RESTRUCTURING AID FOR BRITISH ENERGY: ISSUES FOR THE EUROPEAN COMMISSION

A Report for Greenpeace UK

Prepared by NERA

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1. INTRODUCTION

In submitting its notification to the European Commission (EC) of restructuring aid for British Energy (BE), the UK Government appears to have notified Measures A as state aid while arguing that Measures B and C were not. The EC's provisional opinion is that Measures A, B, C and G do constitute state aid (Official Journal of the European Union, 31.7.03, 'State Aid – United Kingdom' C180/5 to C180/28, hereafter OJEU 2003). The UK Government position on Measures G is not clear. This paper considers only Measures B as potentially interesting for further questioning.

The nuclear industry has been subject to emotive and subjective discussion of technical issues. Our comments below are intended to set out how the European Commission might structure an objective enquiry into Measures B, and suggest some evidence that may be relevant to the enquiry. We do not rule out the possibility that other interested parties can provide objective evidence that would lead to different conclusions.

The conditions for approval by the European Commission of measures that would otherwise constitute 'state aid' involve three tests:

- The 'market economy investor principle' (MEIP) in which measures are allowable if it can be shown that their terms are equivalent to those that a commercial investor would provide in a market economy;
- The aid does not distort or threaten to distort competition;
- There is no effect on trade between member states.

The two critical areas are the MEIP principle and the distortion of competition principle and these are the focus here.

MEIP The UK Government needs to show that the proposed restructuring package proposed for BE satisfies the MEIP test – that relevant parties have behaved in the same way as would a private investor or creditor party facing the same financial situation at BE. Some of the questions raised below are designed to help the Commission test the UK parties on this subject.

Distortion of competition An important issue here is the possible effect of the restructuring package on BE's avoidable costs and therefore output. Output decisions by BE will be determined by the *avoidable* costs of operating nuclear stations. Avoidable costs (not mentioned in the EU's comments) are always higher than marginal costs because they also include all operating costs as well as maintenance and future capital costs of operating plant. Generally, plants will stay open as long as the selling price of electricity exceeds individual stations' avoidable costs, and will close if there is no prospect of covering avoidable costs. If the restructuring package were to reduce avoidable *charges* to BE below the level of avoidable *costs* for reasons that are not consistent with the MEIP, it might have

the effect of sustaining BE output above the level it would otherwise be. This effect would arise if avoidable costs at some stations were above the selling price of electricity before restructuring, but were reduced to levels below the selling price of electricity after restructuring. Such an outcome would induce BE to keep running some stations that would have closed in the absence of restructuring. This in turn, by artificially raising overall electricity output, would have the effect of distorting competition in the market: any additional output from BE would lower prices and displace output from other generators with potentially lower costs. We explore below questions intended to shed light on this subject.

The issue of avoidable costs has a further important dimension in relation to possible 'internal compensation' measures that the Commission might apply to BE as a condition for approval of restructuring aid. 'Irreversible closure of capacity' is a common compensation measure and consideration of avoidable costs would be an important pre-requisite for deciding upon such remedies. However, within an electricity system, closures have a complex effect on total avoidable costs and so on economic efficiency, since an efficient portfolio of generation capacity will include plants whose avoidable costs differ widely, according to differences in their technology and load factor (rate of capacity utilisation). It is therefore rarely possible to say that closing plant with the highest avoidable cost is always the most desirable or economically efficient path. At the very least, it would be necessary to consider BE's own commercial reasons for maintaining generator capacity with high avoidable costs (e.g. to provide flexibility of output to match demand). The Commission might also wish to consider the effects on the avoidable cost of the electricity system as a whole. Furthermore, for closures of BE plant to be feasible, it would be necessary for the Commission to be persuaded that there was sufficient surplus capacity (strictly, enough "market adaptability") for the closure of some BE capacity not to threaten security of supply.

2. QUESTIONS ON MEIP: THE BE/BNFL RE-NEGOTIATION (MEASURES B)

The UK Government argues that Measures B do not constitute state aid because they were the result of 'arms length' negotiations between two 'commercial' parties. In other words the UK Government believes that the negotiations, and their results, represent the behaviour that a private investor would have undertaken – that the new agreement passes the MEIP test.

The alternative view, of which the Commission is provisionally convinced, is that BNFL acted as an agency of the state in securing terms for BE that were more favourable than a private investor would have allowed. The basic question for the Commission here is the extent to which the proposed arrangements do or do not contravene the MEIP test, but the test is not specified in detail. To answer this question fully, the Commission would need to establish some standards in relation to the terms of Measures B, based on what a commercial entity would negotiate, and check whether or not Measures B met these standards.

The proposed new BE/BNFL contract covers several areas and the most relevant are the spent fuel management contract and the sale to BNFL of BE's uranics stocks.

3. SPENT FUEL MANAGEMENT

The proposed agreements on spent fuel loaded after the Restructuring Effective Date include the following two terms:

- BE will pay BNFL £150,000 for each tonne of (probably AGR-only) fuel loaded (OJEU 2003, para. 56). The rationale for this 'base price' is presumably the idea that this is 'comparable to the international costs for spent fuel management' (OJEU 2003 para. 30. We presume that the new deal only refers to AGR fuel, whereas the reference to international costs concerns PWR fuel, though in practice the costs of storage for AGR and PWR fuel are likely to be very similar. This £150,000/tonne appears to be the only payment BE will make to BNFL for spent fuel services.
- BNFL will assume title (ownership) of the spent fuel as soon as it is delivered to BNFL, and BE will have no further liability beyond that date (OJEU 2003 para. 56).

The cost of interim spent fuel *storage* over significant periods - where storage, as in the UK case, is located away from reactors - is of the order of £150,000/tonne or slightly less. The recent and authoritative Harvard study on this subject[1] quotes $200/kg (discounted) as a representative interim storage figure (Bunn et al 2003, pp. 53-54). This translates into $200,000/tonne, or some £110,000/tonne at the current exchange rate.[2] This estimate lies a little below the UK Government figure.

However this figure ignores the cost of *final disposal or disposition* of the spent fuel after storage. This cost is likely to be both significantly higher than the cost of storage and much more uncertain, given that no final repositories or other methods for high-level waste/spent fuel disposition have been completed anywhere in the world. The Harvard study puts the most likely cost of such disposal at a *further* $400,000/tonne or double the cost of storage (Bunn et al. 2003, pp. 35-36)

The suggestion in the package is therefore that BNFL is offering a fixed price contract for spent fuel storage at slightly above international storage prices, but will then assume all the costs and risks of final disposal – extremely uncertain but probably an extra $400,000/t (£220,000/t) - without any apparent further financial compensation. The European Commission will need to ask whether such behaviour would credibly meet the MEIP test and the answer is not a foregone conclusion. BNFL would only be likely to make such a concession if it believed that, without it, its financial position would be even worse. It is

[1] M. Bunn et al. *The Economics of Reprocessing vs. Direct Disposal of Spent Nuclear Fuel* Final Report December 2003, DE-FG26-99FT4028, Belfer Centre for Science and International Affairs, Harvard

[2] Using a current exchange rate of £1 = US$1.82. However, at a more characteristic rate over the last few years, £1 = $1.6, the cost would be £125,000/t.

possible that in this situation it might choose not to allocate joint sunk costs[3] to BE. BNFL could take this decision if a less accommodating stance would cause BE to cease trading, and thus curtail future BNFL income. On the other hand, exempting BE from all long-term costs and risks of spent fuel disposition might not be a necessary condition for BE's survival and BNFL's behaviour might then be more difficult to reconcile with the MEIP test. The Commission could question the relevant parties on these issues.

A further issue for the Commission to consider is the possible influence on BNFL's behaviour of the knowledge, dating from July 2002, that its Sellafield operation (which includes all spent fuel management) was to be placed directly in the hands of a non-commercial public body, the Liabilities Management Authority (LMA).[4] While BNFL would in future obtain management contracts for spent fuel management activities at Sellafield, its profitability would no longer depend directly on the commercial operation of spent fuel services. While it was expected in July 2002 that privately owned spent fuel would remain under its original ownership, it would seem important for the Commission to ask how far this radical change in the future operation of spent fuel services would affect the extent to which BNFL's decision-making in respect of BE was equivalent to that of a private investor.

However, the Commission would also need to establish whether the change in BNFL's commercial policy arose from Measures B, or from the separate set of Government decisions relating to the creation of the LMA.

The value of the change in title to spent fuel is not included in OJEU Table 3, which otherwise sums up the impact of the proposed changes to the spent fuel contracts. It is therefore not clear what importance the Commission has given to this potentially important item in its reasoning to date. The UK Government's view of final waste disposition costs will also be a matter of particular interest in this context, since there is no experience from which to derive an estimate.

OJEU 2003 (para. 60) quotes the UK Government as putting a 'subjective' discounted value to BE on BNFL's agreement to assume title to spent fuel, and the risks attached, of £1.421 billion undiscounted or £148 million discounted. It is not clear what the word 'subjective' means in this context, or whether it reflects the view of the Commission or a statement by the UK Government. In either case, it would be important to discover and to probe any aspect of the calculation regarded as "subjective". To test these "subjective" parts of the

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[3] Joint sunk costs would be costs historically incurred by BNFL in facilities devoted to managing spent fuel for BE. BNFL could choose to bear a higher proportion (or all) such costs in the future, having previously shared them with BE or charged them all to BE.

[4] The UK Government Department of Trade and Industry produced a White Paper in July 2002, *Managing the Nuclear Legacy,* Cm 5552 which made clear that the Government's intention was that the LMA (now known as the Nuclear Decommissioning Authority or NDA) would take over ownership of all activities at the Sellafield site, and would in the future regard the optimisation of nuclear clean-up as the primary LMA/NDA objective (see para. 5.15, p. 46).

calculation, the Commission can (1) ask for the calculation to be broken down as much as possible, to maximise the use of "objective" data inputs and to minimise "subjective" elements, and (2) compare the remaining "subjective" elements with the views of others, to establish whether the Government's estimate is within the range of consensus.

4. URANICS STOCKS

A second area for questioning here is the proposed sale by BE to BNFL of its uranics stocks at a price of £67 million in order to allow BNFL to build a uranics procurement and supply business (OJEU 2003, paras. 61-64.). This area is entirely separate from pre-existing contractual arrangements between the two companies for fresh or spent fuel. The question here is whether or not a private investor would offer to buy these stocks for as much as £67 million in circumstances where there were no existing contractual arrangements – in other words where BNFL had no prior exposure, in the area of the uranics business, to BE's financial problems .

The context of BNFL's decision to spend £67 million of cash to buy uranics stocks includes the following:

- BNFL needs Government guarantees to the extent of over £5,000 million (the Secretary of State's Undertaking) to be able to trade legally;
- In the three financial years to 2003, BNFL made operating losses of over £550 million and suffered a net (adjusted) cash outflow of over £580 million (reported in successive BNFL Annual Reports and Accounts).

In addition, there appears to be no public record of BNFL having any plan to develop such a uranics business. Nor is it clear – even if BNFL had such a plan - why the immediate purchase of some £67 million of stocks would be the best entry strategy. It may be that BE's troubles created a new "commercial" opportunity for BNFL, but in the current context is merits investigation like any other Measure.

5. QUESTIONS ON POSSIBLE DISTORTIONS OF COMPETITION: MEASURES B AND AVOIDABLE COST

As outlined earlier, BE will find it profitable to continue operating power stations provided that the avoidable cost of so doing is expected to be below the selling price of electricity. The predecessor companies to BE consistently argued that all AGRs had avoidable costs well below the selling price of electricity and so there was no case for shutting down any capacity. Further, it would normally be expected that a private, profit-making company, facing major financial problems, would choose to close capacity which added to its financial losses, so that BE's own incentives are compatible with the Commission's policy. For these reasons, issues of avoidable cost may appear unimportant. However, there remain aspects of the package which may require further detailed investigation:

- If the restructuring package were approved, the avoidable costs of BE's most expensive plants, which might previously have been above the selling price of power, might now fall below that price. The Commission would need to convince itself that BNFL's avoidable charges to BE will not now lie below its avoidable costs. Otherwise, the ability to avoid avoidable costs might keep electricity output above the levels it would otherwise have reached, and so distort competition;

- If the Commission wished to apply any 'internal measures' to BE as a condition of approving the restructuring package or any part of it, 'irreversible' capacity reductions would be a likely candidate. The highest avoidable cost plant would then be obvious candidates for such reduction (although BE would anyway wish to close plant in these conditions and has already carried out a number of actions to restructure its business);

- There are technical reasons, outlined below, to suspect that BE may not have calculated avoidable costs accurately.

The avoidable costs of the AGR reactors have been variously estimated by past operating companies (Nuclear Electric and Scottish Nuclear) as averaging around 1.2p/kWh, with Dungeness B a marginal outlier at around 1.4p/kWh. We are not aware of any information about the avoidable costs for AGRs that has been made public since 1995, though since that time BE's overall costs (and presumably avoidable costs) appear to have fallen. Even with selling prices for electricity in the 1.6 to 1.8p/kWh range, this would make all AGRs still an economic proposition (and forward prices are now somewhat higher than this level). However there are grounds for suggesting that avoidable costs at marginal stations like Dungeness B may actually be higher than operating companies have argued, and possibly higher than recent electricity prices. There are several reasons why this might be true:

- It seems possible that the methodology still used for avoidable cost calculations is that of levelised costs, a method which involves averaging future economic data such as electricity prices. This method was adopted by the CEGB in 1985 and was broadly

suitable for a monopoly market with a relatively stable future electricity price. However it is a less appropriate methodology (as Ernst and Young have suggested in their work on Magnox avoidable costs[5]) where the future profile of prices is less stable. Ernst and Young recommend net present value (NPV) approaches, which avoid the averaging problems of levelisation. They argue that NPV calculations would give more accurate results and this may be important in current and relatively unstable NETA market conditions. Such NPV-based results might show that in a period of depressed immediate future prices the case for continuing to operate marginal stations would be poorer than if levelising is used. It may of course be that BE already uses an NPV methodology, rather than 'levelised' methodology, but the Commission could seek to discover if this is the case.

- Avoidable cost calculations are essentially forward looking and involve forecasts of future costs. The most critical assumptions concern future capital spend and especially future availability. On this latter subject, the most recent avoidable cost calculation for Dungeness B, running forward from 1995, assumed that its average future availability would be 70%.[6] This was an unrealistic assumption: the lifetime availability of Dungeness B to 2000 was 35% and its performance between January 2000 and August 2003 amounted to 46%. Putting in a 46% figure for availability in 1995 would have produced an avoidable cost per unit of just under 1.9p/kWh and 35% would produce avoidable cost per unit of 2.1p/kWh.[7] .

- The proportion of costs that is considered avoidable and unavoidable inevitably also requires many other judgements and forecasts of future behaviour especially by BNFL. The judgements that English and Scottish operators of virtually identical nuclear plant have made about avoidability have been radically different, and room for judgement inevitably remains.

Given that BE would normally wish to close plant whose actual avoidable costs lay above market prices for electricity, the Commission should be wary of reaching a conclusion that BE's avoidable costs are higher than electricity prices. However, to reach a fully informed decision, the Commission would need to investigate the basis on which BE's avoidable costs are reported, to check that the reported estimates are appropriate for current conditions (i.e. distinguish between avoidable charges and avoidable costs, and use up-to-date estimates of unit costs and achieved availability).

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5 Ernst and Young *Responses to the Fourth Round of Questions asked by the EA, Dungeness Application Document 15,* pp. 7-9.

6 AGR &PWR Co Limited *The Continued Operation of Dungeness B Power Station* 14 July 1995, p.25.

7 The AGR & PWR report of footnote 2 shows that at a 14% reduction in expected future output, there would be a 14% rise in avoidable cost. Interpolation suggests that a 34% reduction in output (from 70% to 46% availability) would cause avoidable cost to rise to 1.88p/kWh.

6. SURPLUS CAPACITY

If there were any prospect of closing down any BE capacity, the question arises as to the effects this might have on security of supply. If a large tranche of capacity were closed with little notice, there could be immediate problems in conditions of high demand (e.g. at winter peak times). At present the Commission seems inclined to the view that there is sufficient surplus capacity (or systemic capacity for rapid adjustment of the demand/supply balance) to absorb some closures of BE plant. There does not seem any reason to believe that well-signposted closures would result in major market problems in relation to security, as long as the electricity trading arrangements respond in the expected manner. One purpose of the market is to induce responses to tightening demand/supply balances (as witnessed this winter in the return to service of plant previously mothballed).

The scope to manage shortages by relying on mothballed plant will diminish over time, but there also seems no particular reason to suppose that the market would automatically produce a surplus capacity margin of around 20%. Assessing the potential for closure without shortage should therefore allow for the greater flexibility, and lower apparent reserve margin, that a competitive market produces.

7. CONCLUSION

The main focus of argument in this paper has been on issues of the market economy investor principle applied to Measures B (BE/BNFL contract and wider commercial arrangements) and on possible distortions to competition arising from issues of avoidable cost and BE's output decisions.

It is therefore suggested that the Commission may wish to put further questions to the UK Government on:

- the 'commerciality' of the new arrangements between BE and BNFL, especially in spent fuel contracts and in the proposed sale of uranics stocks
- the issue of the methodology and calculation of the values of avoidable costs.