19-3.2 <http://webarchive.nationalarchives.gov.uk/20080305120007/http://www.berr.gov.uk/consultations/page44784.html>

47 Lord Whitty, Lords Hansard, 15th January 2004, Column GC172  
[http://www.publications.parliament.uk/pa/ld200304/ldhansrd/vo040115/text/40115-23.htm#40115-23\\_snew0](http://www.publications.parliament.uk/pa/ld200304/ldhansrd/vo040115/text/40115-23.htm#40115-23_snew0)

48 [http://www.opsi.gov.uk/acts/acts2004/ukpga\\_20040020\\_en\\_1](http://www.opsi.gov.uk/acts/acts2004/ukpga_20040020_en_1)

49 [http://www.nce.co.uk/energy/news/2008/01/operators\\_to\\_snub\\_nuclear\\_power\\_programme\\_plans.html](http://www.nce.co.uk/energy/news/2008/01/operators_to_snub_nuclear_power_programme_plans.html)

50 NDA reply to GP FOI request (RFI200700039) dated 13th August 2007