



Office for Nuclear Development
Area 3D, Department of Energy & Climate Change
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18th June 2010

To whom it may concern,

SUBMISSION OF THE NUCLEAR FREE LOCAL AUTHORITIES TO THE GOVERNMENT'S CONSULTATIONS ON THE FINANCE ARRANGEMENTS FOR RADIOACTIVE WASTE MANAGEMENT AND NUCLEAR REACTOR DECOMMISSIONING

I attach the submission to the Government's consultation on fixed unit price and finance arrangements for radioactive waste and nuclear reactor decommissioning from the UK and Republic of Ireland Nuclear Free Local Authorities.

1. Fixed Unit Price consultation

Consultation Question 1:

Do you agree or disagree that prospective operators of new nuclear power stations should be given the option to defer the setting of their Fixed Unit Price? If so, do you agree that this deferral should be limited to 10 years after the nuclear power station has commenced operation? Do you have any comments on the way the Government proposes to determine an expected Fixed Unit Price as the basis for an operator's interim provision in the event that they choose to defer the setting of their Fixed Unit Price?

NFLA response: No – operators should not be given the option of deferring the setting of their Fixed Unit Price. Our view is backed up by the following points below.

1.1 In the 2008 consultation on the Funded Decommissioning Programme Guidance, the Government stated that:

“Energy companies have indicated that they would be prepared to pay a significant risk premium over and above the expected costs of disposing of waste and spent fuel, in return for having the certainty of a fixed upper price”. (1)

1.2 Clearly nuclear operators have decided that uncertainties are so high that the risk premium will be too expensive. The nuclear industry should be required to pay the full commercial rate for waste disposal costs. If this proves to be far too expensive, diminishing the prospects of any new reactors, (2) then utilities will need to generate electricity by other, less risky means, or implement efficiency measures. There are plenty of opportunities to do this without requiring the tax payer to accept the risk for such uncertain outcomes. (3) The further the Government allows the industry to move away from a fully commercial arrangement, the greater the risk that costs will fall onto the taxpayer.

- 1.3 There can be little confidence in calculations of FUPs and eFUPs. These calculations could be described as “Voodoo Economics”¹ designed to reduce the amount of money nuclear operators have to set aside now and leaving the taxpayer with maximum risk. The FUP, with or without the risk premium is dependent on the huge uncertainties in waste disposal costs.
- 1.4 One example of uncertainty is, for example, the variation given in the length of time it is expected to take to place all legacy waste in the GDF. The Government says all legacy wastes may not be emplaced until 2130 – 90 years after the GDF is expected to be available. (4) CoRWM recorded the Nirex view that it would take around 65 years after a repository opened to emplace the legacy backlog. (5) So, it has already increased by 25 years. New build wastes could not *start* to be disposed for more than 100 years after new reactors start to come on stream around 2020 - if all goes well. Spent Fuel might require 100 years of cooling in any case. (5) Consequently some new build waste would be in storage for 160 years after the reactors open. If wastes have to remain in storage for 100 years and more, there will be some risk that re-packaging prior to final disposal may be required. It will be difficult for operators to know what kind of packaging to use until they know the characteristics of the GDF.
- 1.5 Setting the FUP will also be dependent on guessing on the future performance of the stock market, since funds set aside at the start of reactor operation will need to be invested. The nuclear economist, Ian Jackson, told an audience at Sellafield the commercial price for nuclear waste disposal for each new reactor would be around £1bn - £1.4bn. ***But this would not be payable for 100 years.*** The nuclear utility would make fixed pay-as-you-go payments into a pension-type fund. Assuming a 1% rate of return the utility would pay £16m per year over the reactors 40 year life, but after 100 years this would have accrued £795m in interest. This means only around 3 – 4% is added to the cost of electricity. So the availability of the required funds in 100 years time will depend on the performance of the stock market over the next century – which is almost totally unpredictable. Up to 83% of the cash required is expected to come from interest payments. (6)
- 1.6 As soon as a nuclear power station is turned on there is a risk that decommissioning costs will become due at any time as a result of an accident which makes the further generation of electricity impossible. The industry should be required to pay a commercial rate for waste disposal and to set aside sufficient funds for decommissioning as soon as the reactor is switched on. How many credit crunches or stock market crashes can the UK expect between now and the day the decommissioning fund is expected to pay out?

2. Taxpayer Liability to Start Early?

Consultation Question 2:

Do you agree or disagree with the proposal that the Schedule for the Government to take title to and liability for an operator’s waste should be set in relation to the predicted end of the decommissioning of the nuclear power station? Do you have any comments on the way the Government proposes to recoup the additional costs it will incur in this case?

¹ Voodoo economics, according to the Wise website is the derogatory term used by George Bush Senior in his fight against Ronald Reagan for the Republican nomination in 1980. It was used to describe Reagan’s economic policies. The unintended consequence of voodoo economics was a large increase in the national debt, and the loss of vital social programs as government-funded programs had to be cut in response to the tax cuts. Branding the system as “voodoo” was an attempt by Bush to suggest that Reagan’s economic theories were based on magic and imagination, rather than realistic expectations made from solid theory. <http://www.wisegeek.com/what-is-voodoo-economics.htm>

NFLA Response: No. The Government should not be planning to take title to, and liability for, an operator's waste, as the following comments outline.

- 2.1 The experience of dealing with the problems of the former state nuclear utility company British Energy should have left the Government feeling very nervous about the taxpayer being lumbered with nuclear liabilities. British Energy (BE) became virtually bankrupt in 2002. Under the restructuring plan drawn up to save the company, the government agreed to indemnify the company against any shortfall in its nuclear liabilities fund. The National Audit Office criticised the Government for placing "a significant risk in the hands of the taxpayer." (7) The Energy Act 2004 already gives the Government the power to give the Nuclear Decommissioning Authority (NDA), with the consent of the company concerned, responsibility for securing the decommissioning and cleaning up of sites operated by companies in the private sector. (8)
- 2.2 Obviously the financial health of companies, which today are solvent nuclear utilities, is difficult to predict in 160 years time, or even whether the companies will exist. Rather than regulate to make sure that sufficient financial provision is made by companies applying to build new reactors to cover all eventualities and all uncertainties, the Government seems to prefer to guess what waste management and decommissioning will cost, and then to charge the utilities to take over their responsibilities for them. It is gambling with taxpayers' money.
- 2.3 The Government says because of the very long timescales it considers itself better placed than an operator to manage cost risks, so it will take title and liability earlier in line with the operator's decommissioning timetable, rather than in line with the estimated availability of a GDF. ***The Government is once again placing "a significant risk in the hands of the taxpayer."***
- 2.4 The Government says it will want to be compensated for, amongst other things, the cost of encapsulating spent fuel for disposal - in line with the assumption that encapsulation of spent fuel takes place immediately prior to 'disposal'. But in a footnote the Government says:
- "It should be noted that this does not imply that the Government would commit to the provision of encapsulation facilities for the spent fuel from new nuclear power stations. The Government's view remains that the operator should be responsible for ensuring the encapsulation of its spent fuel and would expect the operator in its FDP to demonstrate credible plans for the encapsulation of its spent fuel and prudent provision for the costs. If Early Transfer means that the Government is ultimately responsible for carrying out encapsulation, the operator's plans and financial provision would transfer to the Government alongside the spent fuel."* (9)
- 2.5 The NFLA see this as a somewhat muddled argument. It implies that the Government might take title to spent fuel in, say 2080, and be responsible for its storage for 50 years until 2130. But, just prior to the waste being sent to the GDF, the nuclear operator, if it still exists, is asked to come back on to the site it has abandoned, using money it still has in a decommissioning fund, build an encapsulation plant and then encapsulate the spent fuel *before* the Government transports it to the GDF.
- 2.6 The reason for the muddle is because, according to the Government there is considerable uncertainty around the costs of encapsulation, and hence the additional risk premium would be large if this were to be incorporated into the FUP. Therefore it does not propose to extend the scope of the FUP beyond the cost of the GDF.

- 2.7 The operator is required in its Funded Decommissioning Programme (FDP) to estimate waste management costs. These estimates must be independently verified, periodically reviewed and agreed by the Secretary of State. So the operator will continue to be required in its FDP to make provision for all costs in the independent Fund up to the point that waste is delivered to a GDF for final disposal. Thus, the Government is still in control of the amount of money set aside by the operator. The difference is that, with the costs associated with the GDF, the Government is proposing to take on the risks, whereas with encapsulation and interim storage the risks are being left with the operator.
- 2.8 The case for the Government and taxpayer taking on any risk has not been made. GDF costs are likely to be associated with even more uncertainties than encapsulation costs. The risks should continue to reside with the operator and the Government should regulate to ensure that sufficient funds are set aside.

3. FuP Methodology

Consultation Question 3:

Do you agree or disagree that the proposed methodology to determine a Fixed Unit Price strikes the right balance in protecting the taxpayer, by taking a prudent and conservative approach to cost estimation, while facilitating new nuclear build by providing certainty to operators? What are your reasons?

Consultation Question 4:

Do you agree or disagree with the proposed approach to determining an operator's contribution to the fixed costs of constructing a Geological Disposal Facility? What are your reasons?

The NFLA response to both questions is outlined through the following points.

- 3.1 The NDA's current best estimate within the range of potential costs for a GDF was given as £12.2 billion undiscounted in the first Pre-Consultation Document. (10) This figure covers both the fixed costs of a GDF and the variable costs of the disposal of legacy waste, which is all known waste that currently exists and waste arising from current facilities. It does not include any provision for new build waste or a number of other potential wastes.
- 3.2 The exact cost of a GDF will be influenced by many different factors, including the inventory of waste, the geology of the site in question and the design of a GDF. So the NDA has developed a model – known as the Parametric Cost Model - to allow it to generate a series of cost estimates for geological disposal under different circumstances by varying key parameters that impact on the construction and operating costs.
- 3.3 Almost none, if any, of the UK's nuclear facilities was completed on budget. And this is not a problem restricted to Britain's past. India's most recent 10 reactors have averaged at least 300% over budget. (11) The Finnish Olkiluoto reactor– the first to be built in Western Europe since Chernobyl – is already three years late and 75% over budget. (12) It is quite possible to imagine costs of the GDF escalating far beyond those allowed for in the risk premium charged as part of the FUP. Perhaps more likely is the possibility that a GDF fails to make an acceptable safety case or find a suitable volunteer community. What the Government is trying to do in attempting to predict the cost of waste disposal in 2130 is akin to predicting the weather in 2130.
- 3.4 The methodology for calculating the FUP will be based on the assumption that new build spent fuel can be co-disposed of with legacy waste. However, if this turns out to be the

wrong assumption then subsequent reactors will be charged an FUP which covers building a second GDF. Those operators who have deferred the setting of their FUP may find themselves paying a higher rate. In other words, operators can gamble against there being a 100% escalation in costs if they want to, but the taxpayer must gamble whether they want to or not.

- 3.5 The idea of the taxpayer “facilitating new nuclear build” by accepting the risk that cost estimates made now about something which will not be happening until 2130, in order to provide “certainty to operators” is completely reckless. If utilities are not prepared to accept the risks and the uncertainties associated with waste management costs they should opt for other forms of low carbon generation or efficiency measures with lower risks.

4. FuP – pence per kWh

Consultation Question 5:

Do you agree or disagree with the proposal that the units to be used for the Fixed Unit Price are pence per kWh for spent fuel and cubic metres of packaged volume for intermediate level waste? What are your reasons?

The NFLA response to this question is outlined through the following points.

- 4.1 It would be far fairer to the taxpayer if a commercial arrangement were made between the GDF operator (or better still a nuclear waste management agency charged with managing waste according to strict environmental principles) and the nuclear operator. If this were the case it appears that building new reactors would probably be too expensive and the energy system would have to follow a more sustainable pathway. But this should not be a reason for paying this hidden subsidy to nuclear operators, which is what the FUP would amount to, since there are far more sustainable alternatives to building new reactors.
- 4.2 The consultation document, however, does highlight the huge uncertainties involved in setting the FUP. The NDA’s Parametric Cost Model assumes the KBS-3 copper canister disposal concept - the method being considered in Finland and Sweden - and estimates costs on a per canister basis. The consultation however points out that “*it has not been confirmed that this will be the disposal route finally adopted for a GDF*”. (13) Recent research suggests corrosion of the copper canisters may prove to be more of a problem than previously expected.

“According to a current concept, copper canisters of thickness 0.05 m will be safe for nuclear waste containment for 100,000 years. We show that more than 1m copper thickness might be required for 100,000 years durability.” (14)

Clearly, if such thicknesses of copper were required to ensure safe long term isolation of canisters, the cost and availability issues alone would render the entire disposal concept unviable.

5. Cost Estimates

Consultation Question 6:

Do the updated cost estimates represent a credible range of estimates of the likely costs for decommissioning, waste management and waste disposal for a new nuclear power station?

The NFLA response is outlined through the following points.

5.1 The consultation document is particularly confusing here. Sometimes it talks about decommissioning costs and sometimes decommissioning and waste management costs. Sometimes it discusses costs for a 1.35GW PWR Reactor and sometimes a 1.59GW reactor. Decommissioning and Waste Costs in the 2007 Nuclear Consultation were given as £636m for a 1.59GW reactor, which is equivalent to £540m for a 1.35GW reactor.

5.2 The NFLA notes that, unsurprisingly, estimates have escalated since 2007:

“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.” (15)

5.3 For a generic PWR reactor with a capacity of 1.35GW, decommissioning and waste management costs are now estimated to be in the range £800 – £1800m. This is up to 330% of the estimate given in the 2007 consultation document. ENDS Journal notes:-

“These estimates equate to up to half the construction cost of EDF’s new reactor in Flamanville, Normandy, and suggest back-end costs for EDF and RWE Eon’s proposed 12.4GWe plans in the UK would reach at least £7bn and potentially over £16bn.”(16).

5.4 The consultation itself highlights how this cost escalation in three years *“has reinforced the extent to which there is uncertainty over the likely costs of decommissioning a new nuclear power station, and that caution is needed in making a generic cost estimate”*. This surely underlines the reckless nature of the Government’s proposal to set the FUP soon and accept some of the risk that prices may escalate more quickly than predicted. There are far too many uncertainties to be able to say that the *“updated cost estimates represent a credible range of estimates of the likely costs for decommissioning, waste management and waste disposal for a new nuclear power station”*. (17)

6. Funded Decommissioning Programme consultation

6.1 The Government’s Consultation on the financing arrangements for nuclear decommissioning and waste handling regulations, is simply seeking views on whether or not the proposals in the document are explained clearly enough for both new nuclear operators and the public to understand. It is noted by the NFLA that the draft guidance will be published in its final form later in 2010 and that it will take account of comments received as part of this consultation and the Fixed Unit Price Consultation.

6.2 The NFLA also notes that the Secretary of State can use a third party assessment of the FDP to gain additional assurance as to the accuracy of the operator’s estimates of the costs of the designated technical matters and to provide an independent assessment of the level of prudence made for the financing of the designated technical matters.

6.3 If new reactors are built then the NFLA would want to see a Segregated Decommissioning Fund established by the nuclear operator. It is right that the adequacy of this fund is checked by the Government and that it should be able to recover its costs for verifying the adequacy of the fund.

6.4 Where a third party assessment of the FDP is used, the NFLA believe this should be an independent third party appointed by the Secretary of State, not by the nuclear operator.

7. NFLA Letter to the Secretary of State for Energy and Climate Change

The NFLA Chair wrote to the Secretary of State on the 20th May asking for these consultations to be withdrawn given the new Government's publicly pledged policy of no state subsidy for a new nuclear build programme. The letter also asked for a meeting with the Secretary of State to discuss these and other issues. To date, there has not been a reply from the Government on this matter or to the request for a meeting. The NFLA also notes with dismay the almost immediate meetings and discussions with the nuclear industry. The letter is attached as Appendix 1 and the NFLA would appreciate a full response to this letter as soon as possible.

This reply has been endorsed by the NFLA Steering Committee and has been sent to all its member authorities.

Yours sincerely,



Bailie* George Regan
Chair of UK and Ireland Nuclear Free Local Authorities

* Bailie is a Scottish word for a senior councillor, such as an Alderman.

8. References

(1) Consultation on Funded Decommissioning Programme Guidance for New Nuclear Power Station, BERR, February 2008, para 2.9

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

(2) Jackson, I, Buried Costs, Nuclear Engineering International, 27th March 2008

<http://www.neimagazine.com/story.asp?storyCode=2049209>

(3) Just one current example of the potential is given in a letter from 30 academics in the Independent on 4th May 2010. <http://www.independent.co.uk/opinion/letters/letters-nuclear-power-1961532.html> It concludes:

"The fact is, we are approaching an energy future of rich and bewildering choice, where a variety of radically different options present technically and economically viable alternatives – a future where the nuclear option is the dearest and riskiest of gambles".

(4) para 3.2.24 FUP Consultation Document.

(5) Mackerron, G. Response to 'Consultation on Funded Decommissioning Programme Guidance for New Nuclear Power Stations', BERR February 2008. Sussex Energy Group, University of Sussex, May 2008

http://www.sussex.ac.uk/sussexenergygroup/documents/decom_funding_consultation_gm.pdf

(6) See footnote 20. FUP Consultation Document.

(7) The Economics of New Nuclear Build at Sellafield. Presentation by Ian Jackson.

Slide Share 7th July 2009 <http://www.slideshare.net/jacksonconsult/new-nuclear-reactor-build-at-sellafield>

(8) Guardian, 17th March 2006

<http://business.guardian.co.uk/story/0,,1732769,00.html>

The Restructuring of British Energy, National Audit Office, 17th March 2006
http://www.nao.org.uk/publications/0506/restructuring_of_british_energ.aspx

(9) See para 44 Energy Act (2004) Explanatory Notes.
<http://www.opsi.gov.uk/acts/acts2004/en/04en20-a.htm>

(10) Footnote No.21 page 23.

(11) Pre-consultation discussion paper No.1 on a methodology to determine how the fixed costs of building a geological disposal facility should be apportioned to and shared between operators of new nuclear power stations. Office for Nuclear Development, October 2008.

para 4.2.1 <http://www.berr.gov.uk/files/file48571.pdf>

See also FAQs related to Geological Disposal, NDA, November 2009

<http://www.nda.gov.uk/documents/upload/Frequently-Asked-Questions-Related-to-Geological-Disposal.pdf>

(12) The Economics of Nuclear Power, by P. Bradford, A. Froggatt, D. Milborrow and S. Thomas

Greenpeace International, May 2007

http://www.greenpeace.org.uk/files/pdfs/nuclear/nuclear_economics_report.pdf (17) Guardian
19th October 2009.

<http://www.guardian.co.uk/environment/2009/oct/19/nuclear-power-gas-coal?>

(13) para 3.4.6

(14) “*Water Corrodes Copper*” G. Hultquist et al (July 2009) Catal Lett (2009) 132:311–316

http://www.mkg.se/uploads/Water_Corrodes_Copper_-_Catalysis_Letters_Oct_2009_-_Hultquist_Szakalos_et_al.pdf

(15) para 5.3.20

(16) DECC may share £16bn new nuclear waste risk, ENDS Report, April 2010

<http://www.endsreport.com/index.cfm?action=report.article&articleID=22346>

(17) Consultation on Funded Decommissioning Programme Guidance for New Nuclear Power Station, BERR, February 2008

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

Also see Eccleston, P. Nuclear power station costs to go to power companies. Telegraph February 22, 2008.

<http://www.telegraph.co.uk/earth/earthnews/3326437/Nuclear-power-station-costs-to-go-to-power-companies.html>

NFLA letter to the Secretary of State for Energy and Climate Change

Rt Hon Chris Huhne MP
Secretary of State
Department of Energy and Climate Change
3 Whitehall Place
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20th May 2010

Dear Chris Huhne,

NUCLEAR POWER FIXED DECOMMISSIONING COSTS AND OTHER MATTERS

On behalf of the Nuclear Free Local Authorities I would like to congratulate you on your appointment as the new UK Energy and Climate Change Minister. The UK and Ireland Nuclear Free Local Authorities (NFLA) is a cross-party (we have representatives from 11 political parties on our Steering Committee) body which puts forward concerns around the development of nuclear power, radioactive waste management and nuclear weapons proliferation (where we interact with the Foreign Office).

Your professed public scepticism about nuclear power tallies very much with the view of the NFLA and so we were disappointed to see that, in the agreed coalition agreement for the new government, the Liberal Democrats are to abstain on nuclear power matters and allow your deputies to bring forward a new nuclear build programme. We are though heartened by your continued comments that new nuclear build will not be provided with any public subsidy.

We would like therefore to get your views on two specific areas where this policy can be considered at this particular juncture of the debate.

Firstly, your predecessor Ed Miliband and his civil servants opened a consultation in March 2010, running until 18th June, which seeks views on the facilitative actions for new nuclear build around the agreed funding of radioactive waste and decommissioning programme for any new nuclear power station. This relates to actions required under the 2008 Energy Act.

The NFLA have considered this consultation carefully and informed all our members of our suggested response through our publication, New Nuclear Monitor Edition 21, which I attach with this letter. The NFLA is very concerned that, as part of the consultation, the Government will set a "fixed unit price" for waste 'disposal' when approval is given for a new reactor. In the view of the NFLA, this effectively caps the cost to the operator of nuclear waste disposal and transfers the risk of cost overruns to the taxpayer. In other words, is this not effectively an indirect public subsidy to the industry which could cost the UK taxpayer billions of pounds?

The NFLA would therefore ask you to consider withdrawing this consultation, rethinking it and addressing how the economics of new nuclear build will be addressed, and how the new Government will guarantee its pledge of no public subsidies for new nuclear build.

Secondly, and perhaps even more importantly, the previous Government had opened a consultation on its draft decision that new nuclear power stations can be 'justified' under European environmental law. A final public decision from this consultation is still awaited. The NFLA, amongst many other groups, urged the Government to hold a public inquiry to ensure critical issues such as the medical effects of low level radiation, nuclear safety, long-term radioactive waste management policy and the links between nuclear power and nuclear weapons proliferation could be adequately considered before such a final decision on the potential benefits of developing a new nuclear build programme could be made. The NFLA

therefore urge you, as the new Energy and Climate Change Secretary, to call for a public inquiry before approving the 'justification' decision.

Finally, the media has noted that you have been in communication with a number of leading figures from the nuclear industry. The NFLA would urge you to consider holding a meeting with groups who are concerned about a nuclear new build programme to evaluate the alternative view which has tallied with your official party policy throughout the election campaign. We would be very happy to be part of such a meeting and can recommend other group representatives who would wish to be involved.

I would be happy to discuss the issue of this letter with you at your convenience.

Yours sincerely,
Bailie George Regan
Chair of UK and Ireland Nuclear Free Local Authorities