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Series : ENERGY

File : POLICY

Part: 7

Date	From	То	Subject	Class	Secret
26/11/2002	PUS/FCO	MS/DTI	Energy White Paper	U	
27/11/2002	SS/DEFRA	MS/DTI	Energy White Paper	U	
29/11/2002	FCO	DPM	International energy policy	С	
05/12/2002	FCO	PPS	Could we break OPEC?	С	
09/12/2002	ost	DPM	Energy White Paper	R	
10/12/2002	SS/DEFRA	DPM	Energy White Paper	U	
10/12/2002		SS/DEFRA	From OFGEM - Contributing to the Energy White Paper	U	
10/12/2002	PD(GN)	PM	Meeting with Coal MPs	U	
10/12/2002	SS/WO	DPM	DA (N) 11 December - Issues for the Energy White Paper	U	
12/12/2002	PPS	FCO	Could we break OPEC?	С	
12/12/2002	PD(OJ)	PM	OPEC Ministerial	R	
18/12/2002	PD(OJ)	PM	Could we break OPEC 2	С	
18/12/2002	CST	DPM	Be legislation	С	
18/12/2002	SS/DEFRA	FCS	Negotiating Position for a Directive on the Promotion of Cogeneration	U	
18/12/2002	FCO	PPS	UK/US Energy Dialogue	С	
19/12/2002	PD(GN)	PM	The future of the UK coal industry	С	
20/12/2002	PD(JK)	PM	Jonathan Porritt's note on the energy white paper	С	
20/12/2002	PD(GN)	PM	Energy White paper - a first canter round the course		
20/12/2002	ss/dti	DPM	Energy White paper	С	
23/12/2002	CST	LP	Electricity (trading and transmission) bill	С	
29/12/2002	ms/ODPM	DPM	Energy White Paper	U	
06/01/2003	PD(GN)	PD(MH)	Energy White Paper : PM's Comments	U	
06/01/2003	PD(OJ)	PM	Oil creeps higher despite Opec	U	
07/01/2003	SS/WO	DPM	Draft energy white paper	С	
08/01/2003	PUS/SO	ss/dti	Key issues for the energy white paper	С	
08/01/2003	DPM	MS/DTI	British energy bill		
09/01/2003	so	LP	LP Correspondence: Electricity (Trading and Transmission) Bill	R	
10/01/2003	PD(OJ)	PM	Latest Oil Market News	R	
10/01/2003		PD(GN)	From Confederation of Coal Industries: Projected coal burn to 2012	U	
13/01/2003	NI/Assembly	HMT	Possible low cost borrowing mechanism for the energy industry in NI	С	
13/01/2003	LP	ss/dti	Electricity (Trading and Transmission) Bill	U	
13/01/2003	ss/dti	ss/defra	Negotiating Position for a directive on the promotion of cogeneration	U	

RESTRICTED - POLICY AND COMMERCIAL DEPARTMENT OF FINANCE & PERSONNEL

Craigantlet Buildings Stormont Estate **BELFAST BT43SX**

Tele: 028 9052 0444 Direct Line: 028 9052 7437 or 27437 on Network Fax: 028 9052 7270 or 27270 on Network

> From: Dr Andrew McCormick Second Permanent Secretary

> > 13 January 2003

Mr Geoffrey Spence **Head of Private Finance Unit HM Treasury** 1 Horse Guards Road LONDON SW1A 2HQ

Dear Geoffrey,

POSSIBLE LOW COST BORROWING MECHANISM FOR THE ENERGY INDUSTRY IN NORTHERN IRELAND

- 1. I am very grateful to Sean Byrne and Ros Dunn for their help so far with this topic: the informal exchanges so far have led the Minister here, Ian Pearson. to agree that this issue should be put formally to the Treasury for consideration and I am very grateful that arrangements have been made for a meeting tomorrow. In preparation for that discussion, I have sought to set out in this letter the issues taken "from the top" as some of the points from the earlier informal exchanges have now been overtaken.
- 2. lan Pearson, the Minister responsible under suspension for both DFP and the Department of Enterprise, Trade and Investment here, has agreed that I should seek Treasury views on a proposal in respect of Energy legislation here. He hopes very much that you will be able to signal that this can be accepted in policy terms - at worst, on the basis that action such as this in the limited context of Northern Ireland would not be likely to have material repercussions for the major issues you are addressing at UK level in other sectors.
- 3. The policy objective is to reduce electricity prices here. There is premium of 30-40% on average bills, mainly as a consequence of the structural and financial arrangements that resulted from privatisation. The general background remains as explained in the first part of the attached paper (Annex 1) which was prepared last year. Paragraphs 1-9 remain relevant as a summary of the background and context of the NI electricity market, and some of the considerations which affect future policy making. The specific

propositions dealt with from paragraphs 10 on have been overtaken in a number of respects.

- 4. The fundamental point remains that electricity prices are markedly higher than elsewhere in the UK, and higher than they need to be even allowing for the disadvantages of a small scale market with limited connectivity with wider markets. One central problem remains the contracts with the main power stations which were built in to the privatisation arrangements 10 years ago. I should not understate the degree of resentment and antipathy to private sector involvement in public services that can be attributed to the consequences of that privatisation: this has had consequences for all policy developments in relation to PPPs or privatisations. Hindsight has shown that important mistakes were made in the arrangements, most specifically the serious underestimate of the availability that could be provided by the power stations which meant that the formula for the availability charge proved much more lucrative to the buyers than was expected in the negotiations.
- 5. Another problem has been the financing costs of certain projects, such as the Scotland-Northern Ireland gas pipeline (SNIP), which were perceived as high risk bringing natural gas here for the first time with no guarantee of a strong customer base (apart from Ballylumford power station). Additionally, of course, in a small, peripheral market, there is often just a single sponsor prepared to take forward a project British Gas (SNIP), Phoenix (gas distribution) and Bord Gais (extension of the gas industry).
- 6. This is very important background, because it creates a unique context where there is tremendous significance for a number of aspects of public policy arising from the electricity price differential. It is highly relevant to the current debates on aspects of local taxation:
 - a. industry claims that the price differential in energy should be taken into account in looking the plans to phase out industrial derating;
 - b. in the domestic sector, it is argued that the high electricity prices, which were a consequence of public policy actions 10 years ago (that is the way privatisation was implemented) should affect the debate on regional rate and water charges which is a very live topic at present.
- 7. There has been much discussion, especially over the last year, on various mechanisms which would put downward pressure on prices. The main focus of the discussions with No 10 and the Treasury in the run up to the announcement on the Reinvestment and Reform Initiative and subsequently in the advice from Caminus, was on ways and means to increase competition. There are some material limitations on this approach, especially the existing long term generation contracts, and the small scale of the market. But DETI is still pursuing that as a key aspect of policy. The non-domestic market will be fully open from 2004 onwards, leaving only the domestic market tied to the generation contracts.
- 8. But in reality, there is only limited experience so far of major cost improvements from market opening, mainly because the Moyle Interconnector

supply is available only to the 750 largest users. Even with Moyle, prices are in the region of 2.9pKh compared to 1.5pKh in England. With the over-priced contracts in place, it is unrealistic to expect early and substantial price reductions even for the remaining non-franchise customers in the next few years.

- 9. With the current very low prices in England although these are seen as unsustainably low we are seeing if anything a divergence in prices. The context remains one of vast differences between the energy markets in NI and GB, and nothing like a level playing field in the UK in terms of competition and prices. Nevertheless, NI is expected to contribute proportionately to UK targets, such as those for renewable energy, which will push prices even higher. Hence we believe that there are very strong arguments that, from time to time, some peculiar NI measures are essential if we are to close the gap in energy prices.
- 10. The Regulator's focus is on the issue of the cost of capital, believing that he has a very clear responsibility to address the problem of excessive prices. In an informal communication, he has said his "objection to [Caminus'] competitive model is based on one point only that it would increase prices because it would nominally but not actually transfer risk currently borne by customers to shareholders and for this perceived transfer customers would pay more over the next twenty years. Customers in return would have to have "Faith" in defiance of reason and evidence that the market would produce a better solution."
- 11. Aside from the generator contracts, which are in place until 2010 and 2012 for the two power stations respectively, the cost of capital is seen as the largest cost driver in the system and one which is amenable to some degree of change. The focus is not, at present, on the ideas for a bond-based buy out or buy down of the generation contracts as described in Annex 1, but on more specific possibilities for refinancing:
 - a. the Moyle Interconnector;
 - b. the SNIP gas pipeline;
 - c. Ballylumford (which has already been refinanced by its owners for the purposes of funding a new CCGT, but where there remains scope for lower cost borrowing) and/or Kilroot – the point on the two power stations is to see if a lower cost of capital for their owners, within the existing contractual framework, would produce a benefit for consumers; and
 - d. the T&D network where a consortium led by the Royal Bank of Canada has been developing a case for a mutualisation.
- 12. Some mutualisation/ refinancing options can be pursued with no Government involvement. However, to secure the best possible interest rates, it has been proposed that special statutory provisions should be introduced to provide additional certainty for the lenders in relation to aspects of the possible

transactions. Only if sufficiently strong statutory powers are in place will the banks lend at the low rates needed to make the proposals worthwhile - it is claimed that this approach has been affected by recent developments in relation to the issue of covenant at UK level.

- The proposal is that the Draft Energy Order would be extended to include such 13. provisions. This is nearly ready for introduction as a Draft Order in Council the usual mechanism for primary Northern Ireland legislation under direct rule. It deals mainly with provisions for the new gas pipelines approved by the NI Executive last year, which require postalisation of gas prices to proceed. The main provisions had progressed as a Bill before the NI Assembly before suspension, and are very urgent - the Secretary of State is committed to ensuring the Order is introduced in time for it to be made at the Privy Council in February - ie before the possible restoration. If this timetable is not met, vital powers may be lost. Both the gas-related measures, and the new proposals for access to low cost borrowing, command broadly based political support here. The timetable is not guite as acute as we thought before Christmas, but the Order does need to be laid by 20 January. The point remains that once it has been laid it cannot be subsequently amended. Hence we will need to take final decisions on this issue this week.
- 14. Each of the possible transactions mentioned above would give rise to different issues of detail. The most immediate focus is the Moyle proposal, where NIE wishes simply to sell its subsidiary, and a purchase by a debt funded SPV is seen by OFREG as the optimum solution. I have already sent you and colleagues the OFREG consultation paper which gives some relevant details: the structure and sequence of steps is summarised in the attached chart (Annex 2), and the note from OFREG at Annex 3 provides updated figures which may also help draw out the issues in that case.
- 15. On the detail of the proposal, the discussions at one stage involved the idea of creating a provision which would seek through legislation to establish security directly on the revenue stream from customers. DETI considered this unworkable without duplicate billing systems or other intricate legislative provisions. The possible provision which is now attached (Annex 4 although this is still not in final form) would not change the position whereby all charges paid to the SPV and hence to the lender would be applied to licence holders, (generally supply companies) and not consumers directly. The banks' view is that, collectively, these licence holders provide reasonable security if the present risk of channelling and collecting charges through a single licence holder can be reduced. But the point remains that the reason for adding any new provision into legislation is to reduce the perceived risk to the banks.
- 16. It can be argued that the change that would result from refinancing supported by legislation of the sort that is proposed is much more of perception than of real risk (ie that in substance the majority of the risks involved are already in practice being carried by consumers), and thus that there is no additional risk for the consumer in this scenario. On the contrary, it is argued, if costs can be reduced, it will be a benefit not an additional liability or risk which is passed through to them. Indeed, some might say that it is totally disproportionate to

worry unduly about the possibility of additional risk to consumers, when the latter are carrying and have been carrying for a decade, not the risk of loss, but a very large actual problem, in the form of the very large premium on bills that resulted from privatisation.

- 17. To conclude: Ian Pearson wishes to facilitate a potentially beneficial intervention in the energy market, which commands broadly based political support here, and wants strongly to be able to secure urgently statutory power that would make it possible to proceed if one or more of the ideas under consideration at present emerges a worthy candidate. Only Moyle is at the point of being developed into a firm proposal. The question now is whether the proposal to facilitate low cost borrowing by private sector players in the NI energy market through legislative provisions is acceptable from the point of view of national policy. This is all happening in a regulated private sector environment, but the nature of the arrangements that might result could take us close to the substance of a public sector transaction. I am also very conscious that, as the issue arose because of a change in banks' perception on the general issue of covenant, from cases at UK level, that there are issues of principle and precedent where you will want to take a view. I should repeat that there is very intense political pressure locally for this to proceed, and as Ros and Jacob will recall from the nature of the RRI discussions last year, we can expect the issue to be raised with No 10.
- 18. I hope this is helpful as background to our discussion tomorrow. Copies got to Ros Dunn, Jacob Nell (No 10), Will Haire (OFMDFM) and to other colleagues in DETI and DFP here.

Yours sincerely,

Andrew McCormick

ANDREW MCCORMICK

[RRI Paper 3 dated 4 March 2002]

ELECTRICITY IN NORTHERN IRELAND

Introduction

 This paper provides background to the strategic issue of how to reduce the excessive electricity prices payable in Northern Ireland mainly as a result of the way the privatisation of NI Electricity was settled in 1992.

Background

- At the time of privatisation the industry was divided up with separate sales of four generating plants (Ballylumford, Kilroot, Coolkeeragh and Belfast West) and the transmission and distribution network. The name NIE was retained for the latter.
 - Belfast West was an old coal-fired plant which will close at the end of March 2002 and does not affect the present issue;
 - b. The recent agreement by the Executive to the gas pipeline proposals will make it possible for a new gas-fired generating plant to replace the old oil-fired Coolkeeragh station, which is also nearing the end of its contract. The new plant is being built, without any guarantee of a contract with NIE, and thus this plant is not a constraint on the present issues on electricity prices (apart from the effects of postalisation of gas prices, which is necessary to make the pipeline proposals acceptable) indeed it should contribute to increasing the degree of competition as the market opens;
 - c. The Ballylumford gas-fired plant, now owned by Premier Power, (current capacity 951 MW) was oil-fired at the time of privatisation, and Kilroot, now owned by AES, (capacity 390MW on coal/ 520 MW on oil) is dual coal / oil-fired.
- NIE is the public supplier for the franchise market (the domestic market and other customers taking less than 790,000 kwh per year

- such as farms, small businesses, charities etc), through its Power Procurement Business (PPB). This represents about 65% of the total market. Supply for this market has to be purchased at the Bulk Supply Tariff, and hence there is no realistic way for a competitor to enter this part of the market because they would not be able to obtain sufficient margin on the supply business only. The supply business accounts for only 5% of the price of electricity to the franchise market with generation costs at 60% and transmission and distribution costs at 35% representing the major proportions of the final price.

The Generation Contracts

- 4. At privatisation, long-term contracts were set between the PPB and the generators, giving them a guaranteed inflation proofed revenue stream as long as their capacity is available to generate (whether actually generating or not). In practice this permits them to make a substantial return on capital (perhaps around 12%, but possibly more). The contracts run until 2012 in the case of Ballylumford and 2024 for Kilroot. With the introduction of market opening, the generation contracts now relate to the supply of electricity to NIE's franchise customers. The non-franchise (eligible) market, consisting of around 750 more intensive users, can contract bilaterally with suppliers for their electricity outside of the long-term contracts.
- 5. The PPB holds the contracts for all the power stations' output it can sell. Any of the output from the power stations above NIE's requirements for the franchise market can be sold:
 - a. in the Republic of Ireland; or
 - b. to independent power producers; or
 - c. to suppliers in the competitive market

but any sales must be at NIE's Bulk Supply Tariff, to prevent abuse of NIE's dominant market position.

6. Thus the market position is that NIE has a monopoly position in supply to franchise customers, and non-franchise customers can buy their supply from the additional capacity available over and above that which is needed and contracted to meet the franchise customers requirements, including now from the Moyle interconnector (see below). The effect of this is that the excess cost issue applies to the domestic consumer and small business sectors. While it would in theory be possible to reduce or remove the statutory restrictions that give the PPB an effective monopoly in relation to the franchise market, that would not solve the problem, because it would not remove NIE's contractual obligation to pay the availability charge to the generators.

7. The NIE T&D asset base is covered by a price control that guarantees a return on capital for NIE, and this represents a cost to all electricity consumers (that is, including those businesses that are outside the franchise arrangements).

Developments since Privatisation

- 8. In 1996, the introduction of natural gas supply to Northern Ireland and the conversion of some generating plant to gas firing has changed the context somewhat. However, there is a very costly "must take" contract for gas supply, (LTI3) between Ballylumford power station and Centrica. The contract is a legacy of the privatisation arrangements and now represents an inflexible part of the cost structure. This contract applies until 2008. There are also high costs resulting from the obligations in respect of the Scotland Northern Ireland Interconnector Pipeline (SNIP), which arise from the costs of financing that pipeline.
- 9. More recently, the Scottish (Moyle) Electricity interconnector at a capacity of 500 MW, opens up the region to much greater competition in electricity supply. However, the benefits are restricted at present because of the long term generation contracts, and because, in the absence of competitively priced plant in Northern Ireland, Scottish suppliers can in practice charge higher prices than for their home market, that is, price up to the market.

Possible Customer Bond

10. The proposals brought forward late in 2000 were for the customers to buy out a series of future contract payments with an up front lump sum, with the lump sum being raised by issuing a bond. The bond requires annual repayments to be made and if the annual

- payments on the bond are lower than those which would have been paid under the contract then there would be a saving.
- 11. For example the generators (Ballylumford & Kilroot primarily) may be able, under the present arrangements, to earn something in the region of a 12% return (nominal) through the contracts. Borrowing a lump sum @ 7% nominal and using it to buy out the future payments to the generators could produce savings for customers of the difference between the two rates perhaps of the order of 5%. Thus customers would pay money in their bills towards bond repayments (albeit over a longer period of time) rather than payments to generators.
- 12. The second key point is the benefit from the difference between the real cost of the bond and the real cost of the contracts. The generator contracts are inflation proofed, as is NIE's asset base and their return on it. Buying out a stream of real payments with a Bond whose repayments are fixed nominally will reduce the real cost of those payments as inflation erodes the real debt burden. Thus the real cost of the repayments will become progressively lower as time goes by. It is likely however that the generators would take account of this in the lump sum they would require in exchange for the guaranteed income stream. Thus the potential benefit from the buy out may be substantially less than is indicated at paragraph 11.
- 13. There are also proposals for replanting the stations:
 - a. in the case of Ballylumford this means the old dual fuel generating sets which have low fuel efficiency (around 31%) are to be replaced with a highly efficient (48%) Combined Cycle Gas Turbine (CCGT) station. This will require 30% less fuel to produce the same amount of electricity compared to the old dual fuel sets. The capacity of the new CCGT station, due to come on stream at the end of 2002, is 600MW (see paragraph 16 below);
 - b. the replanting envisaged for Kilroot is of a different nature. Kilroot currently burns coal but it could be replanted to burn orimulsion (a bitumen based fuel). While the efficiency remains the same orimulsion is much cheaper than coal and it would also enable Kilroot to maximise its generating capacity which is restricted on coal. The net effect would be

lower fuel costs are and higher potential output. However, orimulsion is high in sulphur and other pollutants, and has only one source (Venezuela). DETI and the Regulator are concerned to avoid a tendency to over dependence on one fuel (gas) for the small system in Northern Ireland, but it is not clear that this is necessary or sufficiently beneficial to outweigh the higher costs compared to gas. The costs of flue gas desulphurisation (£40-60 million) - which would be needed if Kilroot burns British coal or orimulsion - would push costs up, but would be a consequence of the diversity policy The orimulsion proposal also depends on an assumption that Kilroot would be able to sell 4,000Gwh in Northern Ireland: this is doubtful, given the new competition that will come from the new CCGT plant at Coolkeeragh. If that assumption is not well founded, the economics of using orimulsion would not be as good as indicated above.

14. The up shot of replanting is that the marginal cost of generation will be reduced due to greater fuel efficiency and lower fuel costs and this leads to an opportunity to trade the excess output from the stations. The marginal costs for Ballylumford and Kilroot are estimated at 1.4p per kWh and 1p per kWh respectively. With NIE's Power Procurement Business (PPB) holding the contracts for all the power stations' output, it could - provided it is detached from NIE - sell any of the output above its requirements for the franchise market to the competitive market to make a contribution to the fixed price of the contract. With the potential of 2,600GWh being available, the profit could be substantial and this profit would be used to offset payments on the bond. To realise all the potential benefits of efficient plant for reducing Northern Ireland's electricity costs, further structural development of the competitive market will be required - a process which is in any case inevitable.

Recent Discussions with OFREG

- 15. The proposal in 2000 was for a £1.3 billion bond to buy out the generation contracts, NIE's T&D business, LTI3, and some other contracts. In recent discussions, the Regulator has given an updated view of the issues and options. This takes account of the progress with thinking on the replanting issue.
- 16. Taking first Ballylumford's output of 951 MW:

- a. 234MW were out of contract anyway and have been squeezed out by market forces because it was from old inefficient plant;
- b. NIE is contracted to take 117 MW until (only) 2004, not 2010;
- c. the remaining 600 MW is from the new, highly efficient CCGT machine under a new contract which will allow the cost of that new plant to be spread over 10 years with NIE having an option to extend.
- 17. The only remaining cost from Ballylumford relating to the old contracts is a debt of £172 million, representing a refinanced element of the privatisation contract. This costs some 5-8% on tariffs for small businesses and domestic consumers, and runs to 2012. It might be possible to improve this by further refinancing (the current rate payable is 7.62% nominal).
- 18. The Kilroot contract, at c. £60 million a year, includes some specific special elements which stand on their own merits and a premium of c. £6-10 million, which is essentially a public service obligation arising from DETI's policy of diversity (to avoid a future where all our generation capacity is gas fired). The proposed conversion to orimulsion could leave Kilroot in a very competitive position. If the conversion to orimulsion was not to proceed, the possibility of buying down the generating contract could be considered alongside the "do nothing" option of sticking with the station on coal until 2010.
- 19. Thus OFREG does not see a justification for refinancing the generation contracts. The actions in hand or planned will eliminate the unfair elements arising from privatisation. One important point is that when replanting takes effect and the local suppliers are providing lower cost power, that will introduce a competitive pressure on the Scottish suppliers in respect of the power sold through the Moyle interconnector. There would also be a concern that a buy-out would put the existing generators in a very strong (cash-rich) position, which could make it much more difficult to drive in greater competition.
- 20. These factors will have a significant effect in reducing the price differential. The existing arrangements have already led to competitive pressure for supply to non-franchise customers, who in

2000 (according to the figures produced by the Electricity Association) paid 126% of the prices of comparable companies in the South of England compared to 131% for franchise customers. The introduction of NETA in England and Wales and the much greater exposure of Northern Ireland's generation costs to the increase in world market prices of gas, oil and coal have widened these differentials since. This greater relative disadvantage of franchise customers and in particular small businesses is expected to be exacerbated this year as the introduction of the Moyle interconnector will reduce prices for non franchise customers.

NIE T&D Buyout Proposal

21. This involves the buyout of NIE's Transmission & Distribution (T&D) assets. The cost of the buyout is estimated at £676m (assuming no tax leakage). The potential saving from this buyout is estimated below.

T&D	20 yr Buyout Bond	40 yr Buyout Bond
Annual Saving	£6m	£18.6m
Effect on Bills	1% reduction	3.5% reduction

- 22. The Regulator recognises that NIE has little scope to make money from ownership of this major asset base (while they recoup enough from tariffs to service their equity finance, this is heavily regulated and under the terms of the privatisation contracts, very costly to consumers). NIE may prefer to get out of this business, and hence the attractions in a bond based buy out, transferring the assets to a not for profit company. The major doubt is whether, by removing the need to service equity finance, the system would also lose the main incentive to good management of this business.
- 23. As all the relevant companies are in the private sector, the only need for government involvement in this would be to ensure that the legislation would make this possible (provided Government does not become guarantor of last resort). OFREG was assuming that the bond could be raised without any other intervention by Ministers. The law would need to be amended to permit the

inclusion of payments to service the debt in customers' bills. This could generate savings to consumers of £20 million a year.

Implications of the Bond Option

- 24. For the Customer Bond idea to work within the present privatised structure, and avoid any breach of State Aids rules, the bond would have to be raised by some organisation or body at arms length from government possibly the PPB if, as will be necessary anyway under EU directives, it is separated from the T&D business or, alternatively, some other Special Purpose Vehicle (of non-profit status). Even though it would be self financing, the way in which the bond is raised could otherwise impact on the PSBR. That body would have to be responsible for the customer levy which would raise funds from electricity customers to make the repayments on the bond.
- 25. Further permutations that have been discussed with OFREG by some contributors to this debate include:
 - a. NIE participation in a mixed infrastructure management entity. In this model NIE would retain ownership of the T&D assets, but synergies would be secured to the benefit of consumers by managing these assets alongside other aspects of infrastructure;
 - b. a multi-purpose infrastructure management entity which would buy the T&D assets from NIE and manage them as in (a) above, in one Not for Profit entity (mutualisation option). The scope for economies through joint planning, construction, billing, metering, etc has been identified, but not explored in detail.

The Gas Industry

26. The Gas Industry in Northern Ireland is entirely new since 1996, and has to compete against other fuels that have a strong market position. The Regulator's view is that there would be important long term benefits from a refinancing of the gas assets (the SNIP pipeline in particular – though the contracting parties to SNIP have indicated that this may not be possible) from a 20 year basis to 40 years. The current position is based on a real rate of return of 8.5% pre tax to 2016, which is unrealistic. Refinancing a large

proportion of the asset base through bond based finance would improve the relative position of the gas supplier and strengthen that sector for the longer term. Around £100m of bond finance would be needed now, but this could rise to around £250m as the industry develops.

Conclusion

- 27. In the context of the package of proposals under consideration between OFMDFM, DFP and the Treasury, the question is how best to achieve real reductions in electricity prices. It may be that bond financing arrangements could be linked to a wider PPP idea for infrastructure reinvestment.
- 28. The Regulator's view is that bond finance is worth exploring for:
 - a. aspects of the financing of the existing electricity assets;
 - b. a possible refinancing of the gas industry; and
 - c. future energy infrastructure developments he estimates that capital expenditure on gas and electricity networks over the next ten years is likely to require at least £750m.

His view is that a low cost way of funding capital expenditure would offset Northern Ireland's disadvantage in having to develop its full energy infrastructure - including interconnection with Great Britain and the Irish Republic - decades after the rest of the UK had secured for itself a comprehensive network at public sector costs of capital.

29. DETI has appointed consultants (Caminus/Simmons & Simmons) to advise on these issues. In preliminary discussion, the emphasis has been on how to tackle the fundamentals of the position, by finding ways of increasing competition, as the main driver of lower prices, rather than focusing on the cost of capital underlying the existing arrangements. Some buy-out of the "above market" aspects of the existing contracts may be worth considering, if that is the key to securing lower prices for the franchise market. They also wish to explore if some of the mothballed generation assets could come back into the market to add to competition.

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- 30. There may also be scope to open the region to stronger competitive pressures by making it more effectively a part of wider markets on an east-west (and north-south) basis. In other words, if existing constraints to creating a genuine single UK market in electricity are removed, interconnection could allow cheap power from England to be transmitted through the Moyle Interconnector.
- 31. The consultants have been asked for a short position paper by 21 March.

Working Draft of Possible Additional Provisions for Draft Energy Order

Low cost borrowing mechanism

Designation of certain arrangements for purposes of levy [j200]

- *.—(1) Article {j201} applies where—
 - (a) in accordance with any arrangement which-
 - (i) involves the provision or operation of any electrical plant or electric line; or
 - (ii) otherwise affects the generation, transmission or supply of electricity by a licence holder,
 - a loan is, or is to be, made by a person to a party to the arrangement; and
- (b) the arrangement is designated by the Authority in accordance with paragraph (3).
- (2) That Article also applies where—
 - (a) in accordance with any arrangement which—
 - (i) involves the provision or operation of any gas plant; or
 - (ii) otherwise affects the conveyance, storage or supply of gas by a licence holder,
 - a loan is, or is to be, made by a person to a party to the arrangement; and
 - (b) the arrangement is designated by the Authority in accordance with paragraph (3).
 - (3) A designation of an arrangement under paragraph (1)(b) or (2)(b)—
 - (a) shall be in writing;
 - (b) shall not be made except with the approval of the Department;
- (c) shall not be made unless the arrangement fulfils such conditions as may be prescribed;
- (d) shall not be made except with the consent of such persons as may be prescribed;
- (e) shall not be made unless such procedures as may be prescribed have been followed;
- (f) shall expire at such time as may be specified in or determined under the designation;
- (g) shall specify such other matters as are required to be specified by Article {j201} or regulations under that Article; and
- (h) may contain such other provisions as are authorised by that Article or such regulations.
- (4) A designation of an arrangement under paragraph (1)(b) or (2)(b) may not be amended or revoked except—
 - (a) with the consent of such persons as may be prescribed; and
 - (b) in accordance with such procedures as may be prescribed.

- (5) For the purposes of this Article and Article {j201}—
 - (a) "an arrangement" means—
 - (i) an agreement in writing; or
 - (ii) two or more such agreements which relate to the same matter; and
 - (b) a person is a party to an arrangement if he is a party to an agreement constituting, or included in, the arrangement.
- (6) In Article {j201}, as it applies by virtue of paragraph (1) in relation to an arrangement designated under paragraph (1)(b)—
 - (a) "designated arrangement" means an arrangement so designated;
 - (b) "relevant licence holder" means the holder of a licence under Article 10(1)(b) or (c) or (2)(a) of the Electricity Order;
 - (c) "specified" means specified in the designation of the arrangement under paragraph (1)(b).
- (7) In that Article, as it applies by virtue of paragraph (2) in relation to an arrangement designated under paragraph (2)(b)—
 - (a) "designated arrangement" means an arrangement so designated;
 - (b) "relevant licence holder" means the holder of a licence under Article 8(1)(a) or (c) of the Gas Order;
 - (c) "specified" means specified in the designation of the arrangement under paragraph (2)(b).

Levy regulations {j201}

- (1) The Department may by regulations provide—
 - (a) for the imposition on relevant licence holders of a levy in respect of a designated arrangement;
 - (b) for the collection of payments in respect of that levy by a specified person ("the collector"); and
 - (c) for the sums realised by the levy (after payment of the administrative expenses of the collector) to be paid by the collector to a specified person ("the recipient").
- (2) Regulations under this Article may in particular make provision for—
 - (a) the levy to be imposed on specified relevant licence holders only;
 - (b) the amount of—
 - (i) the levy in respect of a designated arrangement; and
 - (ii) any payment by a relevant licence holder in respect of the levy, to be calculated by such method as may be specified;
 - (c) the times at which payments falling to be made in pursuance of the regulations (whether to or by the collector) are to be made;
 - (d) dealing with overpayments or underpayments of the levy;

- (e) the recovery by the recipient or the collector of any payment due in respect of the levy (including provision for any such payment to be treated as a debt);
- (f) any rights of a recipient in relation to sums realised by the levy not to be assigned without the consent of the Department (and for such consent to be given subject to such conditions as the Department thinks fit);
- (g) the collector to hold any sums realised by the levy on such trusts or other terms as may be prescribed;
- (h) imposing requirements on the recipient, the collector and relevant licence holders;
- (i) enabling a party to the arrangement to be designated as the collector or recipient of payments in respect of the levy;
- (j) prescribing anything authorised or required to be prescribed by Article {j200};
- (k) such other incidental or consequential matters as appear to the Department to be necessary or expedient for the effective imposition and collection of the levy and the handling and payment of the sums realised thereby.
- (3) Regulations under this Article may authorise or require matters to be specified in or otherwise dealt with by the designation of the arrangement concerned.
- (4) The Authority and the Department shall exercise their powers under this Article and Article {j200} in such a manner as to secure that the sums realised by the levy—
 - (a) are sufficient (after payment of the administrative expenses of the collector) to pay to the recipient the specified amounts; and
 - (b) are no greater than is necessary for those purposes.
- (5) Regulations shall not be made under this Article unless a draft of the regulations has been laid before and approved by resolution of the Assembly.



Memorandum

To: Victor Hewitt

CC:

From: Mike Lowry

Date: January 14, 2003

Re: Moyle Interconnector Financing Assumptions

The numbers used in our September paper have changed following negotiation with NIE and movement in the capital markets. I set out the current state of play.

The purchase price (that is the total amount payable to NIE) is based on the following:

Ofreg determined a RAV (regulatory asset value) for Moyle in its final T&D price control proposals in June of £113m at March 2002 in 2000/2001 prices. This is based on indexed capital expenditure and capitalised interest during construction. Moyle raised £1m in auction receipts for the period Jan-Mar 2002 which we use to fund £1m depreciation giving a RAV of £112m

This is indexed to 2002/03 giving £114.31m

Depreciation for 2002/03 @ 3% gives a RAB @ March 2003 of £110.88m

If the Interconnector remained with NIE's T&D business its RAB would be £110.88m. This would then earn a 6.25% real rate of return during the current price control period and be depreciated at 3% (of £114.31m) per annum for 19 years and 2% per annum for a further 20 years (the counterfactual).

To the RAV we add:

Arrangement fees paid to date (subject to Ofreg approval) of £1.4m (£112.28m) and developer's fee of £1.3m (£113.58m). The remainder of the £4m developer's fee (£2.7m) is paid in the form of tax losses surrendered by Moyle to NIE. This surrender is an efficient method of fee payment from Moyle's perspective given the length of the period before Moyle becomes liable for tax.

We wish to take advantage of the relatively lower cost of capital on Moyle by funding £10.47m depreciation on T&D RAB via the Moyle bond (£124.04). The derivation of this £10.47 is immaterial to the transaction.

The final size of the bond to be raised and cost of finance depends on the bond's underlying rating and the requirement for reserve accounts. The underlying rating depends, *inter alia*, on whether the revenue stream has legislative or regulatory backing and any residual asset risk.

The cost of finance (coupon) is based on the equivalent (14-18 year index linked) gilt reference rate plus spread (risk premium). Depending on the underlying rating a monoline wrap (bondholders' insurance against default by a specialised insurer) may be efficient and reduce the required spread, the benefits of which are distributed 2/1 between monocline insurer and customers respectively.

Our current assumption is that a monocline wrap would be required giving an 85 basis point spread for a 35 basis point monoline fee (paid upfront) on a 2.40% gilt reference rate.

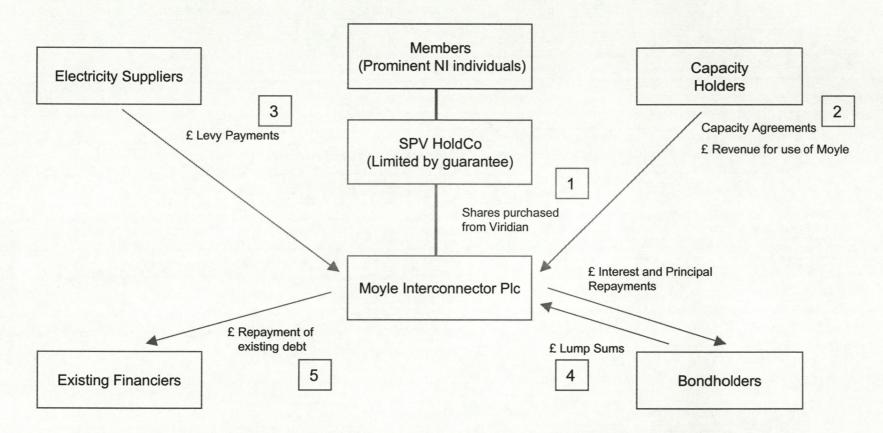
Debt service and maintenance reserve accounts will also initially be funded via the bond proceeds together with further (Ofreg approved) arrangement fees currently estimated at £3.6m.

The principal is amortised over 30 years the precise schedule depending on our objectives apropos intergenerational distribution of benefits and current and expected future costs in the industry, the only restriction being that the average life of the bond is between 14 and 18 years.

I hope this is useful. If you have any further queries do not hesitate to contact me.

Mike Lowry

Annex 2: Moyle Refinancing Structure



- 1. New "not for profit" company limited by guarantee purchases shares in Moyle Interconnector Plc ("Moyle").
- 2. Moyle enters into contracts for use of capacity on its interconnector.
- 3. Levy imposed in favour of Moyle on all electricity suppliers in NI.
- 4. Bondholders lend a lump sum to Moyle on issue of bonds by Moyle.
- 5. Existing debt of Moyle repaid.

Note A: the same structure could be used without a bond issue. A commercial loan could be made by financiers to Moyle instead. Note B: this structure is based on a diagram provided by Moyle's current owners. It is not clear how the price for the purchase by the SPV of Moyle shares is to be financed.

Simmons & Simmons

The Rt Hon Patricia Hewitt MP Secretary of State for Trade and Industry

The Rt Hon Margaret Beckett MP
Department for Environment, Food and Rural Affairs
Nobel House
17 Smith Square
London
SW1P 3JR

B January 2003



Secretary of State Department of Trade and Industry

1 Victoria Street London SW1H 0ET

Direct Line 020 7215 6272

DTI Enquiries 020 7215 5000

URL http://www.dti.gov.uk.
e-mail mpst.hewitt@dti.gsi.gov.uk

Dear Pagazet,

NEGOTIATING POSITION FOR A DIRECTIVE ON THE PROMOTION OF COGENERATION BASED ON A USEFUL HEAT DEMAND IN THE INTERNAL ENERGY MARKET

This letter is to agree broadly the negotiating line proposed in your letter to colleagues of 18 December 2002.

I agree with the stated claim of the Commission's proposal to emphasise the promotion of high efficiency co-generation to contribute to the achievement of carbon saving targets. However, I share your concern that the proposal, as currently drafted could be unhelpful in some respects including, in particular, Article 7's proposed restriction on public support for cogeneration schemes greater than 50 MWe. This restriction seems to run counter to the related purpose of the directive, to contribute towards carbon saving and the reduction of climate change. I consider the key criterion for support should be the environmental benefits that co-generation can bring and large schemes have the potential to deliver big benefits. I agree, therefore, that we should argue strongly against limiting support to schemes under 50 MWe.

As regards Article 5, I agree that we should support the proposal for common principles for determining the criteria for high energy efficiency cogeneration but that some flexibility may be needed to allow Member States, including ourselves, to use their own methodologies But I think it is important that the provisions of the directive should ensure that support is limited to schemes that deliver real carbon savings.

I agree that we should support Article 8 in principle but argue to ensure that our concerns are met and that the directive is drafted in a way that is compatible with the liberalised UK market and regulatory framework. My officials will work with yours to help achieve this aim. They are currently working on implementation of a similar article included in the Renewables Directive – there will be a consultation about how to do this – and will ensure that experience



And copying this letter to the Prime Minister,

Beta wise, Et members and Sir Andrew Turnbull. here is shared with you where it is relevant to the way in which the CHP directive might be

PATRICIA HEWITT



RT HON ROBIN COOK MP

LEADER OF THE HOUSE OF COMMONS

2 CARLTON GARDENS

LONDON SWIY 5AA

TEL: 020 7210 1025

Our Ref: LP/02/311/JN

13 JAN 2002

Dear Pat,

ELECTRICITY (TRADING AND TRANSMISSION) BILL

Thank you for your letter of 16 December requesting agreement to publish the Electricity (Trading and Transmissions) Bill in draft later this month. I am happy to agree to this: LP Committee will consider the final draft of the Bill for approval for publication when it meets on 27 January. As you are aware, Cabinet has now agreed that the Energy Bill should be included in the Third Session programme and that this Bill should be used to implement the British Electricity Trading and Transmission Arrangements (BETTA). I have also considered your request to make a statement that the Government will implement these new arrangements by April 2005 and I am content to agree to this.

Your letter of 16 December requested agreement to publish the Electricity (Trading and Transmission) Bill in draft later this month. It said that early publication would enable the Bill to be introduced into Parliament later in the session. You also requested clearance to state the Government's intention to implement BETTA by April 2005 at the latest.

Paul Boateng wrote in support of your letter, stressing the importance of maintaining momentum on the BETTA proposals.

The government is committed to the publication of more Bills in draft and greater prelegislative scrutiny; therefore I would welcome the early publication of this Bill. LP Committee is scheduled to consider the Bill for publication when it meets on 27 January.

As you are aware, the Cabinet has now approved the legislative programme for the Third Session. The Energy Bill has been included in the programme and this Bill will be used to implement the BETTA proposals. You should note however that its place in the programme is conditional on satisfactory progress being made on the preparation of the Bill.



Your letter also requested clearance to make a statement committing the Government to implementing the new trading arrangements by April 2005 at the latest. You cited the need to make public any decisions which may affect the bondholder's decisions on British Energy before 14 February and also the need to ensure that the three transmission companies are aware of the Government's serious intention to legislate and begin preparatory work. As the proposed statement does not pre-empt the contents of the Queen's speech, I am content to give my agreeing to the proposed statement.

I am copying this letter to the Prime Minister, Members of LP Committee, Sir Andrew Turnbull and First Parliamentary Counsel.

Yours sincerely

ROBIN COOK

The Rt Hon Patricia Hewitt MP Secretary of State for Trade and Industry





CONFEDERATION OF UK COAL PRODUCERS

Confederation House Thornes Office Park Denby Dale Road Wakefield WF2 7AN West Yorkshire England
Tele: +44 1924 200802 Facsimile: +44 1924 Facsimile: +44 1924 200796 E-mail: admin@coalpro.co.uk www.coalpro.co.uk

Our Ref: BJR/3302/af 10 January 2003-01-10

Mr Geoffrey Norris Senior Energy Advisor **Policy Directorate** 10 Downing Street **LONDON SW1A 2AA**

Dear Mr Norris

Projected Coal Burn to 2012

We attach copy of a letter and report regarding Projected Coal Burn to 2012 which we sent to Patricia Hewitt in December 2002 and which we feel will be of interest to you at this time as the Energy White Paper is finalised.

We would be pleased to discuss the report and would be grateful for any comments you may have on its contents. Indeed any assistance you feel we may be able to give to assist your deliberations in finalising the White Paper will have our immediate attention.

We look forward to hearing from you.

Yours sincerely

Brian J Rostron Director General

Encl.

Chairman: Vice Chairman - England: Nigel Yaxley
Vice Chairman - Scotland: J Scott Brown Director General: Brian J Ro Registered in England No: 2551116

Tom Allchurch



Our Ref: BJR/5101/af 06th December 2002

Rt. Hon. Patricia Hewitt, MP Secretary of State for Trade and Industry Department of Trade and Industry 1 Victoria Street London SW1H 0ET

Dear Secretary of State

Projected Coal Burn to 2012

The coal industry has been concerned for some time that the role that coal is likely to play in meeting the nation's electricity requirements has been seriously underestimated. We believe that the energy projections in Energy Paper 68 (EP68) have given the false impression that coal burn will fall sharply and that reductions in emissions (particularly $8O_2$ and CO_2 emissions) can be achieved at minimum cost and without affecting security and diversity of energy supply. It is clearly important that the forthcoming White Paper is founded on a range of realistic and credible energy projections, otherwise it will inevitably be discredited.

The fall in wholesale electricity prices following the introduction of the New Electricity Trading Arrangements has exposed the nonsense of the dash for gas where expensive gas stations replaced lower cost coal stations in the electricity market. We note that new gas station construction has almost ground to a halt. Therefore the projected displacement of coal in EP68 is simply not going to occur. Coal burn and emission from coal-fired stations are going to be higher than those projected and used by your Departments.

To help quantify the impact of a more realistic approach, the Confederation of UK Coal Producers commissioned CLG Energy Consultants to produce projections of electricity production and associated coal burns and a copy of the report is attached for your information. The comparison of coal burn between the CLG study and EP68 is as follows:



Comparison of CLG and EP68 Coa	I Burn Projec	ctions - Mt
	2005	2010
High Coal Burn Case		1 m (36 m
CLG	46.9	47.8
EP68 CH Scenario	39.2	33.9
	A	
Low Coal Burn Case	4	-
CLG	35.0	33.0
EP68 CL Scenario	22.0	15.5

We would welcome the opportunity to take you and your experts through the CLG projections to help you appreciate that the real world is very different from EP68. Coal will play an important role in energy supplies in the 21st century. It is important that production of economically recoverable coal in the UK is maximised and that we have emission limits that are touch and achievable and permit the continued use of our indigenous coals to provide electricity at competitive prices.

Yours Sincerely

Brian J Rostron
Director General

Copy: Brian Wilson, MP - Minister of State for Energy and Construction

Joan MacNaughton)
Rob Wright) Dti
Peter Mason)

Rt Hon Michael Meacher, MP – Minister of State (Environment and Agri-Environment

Martin Williams

Michael Harryman) DEFRA

UK Electricity Market To 2012

Colin Godfrey, CLG Energy Consultants, November 2002

1. Introduction

1.1 Coal burn in the UK fell sharply through the 1990s as a result of electricity market liberalisation with a large tranche of gas fired power stations being built to replace coal units, the dash-for-gas. The deployment of renewable technologies was supported through the non fossil fuel obligation, though with limited success.

Electricity Pro	duction TV	Wh (Gross)			
	1996	1997	1998	1999	2000	2001
Nuclear	94.7	98.1	99.5	95.1	85.1	90.1
Renewables	6.0	7.4	9.2	10.2	10.4	10.1
Gas	82.1	107.5	117.8	142.9	148.2	142.6
Coal	145.8	119.8	123.0	106.2	120.0	131.4
Others	18.8	12.6	13.2	13.8	13.6	11.6
Imports	16.7	16.6	12.5	14.2	14.2	10.4
Total	364.1	362.0	375.2	382.4	391.5	396.2

1.2 Government projections in their November 2000 Energy Paper 68¹ (EP68) assume that the displacement of coal will continue through the early years of the 21st century. With the introduction of the New Electricity Trading Arrangements (NETA), the wider ownership of coal fired power stations and the associated fall in wholesale electricity prices, few new gas fired power stations are being built. Previous projections of the rapid demise of coal burn in the UK are no longer realistic, if they ever were.

2. Electricity Market Projections

- 2.1 The projections of electricity generation through to 2012 are based on standard market information and Government policy initiatives. The forecasts are consistent with outturn demands and demand forecasts from the National Grid Company Seven Years Statement². Government have targets for the installation of renewables and CHP and the forecasts assume that Government targets are achieved, though as discussed in section 4, it is hard to see such targets being achieved in the current investment climate.
- 2.2 The model deployed is a simple spreadsheet model of the electricity market. Other energy sources (nuclear, renewables, links, and CHP) are assumed to run before coal and gas stations. Under NETA coal and gas stations compete for generation dependent upon the competitiveness of each fuel source. In 2001 gas prices were high relative to coal prices and

² The forecasts assume a 2002 demand of 391 TWh (consistent with Q1 and Q2 2002) and 1.6% p.a. growth thereafter compared to a 1.9% rate of growth through the 1990s

¹ Energy Paper 68, Energy Projections for the UK, dti, November 2000

coal stations ran at higher load factors. In 2002, particularly through summer 2002, the situation reversed with gas being lower cost than coal. This limited experience under NETA³ suggests that two cases are likely to apply, a high gas price/higher coal burn case and a low gas price/lower coal burn case. This is modelled in the spreadsheet by applying a relaxation factor to the maximum output from combined cycle gas turbine (CCGT) stations of 20% and 5% respectively, consistent with recent experience.

- 2.3 The actual split between coal and gas fired stations will depend upon a number of factors including the competitiveness of fuel supply, electricity market prices, contractual terms such as take-or-pay obligations and the aggressiveness in the electricity market of the plant owners/operators at any point in time. Such contractual and financial information is commercially confidential. Fuel burns could yoyo between these cases on a year-to-year basis dependent upon the relative price of coal and gas.
- 2.4 The model assumes that new CCGT pant is commissioned to maintain plant margins at around 20% in England and Wales⁴. In the higher coal burn case it is presumed that 1500 MW of clean coal plant is installed between 2008 and 2012 associated with a desire to ensure coal burn is achieved at minimum environmental impact with a consequent reduction in new CCGT capacity to maintain the 20% plant margin.
- 2.5 The spreadsheet calculates total electricity production to meet electricity demand, transmission and distribution losses and energy industry own use. A full table of results is included in Appendix 1. Summary figures for 2005 and 2010 are:

For	ecast Gen	eration TW	h (Gross)		
	Higher Coal Case		Lower Coal Case		
	2005	2010	2005	2010	
Nuclear	85.9	61.9	85.9	61.9	
Renewable	25.6	46.9	25.6	46.9	
S					
CHP	28.0	43.0	28.0	43.0	
CCGT	129.7	142.0	160.4	180.4	
Coal	120.5	123.3	89.8	84.9	
Others	20.4	27.0	20.4	27.0	
Total	410.1	443.9	410.1	443.9	

It can be expected that the majority of CHP generation will be fuelled by gas. In 2001 gas was the fuel for 70% of CHP schemes and most CHP schemes installed in the over the last decade have been gas fired.

2.6 It is important to note that even with a massive increase in renewable generation (380% over the period) generation from carbon free sources will decline as nuclear stations

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³ NETA went live on27 March 2001

⁴ Some generators argue that lower margins are likely under NETA. The assumption of a 20% margin results in greater gas displacement of coal and lower coal burns than would occur if a lower plant margin was used.

close. Coal generation is unlikely to fall below 85 TWh unless Government implement policies to ensure its demise.

3. Coal Burns

3.1 These forecast coal generation figures convert to the following coal burn levels assuming an efficiency of 37% (in line with the UK Digest of Energy Statistics) and an average calorific value of 25 GJ/te (NCV):

Coal Burn in the UK Electricity Market - Mt				
	2000 actual	2005	2010	
High Coal Burn Case	46.2	46.9	47.8	
Low Coal Burn Case	46.2	35.0	33.0	

3.2 These projections are in stark contrast to the projections contained in EP 68, again converted to coal burn:

Comparison of CLG and EP68	Coal Burn Projec	ctions - Mt
	2005	2010
High Coal Burn Case		
CLG	46.9	47.8
EP68 CH Scenario	39.2	33.9
Low Coal Burn Case		
CLG	35.0	33.0
EP68 CL Scenario	22.0	15.5

- 3.3 Put bluntly, coal burn in 2005 cannot fall to the levels projected in EP68. The new CCGT plants that would have to be built to achieve the levels of coal displacement are simply not under construction and the current wholesale electricity prices do not support investment in new CCGT stations⁵. Coal burn in 2010 can only fall to EP68 levels if Government intervenes to restrict coal burn and erode energy diversity and security.
- 3.4 Coal production in the UK totalled 31.9 Mt in 2001 and is set to fall with the closure of Prince of Wales and Longannet collieries in 2002 and the announced closure of Selby in 2004. The coal burn projections demonstrate that there will be adequate market for all coal produced in the UK over the next decade if the coal can be produced at a competitive price and Government create a positive investment and planning environment for coal producers.
- 3.5 Imported coal will continue to have a significant role to play in meeting the needs of the nation's electricity generators. Both UK and international coal suppliers are likely to be subject to large swings in demand year-on-year dependent upon the price differential between coal and gas. This will raise particular challenges for coal producers, traders and users.

4. Sensitivities

⁵ New CCGTs would generate at around 2.1 to 2.2 p/KWh compared to baseload wholesale prices of under 1.6 p/kWh

- 4.1 The gas relaxation factors used in developing the two cases above are based on the limited experience under NETA. There is little potential upside for gas generation and the use of a zero % relaxation factor in the lower coal case would only reduce coal burn by around 4 to 5 Mt coal pa through the period.
- 4.2 The more important sensitivity is that to a higher relaxation factor that would apply if there were to be disruption to gas supply or a steep rise in gas prices. As we move towards high import dependency it is possible that either of these effects could apply for a short or extended period. The use of a gas relaxation factor of 30% in the higher coal burn case would increase coal burn by 7.5 to 10 Mt coal per annum through the period.
- 4.3 The model assumes that electricity links into the UK continue to import at 2001 levels. However if there are supply disruptions around Europe associated with expensive or unreliable gas supplies then it is likely that such an assumption is not valid. It is possible that periods of disruption/dislocation that imports of electricity from France could stop or even reverse. A cessation of electricity from France would increase coal burn by nearly 4 Mt pa.
- 4.4 Given experience in 2001 and current low wholesale electricity prices, the chances of the 10 GW CHP target being met looks unlikely. If only 8 GW of CHP commissions by 2010, still a very challenging target than coal burn could be up to 4 Mt higher per annum by 2010. Similarly renewables may fail to reach the obligation target. A 1% point shortfall in the 10% renewables target under the Renewables Obligation would increase coal burn by over 1 Mt pa by 2010.

5. Issues Raised

- 5.1 The prospects for coal look substantially better than they did a few years ago. Coal burn is likely to be at significantly higher levels than EP68 projections suggest throughout the period to 2012. It is essential that Government accept the scale of the challenges it faces in meeting conflicting energy and environmental policy objectives and assesses its initiatives and proposals against realistic energy projections.
- Unless Government intervene in the electricity market to constrain coal generation coal burn will remain in the range of 30 to 55 Mt per annum. This will challenge international and national targets on CO₂ and SO₂ reductions. Should Government intervene to force the closure of coal generation and production capacity through statute and regulatory initiatives or should they embrace coal as a part of the future supply scene and give the generation market the confidence to invest in retrofit clean up plant and new clean coal capacity? The unrealistic projections in EP68 have served to mislead Government into believing that environmental targets can be achieved at zero cost⁶. The discredited EP68 projections should be abandoned and new realistic projections produced.
- 5.3 The long awaited White Paper on Energy Policy is scheduled for publication in the New Year. The opportunity should be taken in that White Paper to set out credible energy projections that would inform the policy debate and enable the various options to be fairly assessed and costed.

⁶ Both the Revised Large Combustion Plant Directive (that is currently being implemented by DEFRA) and the Climate Change Programme have been misleadingly assessed against EP68 Projections.

- As the UK moves into a period of dependence on imported gas over the next decade, the risks of dislocation through price shocks or interruption to supply will inevitably grow. The only fuel that offers the flexibility to replace gas in the electricity market in the short to medium term is coal. Appropriate policies should be developed to maximise economic production of coal in the UK and ensure that the regulation of emissions from coal combustion are tough but achievable.
- 5.4 A large tranche of flexible coal fired capacity will be essential if the electricity network is to accommodate a significant increase in intermittent and unreliable renewable sources such as wind energy.

Appendix 1 – UK Electricity Market Forecast Results

Higher Coal Case

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Electricity Prod	uction -	TWh (Gross)								
Nuclear	88.1	87.2	86.9	85.9	81.1	79.6	71.7	63.6	61.9	48.3	43.8
Renewables	14.0	19.8	23.0	25.6	30.1	35.0	40.1	43.8	46.9	50.1	53.2
CHP	19.0	22.0	25.0	28.0	31.0	34.0	37.0	40.0	43.0	46.0	49.0
CCGT	124.4	124.4	127.8	129.7	131.6	133.5	135.4	138.2	142.0	145.2	148.5
Coal	125.1	123.5	120.6	120.5	115.9	114.3	119.0	124.4	123.3	134.5	136.8
Others	20.4	20.4	20.4	20.4	27.0	27.0	27.0	27.0	27.0	27.0	27.0
Total	391.0	397.3	403.6	410.1	416.6	423.3	430.1	437.0	443.9	451.0	458.3
Coal Burn Mt	48.7	48.1	46.9	46.9	45.1	44.5	46.2	48.3	47.8	52.1	53.0

Lower Coal Case

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Electricity Prod	uction -	TWh (Gross)								
Nuclear	88.1	87.2	86.9	85.9	81.1	79.6	71.7	63.6	61.9	48.3	43.8
Renewables	14.0	19.8	23.0	25.6	30.1	35.0	40.1	43.8	46.9	50.1	53.2
CHP	19.0	22.0	25.0	28.0	31.0	34.0	37.0	40.0	43.0	46.0	49.0
CCGT	153.2	153.2	157.8	160.4	162.9	165.5	170.5	174.3	180.4	185.6	192.7
Coal	96.3	94.7	90.6	89.8	84.6	82.3	83.8	88.2	84.9	94.0	92.7
Others	20.4	20.4	20.4	20.4	27.0	27.0	27.0	27.0	27.0	27.0	27.0
Total	391.0	397.3	403.6	410.1	416.6	423.3	430.1	437.0	443.9	451.0	458.3
Coal Burn Mt	37.5	36.9	35.2	35.0	32.9	32.0	32.6	34.3	33.0	36.6	36.1

From: Oly Jones

Date: 1

10 January 2003

PRIME MINISTER

cc:

Jonathan Powell Geoffrey Norris Jeremy Heywood Arnab Banerji

David Manning

Matthew Rycroft

LATEST OIL MARKET NEWS

OPEC acts to limit recent oil price rises, with some success. But oil prices remain fairly high and have started to affect UK forecourt prices (slightly).

Due the sustained high oil price, OPEC has agreed to a special meeting on Sunday to decide whether to increase oil production to cover the shortfall in the world market of around 2.5m barrels per day caused by the strike in Venezuela. Unless something significant happens between now and then, OPEC will probably agree a temporary production increase of around 1.5m per day.

The announcement of the meeting, coupled with good US stock data, pulled crude down from highs of around \$30 to just over \$28. However, it is unlikely that actual agreement to increase production on Sunday will greatly affect oil prices – i.e. the impact of the increase has already been factored into prices by traders.

Outlook: the oil price is being supported by a combination of the Venezuelan strike and ongoing fears about the Middle East. There is no obvious prospect of prices falling significantly until the situation changes in one of these two arenas.

It is also worth noting that spare OPEC production capacity is <u>not</u> enough to fully make up the shortfall <u>if Venezuela and Iraq stopped exporting oil at the same</u>

<u>time</u>. There is, at least, the *possibility* of this happening: if it did, prices would rise further and international action to release strategic oil stocks may become necessary.

UK forecourt prices

The high oil prices have fed through to UK forecourts. <u>Diesel and unleaded</u> petrol prices rose around 1p/l last week, forced up by 2p/l wholesale price increases in December. The average price of unleaded petrol is now 74.9p/l, and diesel is 76.3 p/l.

However, these price increases <u>eased pressure on retailers' margins</u> making further increases in retail prices less likely at this stage.

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OLY JONES





SCOTLAND OFFICE DOVER HOUSE WHITEHALL LONDON SW1A 2AU

www.scottishsecretary.gov.uk

Restricted - Policy

Rt Hon Robin Cook MP Leader of the House of Commons 2 Carlton Gardens London SW1Y 5AA

9 January 2003

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LP CORRESPONDENCE: ELECTRICITY (TRADING AND TRANSMISSION) BILL

Thank you for copying to me your letter of 3rd December about the timetabling of the Electricity (Trading and Transmission) Bill. Given the pressures on the Legislative Programme, I agree that the publication of the Bill in draft early in the New Year is the best way forward.

The new arrangements proposed by the BETTA Bill will encourage new transmission capability to be built and help support development in the Renewables sector. It is therefore imperative that we make industry aware of our commitment to this project. I therefore fully endorse Patricia Hewitt's suggestion, in her letter to you of 16 December, that a written statement outlining the timetable for legislation be issued as soon as possible.

I am copying this letter to the Prime Minister, Cabinet and LP colleagues, Sir Andrew Turnbull and First Parliamentary Counsel.

HELEN LIDDELL



OFFICE OF THE DEPUTY PRIME MINISTER 26 Whitehall London SW1A 2WH

Tel: 020 7944 8623 Fax: 020 7944 8621

Brian Wilson MP
Minister of State for Energy and Constuction
Department of trade and Industry
1 Victoria Street
London
SW1H 0ET

0) &: GN CS Q'S

S January 2003

BRITISH ENERGY BILL

You sought policy agreement in your letter to me of 13 December to a short Bill to address urgent matters arising from British Energy. This letter gives you DA clearance to proceed, subject to the views of colleagues recorded below.

A reply was received from Paul Boateng indicating his agreement to your proposals. He said that in recognition of the unique nature of the tax liability arising as a result of your restructuring proposal, the Bill should also include a provision to disregard the tax liability arising from payments under Schedule 12 of the Electricity Act 1989.

No other DA colleague commented, you may therefore take it you have DA clearance to proceed.

I am copying this letter to the Prime Minister, members of DA and LP Committees, the Paymaster General, Sir Andrew Turnbull and to First Parliamentary Counsel.

JOHN PRESCOTT

Website: www.odpm.gov.uk

Email: john.prescott@odpm.gsi.gov.uk



SCOTLAND OFFICE

Parliamentary Under Secretary of State

Dover House Whitehall London SW1A 2AU Telephone: 020 7270 6806/6741 Fax: 020 7270 6703 www.scottishsecretary.gov.uk AN OIFIS ALBANNACH

Fo-rùnaire Stàite na Pàrlamaid

Taigh Dhòbhair Whitehall Lunnainn SW1A 2AU

The Rt Hon Patricia Hewitt MP Secretary of State for Trade and Industry 1 Victoria Street London SW1H 0ET

January 2003

Doar Patricia,

KEY ISSUES FOR THE ENERGY WHITE PAPER

Thank you for sending me a copy of your letter of 20 December to the Deputy Prime Minister.

I agree that we need to move swiftly to resolve the key policy issues. I also agree with your proposal for bringing forward the debate on the nuclear issues.

It is important to get the involvement of the Devolved Administrations onto a more satisfactory footing.

In an earlier letter to Brian, I expressed my concern to ensure that the Devolved Administrations remain as fully engaged in the process and outcomes as we can possibly manage. I believe there is a need to reinforce their involvement and seek their engagement in the drafting of relevant sections of the White Paper. I therefore welcome the recommendation that the draft White Paper text is shared with them.

Both from a practical perspective, and in keeping with the spirit and the terms of the Memorandum of Understanding and the concordats between the administrations, we should aim to consult the Scottish Executive on a full draft text of the White Paper at the earliest opportunity.

It seems to us that the Energy White Paper involves by far the most complex amalgam of reserved and devolved interests we have had to deal with to date. It is therefore important that it should demonstrate the effectiveness of the co-operative relationship between the Government and the Scottish Executive.

Consultation with the Scottish Executive prior to the publication of the White Paper would of course be on a strictly confidential basis. However we have to recognise that Executive officials may need to seek the views of their ministers as appropriate on the implications of the White Paper for devolved responsibilities.

The sensitivity is heightened by the likelihood that the White Paper will be published in the run up to the Scottish Parliament elections in May. It would be embarrassing for the Government (and possibly for Scottish Executive ministers too) if the White Paper were to be seen as misunderstanding or misrepresenting the division of responsibilities under the Devolution settlement or not giving sufficient recognition to the role and contribution of the devolved administrations.

The continuing success of devolution depends in large part on effective partnership between the UK Government and the devolved administrations. I believe that there should be two objectives in relation to the Energy White Paper

- ensuring that the reserved/devolved relationships and responsibilities are correctly described in the White Paper text (bearing in mind that there are some significant differences between the position in Scotland and in other parts of the UK);
- maximising the scope for positive engagement from the devolved administrations in contributing to the delivery of the Government's overall energy policy objectives.

We will only be able to meet these if there is early consultation, on a confidential basis, with the Scottish Executive on the full text of the White Paper.

I am copying this letter to the Prime Minister, members of DA(N) and to Sir Andrew Turnbull.

ANNE McGUIRE

Best on she





Ysgrifennydd Gwladol Cymru Secretary of State for Wales

Rt Hon Peter Hain MP

Tel. 020 7270 0549 Ffon: 020 7270 0549

Fax: 020 7270 0568 Ffacs: 020 7270 0568

Our ref: POH/02/03

Draft Energy White paper

Wales Office | Swyddfa Cymru

Office of the Secretary of State for Wales
Gwydyr House
Whitehall
London SW1A 2ER

Swyddfa Ysgrifennydd Gwladol Cymru Tŷ Gwydir Whitehall

Llundain SW1A 2ER

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January 2003

I am grateful that Patricia says that she will pick up the points I made in my letter of 10 December during the DA(N) meetings scheduled to take place this month. I share Patricia's concern about limiting the White Paper to the current spending review settlements. However I am disappointed that the latest draft of the White Paper has not taken on board the central arguments about being more ambitious on renewables as an alternative to planning an expansion of nuclear. I would like to see more in the White Paper on tidal and wave power. I would like to see the references to CO capture and storage broadened and I would welcome more detail on advanced traditional cleaner coal technologies. In the section on coal mine methane I would like to see a greater commitment to exploiting these technologies. I support the proposal to share the draft White Paper with the Devolved Administrations.

As promised in my letter dated 3 January, I am writing with substantive points on the latest draft Energy White Paper and Patricia's letter of 20 December.

I am grateful that Patricia says that she will pick up the points I made in my letter of 10 December during the DA(N) meetings scheduled to take place this month. I hope that we can agree a date for our next meeting as soon as possible, and in any case before any announcements are made on any part of the White Paper.

Wales Office | Swyddfa Cymru



I share Patricia's concern about limiting the White Paper to the current spending review settlements. The Government is developing proposals for the first serious, new energy policy for a generation. Any suggestion that the proposals should be confined to current settlements undermines their importance, leaving them, as Patricia says, "simply rhetoric". Whilst I accept that there are serious implications to looking beyond current settlements, it is important that we recognise the sheer scale of the challenges the world faces. Some of those challenges – such as climate change - if not grasped soon, will lead to huge pressures being generated on future Spending Reviews. I hope that the Chief Secretary will reconsider his position on this.

However I am disappointed that the latest draft of the White Paper has not taken on board the central arguments about being more ambitious on renewables as an alternative to planning an expansion of nuclear. I agree with Jeff Rooker that security of supply and dependence on foreign imports have been given a somewhat complacent treatment – but I do not accept the argument that the public should pay a 'security premium' for nuclear. What would this cost? How could it be compared on a proper opportunity cost basis with public funding of renewables, nuclear fusion and so on?

I would like to see more in the White Paper on tidal and wave power. It seems to me that if we in the UK were to give wave and tidal power a real priority there is an opportunity for us to be a world leader and to establish intellectual property rights. We are behind the Germans on PV/solar, the Scandinavians on wind power and others on fuel cells – but wave and tidal could put us in pole position, provided we give it a real push with public funding for R&D. Up until now insufficient priority has been given to wave and tidal – there are only 4 or 5 demonstration projects, including the one at Islay. The models work, but they are insufficiently developed yet to be economic.

I would like to see the references to CO² capture and storage broadened so that they do not focus as heavily on North Sea oil wells. In addition, I would welcome more detail on advanced traditional cleaner coal technologies. Coal offers price stability over the next decade at least. By exploiting these technologies we could set an example that could be emulated by and exported to, China and India and other nations which are heavily dependent on coal and likely to become more so, dwarfting any CO² savings the UK makes. In the section on coal mine methane I would like to see a greater commitment to exploiting these technologies.



Finally, I support the proposal to share the draft White Paper with the Devolved Administrations. Not only is this in accordance with the Memorandum of Understanding but also with Jeremy Heywood's letter of 6 November. The draft White Paper encompasses the most complex combination of reserved and devolved policy issues seen to date. Involving the Devolved Administrations will both secure their early commitment to the Government's proposals and allow them to have input into the draft in so far as arrangements are different from those in England. The White Paper will be out for consultation during the run-up to the Assembly elections in May. I wish to avoid the Government, or the Devolved Administration, being embarrassed as a result of any failure to communicate effectively on these sensitive issues.

I am copying this letter to the Prime Minister, members of DA(N) and to Sir Andrew Turnbull.

The Rt Hon John Prescott MP

Deputy Prime Minister and First Secretary of State

Office of the Deputy Prime Minister

26 Whitehall

London SW1A 2WH



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You are in: Business Monday, 6 January, 2003, 10:55 GMT

Oil creeps higher despite



Striking Venezuelan oil workers blockade an oil tanker Technology

Oil prices have remained near two-year highs as a general strike in Venezuela continues to halt supplies, and despite Opec production increases due on 14 January.

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Prices shot higher last week as data from the US showed that oil reserves had fallen to near 26-year lows and over the growing prospect of a war on Iraq.

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Change to World

BBC WEATHER On Sunday, the world's cBBC news two leading oil exporters, Saudi Arabia and Russia, also agreed barrels per day... It to try to bring down the will depend on oil price.

Abdullah al-Attiyah At 1015 GMT, Brent Opec president

66 An increase could

be anywhere between

500,000 to one million

consultations

crude was unchanged at \$30.77 a barrel, just below a two-year high of \$31.05 reached on 11 September 2001 after the attacks on the US.

US light sweet crude peaked at \$33.33 in Asian trade, just below a two-year high struck on 30 December at \$33.65, after gaining more than \$1 on Friday.

Opec assurances

Oil sales by Venezuela, the world's fifth exporter, were still only 500,000 barrels per day last week as a strike to remove President Hugo Chavez entered its sixth week.

Members of the oil cartel Opec again offered

See also:

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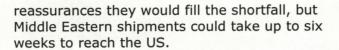
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The US, the world's largest energy consumer, usually sources 13% of its oil from Venezuela.

Unless there is a sharp fall in the oil price, Opec is due to increase output on 14 January.

War fears rise

"An increase could be anywhere between 500,000 to one million barrels per day... It will depend on consultations," Opec president and Qatari Oil Minister Abdullah al-Attiyah said on Sunday.

Saudi Oil Minister Ali al-Nuaimi and Russian Energy Minister Igor Iusufov also promised "to restore stability to the markets and make sure they do not rise to a level which could have a negative impact on world economic growth," the official Saudi Press Agency said.

Traders' fears of supply disruption have also been raised by increases in US troop numbers in the Gulf.

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MARTIN HURST JO KEY LIZ LLOYD JEREMY HEYWOOD From: Geoffrey Norris
Date: 6 January 2003

ce: Oliver Jones

Geoff Mulgan (Strategy

Unit)

Catriona Lang (Strategy

Unit)

ENERGY WHITE PAPER: PM'S COMMENTS

Attached PM's comments on the Energy White Paper. You will see he is concerned about the <u>realism</u> of achieving the changes in behaviour required to reach a 60% carbon reduction target. We will need to focus on this when we have the session with him.

GEOFFREY NORRIS

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I am v. alward about this. I toldly share two of eltine of a boy. Newschai by 2050 but two of eltine of a boy. Newschai by 2050 but as you set out, it requires the change in Brom: Geoffrey Norris Date: 20 December 2002 a rie of up to foil. in PRIME MINISTER remembles or co: Jonathan Powell Jeremy Heywood Nove. a temphilip mane multor; Jeremy Heywood Nove. a temphilip mane multor; Jeremy Heywood Nove. a temphilip mane multor; Andrew Adonis Pat McFadden Andrew Adonis of enlish elicity; a nove to planta Sally Morgan Pat McFadden Andrew Adonis of Martin Hurst (ar falls. Now all of this; May be Martin Hurst (ar falls. Now all of this; May be Martin Hurst (ar falls. Now all of this will be with expectations of the planta of the

The first readable drafts of the Energy White Paper are finally emerging from the DTI. There is still a long way to go – some quite significant policy issues are yet to be resolved, there are disputes about money and better drafting is needed. But the shape of the argument is becoming clear and the outlines of the policies needed are emerging.

Attached are the first couple of chapters of the current draft of the White Paper and a commentary on the key issues by Oliver, Jo and Martin. To flag the big issues:

Carbon reduction is at the core of the White Paper. The draft proposes that we say:

We will take measures now, and in the next few years, to put the UK on this path using our influence around the world to encourage other countries to adopt similarly challenging targets."

This isn't quite a unilateral commitment to 60%, but is quite close to being one. Is that sensible? How were commitment to 60% but is quite close to being one.

What is the cost of carbon reduction? The so-called "Markal Model" we are using to assess the economic impact of a 60% reduction in emissions suggests that the "price" would be negligible. By 2050 GDP is expected to triple, Markal

suggests that the cost of meeting 60% could be just a small fraction of that figure. Markal makes a lot of assumptions and forecasting so far ahead is fraught, but the figures look to relatively robust.

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The draft proposes that we put in place strategies to cut carbon emissions by 15-25 million tonnes by 2020. To achieve them we will need a big increase in renewables (20% of electricity generation compared with a couple of per cent today) – and that will mean a hike in electricity prices. We will also need a big increase in energy efficiency – and that will mean more regulation on building and product standards. And we will need significant cuts in emissions from transport- and that will mean much cleaner cars and starting to tackle aviation (and low fairs).

Security of supply is also a central issue for the White Paper. The basic analysis is the same as in the PIU report. The facts are that we are going to be an importer of energy and heavily dependant on oil and gas. The analysis is that we shouldn't be that worried about it – there are no big proposals to intervene in the market to "secure" reliability of supply. Our gas in the near term will come primarily from Norway and in the longer term from a variety of sources. Supply looks fairly secure, but price volatility may be more of a problem.

The future of **nuclear power** is being side stepped. The policy issue is that our present fleet of nuclear power stations has a finite life. The analysis shows that they make a significant contribution to carbon reduction, but doesn't conclusively say we need them to achieve the 60% reduction target. The draft doesn't rule out building new nukes at some point the future, but says we aren't going to build any now.

This conclusion reflects the balance of ministerial opinion. Brian Wilson and Dave King have be lone voices in arguing for new nuclear build. Margaret Beckett is stridently opposed and Patricia H is deeply uncomfortable. Larry Whitty is a nuclear sceptic, HMT (rightly) don't see how the sums add up without a big public subsidy or intervention in the market. As we step through the debris of the demise of British Energy it doesn't look credible to me for us to be saying anything more positive about new build, for now at least.

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Security of supply

The WP is clear that security of supply is the bedrock of energy policy. This must be right: ensuring the <u>ongoing physical availability</u> of oil, gas or electricity for consumers except in the most extreme circumstances – e.g. a temporary black out after a violent storm – is fundamentally important to our economy and to living standards. However, there is a second aspect to energy security: <u>access to energy at a reasonable cost</u>, that is we should not only be concerned about enough oil reaching the UK, but also that if oil cost (e.g.) \$100/bl then this would be as unacceptable as a physical shortage. In reality, high prices are linked to shortages, and so the mitigation measures are the same.

The WP follows a period in which the UK had the most diverse mix of fuel ever – coal, gas, oil electricity, nuclear, and renewables. We remain net exporters of oil and gas. However, this is set to change. We will become increasingly dependent on gas for electricity generation. We start to become a net importer of oil and gas in the next few years. And we will continue to be reliant on oil for transport for at least two decades.

However, none of this is a necessarily a problem. Only the UK and Canada in the G7 are self-sufficient. Therefore the WP – as did the original PIU energy study - currently takes a fairly relaxed view of threats to security of supply. The WP argues that there are clear risks, such as our reliance on OPEC and the relatively small number of gas import terminals, but that the nature of these risks is that the cost of the necessary steps to avoid the risks are not justified.

We think this is broadly right. There is certainly no room for any complacency, and the WP is right to say we should continue to work hard to diversify away from OPEC for oil and gas, and to diversify our fuel mix. We should also monitor carefully the robustness of the UK transmission networks, to guard against mechanical or terrorist disruption, and to ensure that adequate capacity is maintained to deal with peak demands.

In more detail:

(i) Getting oil and gas to the UK

The projections in the WP make clear that we are going to remain reliant on oil and gas for a major part of our energy needs for many decades to come.

Transport is still heavily dependent on oil. Gas heats our homes and will in time

produce the majority of our electricity. The WP notes that, as North sea production reduces, the UK becomes ever more reliant on imports - we are likely to become a net importer of gas on an annual basis by around 2006 and of oil by around 2010 and by 2020, we are likely to be importing around 75% of our energy needs.

For oil, this doesn't really change much, since it is traded on an open market and we have international commitments: only in the most extreme geopolitical circumstances would we have been able to insulate ourselves from a global shortage by refusing to sell our production onto the world market. This means our goal should still be to diversify production away form OPEC, and to work with OPEC to ensure they supply oil at reasonable prices (Oly Jones' separate note covers this area in much more detail).

Gas is more interesting, since at the moment it is regionally traded (because transmission is via pipelines rather than ocean tankers that ca travel anywhere). The WP notes that we will become increasingly reliant on three sources for the great majority of our gas: Norway; Russia and the Caspian region, and Algeria. The WP argues we need to do four things: work with these states at a political level to ensure they keep exporting; work to develop Liquid Natural Gas transport and terminal facilities so that gas becomes an globally traded commodity, so reducing our reliance on any particular source; pursue liberalisation of the EU gas market through which much of our oil will need to travel; and monitor the pipeline and terminal infrastructure to ensure the system is robust and capacity is adequate.

Again, we think this is right, although our view is that not enough attention is being paid to the geopolitics of gas given its importance, and we will look to strength this area of work.

(ii) Transporting oil, gas and electricity from ports, pipelines terminals and power stations to the consumer.

There are important domestic issues too. We do not want a repeat of the Californian power crisis in the UK. Ensuring that the infrastructure is well maintained, robust and carries adequate capacity to meet peak demand is a balancing act in liberalised markets. The WP sets out three specific risks:

- a concentration on just two gas terminals
- lack of gas storage capacity to deal with mechanical problems

 concerns over the provision of enough electricity capacity to meet the peak of winter demand

On each, the WP concludes that there is not yet a problem which merits intervention now. The market is expected to encourage greater diversity of investment gas terminals and it will be important that the market provides more gas storage as the UK's gas output falls and the ability of the UK gas fields to meet short-term periods of high demand declines in parallel. The electricity capacity margin in England and Wales is currently running at around 19%, close to historical standards of 20%. The WP rejects the case for a capacity margin instrument (CMI) to seek to secure a fixed level of capacity margin. A CMI could increase the cost to consumers by around 1% but not entirely eliminate the risk of shortfalls. The argument is that suppliers are already obliged in their license conditions to 'take all requisite steps, so far as is reasonably practicable, to secure the necessary supply of electricity'. This is backed up by the development of forward looking markets 2 – 3 years ahead, which allows companies to take action to achieve their obligations and gives a price signal about future shortages.

Nevertheless, the WP recommends that these and other domestic issues are kept under review. The regulator, Ofgem, plays a key role here. The WP is clear that the DTI/Ofgem Joint Energy Security of Supply (JESS) group, whose mandate is to monitor the market and take action if necessary, is responsible for this area.

60% target and Markal

There is a broad consensus amongst all the world's top scientists that we need to reduce carbon emissions globally by at least 60% by 2050 to prevent the most extreme impacts of climate change (for example the Intergovernmental Panel of Climate Change, the Royal Commission on Environmental Pollution, even the US National Academy of Science). If we are to take a science-based approach to policy making we have to accept this evidence. And if we are to lead, we need to take a firm position soon. The 1997 Manifesto commitment of a reduction of 20% sent a real signal to the international community.

Germany has said that they will reduce emissions by 40% by 2020, with steeper cuts by 2050, if the EU as a whole signs up to a 30% reduction target. France has said they believe a [75%] reduction in emissions by [2050] is necessary by developed countries.

The cost of achieving a 60% reduction in emissions in the UK has been estimated using the DTI's Energy Model, "Markal". Markal works by using information about the costs of particular technologies, and trend rates of growth and innovation, to plot a path of expected take-up of different technologies in the UK.

Markal predicts that we can achieve 60% at relatively low cost. The costs are estimated to be between 0.5% and 1.5% of GDP in 2050. This is roughly equivalent to delaying the UK's growth by about 6 months over the fifty-year period (against an overall tripling of GDP between now and then).

Why are the costs so small? The main reason is because the model allows the changes to take place slowly – over a fifty year timeframe - so new investment is simply built into normal investment cycles. The model also 'chooses' the cheapest technology options with perfect knowledge and foresight. Of course there is no guarantee that business or governments will be able to achieve this in practice. Having said that, the Markal results are not very different to those predicted by other (mainly US) models, which use similar assumptions.

Given the strong scientific basis, the positions taken by other countries, and the low estimated costs of taking action over the medium term, we think the EWP should commit to a UK target of a 60% reduction by 2050 and to argue internationally for others to do the same.

What does achieving a 60% target mean in practice? DTI's modelling shows that to reach 60% by 2050 at lowest cost to the economy means:

- <u>nuclear power</u> supplying between a third to a half of generation this means replacing existing nuclear power stations when they close down;
- <u>increase in renewable energy</u> to between 25% and 40% of generation (from less than 5% now);
- continuing transport growth, but a significant switch to hydrogen after 2030;
- significant increases in energy efficiency.

[nuclear. One point to mention is that the modelling shows no significant increase in costs if we do not build any new nuclear stations. But there is a significant increase in costs if we cannot build new nuclear <u>and</u> we cannot do sequestration.]

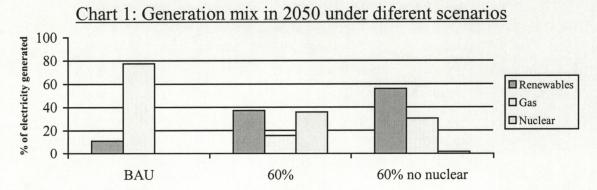
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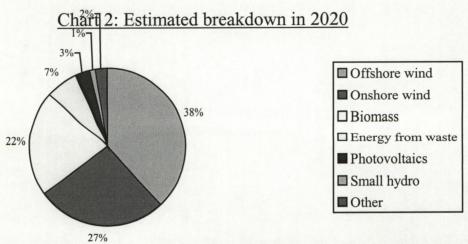
More renewable energy will be essential if we are to achieve 60%. The Energy White Paper suggests that – in addition - we adopt a target that 20% of our electricity supply come from renewables by 2020, with further increases to 2050. This is what the Strategy Unit proposed in their Energy Review.

Chart 1 below shows the contribution renewables will make to the electricity generation mix by 2050 under 1) business-as-usual; 2) with a 60% target and 3) with a 60% target but assuming no new nuclear.



As the chart shows, under business as usual, renewable energy makes up about 10% of our generation in 2050. With a 60% target, this increases to nearly 40%. But if no new nuclear stations are built, renewables take up the slack, rising to nearly 60%.

A key question is what this means in practice. Chart 2 below shows the estimated breakdown between the different types of renewable energy in 2020. As you can see, the bulk of the contribution to a 2020 target would come from wind, particularly offshore wind, with biomass also making a significant contribution.



To give you an idea of scale, this would mean around 6,000 additional onshore wind turbines, equivalent to about 300 new wind farms, between now and 2020. There are currently about 50 wind farms in the UK, so this represents a significant, but not unrealistic, increase. The first offshore wind farms are still under construction in the UK; we would have to build 100 such wind farms What about power? offshore by 2020 to meet the 20% target.

Energy efficiency

The EWP analysis shows that energy efficiency making a significant contribution - over [x]% - to meeting the 60% reduction. This equates to raising the historic rate of energy efficiency improvement from 2.1% to 2.6% per year. ongoing discussion about whether we shoul include a separate target for energy efficiency in the White Paper.

All are agreed that there is plenty of scope for improving energy efficiency. A new home in the UK uses three times as much energy as Denmark; 75% of new boilers in the Netherlands are the more efficient condensing boilers, compared to only [10%] in the UK.

But we do not have a very good record of making people improve their energy use. Exhortation is a weak tool when energy prices are at an historic low. So the EWP suggests a number of stronger measures: improving building regulations, including those for renovation; introducing energy certification for buildings; tightening standards for appliances; and boosting the Energy Efficiency Commitment (the obligation on energy suppliers to improve energy efficiency of their domestic customers). We agree that legislating to raise energy efficiency standards is the only way to achieve the kind of reductions that are necessary, but

we will inevitably run into criticisms of imposing a greater regulatory burden on we certainly will. business and consumers.

Planning

Probably the single main reason why onshore wind power in particular has been slow to get of the ground has been the difficulty of getting planning applications through, against well organised NIMBY protest. While this is most true in Wales (which has its own planning system), it has also almost certainly discouraged applications more widely. This has not been helped by the number of times MoD has protested against proposed development.

And this is not solely a problem for onshore wind. Offshore wind has suffered as well, and it is far from clear that other technologies would get a clear run.

DTI and ODPM have, belatedly started talking. And it is hoped that the new planning guidance will be much more permissive (albeit with greater restrictions in places like the greenbelt – although is even this needed?). We could say something much more positive about renewables in the green paper if these discussions bear fruit.

DTI have also had a specific idea about how to expedite planning consent for offshore wind – preidentifying designated sites. This could be a good way forward.

A final issue concerns the infrastructure needed to support new technologies. In particular, widespread take up of fuel cells vehicles may require new refuelling more likely to be a delaying than an enabling factor in achieving a decent coverage of refuelling sites, unless we explicitly tackle this. sites. Our experience with gas powered vehicles is that local planning is much



Jeff Rooker Minister of State For Housing, Planning and Regeneration OFFICE OF THE DEPUTY PRIME MINISTER

26 Whitehall London SW1A 2WH

Tel: 020 7944 3012 Fax: 020 7944 4489

E-Mail: jeff.rooker@odpm.gsi.gov.uk

Web site: www.odpm.gov.uk

29 DECEMBER 2002

CE CAN SK MH

Dear John.

Energy White Paper

I may not be able to attend meetings of DA (N) in January. I therefore write to indicate concerns on the latest version of the White Paper circulated by Patricia Hewitt on Dec 20th. These concern fairly narrow issues I have raised at DA (N) and the away day meeting.

I do not believe we have addressed the paradox of boasting about open markets and lower prices (Para1.2) of a commodity we want people to use less of. A normal consequence of lower prices is more sales, higher production, more investment etc etc. We do not want this in energy use even with renewables.

Worse still we have lower prices and excess capacity at the same time so why should anyone invest in new capacity. Yet we need the excess capacity as a national insurance to secure supply. There is a premium on this policy, which we do appear to want to pay.

In stating that energy policy has 'four goals' Para 1.6 gives the first as 'energy reliability'. I question therefore having the discussion on energy security in Chapter 8. I realise Chapter 1 is the introduction but it is the only place in 1.14 we find a specific reference to 'foreign policy'.

We tell the reader early on that the UK is to become a substantial net importer of gas (this will be new to most) then mention foreign policy and wait until Chapter 8 at Para 8.10 to point out, almost casually, that in less than 20 Years the UK will import three quarters of energy needs and by this time half the worlds gas and oil will be in countries that are currently unstable.

It is complacent in my view to shrug this off by referring to the point that most other advanced industrial countries already import significant proportions of energy (not our French cousins of course).

Para 8.14-8.16 should worry any concerned reader. There cannot be a more obnoxious set of states than those listed. I would hate to think the foreign policy implications referred to in the intro is that we ask these states to be good guys. What if they say, "You want our energy – well pay for it and mind your own business at how we run our country? If you don't like it go somewhere else!"

This ramble has a purpose. We are leaving ourselves open to blackmail on political or economic grounds in a way, which has never occurred before.

This is why I can get depressed at the sometimes-hysterical opposition to the mere mention of nuclear power I have heard at DA (N). I have always been agnostic on the nuclear issue believing as the late Norman Atkinson MP used to say we could engineer solutions to the problems over time. (Both being engineers we would say that). Mind you I said many a time to Jack Cunningham when I was on his team in opposition and the nuclear Minister at MAFF that we should have shut down the MAGNOX reactors long ago. They are crude and so far past their design life it has to be a worry.

I therefore want to make it clear that I support the thrust of Chapter 6 and would not want to see this watered down. Keeping our skills is a big issue and it is not just the technical skills. You only have to recall that the last person to order a nuclear station in the UK was Tony Benn to realise our commissioning skills in ordering plant are historical.

Opponents of nuclear energy have misused the 'waste issue'. It almost seems like a conspiracy, i.e., 'don't deal with waste and we can always say no more nuclear because of the waste'. The white paper needs to be more positive on this issue.

The idea mooted in Para 1.25 that the private sector is free to bring forward nuclear build is almost laughable. Why should they? Over capacity, low prices and an open market put paid to that. We do not appear to have a financial mechanism to secure the over capacity we need for insurance from breakdown of supply from these unstable states without forcing firms into bankruptcy. Somewhere there has to be a security premium and we should be prepared to pay it.

Of course if we were to begin to raise our eyes over the horizon of two decades and many spending rounds to get ourselves secure with renewables it would be different but Paul Boating's letter of 17 December seems to have closed the door on this. Should we do this?

In short I would rather pay to protect a new generation of nuclear stations and pay to deal with waste than put the nation at risk. It is a lot easier to protect what is in the UK than pipes across the parts of the globe most people have never heard of other than in respect of conflict.

I am copying this letter to the Prime Minister, members of DA (N) and to Sir Andrew Turnbull.

JEFF ROOKER



HM Treasury, I Horse Guards Road, London, SWIA 2HQ RESTRICTED - POLICY

The Rt. Hon. Robin Cook MP Leader of the House of Commons and President of the Council 2 Carlton Gardens London SW1Y 5AA 05

December 2002

ELECTRICITY (TRADING AND TRANSMISSION) BILL - BETTA

- 2. I have seen your letter of 3 December, and Patricia Hewitt's letters of 19 November and 16 December on the Electricity (Trading and Transmission) Bill.
- 3. I appreciate the growing pressures on the current Parliamentary session and that as a result it may be difficult to accommodate the Electricity Bill in this session's programme. But I also agree with Patricia that it is very important to maintain momentum on the BETTA proposals and that this commitment must be clearly signalled to industry and other stakeholders.



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- 4. I am therefore prepared to see the Electricity Bill delayed but emphasise that we should manage carefully the presentation of any slippage. I would particularly support publishing the draft Bill in January, giving the Bill the best possible chance of early enactment. I would also firmly support a strong public statement along the lines proposed by Patricia, to help affirm our commitment to extending the benefits of NETA across Great Britain.
- 5. Finally, I reiterate the importance of forthcoming DTI legislation establishing the Liabilities Management Agency. I trust that the delay of the Electricity Bill will not impact on LMA legislation, which is at a reasonably advanced stage and is planned for introduction in the next parliamentary session.

6. I am copying this letter to the Prime Minster, Cabinet, LP colleagues, Sir Andrew Turnbull and the First Parliamentary Counsel.

PAUL BOATENG

The Rt Hon Patricia Hewitt MP Secretary of State for Trade and Industry

The Rt Hon John Prescott MP
Deputy Prime Minister and
First Secretary of State
Dover House
Whitehall
LONDON
SW1A 2AU

20 December 2002



Secretary of State Department of Trade and Industry

l Victoria Street London SW1H 0ET

Direct Line 020 7215 6272

DTI Enquiries 020 7215 5000

URL http://www.dti.gov.uk.
e-mail mpst.hewitt@dti.gsi.gov.uk

OJ

C: GN

Da John,

We are now in the final stages of producing the energy white paper. I attach the latest draft, which has moved on significantly since the last version circulated to you a few weeks ago. I am circulating this now so that we can return in the New Year swiftly to resolve the key issues.

There are four key issues I would like to raise. First a word about **timescales**. As we discussed at our recent meeting, there is a significant link between the publication date of the white paper and the decision of the British Energy bondholders on the proposed restructuring plan for the company, which is due on 14th February. Legally, it is important that they are aware well in advance of any significant policy developments that might affect that decision. A letter will follow setting out the detailed implications for policy decisions and announcements.

To deal with that sensitivity, I propose to make an announcement or stimulate a debate in the House as soon as possible in January on the nuclear elements of the White Paper. This will precede the publication of the white paper, but I am advised that this is the only legally sound course. It will also help to ensure that, when the White Paper is published, what it says on nuclear will not be the main focus of attention.

More generally on timescales, the white paper needs to be laid before Parliament. Parliament will rise for the mid-February recess on 13 February and return on 24 February. This therefore points to our aiming for publication after the House returns on 24 February. That will be a little over a year after the PIU report. There would therefore be presentational advantage in publishing the white paper quickly after Parliament has returned from the recess.

A number of **policy issues** remain to be finally decided, partly as a result of the difficulties in arranging meetings of DA(N) in the last few months. The draft includes text on these issues which will be specifically discussed in January. They are:





i) Nuclear (chapter 6)

ii) Energy Efficiency (chapter 3); and

iii) Combined Heat and Power (in chapter 4).

In addition, we need to reach firm conclusions on the role of OFGEM. I will bring forward proposals on this early in the New Year.

The Cabinet Office are arranging two more meetings of DA(N). We will need at least three weeks between agreement of the final text and publication. If we are to publish in the week beginning 24 February, we will need to have made all the major underpinning decisions and have finally settled a draft by the end of January. These meetings will also pick up the points made by Peter Hain on an earlier draft of the white paper (his letter of 10 December).

Thirdly, I have seen the recent letter from the Chief Secretary to the Treasury, and wanted to take this opportunity to respond to some of the important points he makes on targets and resources. The Chief Secretary makes the point that we should not undermine our long-term approach to climate change by binding ourselves multiple targets in the interim.

As you are aware, a key starting point for the white paper is that we will accept the RCEP's recommendation that the UK puts itself on a path to 60% cuts in carbon dioxide emissions by 2050. DA(N) has already agreed that this should be an objective, and that we should work hard to ensure similar commitments from other countries. We will lose the opportunity to take a lead here if we couch this commitment publicly with heavy caveats. But clearly, if we were to find we were jeopardising our competitiveness in practice, we would need to review this target. But if it is to be meaningful, we also need to make a firm commitment to take credible measures now to put the UK on a path towards a 60% reduction by 2050.

This means that the White Paper <u>must</u> set out ambitious interim targets on energy efficiency and renewables, and the measures to deliver them. To do otherwise will severely test the credibility of our long-term goals. There remains great potential for energy efficiency to deliver carbon and economic savings, but that potential needs to be unlocked. We need new measures to do so. On renewables, we need to overcome barriers to our current 10% target, and signal readiness to move to higher targets in future. I believe we should base our policies on the PIU's recommendation of a 20% level of renewable electricity by 2020.

The Chief Secretary also asks that all references to expenditure that could not be met from within Department's existing spending review settlements be removed from the white paper, along with all references to possible spending allocations in the next spending review. Details of the price and cost impacts of the proposals in this draft have already been shared at official level.

I agree that we need a serious discussion about where the funding for the white paper measures will come from. But I believe our commitments will appear empty if we are not prepared to back them with new funding. In some cases, this may involve expenditure funded via energy bills, as with the current renewables obligation. In others, though, there will be a need for direct public expenditure. Some new measures now – for example, on capital grants for renewables, on energy efficiency, on local community projects, and on carbon sequestration – will show we are serious



about our goals. I also believe it is important to signal that we are prepared to act in these areas in later Spending Reviews. Without some new commitments, our energy policy will be seen as simply rhetoric.

As you know, I intend to table a paper on costs and commitments at the next meeting of DA(N). I do not agree that we should pre-empt discussion of that paper by removing all references to spending that might be beyond the scope of Departments' agreed spending review settlements. However, all such references are placed in square brackets within this draft, so that colleagues can judge the likely impact of their deletion.

Fourthly, DA(N) members will have seen the paper that was due to be tabled at the meeting that was scheduled to occur on 11th December on what we could share with officials within the **Devolved Administrations**, in line with our memorandum of understanding with them. As that paper noted, it is clearly important that the interests of the devolved administrations in Scotland, Wales and Northern Ireland are fully reflected in the final text of the White Paper. The White Paper team have already had a number of bilateral meeting with officials from the DAs, and those officials have also been closely involved in drawing up proposals in areas where powers are devolved – for example, energy efficiency.

But the devolved administrations, as well as officials in the Scottish and Welsh Offices, have stressed that this consultation can only be effective if the draft White Paper text is shared with officials in the devolved administrations. I would be grateful for your views on this, and the views of other recipients.

I am copying this letter to the Prime Minister, members of DA(N), and to Sir Andrew Turnbull.

PATRICIA HEWITT

Please note that this should inly he treated as an official - level draft.

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ENERGY WHITE PAPER

LOW CARBON ENERGY FOR A SUSTAINABLE FUTURE

Version 5.2 as at 20 December 2002

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Executive Summary

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Chapter 1: Introduction and Summary

- 1.1 Energy affects everyone. We expect it to be around when we need it literally at the flick of a switch. We expect it to be available at an affordable price. Whether for heating, cooking, lighting, powering computers, powering industry, fuelling transport, or as a raw material secure, affordable energy is fundamental to the economic and social well being of people and businesses throughout the UK. Energy policy is also the cross-roads where people's daily lives meet urgent global challenges climate change, international security and economic competitiveness.
- 1.2 Until the 1990s, the energy system in the UK and most other countries was largely owned and controlled by government. Today, the UK has one of the most open energy markets in the world. That has brought real benefits, including lower prices and better customer service and choice. But it also raises new questions: will our energy markets deliver the UK's environmental goals? Do they offer the right incentives for the long-term investment that energy systems need? Are recent company failures just the normal operation of the market, or a sign of deeper problems?
- 1.3 In this White Paper we examine our framework for energy policy and set out the changes needed to ensure we can meet these larger challenges while continuing to provide people and businesses with safe, reliable and affordable energy.
- 1.4 In future, our energy policy will be conducted in a much more international context. The EU is increasingly important in energy and environmental policy. Our businesses operate in international markets. The UK will become a net importer rather than exporter of energy. We are likely to face tougher climate change commitments, negotiated internationally. And we shall need international collaboration to promote the innovation required to develop new technologies to help us achieve carbon emission reductions. The policies set out here demonstrate our willingness to take a leading international role.

Our goals

- 1.5 Our energy policy has four goals.
- 1.6 First, to achieve **energy reliability**, so that people and businesses can rely on secure supplies of energy, gas, fuel and electricity at predictable prices delivered through the market. Reliable energy supplies are an essential element of sustainable development.
- 1.7 In a wealthy country like Britain, we take it for granted that we will have safe and reliable energy. Only when something goes wrong for instance when thousands of families in the East of England were left without heating and light after severe storms, or when the lights went out in California do we realise how much modern, industrialised counties depend upon an extremely complicated energy system. We need to ensure that this system supplies the power we need.
- 1.8 Second, to achieve **competitive energy prices**. Having access to energy supplies is of little use if the price is too high. It is important for our economy and for our productivity that that the cost of energy does not threaten the overall competitiveness of UK business or discourage inward investment. Equally it is important to business and consumers generally

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that energy for manufacturing processes, heating, lighting, cooking, powering IT and so on, is affordable.

- 1.9 Third, we use energy policy to achieve our wider **social objectives**. We can shape the market to help us achieve our aims as a government in areas such as poverty reduction and employment through such measures as fuel poverty policy and the promotion of training and skills.
- 1.10 And fourth, we want to use our energy policy to achieve our environmental goals.
- 1.11 These objectives need to be achieved simultaneously. We are not prepared to compromise on any of them. We believe this can be done, and that in so doing energy policy will in future play a significant part in achieving the government's overall goal of sustainable development. We aim in this way to make social progress that meets the needs of everyone, effectively protects the environment, uses natural resources prudently and maintains high and stable levels of growth and employment.
- 1.12 In many cases the objectives can reinforce each other. For example, improving the efficiency with which we use energy will reduce greenhouse gas emissions, help those in fuel poverty, cut energy bills for businesses and households, and support energy security by reducing demand. And other measures, such as those to encourage renewable energy, can help create new markets and new industries, alongside environmental and energy security benefits.

... progress so far ...

- 1.13 We believe that our actions to date as a government have lead to some success in the achievement of the first three goals. Where further measures are needed to ensure our success is consolidated in future years, these are proposed in the chapters that follow. In summary:
- 1.14 Reliable energy supplies. In the short-term we already have sophisticated mechanisms in place to ensure that the lights stay on and that gas supplies are uninterrupted. We legislated in 2000 to ensure that is the case, by giving the regulator the primary duty to ensure safety of supply. Where problems occur they are the exception rather than the rule, and tend to be quickly resolved. In the long-term there is an understanding that we are likely to become a substantial net importer of gas, and this will have implications for our foreign policy. We need to reassure ourselves that we have the put in place mechanisms to avoid any potential interruptions to supply. Chapter 8 sets out measures to reinforce this.
- 1.15 Competitive energy prices. The UK already has one of the most competitive energy systems in the world. For industrial users, real electricity prices fell by 25% between 1996 and 2001. Domestic customers are now able to choose their electricity and gas suppliers. So successful has our policy been that the European Union as a whole has decided to follow the UK's example, agreeing in November 2002 to liberalise energy markets across the Union. We believe our policies have been a success and consequently are not proposing any major reform to the liberalised, competitive energy market that we have at the moment. The changes that are required are discussed in chapter 10.
- 1.16 Social objectives/fuel poverty. Most of us take for granted being able to turn the lights on and keep our homes warm. But some people can't afford to meet even their basic **RESTRICTED**

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energy needs. We need to ensure that as we address the security, environmental and competitiveness aspects of energy policy we also take account of social impacts, especially on the poorest. The UK Fuel Poverty Strategy sets out the policies to end fuel poverty in vulnerable households by 2010.

Our environmental objective

- 1.17 The quality of the environment has always been important to us. But we now believe we can achieve a step-change in how we use energy to benefit the environment in which we live, and contribute markedly to our overall objective of sustainable development in Britain.
- 1.18 Climate change is now a reality. It brings the threat of temperature increases, drought and flooding which will harm people's health and way of life, and rising sea levels which threaten the existence of some small island states and put millions of people at risk. And the first effects will be felt by countries that are least able to deal with them.
- 1.19 But it does not have to be like this. The worst effects of climate change can be avoided if concentrations of greenhouse gases in the atmosphere are stabilised. That requires international action to cut global emissions well below current levels. Already policy-makers around the world have begun to respond to these challenges. The agreement at Kyoto demonstrated it is possible to reach a global agreement although, as we have also seen, it requires political will to put that into practice.
- 1.20 This government possesses that political will. It is time to put climate change at the heart of our energy policy. This white paper explains how we put that commitment into practice.
- 1.21 Our starting point is that we accept the recommendation of the Royal Commission on Environmental Pollution that the UK should put itself on a path towards 60% reductions in carbon dioxide emissions, from 1990 levels, by 2050. We will take measures now, and in the next few years, to put the UK on this path using our influence around the world to encourage other countries to adopt similarly challenging targets.
- 1.22 On the basis of current policies, we would expect UK carbon dioxide emissions to amount to some 135tC in 2020. Our aim is to put in place strategies that would reduce that by some 15-25mtC by 2020. This will put us on track to a 60% cut by 2050.
- 1.23 It is our view, based on the analysis we have undertaken, that it is possible to achieve our 2020 goal by reducing the amount of energy we consume, combined with a rapid acceleration in electricity generation through renewable energy. That is a hard task but it is our preferred option. We believe that by making our intentions clear we not only provide the signals that are needed for firms to invest but we also ensure that British manufacturers are ahead of the game in developing the green technologies that can play such a large part in our future prosperity. The policy measures we outline in chapters 3-5 of this white paper put forward our proposals in this area.

A role for nuclear?

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- 1.24 Projections over an 18-year time period, are, however, inevitably uncertain. We have therefore considered carefully whether there is a need for action now to encourage building of new nuclear power stations to help deliver our carbon reduction and security objectives by 2020.
- 1.25 We do not believe that there is currently a case for Government to put measures in place to support the building of new nuclear power stations now. The private sector remains free to bring forward proposals for new nuclear build, and we will not stand in their way. Nuclear generation will also benefit from the introduction of the European emissions trading scheme.
- 1.26 But we need to keep the situation under review, and be able to respond if, in future, it appeared more likely that further Government support for nuclear power would be needed to deliver our overall objectives. It would be unwise to rule out new nuclear build entirely as a means to deliver carbon reduction and energy security objectives.
- 1.27 New nuclear power could not suddenly be brought on stream. It could take around 15 years to approve, construct, and commission nuclear power stations. We will therefore take steps to ensure that the framework for regulatory and planning approvals would permit investors to bring new nuclear plant on stream, in the second half of the next decade, if it proved necessary to do so. Chapter 6 sets this out in more detail.
- 1.28 We would not expect to take a decision on whether to give more proactive support or resources to support new nuclear build before around 2006/07, by when progress on renewables and energy efficiency, and on potential long-term solutions to nuclear waste, will be clearer. If we reached a view that new nuclear build was necessary to deliver our energy policy objectives, we would publish a further White Paper, setting out the case, before taking action.

A role for coal?

- 1.29 In a low carbon economy, the future for coal must lie in cleaner coal technologies and carbon capture and storage. For coal to play more than a marginal role in the energy mix beyond around 2015, ways need to be found cost-effectively to handle deal with its carbon emissions. If this could be done, keeping coal-fired generation in the fuel mix would offer significant security and diversity benefits.
- 1.30 One option is to capture and then store the CO2. The most promising approach at present would be to lock the gas away in geological structures such as depleted oil and gas fields. The UK North Sea offers a potentially very valuable resource in this respect. Chapter 7 examines this in more detail.

Conclusion

1.31 We believe the changes we outline in this white paper will take us to a very different energy system by the end of the next decade. That is our intention. Large scale generation will increasingly be replaced by distributed generation. Carbon emissions will be reduced through renewable technology and energy efficiency. Policy will be even more international. Our vision of the energy system of the future is laid out in our concluding chapter, which also

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describes the institutional changes within government that we believe are required to achieve it. Our aim is a low carbon economy, where prosperity and sustainability go hand in hand.

1.32 Many policies in this White Paper cover the UK as a whole. However, significant aspects of energy policy in Northern Ireland, Scotland and Wales are the responsibility of the devolved administrations, so that decisions are made in light of each country's particular circumstances. Where matters are devolved, the White Paper focuses on measures in England, but some references are included to related policies in Northern Ireland, Scotland and Wales. The Government will be keen to work with the devolved administrations in addressing the energy challenges that we all face.

Consultation

- 1.33 Many of the policies set out in this white paper take as their starting point the Energy Review published by the Cabinet Office's Performance and Innovation Unit (now the Strategy Unit) in February 2002. In publishing the review, the Prime Minister said that he wanted to launch a thorough debate on the issues it raised. In February 2002 the Trade and Industry Committee published a report on Security of Energy Supply and the House of Lords Select Committee on the European Union published a report on European energy issues (Energy Supply: how secure are we?). The Committees' recommendations have been taken into account in drawing together our conclusions in this white paper.
- 1.34 In response, we launched a major stakeholder and public consultation in May 2002. This:
 - stimulated a wide range of workshops, meetings, conferences and seminars, some run by stakeholders, some run by government departments and other public bodies;
 - prompted over 2,500 written submissions to the team working on the white paper;
 - launched a wide reaching and innovative public consultation process, commissioned by the DTI, involving focus groups, deliberative workshops, outreach to school students, and a web-based questionnaire;
 - provided the basis of a web-based stakeholder debate.
- 1.35 In total, over 6500 individuals and groups have made an input to the consultation. This represents the most significant consultation on energy policy ever undertaken in the UK. It has provided an immensely rich source of views and information to help guide the development of policy options. We are very grateful to all those who participated in the consultation.
- 1.36 Most of the material submitted to the white paper team is on the DTI's website (at www.dti.gov.uk/energy/developep/pub_con_rep.shtml). Only where those submitting information asked for it not to be made publicly available has the material not been put on the website. In addition, the website includes summary reports on many of the meetings held by various bodies, and of both the stakeholder and the public consultations.
- 1.37 In parallel, the DTI and other government departments have undertaken a significant programme of analytical work to inform the work on policy options. Much of this work has been carried out by expert groups outside the government. It has wherever possible been peer reviewed either formally (eg through the Government's Energy Advisory Panel) or

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informally, for example by making the material available through the internet for comment. All the relevant outputs from this work are available on the DTI website (web reference, as above).

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SECTION ONE: CREATING A LOW CARBON ECONOMY

Chapter 2: The environment

... climate change is happening ...

- 2.1 There is now strong scientific evidence that climate change is happening and that it is being accelerated by human activity. The world is getting warmer. The earth's temperature rose by 0.6°C during the last century, and is forecast to rise by about 3°C during this century. The 1990s included seven of the ten warmest years on record and 1998 was the warmest year in a 140 year record.
- 2.2 There is increasing evidence that this is the result of an increase in atmospheric concentrations of greenhouse gases notably carbon dioxide released by burning of fossil fuels such as coal, oil and gas. By absorbing heat, these gases keep the earth's temperature warmer than it otherwise would be. As greenhouse gas concentrations rise well above their natural levels, the additional warming that will occur could threaten human society.
- 2.3 Climate change research has looked at how far changes in temperature over the past century are due to human activities. Natural effects, such as variations in the sun's output and volcanoes, are insufficient to account for the observed warming, which can only be explained by greenhouse gases from human activities.
- 2.4 The rate at which the climate is changing will affect the world in extreme and unpredictable ways. Its impacts include:
 - temperature increases, drought and flooding which affect people's health and way of life, and cause the irreversible loss of many species of plants and animals;
 - rising sea levels which threaten the existence of some small island states and put millions of people at risk;
 - in the UK, rising sea levels threaten our coastal communities and environment; higher temperatures, increased and more intense rainfall will bring droughts and flooding.

[Include diagrams of historic emissions and of potential impacts]

- 2.5 We cannot avoid some climate change. Greenhouse gases which have already built up in the atmosphere mean that some temperature rise is inevitable. But the worst effects of climate change can be avoided if concentrations of greenhouse gases in the atmosphere are stabilised, rather than increasing as they are now.
- 2.6 There is as yet no international consensus on the level at which concentrations of greenhouse gases should be stabilised. But in 1997 the EU member States agreed that we should be aiming for a level below 550 parts per million (ppm) of carbon dioxide (CO2) about twice the pre-industrial concentration to prevent the most damaging effects of climate change.

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- 2.7 Even at this level, there will be negative impacts¹. The majority of the world's population are likely to experience some consequences. At the upper end of the possible temperature rises, there would be severe impacts on natural systems and on all sectors of society, a significant increase in extreme climatic events and a high risk of major geographical changes in ice sheets or in ocean currents. Higher concentrations would be likely to pose even greater risks.
- 2.8 If we are to stabilise CO₂ concentrations in the atmosphere at 550ppm, global emissions will need to drop well below current levels. Action needs to begin now, because of the scale of change required and because gases emitted now will affect the climate for decades or centuries to come.

... and has prompted a global response ...

- 2.9 Climate change is a global problem. It requires a global response. Working together we can solve this problem. Already, policy-makers around the world have begun to respond to these challenges. The UN Framework Convention on Climate Change (UNFCC) and the Kyoto protocol are the starting point for international efforts to cut emissions.
- 2.10 The UNFCC aims to prevent dangerous man-made climate change. Developed countries agree that they should take the lead in tackling climate change, and the Kyoto Protocol set legal targets for them to reduce greenhouse gas emissions by around 5% of 1990 levels in the period 2008-2012. To help meet targets, countries can use international emissions trading or receive credits for reductions achieved by supporting projects in developing countries. Discussions on action beyond 2008-12 must begin by 2005. In the long term, developing countries are most at risk from climate change and need to be helped to become a part of the global response to it.
- 2.11 The UNFCC demonstrated it is possible to reach global agreement on the nature of the problem. But it requires political will to put the solutions into practice. This government possesses that political will. It is time to put climate change at the heart of our energy policy. That is what we propose to do.
- 2.12 The quality of the environment has always been important to us. But we now believe we can achieve a step-change in how we use energy to benefit the environment in which we live, and contribute markedly to our overall objective of sustainable development in Britain.

... so we must act ...

- 2.13 Our starting point is that we accept the recommendation of the Royal Commission on Environmental Pollution that the UK should put itself on a path towards 60% reductions in carbon dioxide emissions, from 1990 levels, by 2050 and we will work actively with others to encourage them to adopt similarly challenging aims. We will take measures now, and in the next few years, to put the UK on this path. This will now be a fundamental goal of our energy policy.
- 2.14 We can get to a 60% cut in emissions by 2050 in a number of ways. But leaving action until the last minute is not a serious option. Carbon dioxide stays in the atmosphere

¹ Based on conclusions of the Third Assessment Report of the InterGovernmental Panel on Climate Change, 2001

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for many years. If action does not begin now, more dramatic and more disruptive change would be needed later on. We need early, well-planned action to provide a framework within which businesses - and the economy generally - can adjust to the need for change. This will for example allow business to plan to act in the course of normal capital replacement cycles. It will also encourage new technologies to come forward to meet the challenges we face.

- 2.15 To be consistent with our longer term aims, we need to plan to reduce greenhouse gas emissions beyond the level we already expect to reach at the end of the first Kyoto commitment period (2008-2012). On the basis of current policies, including the full impact of the climate change programme, we would expect our carbon dioxide emissions to amount to some 135 mtC in 2020. Our aim is to put in place strategies now which will reduce that by some 15-25 mtC in 2020. This will put us on track to reduce our carbon dioxide emissions by 60 per cent from 1990 levels by 2050.
- 2.16 If we are to cut emissions this much, we will need to achieve a fundamental long-term shift in the way energy is supplied and used. Already we have decoupled economic growth from carbon emissions. Over the last 20 years, the economy has grown by X, energy demand has grown by Y, yet carbon emissions have fallen by Z.
- 2.17 In order to achieve our aims we must accelerate this trend. If the UK economy were to grow at an average of 2.25% a year between now and 2050 it would be three times as large then as it is now. Reducing carbon emissions to around 83 million tonnes (mtC), 60% of the 1990 level²] in the same period would require an x fold improvement in the ratio between emissions and economic output. We will achieve this by raising the resource productivity of our economy producing more with less pollution.
- 2.18 Table a, below, shows how cuts of between 15-25 mtC by 2020 can be achieved. Some of the policy framework is already in place. The additional steps that are needed are set out in more detail in chapters 3-5 of this white paper. These are not precise targets the balance of measures could change somewhat to reflect, for example, technological innovation. But they indicate the scale of reduction we are expecting to achieve from various measures.

Table a: Measures to reduce carbon emissions to 2020

	estimated mtC reductions
Energy efficiency in industry and commerce	[around 5]
Energy efficiency in households	[around 5]
New voluntary agreements on vehicles	1.6 - 2.8
Biodiesel and bioethanol for road transport	around 1.2
Increasing renewables to 20% of generation	[around 4]
EU carbon trading scheme	[around 4]
Total	20.8 - 22

² 1990 emission levels are currently used as the baseline for the Kyoto protocol and for the UK's own domestic goals

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... maintaining our competitiveness at the same time ...

- 2.19 We have analysed carefully the likely impacts on the UK economy of cutting emissions by 60% by 2050. A good deal of caution needs to be exercised in looking at economic changes over such a long period. But an extensive review by the Intergovernmental Panel on Climate Change suggests that action aimed at stabilising carbon dioxide atmospheric concentrations at 550ppm would lead to an average global GDP loss of around 1.5% in 2050. This outcome of our UK analysis is consistent with that review. It suggests that, while there are likely to be some costs, the overall impacts over 50 years need not be prohibitive.
- 2.20 Moreover, the more other countries commit to move in the same direction, the less direct impact there will be on the UK. These impacts need to be monitored and managed, both across the economy and sector by sector. And there will also be some economic benefits, for example through increasing energy efficiency or through enabling UK firms to benefit from new opportunities in manufacturing, servicing and exporting lower carbon and renewable energy technologies. We will ensure that the Department of Trade and Industry continues to work closely with businesses to develop strategies to enable them to adapt to, and as appropriate exploit, these changes.

Analysis and modelling work

The Department commissioned Future Energy Solutions to use the MARKAL energy model to look at the costs of substantial CO₂ reduction by 2050. MARKAL is a 'bottom-up' model of the UK energy system which chooses, subject to constraints imposed on emissions, the least cost technologies to meet assumed energy demands.

The results reflect the assumptions - on technology availability and costs - that are made in the model. The assumptions used, however, reflected expert opinion, informed by workshops with industry experts.

The work did not seek to create a single view or forecast. Rather, a wide range of sensitivity analyses was carried out to assess which technologies and measures might be crucial to minimising the costs of emissions reduction, and to assess how costs change if assumptions are varied. The analyses covered business as usual cases as well as reductions in CO₂ of 45%, 60% and 70% by 2050.

For most analyses the cost of reducing CO₂ emissions by 60% by 2050 was in the range £200-300/tC. GDP in 2050 was reduced by 0.5-1.5%, equivalent to an average annual reduction of between 0.01 and 0.02 percentage points from a business as usual GDP growth rate of 2.25% per annum.

Higher costs resulted if innovation in low carbon technologies was limited, if energy efficiency improved only in line with past trends, or if certain technologies (new nuclear build and carbon capture and storage) were completely excluded in the longer term.

Full details are at [website reference]

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- 2.21 Against this background, we take the view that the potential consequences of climate change are so severe that, within a policy framework that keeps costs to a minimum, we should take steps ourselves, and work closely with other countries, actively to reduce our greenhouse gas emissions.
- 2.22 The UK cannot solve this global problem alone. UK emissions of carbon dioxide currently account for only about 2% of the global total. Our own actions will have no impact on climate change unless they are part of a wider, concerted international effort. A wider effort is also necessary, for example in bringing forward technological changes, to keep down costs to the UK and to avoid disproportionately compromising our competitiveness. We will continue to work very closely with other countries to establish both a broader consensus around the need for change and firm commitments to take action to reduce carbon emissions worldwide within the framework of the Kyoto protocol. A key objective of the UK's foreign policy will be to secure international commitment to the same targets as we ourselves have set.
- 2.23 Some countries, including some of our larger European partners, are already moving in this direction. We need, with them, to lead others internationally. It is clear that substantial cuts are needed in the longer term. Delay will only compound the problem. We therefore believe that the time is now right to reinforce our commitment to the achievement of significant long term cuts in emissions in the UK.

... within a clear long-term policy framework ...

- 2.24 To deliver these outcomes, we need to provide industry with a clear and stable policy framework. In practice, we need a mix of measures, including fiscal and regulatory instruments. But we are seeking a framework which, as far as possible, simplifies the mix of measures and reflects the cost of environmental damage from carbon emissions. This will give the market the flexibility to determine the best way to reduce carbon emissions, and drive action on both the demand and supply sides of the economy.
- 2.25 On 9 December 2002, the European Union Council of Ministers reached initial agreement on a new European carbon emissions trading scheme. This is expected to begin in 2005. From the outset, it will cover CO2 emissions from heavy industry, generators and refineries. In the scheme, each participant will be set a cap a target level of emissions. Each will then receive tradable allowances equal to its cap. To comply with the scheme, each participant must hold allowances at least equal in number to its emissions. Participants will therefore have three choices:
 - meet their cap by reducing their own emissions:
 - · reduce emissions below their cap and sell or bank the excess allowances; or
 - let their emissions remain above their cap and buy allowances from other participants.
- 2.26 The best strategy for each participant will depend on the price of allowances in the market compared to the costs of reducing their own emissions. In this way, emission reductions will be achieved at minimum cost across the European Union.
- 2.27 We will make new trading scheme a central plank of our future emissions reduction policies, through which the traded carbon market can set a signal for the

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value of carbon reductions in the economy. It will be a mechanism for delivering part of the carbon savings we need to make, perhaps [around 4] MtC by 2020. We will continue to work proactively with the European Commission, European Parliament and other member States to secure detailed plans for the implementation of the scheme which help to deliver this aim, in particular to encourage its harmonised expansion throughout the EU.

2.28 But emissions trading will not, on its own, be sufficient to deliver the carbon reductions that we need to achieve. Other measures will continue to be necessary, as described later in this white paper. But wherever possible, we will link those measures to the carbon trading scheme to establish a means through which a common Europe wide value can emerge for carbon savings, enabling business and consumers to choose themselves how best to achieve their economic and commercial aims against that background. This will include the need for transitional arrangements from the existing UK emissions trading scheme and from the existing Climate Change Levy regime. We will come forward with appropriate proposals on these arrangements in due course.

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Chapter 3: Securing our objectives through energy efficiency

3.1 Greater energy efficiency has an important contribution to make to our aim of reducing carbon emissions. This chapter sets out existing and new measures that will deliver around 10 mtC by 2020³ over "business as usual" projections. Approximately half the gains will come from housing and the other half from business and the public sectors.

... greater energy efficiency will save carbon and improve security ...

- 3.2 Only a relatively small part of the total energy we consume is put to effective use. Power is lost in electricity generation, transmission and distribution; there are inefficiencies in end use (e.g. in lighting, cooling, heating). Many car engines in use today are far less efficient than the best available on the market.
- 3.3 Over the last 30 years, the economy's energy intensity⁵ energy consumption divided by GDP has improved by an average reduction of 1.8%a year. Without this, home heating, for example, would consume over twice the energy that it uses today. But the energy intensity of some other countries remains better than ours [graph to illustrate]. There is considerable room for improvement.
- 3.4 Energy efficiency helps towards all our energy policy objectives. By reducing demand, it reduces environmental impacts, and benefits security. It can cut costs for business and increase their competitiveness. And it can help consumers, particularly the fuel poor, to spend less on energy needs whilst at the same time having healthier, warmer homes.
- 3.5 Measures to reduce demand are generally the most cost effective way to reduce carbon emissions⁶. We will therefore afford energy efficiency a high priority in our energy policy. We will aim to put the UK among the top 25% most energy efficient economies in the OECD, rather than mid-ranking as today.
- 3.6 Overall, our aim is to achieve, in each of the next two decades:
 - a 20% improvement in household energy efficiency; and
 - a [20-25%] improvement in energy intensity for industry and commerce, as well as the public sector;

These measures will save an additional 10mtC by 2020.]

... but it won't happen on its own ...

3.7 Achieving these goals depends on doing even better in the future than we have already done in the past. Many energy efficiency measures are fully cost effective. But they

⁶ See figures in Annex []

³ This is in addition to the measures set out in the Climate Change Programme which will deliver around 11 mtC savings by 2010

⁴ There is no absolute benchmark of energy efficiency, but energy efficiency is generally expressed in terms of specific energy consumption - i.e. energy used per unit of service demand, where "service" can be very wide ranging – e.g. tonnes of steel produced, illumination per square metre of office space or level of thermal comfort in a dwelling.

⁵ Energy intensity for the UK as a whole is total energy consumption divided by total GDP. It is normally expressed as Mtoe/\$bn, to enable international comparison.

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are still not taken up by householders and businesses. Many homes lack basic measures such as insulation; heating, ventilation, air conditioning and lighting systems in business may be poorly controlled; less efficient products are bought instead of those which may cost more initially but which save money and energy over their lifetime.

- 3.8 The barriers to energy efficiency are now well known. For many households and businesses, energy is a small part of total expenditure, and is not a priority. People are often unaware of their own energy consumption, or how they could reduce it. For business, energy is only one of many demands on valuable managerial time and investment capital.
- 3.9 To overcome those barriers, we need to:
 - <u>build on frameworks for delivery</u> such as the energy efficiency commitment (EEC) [see glossary] on energy suppliers;
 - <u>use existing regulatory structures</u> to raise standards of buildings and products, and to help consumers make energy efficient choices;
 - review a range of fiscal measures to provide incentives for greater efficiency;
 - <u>make</u> consumers and businesses much more aware of the impacts of energy use, and the scope for improving their energy efficiency;
 - <u>set emission limits</u>, and allow companies or industry sectors to trade to meet the limits at lowest cost; and
 - encourage <u>new energy saving technologies</u>.
- 3.10 In time, the European emissions trading scheme will encourage greater energy efficiency in heavy industry. We aim to link other measures with trading where possible. But until that happens, there is a clear role for other measures to stimulate action elsewhere in business, and in households. And measures such as building and product regulation will continue to have an important role alongside trading.
- ... there is scope in homes and businesses ...
- 3.11 Homes consume over a quarter of all UK energy. There is still a large potential for basic energy saving measures in the UK housing stock through:
 - more efficient boilers and heating/hot water systems;
 - installing double glazing and draught proofing;
 - more efficient lights and appliances;
 - better insulation of walls and lofts.
- 3.12 Over the next 10 years we will deliver as many of these measures to as many homes as is practical and cost effective. As figure x shows [for cavity wall insulation] this will require an acceleration in current rates of activity. But it can be done. Over a 20 year period between the 1970s and 1980s Government grants raised the proportion of homes with

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loft insulation from less than 50% to over 90%. And there is experience elsewhere which should encourage us. The case study below compares uptake of highly efficient condensing boilers⁷ in the UK and the Netherlands.

The Netherlands	UK
1980-1987: Subsidies for condensing boilers combined with a widespread information campaign.	1980s: development and demonstration of technology under the Government's Energy Efficiency Demonstration Scheme
Mid 1980s: demand was outstripping supply so manufacturers launched intensive installer training programmes.	1989-today: ongoing promotion under Government's Energy Efficiency Best Practice Programme
1990: Subsidy programme relaunched with government funding matched by funding from energy companies through a customer levy. Housing policy was to promote condensing boilers.	1993-4: British Gas-funded cashback scheme
1995: Building Regulations require new build to meet high standards of energy efficiency only achievable with condensing boilers.	1996-9: Government-funded cashback schemes. 1997-2002: "Energy Efficiency" awareness-raising campaign with labelling of condensing boilers. 2000-2005 EESoP/EEC ⁹ and government fuel poverty programmes installing condensing boilers; Energy Saving Trust working with manufacturing industry.
1996: Long-term and consistent awareness raising campaign started, plus energy efficiency labelling.	
1996: Energy tax introduced with hypothecated8 revenue for energy efficiency.	
2000: Subsidies (25%) for energy audits introduced. 2002: condensing boilers account for 75%	2002: condensing boilers account for 10% of UK market
of Dutch market	2003 onwards: Government-promoted communications campaign to show link between climate change and household energy use.
	2003-5?: Major push on training of heating engineers and gas fitters
	2005?: Potential for industry-wide voluntary agreement to switch to condensing boilers
	by 2007?: Condensing boilers required in building regulations for existing and new dwellings

3.13 Businesses have a wider mix of potential improvements, depending on sector. But in many cases, especially in smaller businesses, the barriers to change are similar to those in households. Particularly important in business, however, is the attitude of top management, and getting messages to them is vital.

⁷ explain in glossary

⁸ explain in glossary

⁹ explain in glossary

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... so we will take action ...

- 3.14 We will consult on an extension and expansion of the Energy Efficiency Commitment (EEC) for domestic energy suppliers.
 - EEC obliges electricity and gas suppliers to achieve improvements in home energy efficiency. The current 3-year scheme began in April 2002¹⁰ and is already having an impact it is expected to deliver annual savings of 0.4 MtC. An EEC running until at least 2008 at around twice its current level would enable a substantial proportion of energy efficiency potential in housing to be taken up. We will keep open the possibility that at some stage EEC may be integrated with a wider trading scheme.
 - OFGEM will have a key role in administering the EEC as well as in regulating energy suppliers. OFGEM is already exploring how disincentives to the introduction of micro-CHP can be removed [glossary]. This work needs to explore how the prospects for suppliers to deliver energy services¹¹ may be improved while maintaining adequate freedom of choice and consumer protection for customers. We will establish a working party with OFGEM, energy suppliers and other relevant parties to examine these issues further. This will cover energy services for businesses as well as households.
- 3.15 Fuel poverty and social housing programmes will raise energy efficiency standards, although since they focus on helping people heat their homes adequately, their contribution to carbon savings is relatively limited in the short term (see chapter 9).

[scheme for tradable permits for builders]

- 3.16 We will tighten up building regulations for new and existing stock in the household and business sectors.
 - Building regulations have reduced the energy needed for heating in a new home by half since 1990. But standards elsewhere, particularly in Northern Europe, remain higher. We aim to raise building standards progressively, to achieve in new homes by 2012, the much lower levels of energy use that are current practice elsewhere in Europe. This would further halve the consumption of energy for heating. Homes with very low even zero heating needs already exist in the UK [add box on BedZed]. We need more.
 - The existing stock will account for most household energy consumption for decades to come. Regulations have covered material alterations and changes of use for some years. Since April 2002, boilers and windows in homes in England & Wales¹² have had to meet higher standards. In Scotland, the Building (Scotland) Bill¹³ will completely reform the building standards system. Together with the Devolved

¹⁰ EEC builds on similar programmes which ran from 1994, when the then electricity regulator, OFFER, established the first energy efficiency Standards of Performance, covering both domestic and small business customers. Initially, this applied to electricity suppliers only, but was extended by OFGEM in 2000 to include gas. At the same time, the scheme was restricted to domestic customers.

¹¹ OFGEM published revised guidance to energy suppliers on energy services on 4th December 2002 – see website

DPM sets Building Regulations for England & Wales; Scottish Executive for Scotland; and Department for Finance and Pensions for Northern Ireland
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Administrations we will look further to amend the regulations to improve energy efficiency in the existing housing stock throughout the UK.

Across the EU, buildings consume over 40% of total energy consumption. The EU [is about to/has introduced] a Directive on the energy performance of buildings.
 We welcome this. It covers homes, business and the public sector and will require member states to:

set minimum standards for building work on new and existing buildings;

require design work for larger buildings to consider the feasibility of low-carbon technologies;

review building standards at least every 5 years;

introduce energy certification on all buildings, so that users and owners know how efficient it is; and

establish regular inspections of larger boilers and air conditioners¹⁴.

• In the light of the Directive and the need to accelerate carbon reductions, we will bring forward the date of the next major revision of the building regulations (affecting both new build and alterations to the existing stock) to 2006/07. The Government will also work with industry and others to consider whether there are opportunities for swifter action on particular measures, such as boilers, and on how to move towards "near zero space heating". We will by summer 2003 launch a dialogue with industry on preparing for these changes, including work to establish the need for specific skills and manufacturing techniques.

[We will also provide additional resources for local authority and private approved building inspectors for stronger enforcement of the regulations.]

... We will provide extra support for low-energy developments ...

- 3.17 A new generation of buildings could have both minimum energy requirements and produce their own electricity.
 - The Government already has Community Energy and Community and Household Renewable Energy programmes worth £60m over three years to support CHP and renewable energy technologies. [In addition, we will now allocate a new programme of demonstration and capital grants of around £165m, over the next seven years, aimed at achieving 70,000 near-zero energy buildings and 500 near-zero energy communities by 2010. This will help households and communities to produce their own electricity, for example through micro-CHP or solar PV.]

¹⁴ The lower limit for boilers is 20kW, while that for air conditioning is 12 kW. Plant of this size is generally found in industry and commerce, though many domestic size combination boilers will come within the scope of this Directive

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- 3.18 We will work with others to improve the energy efficiency standards of domestic and non-domestic products.
 - Product standards are largely set at EU level. We will work actively with the Commission and member states to develop progressively higher European standards across a wider range of products. The Commission is consulting on proposals to extend the current energy labelling regime to further products and on a new directive to set energy efficiency requirements for a wide range of products. It estimates that these policy measures could save 10% of EU energy consumption. We support these directives, and will work constructively to influence their development. We will also consult closely with UK industry on the level and timing of potential standards, and seek voluntary agreements with industry where this will enable higher standards to be introduced earlier than an EU regulatory timetable might permit.

The Government's **Market Transformation Programme** [www.mtprog.com] seeks to improve product efficiency by working at national and EU level with government, industry, retailers and others to develop measures such as standards, labelling and other product information. It aims to identify low cost policy options, giving business confidence to develop improved products in line with Government policies. It also seeks to identify future risks - for example, energy consumption from digital TV equipment is being reduced through measures, such as industry self-commitments.

- We will also continue and enhance measures to encourage the sale of products above EU minimum standards, for example through use of the Energy Saving Trust's Energy Efficiency Recommended logo and the Energy Star label for IT equipment. Fiscal incentives can also be used, and the Government will consult further on detailed proposals in this area. We will also set new Government procurement standards for products (see chapter x)
- 3.19 We will continue to use the taxation system to stimulate greater energy efficiency. The Treasury set out, in the pre-budget report in November 2002 (web ref), the range of taxes such as the Climate Change Levy and other economic instruments already in place to help deliver our environmental objectives. It will be consulting later this year on further specific measures to promote greater energy efficiency by households.
- 3.20 We will reinforce advice, information and delivery programmes:
 - The Government-funded Energy Saving Trust (EST) and Carbon Trust help households, local authorities and businesses. We will continue to support for the work of the Carbon Trust and Energy Saving Trust. [In particular, we will fund an expansion of the UK-wide network of Energy Efficiency Advice Centres, to provide advice to individuals and small businesses.] Over time, these might evolve to become Local Sustainable Energy Advice Centres, covering energy efficiency, renewables, and transport energy use.

Proposal for a Framework Directive on the Eco-Design of End Use Equipment RESTRICTED

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... and we will build on existing measures in the business sector ...

- 3.21 There are already a range of actions to promote energy efficiency in business, including:
 - the Climate Change Levy (CCL), a levy on business energy use, introduced in April 2001. Receipts (around £1 billion a year), are recycled back to business, mainly through reduced National Insurance but also through £50 million for tackling business energy efficiency;
 - Climate Change Agreements have been negotiated with energy intensive industries. Participants pay only 20% of the CCL in return for agreeing to meet challenging energy efficiency targets over a 10-year period;
 - the Enhanced Capital Allowances Scheme, funded through the CCL, to enable businesses to claim 100% first year capital allowances on investments in energy saving technologies;
 - the Carbon Trust, launched in April 2001;
 - the voluntary UK Emissions Trading Scheme, launched in April 2002. Companies in Climate Change Agreements can use the scheme to trade to meet their targets;
 - amendments to the energy efficiency provisions in the Building Regulations in 2002.
- 3.22 These initiatives are continuing, but many will need to be reviewed in the light of the emerging EU emissions trading scheme. Many large industrial sectors with Climate Change Agreements will need to transfer into the EU trading scheme. Others which, initially at least, will remain outside the EU emissions trading scheme, will continue to operate and be able to trade within the UK's emissions trading arrangements. We will explore the opportunity for expanding the UK scheme to other business and public sectors. This will enable "learning by doing" for sectors which will eventually join the EU trading scheme, either through opting in or as part of harmonised expansion with other member states.
- 3.23 [For small and medium sized businesses, where emissions trading is not currently considered the most effective route to stimulate higher energy efficiency, the Government will, subject to consultation, introduce an Energy Efficiency Commitment for business. As with the household EEC, the Government will in the longer term want as far as possible to embed all mechanisms in the framework of the new EU emissions trading scheme in order to establish a common basis for carbon reduction measures.

... and the public sector must contribute, too ...

3.24 The **public sector** accounts for only 5% of UK carbon dioxide emissions. But this sector, and in particular the Government itself, has a vital role to play in tackling climate change and leading by example. Central Government, along with other public sector

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organisations, has taken action over a number of years to improve energy efficiency¹⁶. Current commitments include:

- NHS Trusts to use 15% less energy than in [2000] by March 2010;
- Since 2002/3 <u>local authorities</u> have been required to benchmark their energy use in operational property and street lighting, and will set local improvement targets from 2003/04. They, along with Registered Social Landlords [glossary], are also required to bring their own housing stock up to decent standards [glossary] by 2010;
- the <u>central Government estate</u> has an interim target to reduce carbon emissions by 1% a year from 1999-2000.
- 3.25 We will set new targets in 2003 for energy efficiency on the Government estate. We will also ensure that energy efficiency criteria are appropriately reflected in Government contracts and purchasing choices.

... and we need to look to the longer term ...

- 3.26 We need to develop even better, smarter, ways to satisfy our energy needs. We need to continue to adapt building techniques, while better products such as insulation materials, lighting systems, appliances etc will be required to meet higher standards. Industry needs to continue to develop more efficient processes to improve resource productivity. But the research and development to enable these technologies to make a contribution in the years to come needs to start now. And once products have been developed, we need to get them deployed into the market. [The Government will increase funding to £50m/a by 2006/07 for development and deployment of new technologies]
- 3.27 Management of energy demand through better <u>mmetering</u> can reduce energy consumption and contribute to energy security. New types of meters will be needed to enable homes and businesses to make the best use of onsite electricity generation through renewables or CHP. The technology for this is currently at the demonstration stage. The demonstrator programme described [in chapter 12 the 2020 vision programme] will encompass this.

... altogether, this is a major programme of activity ...

3.28 This is an ambitious strategy. Further work is needed to consult on, and put in place, the detailed policies that will deliver it, for example as the scope and operation of the EU emissions trading scheme becomes clearer. But we do not want to lose momentum. So, jointly with the Devolved Administrations, we will publish before the end of 2003 an implementation plan which sets out in further detail how the various demand side efficiency mechanisms are expected to interact. This will update and expand on the measures set out in the Climate Change Programme. Thereafter, we will report annually on progress towards achieving the savings we have set out.

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¹⁶ ref the CCP

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Chapter 4: Renewables and CHP

4.1 Greater use of renewable energy and combined heat and power (CHP) has an important contribution to make to our aim of reducing carbon emissions by between 15-25 mtC by 2020. Although we expect that the EU emissions trading scheme will signal a value on carbon savings from around 2005, it is very unlikely that emissions trading alone will provide sufficient support for renewables and CHP. Additional measures are needed. This chapter therefore sets out a strategy, building on our current policies, to increase the deployment of renewables and CHP so that we can meet our future carbon reduction targets.

Box 1: What is renewable energy?

Renewable energy encompasses wind power, biomass (energy from forestry or crops), wave, tidal, energy from waste, solar photovoltaics, and hydro generation. These forms of generation offer an enormous potential resource, particularly in the UK where our coastline offers us extensive opportunities to utilise wind, wave and tidal power. They are all carbon neutral – i.e. they produce no carbon at all or, in the case of biomass, produce only the carbon they have already absorbed from the atmosphere when growing.

4.2 By 2050, renewables could contribute at least 30% to 40% of our electricity generation¹⁷. But if renewables are to make a substantial contribution to meeting long-term carbon abatement targets, it will be necessary to develop a wide range of renewable options and to make significant changes to our institutions and systems to accommodate them.

... our current policies ...

- 4.3 We have already set a target that renewables should supply 10% of electricity in 2010, subject to the costs being acceptable to the consumer. To deliver this, we have:
 - introduced a Renewables Obligation for England and Wales in April 2002¹⁸. This gives generators the incentive to supply progressively higher levels of renewable energy over time. The cost is met through higher prices to consumers. By 2010, it is estimated that the value of support through the obligation to the renewables industry will reach £1 billion per year;
 - exempted renewable electricity from the Climate Change Levy;
 - created capital grant schemes worth £250m from 2002-2005. Most of that
 investment is aimed at offshore wind farms and energy crops. Other, further from
 market, technologies are being supported through research and development
 funding (£19m per year);
 - drawn up a strategic framework to facilitate a major expansion of offshore wind;
 - created a new business support team in government Renewables UK to help the UK renewables industry grow and compete internationally.

We are pushing forward this work in consultation with industry: a new Renewables Advisory Board - comprising representatives of the relevant industries, the Government and the Devolved Administrations has been set up with a remit to provide expert, independent advice to the Department of Trade and Industry on renewable energy issues.

¹⁷ Future Energy Solutions (2002).

The Scottish Executive launched the Scottish Renewables Obligation on 1 April 2002. We make proposals in paragraph 4.52 on integrating the Renewables Obligation Certificate trading schemes for Great Britain and Northern Ireland.

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... but we need to do more ...

- We produce less electricity from renewables than some of our European partners. In 2001, renewables (excluding large hydro plant and mixed waste incineration) supplied only 1.5% of the UK's electricity¹⁹. This compares with 7%²⁰ in Germany and 6.5% in Spain²¹. To hit the 10% target, the UK will need to install approximately 10,000 MW of renewables capacity by 2010. This means an annual build rate of over 1,250MW. But only 1,200 MW of renewables capacity has been installed in total so far in the UK, including just over 100MW in 2002. A significant increase in the rate of construction is needed. This presents both a challenge and an opportunity to the industry.
- In addition to the engineering challenge, there are a number of significant barriers that 4.5 are constraining the deployment of renewables. The achievement of the 10% target will therefore be extremely challenging.
- But if we are to achieve our longer-term carbon reduction aims, a further large 4.6 increase in renewables will be needed after 2010. To secure this, there is a need to provide a longer-term target which industry and government can together work towards and which can provide a stable framework of expectations for the industry and for investors. The Government is therefore setting a 20% renewables target for 2020 now. We estimate that this will save 4 million tonnes of carbon a year²² in 2020.
- A 20% target is challenging, but achievable and affordable as long as we lay the right foundations now. We have considered carefully whether we should be trying to do even more. But we have concluded that setting an even higher renewables target at this stage for 2020 would impose unacceptably high economic costs²³. The total cost of meeting 10% renewables in 2010 represents a 5% addition to household electricity prices²⁴. Analysis for the White Paper shows that achieving 20% and 30% renewables by 2020 could increase household electricity prices by some 8% and 15% respectively, over and above the costs of the current Obligation.²⁵ So whilst we do not see 20% as being in any way a limiting factor in the longer term, we do not consider that setting a 30% target for 2020 would be, at this stage, an economic option.
- We remain firmly committed to the current Renewables Obligation and will maintain 4.8 the level of support it provides, as planned, until 31 March 2027. We will review the Obligation in 2005/06. At that time, we will look in the light of the experience of carbon prices arising from the emissions trading scheme, the costs of renewable technologies and possible EU proposals for a Community renewable framework²⁶, to consider what further support might be required to achieve the 20% target. In the meantime, the measures

¹⁹ Digest of UK Energy Statistics (DTI, 2001)

²⁰ Verband der Elektrizitätswirtschaft e.V. (VDEW) (February 2002)

²¹ www.appa.es.

²² Future Energy Solutions (2002)

The resource costs to achieving 20% renewables in 2020 ranges between £9.26b-£12.93b, compared to £10.52b-£17.12bn for 30% renewables. (Future Energy Solutions, 2002)

24 "The Renewables Obligation Statutory Consultation" (DTI, 2001)

²⁵ This assumes a £30/MWh buyout-price for the Renewables Obligation.

²⁶ Under the European Renewables Directive, the Commission is required to produce a report by 27 October 2005 on the different mechanisms used by Member states to support renewable energy. The earliest any proposed framework would be introduced would be October 2012.

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proposed in this white paper will help us to achieve the 2010 target and put us on an early, favourable trajectory to meeting the 20% target.

... there are structural barriers to renewables and CHP ...

- 4.9 Many renewable and CHP generators, because of their likely size and/or location need to be connected to local distribution networks. To achieve our targets for higher levels of renewable generation and CHP plant, distribution networks will have to be capable of accommodating many more directly connected generators than we have now. Very substantial changes—greater than anything we have seen in the last 50 years—in the way in which our distribution networks are designed, organised and financed will be needed. It will also require substantial change in the way Distribution Network Operators (DNOs) work.
- 4.10 Although DNOs are already required under their licences to facilitate competition in the supply and generation of electricity, under the present connection charging policy, there is no incentive for them to plan and operate their networks to make capacity available to distributed generators²⁷. The regulatory framework needs to be amended to ensure fair and transparent access for distributed generation. Much of the information required by distributed generators making initial inquiries will be included in the Long Term Development Statement which DNOs, following the introduction of the Utilities Act now produce annually. In parallel, in setting the framework for the next distribution price control review in 2003 (for implementation in 2005), OFGEM will ensure DNOs are given appropriate incentives to take a more consistent approach to distributed generation and to plan their investment in the networks, in the context of the Government's renewables and CHP targets.
- 4.11 We are also working, with OFGEM, to address the administrative burdens placed on smaller generators and to ensure that they are not unfairly disadvantaged in their relations with local suppliers.²⁸ We are also following up actively a range of wider changes designed to facilitate distributed generation²⁹ and will report progress on this in the follow up to the white paper.
- 4.12 The existing transmission system, the national grid, will also need to adapt to allow the most to be made of renewable generation. The transmission companies need to start the preparatory work to strengthen the transmission network now if the 2010 and 2020 renewables targets are to be achieved. Recognising this, OFGEM will take full account of Government's renewables targets when taking a decision on the regulatory arrangements to appropriately incentivise the Transmission Operators to invest in the transmission system.

... planning is also a problem ...

²⁷ DNOs receive their revenue stream in the form of Distributed Use of System charges from load customers – not from distributed generators. Those taking demand are seen as the DNOs' main customers; those generating on distribution networks are not.

networks are not.

28 OFGEM has recently launched a help facility for smaller generators under NETA. This is accessible on OFGEM's website.

website.

29 The Embedded Generation Working Group (EGWG), comprising representatives from Government, OFGEM, generators, customers, network providers and suppliers published initial recommendations in 2001 for action by relevant bodies to help ensure distributed generation is treated on an equitable basis compared to other users of distribution and transmission networks. The EGWG recommended that a group be set up to oversee the implementation of the EGWG recommendations. This has occurred and has been named as the Distributed Generation Co-ordinating Group. (www.distributed-generation.org.uk)

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- 4.13 Many of the stakeholders who responded to the white paper consultation saw planning decisions as one of the biggest obstacles to new renewables. For example, according to the British Wind Energy Association (BWEA), 40% of onshore wind applications in England, 87% of applications in Wales and 7% of applications in Scotland are rejected in the local authority planning process. The BWEA also state that onshore wind planning applications also take on average some 12-18 months to clear, compared with national targets of 16 weeks for project applications involving environmental impact assessments.
- 4.14 We recognise that this is a problem for renewables. We will accordingly shortly be publishing re-drafted statutory planning guidance on renewables (PPS22) for England³⁰. This will act as a positive tool for the development of renewables. The revised PPS22 will give better weighting of the environmental and economic benefits of renewable energy in planning decisions. It will also provide guidance both to Local Planning Authorities and developers about the best way to promote renewable energy through the planning system as well as to encourage a strategic approach to the deployment of renewable projects through regional planning guidance and local development frameworks.

Box 2: A regional approach to renewable energy: The Draft London Energy Strategy

The draft London Energy Strategy aims to reduce London's contribution to global climate change, tackle the problem of fuel poverty and, and at the same time promote London's economic development through renewable and energy efficient technologies.

Increasing the proportion of energy used from renewable sources will be achieved by expecting the inclusion of energy efficient and renewable energy technology and design, including passive solar design, solar water heating, wind, fuel cells and biomass fuelled electricity, in new developments wherever feasible.

The Mayor will work in partnership with the Environment Agency, boroughs and industry to ensure that the policies of the draft London Plan support the Mayor's Energy Strategy and contribute towards achieving the national renewables energy targets.

- 4.15 But more still needs to be done to embed the national renewables and other energy objectives at regional and local levels. We look at these issues separately in chapter 4.
- 4.16 We currently lack reliable data on the number of renewable projects that are achieving planning approval. This makes it difficult to monitor and adjust policy if we need to. We will therefore explore further with local planning authorities and others the scope for obtaining relevant data.
- 4.17 We also encourage local planning authorities to use their development plans to promote low carbon buildings by requiring all new developments to meet certain specified sustainable energy standards. The approach taken by the local planning authority will depend

³⁰ The National Assembly for Wales is currently revising its national planning guidance on renewables (TAN8) and has commenced the process of developing a Wales spatial plan. The Scottish Executive updated its national planning guidance (NPPG 6) in 2000.

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on local circumstances and the measures set out in their regional energy strategy. One approach could be to make it a condition of planning permission that a proportion of the heat and power requirement of all new developments be supplied by renewable energy sources. [See Box 3]. Another approach could be to set higher energy efficiency standards than those set out in the Building Regulations for all new building developments.

Box 3: A local approach to renewables: Merton Borough Council

As part of its new planning policy, Merton Borough Council requires that at least 10% of predicted heat or power requirements of all businesses occupying large new industrial and commercial developments to be capable of being met by means of on-site renewable energy production (e.g. solar PV, solar-power and geo-thermal water heating, energy crops and biomass).

- 4.18 We have published legislative proposals to streamline the public inquiry process for Major Infrastructure Projects in the planning process, by allowing lead inspectors to appoint further inspectors to share work, and allowing issues to be consider concurrently in inquiries rather than sequentially. We will also apply these principles to decision making for major energy projects, where consents are awarded by the Secretary of State for Trade and Industry. This could streamline planning processes for large onshore renewable energy developments and major upgrading of the transmission network.
- 4.19 Even then, achieving our targets will depend on people being prepared to accept local projects. However much renewables may be promoted in general³¹ the key issue is the acceptability of individual projects at the local level³². Conclusions from the public consultation suggest great enthusiasm for renewable technologies, particularly in view of their contribution to tackling climate change. However, the public feel insufficiently informed about both the practicalities of the technologies and also their ability to generate significant amounts of energy.
- 4.20 The white paper consultation has shown the value of community engagement. Engaging local communities will be crucial for the development of new forms of distributed generation; in gaining acceptance of new infrastructure and in developing opportunities for localised energy delivery. Developers therefore need to continue to engage with local planning authorities and work directly with communities [see Box 4]. Recognising the importance of community engagement, the Government has recently launched a three-year programme of capital grants worth £10m for schemes, such as solar water heating and biomass heat, that are able to demonstrate a strong community or household interest³³. In the future, the Government sees a clear benefit in local communities becoming producers, as well

³¹ "Review of renewable surveys" (BWEA, 2001); "Public Attitudes Toward Wind Farms in Scotland" (Scottish Executive, 2000).

^{32 &}quot;Renewable Energy in the UK" (2001)

³³ Community and Household Capital Grants Scheme. In addition, DEFRA's Community Energy scheme, which has a two-year budget of £50m and is operated by the Energy Saving Trust, helps install and refurbish community heating systems. The Countryside Agency launched the Community Renewables Initiative in 2002. Its vision is to help people to influence and benefit from renewable energy. All of these schemes have a key role to play in helping to breakdown the barriers to public acceptability of renewables by providing local residents with a direct benefit from the renewables development.

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as consumers, of energy, establishing and benefiting from local ownership of some forms of generation.

Box 4: Community action in practice

National Wind Power's practice is to establish community funds at each operating wind farm in consultation with local communities and councillors. These funds benefit the community and typically include student sponsorships, equipment for schools and village halls repairs.

One such example is the provision of IT and other equipment worth up to £60,000 to support 19 schools near St Columb Major in Cornwall (located close to the Bears Down Wind Farm). Local schools also received two days energy efficiency training as part of a £30,000 energy efficiency scheme funded by the wind farm and carried out by the Cornwall Energy Advice Centre.

- 4.21 To help promote ideas and good practice, the Government will collate and publish in partnership with the LGA and the renewables industry examples of projects in which developers have gained added value by taking innovative approaches to engaging and working with communities.
- 4.22 Just as important as engaging with communities is engaging with Councillors on the role of renewable energy schemes. Councillors are the key decision-makers at the local level. [The Government will allocate [£2.5m] to increase councillor-training opportunities on renewable energy, through bodies such as British Wind Energy Association and Local Government Association]

... and we will simplify the procedures for accommodating our national security needs

- 4.23 The Ministry of Defence (MoD) is responsible for ensuring that wind farm developments do not impair operational needs including training and radar monitoring. MoD has recently needed to object to a third of all recent wind energy proposals both on and offshore³⁴. We need to reduce this number.
- 4.24 To address this, MoD:
 - has recently issued new guidelines for wind farm developers through the Wind Energy, Defence and Civil Aviation Working Group³⁵ designed to increase the transparency of the process for assessing wind proposals;
 - will provide more central guidance to those reviewing applications, develop a help line for the industry, and work to shorten proposal turnaround times from the current 6 to 8 weeks;
 - is seeking to work more directly with developers, e.g. where minor adjustments to the siting of turbines may result in an objection being withdrawn;

³⁴ Ministry of Defence (2002)

³⁵ Comprising DTI, MoD, the Civil Aviation Authority, the British Wind Energy Association, the Devolved Administrations and others with an interest

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- is supporting research to model the effect of turbines on radar and to identify ways in which adverse impacts could be reduced, including technical adaptations to turbine design.
- 4.25 MoD is also ready to engage with Regional Chambers as the latter move towards considering optimum sites for the siting of wind farms in the longer term when drawing up their regional energy strategies (as discussed in chapter 14).

...learning to handle intermittency ...

- 4.26 Renewables have a useful role to play in contributing to security of supply supplies will not be disrupted by international crises or run out over time. But some will create additional system complications depending on the extent to which they are intermittent and unpredictable (wind energy, wave energy and solar) or intermittent but predictable (tidal) and on the types of generation they displace. Intermittency causes additional system costs. And as the proportion of intermittent generation increases, the costs of maintaining security of supply will also increase³⁶.
- 4.27 These costs need to be managed and new ways need to be found to minimise them. We are already funding research into this through the DTI's Renewable Energy and EPSRC's³⁷ SUPERGEN³⁸ programmes. As part of our current capital grant programme, we allocated in 2002 an additional £4m to facilitate the demonstration of new control, storage and metering technologies, with a view to encouraging the active management of the distribution networks in order to significantly increase the capacity for connecting generation.

... different technologies are at different stages of development ...

4.28 Of the range of different renewables technologies, some are much nearer commercial deployment than others [See Box 5]. In general, we believe the nearer commercial technologies should be pulled through by the range of measures already in place. But those at a less developed stage need help to prove themselves at a commercial scale; and those still further back in the innovation cycle need help to prove themselves technologically. The remainder of this chapter looks at what needs to be done exceptionally in respect of a number of generic technologies to ensure they can have an opportunity, if they prove themselves, to play a role in delivering our targets.

... offshore wind - about to take off ...

4.29 The UK coastline is windy. Given our experience in offshore engineering, this is an area where we should perform particularly strongly.

³⁶ The additional system costs - attached to transmission, the distribution network as well as the balancing of generation and demand - of 20% and 30% of electricity supplied by intermittent generation is equivalent to some £0.9/MWh and £2.20/MWh respectively. "Quantifying the system costs of additional renewable in 2020" (Ilex, 2002). It is quite possible that technical developments in storage, fuel cells and load management may, by 2020, reduce such costs.

³⁷ Engineering and Physical Sciences Research Council. (www.epsrc.ac.uk)

³⁸ Sustainable Power Generation and Supply initiative (www.epsrc.ac.uk)

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- 4.30 Developers have already entered into agreements for leases for a total of 20 wind farm sites around the UK coast with a total capacity amounting to at least 1,400MW of renewable energy, sufficient to power a city the size of Greater Manchester. The offshore wind industry projects that a further 3,000-4,000MW can be built by 2010.³⁹
- 4.31 Only 250MW⁴⁰ of offshore wind capacity has so far been installed worldwide. 4MW of this is in UK waters. Although the long term potential looks promising, given very limited global market experience of costs, build rates and performance, significant uncertainties remain about the short term.
- 4.32 In particular, the economics of offshore wind are very uncertain. There are significant fixed costs that have to be borne before installation can begin. Without additional capital grant support, these upfront costs are likely to prove a significant barrier to the necessary volumes of new build to make a significant contribution to the 2010 renewables target. [The Government will therefore provide, starting now, additional offshore capital grants worth £X00m for future offshore rounds for the next five years.] This will ensure the rapid deployment of offshore wind to meet future renewable targets.
- 4.33 Delivering the renewables target will also require rapid expansion of offshore wind into deeper waters. We published in November 2002 a consultation document, Future Offshore, which proposes a strategic planning framework to enable the significant potential of offshore wind to be realised⁴¹. A second round of wind farm site allocations is planned for Spring 2003, which will focus on three strategic areas of the sea within territorial waters, informed by a strategic environmental assessment. Substantial new resources will be needed to implement fully this strategic planning framework. [The Government will allocate £9.5m over the next seven years, for future work on strategic environmental assessments as well as £0.5m for implementing an IT system⁴² to fully manage offshore consents regimes.]
- 4.34 To enable further rounds to extend the opportunity for developers to exploit areas beyond the UK 12-mile zone, we will also bring forward legislation as soon as possible to enable the granting of licences for offshore wind farm developments beyond territorial waters. We will also identify and assess the difficulties that might be posed for aviation and other military interests, before we offer areas of the sea to the wind industry for development.

... biomass and waste technologies need to gain momentum ...

4.35 After wind, biomass and waste offer the next most significant renewables opportunity, both in terms of technology development and cost. Biomass and waste can be used for electricity, heat and liquid fuels⁴³. Unlike wind, biomass and waste generation is flexible – it can be generated at any time. Building a strong biomass supply chain can also revitalise rural

³⁹ BWEA, 2002

⁴⁰ BWEA, 2002

⁴¹ The "Future Offshore" consultation document includes proposals for the provision and regulation of offshore infrastructure. We will work with OFGEM, developers and the System Operator, over the forthcoming months, to take this issue forward.

⁴² The development of a case handling IT system linking DTI, with DEFRA and Department of Transport will enable DTI to

⁴³ We discuss the role of biofuels in Chapter 5.

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communities, offering diversification opportunities for farmers and foresters as well as job opportunities in growing, supply and electricity plant building.

- 4.36 But biomass faces a number of obstacles:
 - developing a supply chain. Given the long time it takes to plant and harvest crops for energy projects (2-4 years in most cases), long-term contracts are important both for farmers and for developers. Farmers are reluctant to commit themselves to growing energy crops unless there is a guaranteed market. Developers are unwilling to commit to building power stations unless there is a guaranteed local supply;
 - costs. Biomass is the only renewable source that has to pay for its energy inputs. Even with the help of the renewables obligation, biomass faces serious difficulties in competing with other forms of generation;
 - logistics: the cost and difficulty of getting large volumes of biomass to the generation plant;
 - technology. Advanced energy crop conversion technologies the real long-term option are proving difficult to achieve. If energy crops are to make an important contribution post 2010, we need to make rapid progress in moving these technologies from commercial demonstration to commercial viability.
- 4.37 To develop a stronger stimulus to provide a biomass supply chain, particularly for energy crops, we will initiate a statutory consultation in 2003 with a view to amend the current requirement under the Renewables Obligation that from 2006, energy crops have to form at least 75% of the input of co-firing ⁴⁴.
- 4.38 [Recognising that biomass generation is not yet viable and acknowledging the benefits to the rural economy of biomass, we will provide, starting from now, additional support, worth up to £Xm per annum over ten years, to ensure an economically viable fuel supply for those successful projects supported under the current Bio-energy capital grant scheme.]
- 4.39 To bring forward the advanced conversion technologies necessary for biomass and waste to make a full contribution to renewables targets, [we will allocate, starting from now up until 2010, £X00m to establish an energy crops advanced conversion demonstration programme⁴⁵ in partnership with industry and local authorities, to promote the development of large-scale (20-40MW) commercial demonstrator energy crop power plants.]
- ... and we need to ensure large hydro projects stay in the mix ...
- 4.40 At present, refurbished hydro stations of up to 20MW capacity qualify for support under the Renewables Obligation. [To encourage the refurbishment of the larger stations above 20MW that have not yet been refurbished, the Government will introduce,

45 Such plant may need a mix of biomass and energy crops in their initial period

⁴⁴ Stations that are powered by *co-firing* may have an important role to helping to deliver biomass and energy crops, and in delivering renewable energy capacity quickly at relatively low cost. Under the current Renewables Obligation arrangements, electricity generated from biomass by co-firing in existing generating stations are eligible for ROCs subject to two restrictions. Only electricity generated before 1 April 2011 will be eligible. From 1 April 2006, at least 75% of the biomass must consist of energy crops.

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starting from now, a capital grants scheme with a budget of £Xm.] Not only will the refurbishment bring additional output on stream, but will also safeguard the future of these stations for very many years to come.

... wave and tidal are further off but potentially very important ...

- 4.41 Wave and tidal technologies are still in their infancy, with many competing designs and considerable uncertainty about whether and when commercially viable technologies will be delivered. This presents both a threat and an opportunity. Without support, the technologies may not develop at all, and their long-term potential may not be realised. But as recognised in the Chief Scientific Adviser's review [footnote], because they are little developed anywhere in the world the UK has an opportunity to exploit a world-leading expertise at relatively low cost.
- 4.42 Recognising this, the Scottish Executive is supporting the establishment of a marine test centre off the coast of the Orkney Islands. This centre, a first in Europe, will open in spring 2003.
- 4.43 [Given the potential of such technologies, we will allocate, starting from now up until 2010, additional demonstration funding worth £Xm for wave and tidal energy research. This funding will also be available to support the setting up of demonstration parks, to help offset the very high infrastructure costs involved in setting up demonstrations of these technologies in complex and demanding environments.]
- 4.44 While large-scale tidal barrages have the potential to make a useful contribution to carbon abatement in 2020 or beyond, such schemes have a very substantial impact on the local and regional environment and are very expensive, though some of the costs could be offset by other benefits, such as flood protection. It is also clear that such projects could not proceed in the foreseeable future unless underwritten by the Government. We do not believe that there is a strong case for this at the present time but it remains an option for the longer-term.

... solar is a potentially very large market ...

- 4.45 The costs of solar PV technology have fallen substantially over the last 25 years, and are widely expected to continue to do so as global markets expand. We have also made a commitment in the "Opportunities for All" white paper to embark on a major initiative with industry and others to achieve a UK solar PV demonstration programme in line with those of our main competitors. The current demonstration programme, worth £20 million over 3 years, is the first stage of this process. [We will allocate, starting from now up until 2010 a further £Xm, to subsequent phases of the solar PV major demonstration programme.]
- 4.46 At present solar PV qualifies for the Renewables Obligation. But in practice, almost all schemes are too small to generate the minimum 0.5MWh a month to qualify for a ROC⁴⁶.

⁴⁶ Renewables Obligation Certificate (ROC). Eligible renewable generators receive Renewable Obligation Certificates (ROCs) for each MWh of electricity generated. These certificates can then be sold to suppliers. In order to fulfil their obligation, suppliers can either present enough certificates to cover the required percentage of their output, or they can pay a "buyout" price of £30/ MWh for any shortfall. All proceeds from buyout payments are recycled to suppliers in proportion to the number of ROCs they present.

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We will explore in 2003 whether small renewable generators (including solar PV) might qualify for "guarantees of origin" under the provisions of the European renewables directive. This will allow smaller generators to accumulate their output for as long as it takes to earn a whole guarantee of origin which could then be exchanged for a ROC.

.... and fuel cells offer a longer term advantage

- 4.47 Fuel cells could be an important bridge between fossil fuels and renewable generation as they should be able to work off both fossil-fuel generated hydrogen and renewablesgenerated hydrogen. To ensure that the UK is at the cutting-edge of fuel cells technology, we propose to adopt the following strategy:
 - as part of the joint EPSRC⁴⁷/DTI/Carbon Trust approach, we shall develop a research programme dedicated to Fuel Cells;
 - DTI support for UK projects within the EUREKA⁴⁸ programme will be expanded to £10 million pa by 2004/05;
 - In collaboration with the EPSRC we shall review the supply of doctorates and MScs with the requisite skills for this sector;
 - working with the Carbon Trust we shall support new start-ups in this sector;
 - we shall develop a significant new demonstrator programme to compare with those in Europe;
 - working with academic and business networks, venture capitalists and other stakeholders, we shall facilitate a UK Fuel Cell network to ensure that new innovative ideas are disseminated quickly.
 - [the Government will also allocate, starting from now up until 2010, £Xm to a programme of hydrogen and fuel cells demonstrations.]

... research is needed to give us new options for the longer term ...

- 4.48 Technology will almost certainly surprise us in the field of renewables as elsewhere. To expand the knowledge base, we have already provided an extra £8 million to the Research Councils specifically for renewables research over the next three years as part of a new £28m investment in support of sustainable energy research. The money will be spent on fundamental research into a range of technologies, consistent with the recommendations made by the Chief Scientific Adviser's Energy Research Review Group⁴⁹.
- 4.49 We also need to support industry in taking the new ideas generated in the laboratory to the point where they can enter the market. We have already increased the amount available to support industrially-led research and development through the DTI (£19m per annum) and the Carbon Trust (£5m per annum). In response to the Chief Scientific Advisor's Energy Research Review, [the Government will allocate over the next three years a

⁴⁸ EUREKA is a pan-European network for market-oriented, industrial R&D. EUREKA supports the competitiveness of European companies through international collaboration, in creating links and networks of innovation. The objective is to bring high quality research and development efforts to the market and to use the multiplying effects of co-operation. (www.eureka.be/)

⁴⁷ Engineering and Physical Sciences Research Council.

⁴⁹ "Report of the Chief Scientific Adviser's Energy Research Review Group" Office of Science and Technology, 2001

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further £Xm to the DTI Research and Development programme in the areas of distributed generation, fuel cells, hydrogen and low carbon, net metering and next generation PV]. Industry needs also to continue to take advantage of further opportunities for international collaboration, e.g. through the EU 6th Framework Programme for R&D. The DTI will promote the programme to industry and the research community, and provide a supporting information and advice service.

... and renewables offer big opportunities for UK business ...

- 4.50 The growth in the worldwide renewables market offers considerable opportunities for UK companies to create jobs in manufacturing, services and supplies at home and improve our capability to export. We have set up a new organisation, Renewables UK, to help secure benefit for UK industry in the renewables market.
- 4.51 If the UK is to compete globally, projects need to move out of the R&D stage into commercialisation. We have a role to play in facilitating this. To achieve this we will through Renewables UK develop by 2003/04 programmes and tools to assist the UK renewables supply chain.
- ... widening the renewables obligation certificate market
- 4.52 The Northern Ireland Executive has recently brought forward an Energy Bill containing provisions to introduce a Northern Ireland Renewables Obligation. The Government will introduce legislation⁵⁰ to allow mutual recognition of GB Renewable Energy Certificates under the Renewables Obligation and those in Northern Ireland under their future Obligation.

.... and the international community has a role to play

4.53 The World Summit on Sustainable Development (WSSD) took place in Johannesburg from 26 August to 4 September 2002. The Summit brought together 180 countries who reaffirmed the international community's commitment to sustainable development through action rather than words. It will make a real difference to people's lives, through action to provide access to clean water, sanitation and sustainable energy, and to protect biodiversity, the oceans, fish stocks and natural resources. The Summit agreed joint actions to urgently and substantially increase the global share of renewable energy sources. The Summit did not set a global target for renewables, but even those countries which resisted a global target have nevertheless committed themselves to domestic action. At the Summit, the Prime Minister announced that the UK's Export Credit Guarantee Department will make available £50m per year to renewable energy exports to developing countries. The UK also launched, and is taking forward an international partnership to promote the growth of renewable energy and energy efficiency systems (REEEP).

Moving to a renewables obligation in Northern Ireland cannot proceed without legislation in Great Britain to enable a single UK Renewables Obligation Certificate market

51 It was agreed with a songe of process of the songe of

It was agreed with a sense of urgency, to substantially increase the share of renewable energy within the total global energy supply mix. Recognising the role of national and voluntary regional targets and initiatives where they exist, data should be regularly evaluated to review progress towards this aim. www.johannesburgsummit.org/

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Box 6: A Renewable Energy and Energy Efficiency Partnership

At WSSD the UK launched an initiative for a global Renewable Energy and Energy Efficiency Partnership

The initiative aims to take forward the recommendations of the G8 Renewable Energy Task Force for removing the policy, technical, market and regulatory barriers to renewable energy and energy efficiency.

Interested partners include Governments from OECD and non-OECD countries, businesses, non-governmental organisations and international agencies committed to accelerating the market development of renewable energy and energy efficiency technologies.

Likely focal activities will be on:

State-of-the-art policies for power sector reform, and building on best regulatory practise to promote distributed energy systems

Innovative financing of renewable energy and energy efficiency projects

Evaluation of the non-carbon reduction benefits of renewable energy, such as energy security, rural development and export opportunities

4.54 We will integrate the WSSD agreements and relevant follow-up into UK policy and action, with a sharp focus on the use of technological innovation to deliver sustainable development. If, as a nation, we achieve greater resource efficiency, this will not only help our environment, but also improve our competitiveness.

....combined heat and power has significant potential....

- 4.55 Combined Heat and Power, or CHP, is an efficient form of providing both heating and electricity needs at the same time. As a form of generation, CHP utilises around 70-90% of the input fuel much better than most power stations which are only up to around 50% efficient. As a form of energy efficiency, it enables a very wide range of energy users, from heavy industry down to individual homes, to save money and help the environment by reducing overall carbon emissions. It is also the cornerstone of many community energy schemes, providing heating, electricity and in some cases cooling to a wide range of users.
- 4.56 We have set a target of achieving 10 GWe of good quality CHP⁵² by 2010. Currently, 4.8 GWe is installed. Further growth here would build on the good progress in increasing the number and installed capacity of CHP plants over much of the last decade. Achieving the Government's target could save 1.25MtC⁵³ per year.
- 4.57 In 2002, the Government consulted on a draft CHP Strategy setting out the range of measures believed to be necessary to enable the target to be delivered. These include:

⁵³ Based on assumed emission factors in 2010.

⁵² Good Quality CHP is CHP generation that meets efficiency standards prescribed in the Government's CHP Quality Assurance programme
⁵³ Record on a second of the control of the contr

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- Climate Change Levy exemption on fuel inputs to good quality CHP, on good quality CHP electricity outputs sold direct to end users, and a concession made in the 2002 budget and subject to EU state aid approval on electricity sold to licensed suppliers;
- Climate Change Agreements with energy intensive industry sectors which encourage the use of CHP;
- the UK emissions trading scheme;
- eligibility for Enhanced Capital Allowances to stimulate investment;
- business rates exemption for CHP power generation plant and machinery;
- changes to the licensing regime, benefiting smaller generators;
- a reduction in VAT on certain grant-funded domestic micro-CHP installations;
- the launch of a £50m Community Energy programme to encourage CHP in community heating schemes; and
- promotion and support by the Carbon Trust in non-domestic markets and the Energy Saving Trust in domestic markets for the development of energy efficiency and low carbon technologies including CHP.
- 4.58 Despite these measures, the current level of prices in the wholesale electricity market and the level of wholesale gas prices are adversely affecting CHP as well as other plant developers. Indeed, a number of proposed new power stations which already have received planning approval are waiting for electricity prices to rise and/or gas prices to fall before proceeding. Along with other forms of distributed generation, CHP has also been disadvantaged by some aspects of the NETA regime. OFGEM have put in train changes to address these.
- 4.59 The measures outlined in this white paper in particular the emissions trading scheme will over time encourage lower carbon forms of generation and more efficient use of fuels. And we expect to see a new approach to electricity generation developing one that recognises and encourages local generation opportunities serving communities or even individual households. CHP would benefit on all counts. We remain committed to a target of 10 GWe of good quality CHP capacity being installed by 2010.
- 4.60 [To address the current market difficulties the Government will extend the existing Community Energy programme to the end of the decade and will provide funding for field trials of micro-CHP. In addition, the Government will explore, with OFGEM and the energy suppliers, the scope for providing additional impetus to CHP through the proposed business energy efficiency commitment described in chapter 3.]
- ... the New Electricity Trading Arrangements (NETA) need to continue to evolve ...
- 4.61 Since NETA go-live in April 2001, there have been a number of modifications brought forward which have improved the cost reflectivity of the Balancing Mechanism and have helped all players, but especially smaller generators such as renewables and CHP to operate more effectively in the market. Further changes are ongoing, such as changes to the calculation of the imbalance price, due to be implemented in February 2003. We are pleased that OFGEM has responded to the concerns of the industry and will continue to keep the operation of NETA under close review.
- ... and the British Electricity Trading & Transmission Arrangements (BETTA) ...
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- 4.62 We announced in April 2002 that it intended to bring forward legislation to create a wholesale electricity market for Britain as soon as parliamentary time allowed. The development of these new arrangements, known as BETTA, is being undertaken with OFGEM and with the involvement of industry.
- 4.63 The development of BETTA involves the introduction of a single set of arrangements for GB market participants. Single codes will cover trading, balancing and settlement arrangements and contractual arrangements for connection to and use of the transmission system and a GB Grid Code will govern technical matters associated with connection to and use of the transmission system. A GB system operator separate from generation and supply interests will administer balancing arrangements for GB. The current commercial arrangements on use of the Scotland-England interconnector will be removed, by subsuming interconnector assets into the transmission businesses of the companies that own them and providing access to, and use of, those assets on the same terms as the rest of the transmission system.
- 4.64 BETTA will mean that Scottish domestic and business customers will benefit from the same levels of competition that are now established in the England & Wales market. The single set of trading rules, connection policies and transmission charging arrangements under BETTA will result in a reduction in the barriers for independent generators all across GB in getting their power to market. BETTA will help to create a diverse generating base in Britain and encourage new transmission capacity to be built, helping to support renewables development.

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Chapter 5: Transport

... transport will contribute to carbon reductions ...

5.1. Shifting to low carbon forms of transport will help us meet our aim of reducing carbon emissions by between 15-25 million tonnes of carbon per year (mtC) by 2020. This chapter lays out our plans to achieve cuts of between 1.6 and 2.8 mtC through new voluntary agreements on vehicle emissions and a further 1.2 mtC by the introduction of biodiesel and bioethanol as a transport fuel.

... transport emits a lot of carbon ...

- 5.2 Transport emits around 40 mtC in the UK (including domestic aviation). This is around 25% of the total. Of this, road transport contributes 85%, with passenger cars accounting for around half of all carbon emitted by the transport sector.
- 5.3 Action at UK and European level has promoted significant technical development and innovation in the automotive industries. Since 1990, the average carbon efficiency of new cars entering the fleet the distance travelled for a given amount of carbon emitted has improved by 10%. Cars have also become cleaner and safer. These represent important achievements. At the same time strong economic growth, and the high priority which people attach to mobility, has led to an increasing car mileage. The net effect is that total emissions from car transport have been roughly flat.
- 5.4 Our Transport Ten Year Plan⁵⁴ sets out a comprehensive programme of investment and innovation. This will promote increased use of public transport and a shift of goods traffic from road to rail, and will also help to improve the carbon efficiency of the transport system. The Plan will be reviewed in 2004. The review will roll forward the Plan, setting out the Government's proposals for transport up to 2015. It will continue to take full account of our objective to reduce the environmental impact of transport.
- 5.5 In the aviation sector, demand is rising internationally at about 4% per annum. We all benefit from the growth in business, services and our ability to travel. Emissions from international flights are not counted in national emission accounting arrangements, but currently up to 10 mtC/year originate from UK international and domestic flights.

... we can tackle it through better vehicles ...

- 5.6 The movement of people and goods is essential to a strong, modern economy, responsive to people's needs. Continued economic growth and the high level of priority which people give to personal mobility mean that alongside the measures in the Ten Year Plan continued improvements in vehicle efficiency will have an essential part to play in reducing transport's energy demand and carbon emissions.
- 5.7 Existing EU voluntary agreements on new car fuel efficiency with the European, Japanese and Korean manufacturers are already producing results. They have provided manufacturers with a stable long-term framework within which to plan, research and introduce innovation. This approach, which focuses on the levels of carbon emitted rather

⁵⁴ Ten Year Plan reference

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than on dictating particular technologies, gives manufacturers the flexibility to develop the best and most cost-effective solutions. The agreements are on course to reduce emissions from the average new car from 190 grammes per kilometre (g/km) in 1995, the base year for the agreements, to 140 g/km by 2008 - a reduction of around 25%⁵⁵.

- 5.8 We have backed the agreements up with a supportive fiscal framework which encourages car buyers to take up lower carbon vehicles through the shift to graduated, CO2-linked, Vehicle Excise Duty and Company Car Tax since 2001.
- 5.9 These and other measures for promoting a shift to low-carbon vehicles and fuels are brought together in our 'Powering Future Vehicles' ⁵⁶ strategy published in July 2002. **This strategy is complementary to this white paper.** In the foreword to the strategy, the Prime Minister spelled out his objective that the UK should lead the global shift to the low-carbon economy, building competitive advantage for the UK's automotive industries as well as providing cleaner and better transport. We have set targets that, within the next decade, one in ten new cars sold in the UK will be low-carbon vehicles with emissions of 100 g/km carbon or less, and that one in five new buses will also be low-carbon. We have made the UK the first country to set itself targets for shifting its mainstream transport fleet to low-carbon technologies.

The Powering Future Vehicles strategy

The PFV strategy provides a framework for decisions and action, aimed at:

- Promoting the development, introduction and take-up of low-carbon vehicles and fuels;
- and ensuring the full involvement of the UK automotive industries in the new technologies.

Key components in the strategy are to

- promote research, development and demonstration of new vehicles, fuels and fuelling infrastructure;
- ensure that environmental, health and safety issues are dealt with;
- ensure that new technical standards and testing procedures are promptly developed and put in place;
- work proactively with EU and other partners on international issues and standards;
- facilitate the quick and smooth development of new fuel distribution infrastructures;
- ensure the continued development of appropriate taxation of low-carbon transport;
- in this and other ways, encourage consumers' take-up of low carbon vehicles and

56 Powering Future Vehicles reference

⁵⁵ All figures are for 'tank to wheel' emissions.

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fuels, including financial measures, and consumer information and awareness;

- develop projects through which carbon savings in the transport sector can be brought within the Government's Emission Trading Scheme;
- make maximum use of new vehicles and fuels in the Government and other public sector fleets
- work closely with all stakeholders in establishing the Low Carbon Vehicle Partnership;
- and set targets challenging targets for making the UK a world leader in the move to low-carbon transport.
- 5.10 The creation of a Low Carbon Vehicle Partnership is an important component in the Powering Future Vehicles Strategy.

The Low Carbon Vehicle Partnership - 'LowCVP'

LowCVP is an action and advisory group which will promote the UK's shift to low carbon transport; help industry, consumers, environmental and other stakeholders to participate in the shift; and maximise the competitive advantage for UK businesses.

The Partnership started work in [January 2003]. Its Board includes Chairman and Managing Director level leaders of UK auto manufacturers, transport operators, consumer and environmental groups, and the research and technology sectors.

Early work will include:

a collaborative project for bus manufacturers, operators, and users to work together on the objective of shifting the UK to low-carbon buses;

- advice on the role and remit of the Centre of Excellence for Low Carbon and Fuel Cell Technologies, proposed by the Automotive Innovation and Growth Team (AIGT). (Government has already announced £ 15 million for AIGT Centres of Excellence.);
- an investigation of the value chains for low-technology vehicles, to identify UK companies' capabilities and opportunities;
- advice to Government on 2020 targets for ultra-low carbon vehicles, including zero-emission vehicles, and priorities for action in existing R,D&D programmes.

5.11 Work⁵⁷ commissioned by the Department for Transport and the Department of Trade and Industry indicates the scope for further reducing average new vehicle carbon emissions. This suggests that standard-sized cars emitting 100g/km or less may be achievable within the

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⁵⁷ Ricardo study reference

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next two decades, in particular through hybrid⁵⁸ and related vehicle technologies. These are areas where we have a strong research, development and design presence

(examples box showing some advanced type cars)

- 5.12 As well as the direct benefits of reducing fuel consumption, driving costs and carbon emissions, hybrid technologies are a also a potentially very useful stepping stone for the development of mass-market hydrogen powered fuel cell vehicles, since the electric traction and control systems used in hybrid engines will also be key components in fuel cell vehicles.
- 5.13 The EU Commission is shortly to consider possible future voluntary agreements beyond the present end date of 2008. Given the known technology opportunities for even more fuel-efficient low-carbon cars, the Government strongly supports and will work with the Commission in developing further voluntary agreements, or other arrangements with the same objective, to continue the reduction in average new car emissions, potentially to 100 g/km by around 2020.

... and we can also reduce emissions through lower-carbon fuels ...

5.14 Better cars will significantly reduce fuel use and carbon emissions. But we can also reduce the carbon intensity of transport by adopting lower carbon-content fossil fuels. We already provide fiscal support for road fuel gases with lower carbon contents and lower air quality emissions, and we are promoting the wider use of other alternative fuels.

Biofuels for transport

Fuels from biomass represent an important potential route for achieving the goal of zero carbon transport, alongside that of vehicles running on renewably-produced hydrogen.

The Government has reduced the duty on **biodiesel** to 20 pence/litre below the standard ultra low diesel rate, and this fuel is now coming on to the retail market in increasing volumes, in a 5% blend with conventional diesel. Some lorry fleets are also converting to 100% biodiesel fuelling.

As announced in the Pre Budget Report in November 2002, the Government proposes to introduce the same 20 pence/litre incentive for **bioethanol**, subject to EU agreement. As well as blended fuel, some car manufacturers and fuel suppliers are interested in the possibility of introduction in the UK market of cars that can run on petrol and ethanol in any mixture up to 85% ethanol.

The Government is also interested in supporting the development of bioethanol production from biomass, including farm wastes, forestry residues, coppice crops, and potentially also domestic waste, since these have particular carbon saving and other environmental benefits - and agricultural and rural employment benefits.

⁵⁸ Hybrid vehicles have smaller conventional petrol or diesel engines and larger more powerful, higher voltage batteries. Savings derive, for example, from being able to eliminate engine idling in static traffic and energy recovery from braking systems

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... which will make a significant contribution to carbon reductions ...

5.15 Taken together, the proposed continuation of voluntary agreements on vehicle CO2 performance, increased use of bio fuels and other initiatives could improve the carbon efficiency of domestic transport in 2020 by up to 10%. Carbon savings from more fuel-efficient cars will increase further beyond 2020, as they spread progressively into the fleet.

... and in the longer term take us beyond fossil fuels to a very low carbon transport economy ...

- 5.16 Internal combustion technologies may be capable of becoming twice as fuel efficient as today's vehicles. But this is likely to be the most we can expect from conventionally fuelled vehicles. To continue to reduce carbon beyond this will require a move to carbon free generated hydrogen, or other fuels with equivalent carbon efficiency, such as biomass-based liquid fuels.
- 5.17 So hydrogen looks likely to play a key role in a very low carbon economy, as an 'energy carrier' through which non-fossil energy can replace fossil fuels in vehicles. Hydrogen fuelled vehicles emit only water vapour at the point of use, and also improve local air quality. But hydrogen fuelled vehicles only significantly reduce overall carbon emissions if the hydrogen is derived from carbon free sources.
- 5.18 The auto industry generally expects hydrogen powered fuel cell cars to move towards mass-production around 2020. Also, recent work by environment and energy experts indicates that initially the greatest carbon impact will be achieved by using non-carbon electricity generation to displace more carbon intensive electricity generation, not by using it in transport fuel cells.
- 5.19 But on a longer-term basis, the carbon saving potential of fuel cell hydrogen vehicles is enormous, if current technological and cost barriers can be overcome. There is a strong case for government support for research, development and demonstration programmes (including vehicles and fuelling infrastructure) to overcome the initial market barriers to the development of this technology. We are already actively involved in this. Specifically:
 - we are supporting fuel cell research (chapter xxx);
 - hydrogen projects are a high priority in the Carbon Trust's Low Carbon Innovation Programme;
 - we are funding the trialling of fuel cell buses by Transport for London in 2003 and the supporting hydrogen fuelling station being installed by BP. Plans for hydrogen buses at a new science park in Cambridge in conjunction with on-site production of solar hydrogen are also at an advanced stage;
 - our programmes will also support the trialling of fuel cell cars, as these come out of car-makers design laboratories;

⁵⁹ Fuelling Road Transport - Implications for Energy Policy, by Nick Eyre, Malcolm Fergusson and Richard Mills, 2002

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- we are working with London and other local and regional organisations, on a wider network of demonstration trials, including linkages with existing local hydrogen distribution networks such as that on Teesside. We will encourage projects that can demonstrate hydrogen production in combination with other carbon abatement technologies.
- 5.20 Total government funding for these programmes amounts to over £X million per year.
- ... but a very low carbon economy needs to be planned for ...
- 5.21 So hydrogen and biomass fuels have potentially huge role to play in a very low carbon transport economy. This has significant benefits not only for carbon reduction, but also for energy diversity and security. Significant use of hydrogen for transport has profound implications for the long-term demand for non-fossil electricity as well as for future energy infrastructures, including the electricity and gas infrastructures. Significant use of biofuels similarly has major implications for biomass production and processing.
- 5.22 We need to adopt a strategic approach to these significant new technologies. We need to make sure we have coherent plans to integrate the prospective uses of hydrogen in transport and other energy systems; that we understand more about the options for hydrogen production; and that we have a clear vision of how adequate infrastructure can evolve in good time. We also need to be sure that industry and government have a common understanding of the likely trajectory to the availability of affordable hydrogen vehicles. We will therefore, drawing on the LowCVP and other expert knowledge, produce by the end of 2003 an assessment of the overall energy implications of both a 'hydrogen economy' and of biomass-based fuels, and possible roadmaps of how the transition could take place.
- ... and we need to reduce the emissions from aviation ...
- 5.23 International aviation emissions currently do not count in the national inventories of greenhouse gas emissions. There is no international agreement yet on ways of allocating such emissions. The UK's international emissions currently amount⁶⁰ to some 9 mtC. They are expected to rise by 2020 to some 14-16mtC.
- 5.24 We are committed to ensuring that the long-term development of aviation is sustainable and that it meets its external environmental costs. We will produce an Air Transport White Paper that will set out our plans for the use of economic instruments to take account of, and where appropriate limit or reduce, the contribution of aviation towards greenhouse gas emissions. Potential instruments to address CO2 emissions from international aviation being considered internationally include an en-route emissions charge, and participation in an open emission permit trading system. For domestic flights, BA has joined the UK emissions trading scheme. We would welcome the participation in this scheme of other carriers who operate UK based routes.

.... as well as the other transport modes.

⁶⁰ Airport capacity in the South East Consultation Document.

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- 5.25 These account for much smaller amounts of energy and carbon, but can contribute useful reductions. Like aviation, **shipping** is international in nature and in its oversight. The UK supports the work of the International Maritime Organisation (IMO) to put in place a global strategy for reducing greenhouse gas emissions from ships. An IMO Working Group is working on both technical improvements to engines, on-board machinery, hull and propeller design; and also on operational and market-based measures such as environmental indexing of ships, voluntary agreements, emission standards and emission trading. The Working Group will put forward a draft resolution on the strategy at the IMO Assembly this year
- 5.26 Domestically, the Government is working to reduce carbon emissions from domestic freight transport by encouraging a switch from road to other modes. Freight Facility Grants support freight owners and carriers in switching traffic from road to inland waterways, and this programme has now been extended to coastal freight and short sea shipping.
- 5.27.1 Short passage on rail transport.]

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Chapter 6: A role for nuclear power?

... current nuclear stations will gradually close ...

6.1 Most of the UK's sixteen existing nuclear power stations will close over the next 20 years, with only Sizewell B still running in 2025. At present, nuclear power provides 25% of our electricity. We have to assess the impacts of this decline for our energy policy objectives, in particular our carbon reduction and security of supply objectives.

...there is no pressing case for Government to support new nuclear build, but we will keep the option open for the medium and longer term ...

- 6.2 As previous chapters show, our action to achieve these aims will be focused on higher energy efficiency, through greater use of renewables, and through a range of measures to safeguard energy security. We do not believe that there is currently a case for Government to put measures in place now to support the building of new nuclear power stations. The private sector remains free to bring forward proposals for new nuclear build. Nuclear generation will also benefit from the introduction of the European emissions trading scheme.
- 6.3 [BE paragraph main concern here was to secure safety of the nuclear power stations and the security of electricity supply to the grid and consumers. A shorter term issue about BE rather than a generic issue about potential need for nuclear]
- But we need to keep the situation under review, and be able to respond if, in future, it appeared more likely that further Government support for nuclear power would be needed to deliver our overall objectives. It would be unwise to rule out new nuclear build entirely as a means to deliver carbon reduction and energy security objectives.
- New nuclear power could not suddenly be brought on stream. It could take around 15 years to approve, construct, and commission nuclear power stations. We should therefore take steps to keep open the option for investors to bring new nuclear plant on stream, in the second half of the next decade, if it proved necessary to achieve carbon reductions or maintain security.
- 6.6 We will therefore take steps to ensure that the framework for regulatory and planning approvals for new build is consistent with maintaining that option.
- 6.7 New nuclear build would be subject to a number of regulatory and other approvals, including safety, environmental and security authorisations. Formal approval processes would only take place if there were a firm proposal to construct a nuclear power plant, on a specific site. But these formal processes could be streamlined if preliminary reviews of reactor designs were carried out jointly by regulators before any proposals for site-specific applications were put forward.
- 6.8 In these preliminary reviews, regulators will look at generic designs and provide a view on strengths, areas that needed more work and any major problems. Preliminary reviews will not be part of the formal regulatory process, but are low cost ways for the private sector and regulators to work together to iron out major problems with the design and increase the data available to both company and regulator in advance of the more costly formal licensing

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process. They can also be of benefit for regulators in keeping their understanding of the most recent technology up to date.

- 6.9 We will therefore enable such preliminary reviews to proceed if prospective nuclear licencees were to come forward with new designs. Funding for that purpose would be from the companies concerned, and we will ensure that funds made available by them can be accepted by regulators and used expressly for the purpose of preliminary reviews. We will encourage the regulators to take forward such preliminary assessment work.
- 6.10 In addition, new nuclear power plants could benefit from measures to streamline the public inquiry process for major energy projects, set out in chapter [x].
- 6.11 We would not expect to take a decision on whether to give more proactive support or resources to support new nuclear build before around 2006/07, by when progress on renewables and energy efficiency, and on potential long-term solutions to nuclear waste, will be clearer. If we reached a view that new nuclear build was necessary to deliver our energy policy objectives, we would publish a further White Paper, setting out the case, before taking action.

... we are dealing with the legacy of nuclear waste ...

[Paragraph with brief cross-reference to DEFRA process on waste]

- ... there are also longer term issues ...
- 6.12 Beyond 2020, nuclear power might still have a role in meeting longer term carbon reduction targets. To maintain the option of nuclear power in the longer term we will support research and development on nuclear fission in addition to the support we offer for the development of nuclear fusion, to ensure that the UK keeps up with future developments on nuclear reactors Nuclear fission is one of six energy R&D priorities (see Innovation chapter). International collaboration is particular important in this field, given costs of research and the significance of regulatory requirements.
- 6.13 The UK will continue to participate in international research collaborations, particularly under the USDOE-initiated 'Generation IV Forum' (GIF). GIF's mission is to ensure that new reactor systems worldwide meet very high standards of safety, sustainability and proliferation resistance as well as economic viability. [The Government will commit £7.7million to this programme]. The UK has much to offer, in terms of experience and expertise, as well as much to gain, in terms of influencing future designs and maintaining skills.
- 6.14 Maintaining the option of nuclear power in the longer term will require maintaining an adequate nuclear skills base. Similar skills are also needed for decommissioning and for other technologies involving radioactivity, such as medicine. In December 2002 we published the results of a nuclear and radiological skills study [website reference......]. Although there is no immediate, general skills shortage, some shortages do exist, particularly in safety case production and radiological protection, and problems associated with an ageing

⁶¹ Insert cross-reference to MARKAL analysis

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workforce, competition for engineering and science skills, and uncertainty about the future of nuclear power.

- 6.15 It concluded that a Skills Development Strategy was needed and that a task group should be formed to forge collaboration between employees across the sector.
- ... we will support the development of nuclear fusion as a long term option ...
- 6.16 Nuclear Fusion offers the prospect of power generation from an abundant fuel source with zero carbon emissions and without the problems associated with long-term highly radioactive waste. W are still a long way from a commercial power plant, but the technical feasibility of fusion power generation could be demonstrated within 25 years given adequate resources, leading to full-scale power generation within 50 years.
- 6.17 The next step towards this is the construction of the International Thermonuclear Experimental Reactor (ITER) and the International Fusion Materials Irradiation Facility (IFMIF). The European Commission is leading the EU involvement in these projects and the UK will be pressing to ensure that adequate resources are provided. The UK has considerable expertise in fusion and a complementary national fusion programme will also be needed to maximise the benefit from this expertise.

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Chapter 7: Coal

... the carbon consequences of coal-fired generation need to be handled ...

- 7.1 For most of the time since the industrial revolution, coal has been the main source of primary energy in the UK. Even now coal generation provides about [30%] of the UK's power output. But in a low carbon economy, the future for coal must lie in cleaner coal technologies (which can increase the efficiency of coal-fired power stations and thereby reduce the amount of carbon they produce) or carbon capture and storage. Electricity generation from coal will become more expensive when measures already agreed in the EU's Large Combustion Plant Directive (to control emissions of sulphur dioxide, nitrogen oxides and dust) come into effect. Plant which does not meet demanding emissions standards is likely to be retired over the period to 2015. EU wide carbon emission trading will also penalise coal as a source of power. By 2020, coal generation's contribution to the UK's power output could be as little as [5%].
- 7.2 If ways could be found cost-effectively to handle the carbon, keeping coal-fired generation in the fuel mix would offer very significant security and diversity benefits. Coal is easy to store and transport and can be sourced from a wide diversity of stable suppliers both domestically and worldwide. Loads in coal-fired stations can also be varied relatively easily, so coal fired generation is particularly useful in meeting peak demand or covering for supply intermittencies in other fuels. This may encourage generators to keep some coal-fired plant, so as to give themselves the capacity to meet demand under a variety of circumstances. But this will be at best marginal and would be unlikely materially to increase UK energy security more generally.
- 7.3 If coal is to play more than a marginal role in the mix beyond around 2015, generators will need to find economic ways of dealing with the consequential carbon dioxide emissions. One option is to capture and then store the CO2. The most promising approach at present would be to lock the gas away in geological structures such as depleted oil and gas fields. The UK North Sea offers a potentially very valuable resource in this respect. The following chapters examine this in more detail.

... carbon capture and storage may offer a promising way forward ...

7.4 Carbon capture and storage (CCS) – and the potential value of CO2 injection for enhanced oil recovery (EOR) as a means of extending the life of the north sea oil reserves - is described in detail in the box below. As described in the recent review of cleaner coal technologies [footnote reference to the 2001 DTI review], CCS is currently constrained by a number of significant legal and technical issues. These are the subject of a number of follow-up projects designed to establish if they can be removed.

Carbon dioxide capture and storage (CCS)

CCS offers the potential to deal with the carbon emissions from using fossil fuels in electricity generation or from other large CO2 sources (such as chemical plants and refineries). It would be an option in the generation mix to reduce the emissions both from gas

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plant and from coal plant. It is particularly interesting in the context of coal fired generation in that it would allow much more coal to be used in the mix than otherwise. In coal plant, it could be achieved either by capturing the CO2 from flue gases or, technically more easily, by gasifying the coal prior to electricity generation (in an integrated gasification combined cycle – IGCC – plant).

Once captured, the CO2 needs to be placed in some form of long term storage. The theoretical storage capacity of suitable geological formations (depleted oil and gas fields, deep saline reservoirs and unmineable coal seams) is massive. The key constraints are most likely to be the cost, and the environmental and public acceptability of the technologies involved.

European capacity for storing CO2 in geological formations could be around 220 GtC, mostly under the North Sea and mainly in the Norwegian sector and the UKCS. About 95% of this potential is in deep saline aquifers, and only about 5% in depleted oil and gas fields. The North Sea oil and gas well capacity is sufficient to absorb all UK CO2 emissions at current levels [for potentially hundreds of years]. Theoretically, there could be further capacity in unmineable coal seams, but initial UK analyses suggest this is unlikely to be a significant option, given the nature of our own coal beds.

Geological formations are capable of containing gas, as indeed they have done for thousands of years. Geological sequestration should be capable of retaining carbon dioxide for a very long time, perhaps indefinitely. However accessing reservoirs would necessarily disturb them and leakage might occur, for example through geological faults, seismic activity, failure of pipelines or other engineering components and groundwater movement. The political and public acceptability of CCS is likely to depend at least in part on a convincing risk analysis and on the ability to detect slow leaks if they occur, since these would obviously reduce the usefulness of sequestration as a way of mitigating CO2 emissions.

A pilot project in the Norwegian sector of the North Sea is the only example of offshore carbon dioxide injection currently in process. This takes CO2, which is co-produced with the gas in the Sleipner West field and injects it into an aquifer. In North America, a number of projects are injecting carbon dioxide into oilfields to help increase oil recovery (known as enhanced oil recovery or EOR). During this process most of the carbon dioxide used ultimately remains in the oilfield, so is effectively sequestered.

EOR would allow additional oil recovery from the UKCS – [150 mt (1 billion barrels)] may be achievable over 20 years. This compares to current annual oil production of about 130 mt. But the current rates of field depletion mean that this opportunity only exists in the short term and carbon dioxide injection needs to start by 2006/8 if it is to have an impact on the largest fields before the existing infrastructure is dismantled.

... enhanced oil recovery ...

7.5 Studies by FES and others [footnote reference to material on the website] suggest that EOR is unlikely to be cost effective in a timescale that will fit the existing UKCS needs. A single CO2 pipeline from a medium sized coal power station together with well-head injection and handling facilities could cost of the order of £1-1.5 bn. The additional oil

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recovered could justify this investment, but would not cover the additional costs of capturing and storing the carbon dioxide at source.

- 7.6 Technologically, coal fired power stations offer the most likely source of the volumes of CO2 that are likely to be needed for EOR. Integrated gasification combined cycle power plant (IGCCs) gasifies coal to produce power, hydrogen and carbon dioxide. These offer a particularly promising source of CO2. Two schemes at Onllwyn in Wales and in Doncaster are actively being developed at present, and have applied for section 36 planning consent to build power generation capacity. This plant would also be able to generate large quantities of hydrogen, potentially of interest in enabling the development of production scale hydrogen projects.
- 7.7 If EOR is to be of value to the UK, it needs to start within 5 years. Large fields (Forties, Brent, Ninian, Fulmar) would offer the best prospects. In addition to the short term carbon savings an EOR scheme would offer, this would also deliver a basic infrastructure to enable the delivery of CO2 for later CCS, as and when the technological, legal and gas security issues are resolved. The cost of this basic infrastructure would be significantly less if it were to be funded by the oil companies from expected EOR revenue streams than if it were to be funded for CCS alone from expected carbon emissions trading benefits. And insofar as the technologies need to be demonstrated and tested in an offshore environment before firm commitments could be made to a CCS scheme, an EOR project would also provide significant help to the research and analysis of the options.
- 7.8 Given the potentially significant strategic role that might be played by CCS in longer term energy security, the Government considers there is a strong case to examine more closely what might be done to help stimulate the take-up of EOR in the North Sea. We will therefore set up an urgent feasibility study, with the developers, generators and the oil companies, to establish what needs to be done to get a demonstration project off the ground. This study will reach conclusions within six months, to enable firm decisions to be taken on the funding of any necessary government component as soon as possible thereafter.

... there may be opportunities to sell cleaner coal technologies overseas ...

7.9 Coal will remain the dominant generating fuel in large parts of the developing world, such as China and India, for many years to come. UK industry is potentially well placed to sell cleaner coal technologies into developing countries. In the longer run it should be possible for them to benefit from carbon credits through international trading under the IPCC clean development mechanism. We have already put in place a programme of support for advanced traditional cleaner coal technologies. A UK CCS demonstration project would also provide a significant stimulus to the export of these technologies worldwide.

... coal mine methane is a legacy to be managed ...

7.10 Disused coal mines continue to produce methane even after they are closed. These emissions are significantly more damaging to the environment in terms of their global warming potential than CO2. Where it can be captured, this gas can be used to generate electricity and heat, thereby contributing to the energy mix and reducing the greenhouse gas

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emissions from abandoned mines significantly. To help stimulate the industry, we granted CMM plant an exemption from the climate change level in the 2002 budget.

- 7.11 This is a temporary problem. Emissions decline after mines are closed although they may continue for some time where the mines remain unflooded. Even when extracted, the volumes from CMM do not offer significant long term help to the security/diversity of UK energy supplies. But in the short term, CMM presents a material environmental problem.
- 7.12 With existing levels of support, a number of new projects will remain uneconomic. As a result, the methane will continue to leak to atmosphere. Market based carbon trading systems may offer some help in this respect, bringing on projects that would otherwise not justify themselves. The European Trading Scheme may include a project scheme in due course, which may allow credits to be claimed for CMM projects. [In the meantime, we will work on a framework for pilot projects within the UK emission trading scheme for which CMM projects may be eligible.]

...the UK coal mining industry...

- 7.13 The level of coal fired generation is not of itself a limiting factor on UK mines. Coal production in the UK will decrease over coming years predominantly as a result of the increasingly difficult geological and mining conditions in UK pits. By 2010 most of our existing deep mines are likely to have exhausted their economic reserves.
- 7.14 Coal, like oil and increasingly gas, is an internationally traded commodity. Supplies are available from a wide variety of reliable sources. The relevant infrastructure, notably in ports and the rail network, subject to market-led investment, is likely to be sufficient to meet expected demand in a very wide range of likely scenarios. Given this relatively mature and flexible market, there do not appear to be economic grounds for supporting UK coal production as a hedge against import prices or security of electricity supply grounds for supporting production as a means of increasing diversity.
- 7.15 However, the Government does recognise that coal producers can make positive contributions to areas that are often economically and socially disadvantaged, by providing well-paid and skilled jobs. European rules prevent projects in the coal industry from receiving support through Regional Selective Assistance ("RSA"). However, the new Council Regulation on State aid to the coal industry (EC No 1407/2002) allows Member States to pay investment aid for pits that have a viable future. The UK government therefore intends to introduce an investment aid scheme for the coal industry on a basis similar to RSA, such that support can be given to viable coal projects which maintain access to reserves in order to create or safeguard jobs.

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SECTION TWO: BUILDING ON EXISTING GOALS

Section 8: Energy security

- 8.1 Section one of this white paper outlined our proposals to move to a low carbon economy. As we outlined in the first chapter, we have three other goals that we believe can be achieved simultaneously reliability of supply, competitive energy systems and affordable heating and lighting in every home. These are dealt with in turn in the next three chapters.
- 8.2 Our goal is to achieve energy reliability, namely, that people and businesses can rely on secure supplies of energy, gas, fuel and electricity at predictable prices delivered through the market. Reliable energy supplies are an essential element of sustainable development.
- 8.3 To achieve this we need a resilient energy system one without significant weak points, which operates effectively and which recovers quickly if problems occur. This means a diverse system based on a mix of fuel types, a variety of supply routes, liquid international markets, back-up facilities such as storage, and a robust infrastructure.
- 8.4 We believe that the market left to its own devices can achieve much, but not all, of what is required. For example, suppliers will diversify their own sources to reduce their commercial risks contributing to wider diversity. But we need to facilitate the market (e.g., through international relations) and to satisfy ourselves that the market actions properly reflect longer-term strategic issues on reliability of supply.
- 8.5 For the markets to work, firms need to be confident that the government will not step in. We will not intervene in the market without very good reason, for example where there is a potential safety issue. But we will remedy potential impediments to the ability of the market to deliver reliability.

... short-term reliability issues ...

8.6 The Government (the Secretary of State for Trade and Industry) shares responsibility for energy security with the electricity and gas regulator, OFGEM. The 2000 Utilities Act gives legislative force to this responsibility. It requires the regulator, and Secretary of State, in carrying out their functions, primarily protecting the interests of consumers to have regard to the need to secure that all reasonable demands for electricity are met⁶². Government remains committed to the provision of energy through competitive liberalised markets and as such it is the responsibility of OFGEM, to take action within the market to enable market players to operate effectively so that security is maintained. A variety of mechanisms are available to OFGEM to translate this responsibility into action, such as the setting of supply license conditions, including supplier of last resort, and the price reviews of the monopoly infrastructure providers. The result is that should energy supplies be disrupted, or energy demand exceed expectations in the short-term, it is reasonable to assume that the problem can swiftly be resolved.

⁶² For gas: the need to secure that, so far as it is economical to meet them, all reasonable demands in Great Britain for gas conveyed through pipes are met.

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- 8.7 The market needs reassurance that the regulator is giving sufficient weight to energy security in proposing or making new regulations. OFGEM have agreed that in future its consultation documents will explain how its proposals will affect energy security, as well as their impact on the environment and our social objectives.
- 8.8 Where short-term problems arise we will evaluate what has happened and act accordingly or, where the issue is outside the remit of OFGEM, take action. For example:
 - The storms of 27 October 2002 were severe in some parts of the country and many households were without electricity for over a week. We considered the response of some of the electricity companies inadequate and immediately launched an investigation. We [have published] the results of the study and will...[to be updated, late December.

Following the fuel protests in September 2000, we signed a Memorandum of Understanding with oil industry companies, the police, the Trades Union Congress, the Cabinet of the National Assembly for Wales and the Scottish Executive which sets a framework to improve co-operation and co-ordination between the key organisations in the event of a threat to oil supplies. The Government is now reviewing with the industry and other stakeholders the detailed plans for tackling oil emergencies and updating them in the light of developments in the economy.

... long-term response ...

8.9 We cannot afford to be complacent in matters of energy security and are not. The PIU review concluded, "there appear to be no pressing problems connected with increased dependence on gas." But safe and reliable supplies of electricity and gas are so fundamental to our economy and way of life that the situation must constantly be monitored and it is our responsibility as a government to ensure that every possible action is taken at all times to ensure that the risk of disruption is minimized. This chapter outlines how we propose to do that.

... things are changing ...

- 8.10 As a country we have been largely self sufficient in energy supplies for the past two decades, following the successful development of North Sea oil and gas. But this will change. Forecasts vary but it is commonly agreed that UK oil and gas production will decline significantly over coming years. We are currently working with the industry⁶³ to maximize the economic potential of our North Sea supplies, but it is still likely that the UK will become a net importer of gas on an annual basis by around 2006 and of oil by around 2010. By 2020 the UK is likely to be importing around three-quarters of our energy needs; by that time half the world's gas and oil will come from countries that are currently perceived as relatively unstable, either in political or economic terms.
- 8.11 Relying on imports is not a problem in itself. Most other advanced industrial economies already import significant proportions of their energy needs, without noticeable

⁶³ PILOT initiative, now in its third year, is promoting pan-industry co-operation with Government to enhance economic recovery of the UK's oil and gas resources thus prolonging indigenous supply

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disruption. Import dependency is already a fact of life for all the G7 countries apart from the UK and Canada.

8.12 Worldwide fossil fuel resources are very large. Globally, proven gas reserves would meet at least 45 years of demand⁶⁴, and there remains vast potential beyond this. Oil is the world's most important fuel, accounting for 40% of global primary energy consumption⁶⁵. Its share in 2020 is likely to be at a similar level. Globally, proven oil reserves are more than sufficient to meet projected demand for around 30 years, with potential for twice as long⁶⁶.

... international risks ...

- 8.13 However our move from being largely self-sufficient to a net importer of gas and oil requires us continually to monitor our response to the following international risks:
 - insufficiently diverse sources of fossil fuels. If we are reliant on too few international sources of oil and gas then we expose ourselves to the risk that failure of supply in one geographic area will lead to energy shortages in Britain.
 - lack of liquid markets. The more liquid the international markets for energy supplies, the easier it is to purchase what we need at any time.
 - global anti-competitive practices. Price spikes due to international cartels can jeopardise our ability to purchase the oil and gas that our economy needs.

... diversity in gas markets ...

- 8.14 The main gas reserves are to be found in the Former Soviet Union (FSU), Middle East and Africa. Russia has the largest gas reserves in the world, with over 30% of the world's reserves⁶⁷. There are also many other potential suppliers of gas including Algeria, the Caspian countries, West Africa and the Middle East (in particular Iran). Closer to home, Norway has been and will be a key provider of gas to the UK.
- 8.15 Our priority has to be to bring diverse supplies on-stream and into the EU market. Substantial long-term investment is needed to build the necessary infrastructure. For example, some estimates suggest that investments of US\$240billion may be required to develop gas production in Russia alone to 2020. The private sector has an incentive to undertake the necessary investment but given the scale of the infrastructure investments required in new suppliers to the UK and the long investment lead times, we will continue to monitor the situation closely and support efforts to promote investment.
- 8.16 For companies importing gas into the UK, it will be in their interest to diversify their own risks by having supply contracts with a number of different suppliers and by encouraging the appropriate infrastructure. The number and diversity of participants in the UK gas market is also making a valuable contribution towards widening the range of arrangements for future supply of gas into the UK. The Government will continue to engage with Russia, Iran, the Caspian, Middle East and African countries, and the

65 IEA World Energy Outlook 2002

⁶⁷ BP Statistical Review of World Energy

⁶⁴ Add source (average of estimates, paper to go on DTI website)

⁶⁶ Add source (average of estimates, paper to go on DTI website) and note minority view

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potential transit countries, focusing on good governance and the development of stable investment and transit regimes.

- 8.17 We are putting in place a new treaty with Norway to facilitate continued supplies both as a primary fuel and as a source of feedstock for the UK chemical industry and to assist production from the United Kingdom Continental Shelf (UKCS).
- 8.18 Liquid Natural Gas (LNG) offers a flexible alternative to piped gas. International trade in LNG is growing at about twice the rate of that in pipeline gas and may over time lead to greater price convergence between regional markets, given the increasing scope for arbitrage. The development of LNG in the UK may require additional onshore pipelines in some locations. It is possible that gas imports from some sources, particularly LNG, will vary in energy content and may require blending with other gases in the system, special processing on import or the modification of certain gas appliances. We will keep developments here closely under review. In particular, we shall monitor the likely effects on gas quality and, if so, what the appropriate policy response would be. Overall, we welcome the development of an LNG market as a contribution to diversity, security and as a source of competition to piped gas.

... diversity in oil markets ...

- 8.19 The bulk of world oil reserves are found in the Middle East, with Saudi Arabia alone holding 25%. Other significant reserves are found in South and Central America, Africa and the FSU. In addition to conventional oil reserves, there are also massive unconventional oil reserves in Canada and Venezuela. The costs of production are falling rapidly for these reserves, although they tend to be of poorer quality. To monitor trends in international oil markets and prepare for risks/uncertainties, we will enhance our existing arrangements to monitor oil security issues. This work will be led jointly by the DTI and the Foreign Office.
- An important source of resilience in the event of actual or potential supply disruptions is to have resource to sufficient oil stocks in storage. But they cannot be used to control oil prices and should not as this is ineffective and limits their availability for supply emergencies. The International Energy Agency (IEA) is the key organisation for managing oil supply disruptions and the release of stocks by its members which include countries such as USA and Japan in addition to EU members. Oil supply is a global issue: it is therefore important that oil security arrangements are developed in a global context through the IEA auspices and through arrangements which include other (non-IEA) key consuming countries such as China and India. We will continue to support the work of the IEA in encouraging members and non-members to maintain and develop adequate oil stock levels, as well as other security arrangements, for use in time of oil supply disruption.

... ensuring effective markets ...

8.21 Oil is an internationally traded commodity, and so operates in a liquid market. The same is not yet true for gas. The benefits of an effective gas market for the UK are that it

⁶⁸ BP Statistical Review of World Energy

⁶⁹ Oil not produced from underground reservoirs such as oil shales, oil sands, extra heavy crude and gas to liquids etc.

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makes it more efficient to match supplies with demand. It is therefore an aim for the UK to ensure a fully liquid market in international gas supplies. Our first priority is to work for a fully competitive market within the EU. To this end, the energy liberalisation package agreed by EU energy ministers on 25th November 2002 was a major achievement. It includes a commitment to allow industrial and commercial electricity and gas consumers a choice of supplier by 1 July 2004, and all consumers this choice by 1 July 2007.

- The new liberalisation Directives require the legal separation of transmission and distribution from production and supply, and access to grids and pipelines on published, nondiscriminatory terms. These structural measures are essential to achieving a properly functioning internal EU market, with the benefits this will bring to consumers in prices, efficiency, choice and service levels.
- 8.23 They also require Member States to establish independent economic regulators – such as OFGEM in Great Britain - with specific duties in relation to, for example, transmission and distribution access tariffs, and the allocation of interconnector capacity to third party access on a transparent and non-discriminatory basis. This is vital if the UK is to ensure the security of its energy supply in the long term.
- The UK has been pressing for this for a number of years. We will now work with the Commission and with other member States to make sure the agreement is effectively implemented. We will also continue to press the European Commission to tackle competition issues vigorously.
- In the longer term, we will work within the EU to encourage greater links between the EU market and supplies beyond its borders. Around 70%⁷⁰ of global gas reserves are within economic distance of the EU market. Widening access to the European gas grid from other sources increases diversity and thus the resilience of our own gas supplies.

... preventing anti-competitive practices ...

- Like other importers, our dependence on OPEC⁷¹ for our oil supplies is likely to increase in the long-term, although its membership and role may change. The Middle East is the largest single oil-producing region and Saudi Arabia is currently the key producer, whilst Iraq has the potential to become a very significant oil producer in the next decade. However, supplies from other sources such as the FSU and West Africa will remain important and will add to diversity in the short and medium term. We will continue to promote good relations with key suppliers in the Middle East, FSU and Africa. In particular, we will continue to work towards a transparent, diverse and liquid world oil market, and to improve the investment climate in key producing countries. [Revisit when Iraq situation clearer].
- The development of a gas cartel including many major pipeline gas and LNG producers could threaten long-term price security, although the number of competing suppliers is likely to limit its effectiveness and its impact on prices is likely to be limited. We will work with the European Commission and other Member States in monitoring the situation closely.

⁷⁰ Add source

⁷¹ Members are: UAE, Venezuela, Saudi Arabia, Iraq, Kuwait, Iran, Libya, Nigeria, Algeria, Indonesia, Qatar RESTRICTED

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- 8.28 In addressing these risks we will as a government work across departmental boundaries to give greater prominence to strategic energy issues in foreign and defence policy. Both in the UK and through its network of overseas posts the FCO will work more closely with other government departments to achieve common objectives in international energy security. Our aims are to maintain strong relations with exporting countries and to promote the benefits to both producers and consumers of transparent, liquid, and diverse world energy markets.
- 8.29 Producers and consumers have a common interest in ensuring effective trade in energy products. Both benefit from stable markets that help ensure that supply is sufficient to meet demand and thus contribute to relatively stable global prices.
- 8.30 For over a decade, oil and gas producing and consuming countries have been engaged in a process of dialogue on both a bilateral and multilateral basis. The UK has been an active supporter and participant. The dialogue has helped improve mutual understanding, confidence and awareness of long-term common interests as well as promoting the development of specific initiatives such as the Oil Data Transparency exercise. As trade in energy increases and the "interdependence" between new and existing and new oil and gas producer and consumer countries increases, such dialogue between all countries will become increasingly important.

8.31 We will continue to work with consumers and producers and with the international community to:

- stabilise and resolve regional disputes;
- promote political and economic reform and stability in key producers;
- improve mutual understanding and the functioning of world energy markets, e.g. through continued improvements to international data transparency
- promote conditions for Foreign Direct Investment, through stable financial regimes, transparent legal frameworks, predictable domestic energy policies, and predictable foreign investment terms;
- promote liberalisation of energy markets including through the World Trade Organisation (WTO);
- work with IFIs to support financing for energy infrastructure investment.
- work with OECD partners and the international oil companies to promote economic and political stability in developing countries through the Extractive Industries Transparency Initiative, particularly among the emerging oil and gas producers in Africa and Central Asia.
- develop an Environment Attaches network in following up on the Kyoto Protocol, the Science and Technology Attache network, and the engagement of key posts (producers and consumers) in promoting UK policies and reporting developments relevant to the international oil and gas markets.

... domestic issues ...

8.32 In addition to the international risks there are three potential risks within the structure of our own market, namely that:

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- electricity generation companies will not have the price incentives to invest, in good time, in the capacity required to meet future needs.
- our sources of electricity generation are insufficiently diverse
- availability of gas storage.

... ensuring incentives to invest in electricity generation ...

- 8.33 Reserves of electricity cannot generally be stored (except through the so far very limited use of pump-storage hydro facilities). To meet peak demand, we need to have sufficient spare capacity to meet unexpected outages. This is the capacity margin. It enables the system to respond reliably and quickly to peaks in demand or unexpected interruptions in generation. The capacity margin in England and Wales is currently running at around 19% (excluding mothballed plant), close to historical standards of 20%⁷².
- 8.34 The introduction of the new electricity trading arrangements (NETA) in 2001 exposed the fact that there was too much capacity margin in the electricity market. This was built up over the late 1990s as a response to inflated prices under the previous trading system. Prices under NETA are lower than many companies had anticipated and some are facing financial difficulty. Capacity margins have been reducing as some generators have chosen to mothball, or temporarily withdraw from service, some of their power stations. Others have delayed planned building programmes. These are not market failures, but they have raised concerns about whether, when in due course new build is needed, companies will invest in time. Given current low prices there are currently no incentives to invest in generation plant.
- 8.35 Over the next 20 years, almost all our existing nuclear power stations will close as they end their operating lives. Most coal-fired power stations will also close as they age and as more stringent environmental controls come in from 2005 onwards. But given current excess capacity, and our expectations of renewables and energy efficiency improvements over that timescale, we are unlikely to need any new investment in power stations over the next five years or potentially longer.
- 8.36 Many liberalised electricity margins elsewhere employ a capacity margin instrument (CMIs) to seek to secure a fixed level of capacity margin. We have reviewed the case for such a measure here⁷³. This study has estimated that a CMI could increase the cost to consumers by around 1%. It would not entirely eliminate the risk of shortfalls, but could make a capacity shortage less likely, as companies would have a financial incentive to provide extra capacity.
- 8.37 We have concluded that there appears to be no case for such an instrument in the UK market. Suppliers are already obliged in their license conditions to 'take all requisite steps, so far as is reasonably practicable, to secure the necessary supply of electricity'. We will look to OFGEM to use its powers vigorously to enforce these license conditions. The development of forward looking markets 2-3 years ahead allows companies to take the necessary action to achieve this and evidence from the gas market shows that companies are

Add source and confirm data and difference annual and current data. Margin in Scotland is currently 28%.
 NERA study Security in Gas and Electricity Markets, - Nov 2002 Electricity Markets and Capacity
 Obligations - NERA study - December 2002

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responding to future needs by signing supply contracts or developing infrastructure. Such investments are not needed at present in electricity.

8.38 [OFGEM will, in addition, ensure that National Grid Transco also maintains actively a suitable margin of reserve generating capacity that can be used as a last defence against blackouts].

... a diverse mix of electricity generation ...

- 8.39 There is an argument that the UK government should specify the mix of fuel sources in electricity generation, allocating a proportion to gas, a proportion to coal and so on. We have considered this proposition carefully and have dismissed it. It is, in our view, impossible to specify a particular mix of fuel sources that would provide more security than any other. And to do so would fundamentally cut across the underlying principle of the policies we outline in this white paper; that we can create a market that will deliver our energy policy objectives.
- 8.40 However neither is it the case that we wish to be overly dependent on one fuel source, across the whole economy or in a specific sector e.g. oil in transport. It is our view that the policies we put forward in this paper will encourage the long-term development of new, more diverse and cleaner energy technologies that will promote security and our low carbon objectives.
- 8.41 Coal (UK produced or imported) has traditionally offered a source of energy relatively secure from sudden changes in other international energy markets. There are some that say we should subsidise the coal industry in order to aid security of supply. We are already supporting a number of technologies to help coal to compete fairly with other low-carbon technologies. The future of coal generation, and new measures to encourage the development of carbon capture and storage, is discussed in chapter 7.
- 8.42 There are others that argue we should build new nuclear power stations would also provide greater diversity and security of supply. However, while they are zero carbon, they pose other environmental risks. The future of nuclear generation is discussed in chapter 6.
- 8.43 Diversity goes beyond a simple choice of the fuel that is used. It relates to how fuel or energy is moved and used. Additional electricity interconnectors, like the existing one to France, would also increase resilience. Projects are being developed for new direct current electricity interconnectors to Norway and the Netherlands, and discussion is taking place on a possible link to the Republic of Ireland. These are essentially market decisions, driven by the commercial assessments of electricity suppliers. The Government will continue to keep the diversity of the electricity mix under review.
- 8.44 Reducing demand also helps security. Demand can be reduced through better energy efficiency (as described in chapter 3) and through metering technologies and pricing structures which enable and incentivise users to manage their demand away from peak periods.

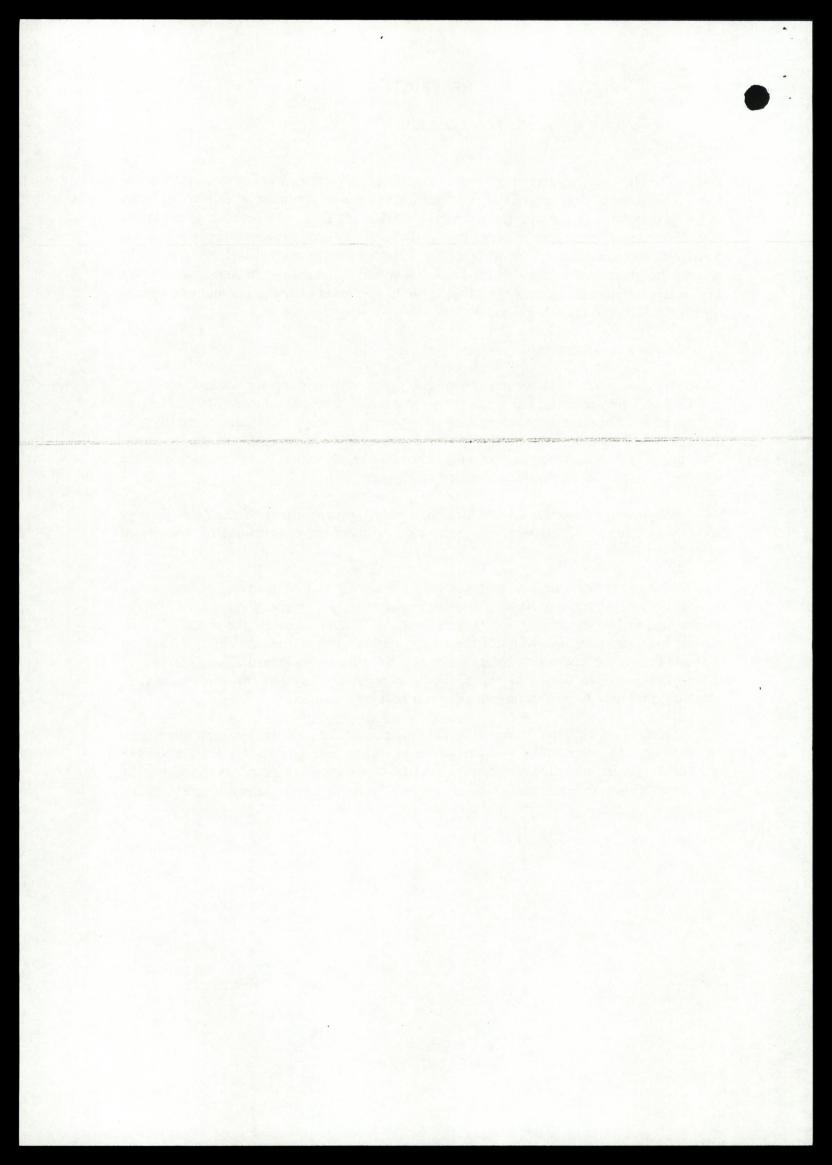
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... gas storage ...

8.45 The UK has a relatively low level of gas storage as compared to France, Germany and Italy. This is not of itself a problem, provided that the market continues to deliver flexibility as UK gas output falls and with it the capability of UK gas fields to meet short-term periods of high demand. Other means of providing supply flexibility such as new storage projects and flexible import contracts appear to be being delivered by the market and along with the progress on liberalisation provide confidence that access to flexibility can be maintained. We will closely monitor and assess the adequacy of provision of instruments that can deliver supply flexibility to the UK gas market.

... monitoring the situation ...

- 8.46 We have laid out above our response to the security of supply risks that have been identified. All are important, but none appears to pose an immediate threat. There are many triggers within a liberalised market to incentivise energy security. And markets are likely to deliver security most cost-effectively. The experiences of California and Ontario, however, show that it is important for governments to monitor security and, particularly, to monitor how their own actions may influence market behaviours.
- 8.47 We will continue actively to monitor energy security through the Joint Energy Security of Supply (JESS) working group and to make the conclusions of that group publicly available.
- 8.48 Monitoring will continue to focus on price signals and on monitoring longer term infrastructure developments, on providing the market with assessment of supply and demand information, and on monitoring the markets' reaction to price signals. The group will also monitor the continuing robustness of the energy system, such as the availability of backup fuels and the availability of mothballed plant, etc. We will use the information gathered by JESS as a guide to issues in the market or regulatory system or elsewhere (e.g. planning) that may be preventing an adequate market response.
- 8.49 There is currently no guidance on the implications for land use planning of projects related to energy security. We will prepare a guidance note on this for local planning authorities. Larger infrastructure projects important for security of supply will also benefit from steps to streamline the public inquiry process for major energy infrastructure projects, described in chapter 4.



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Section 9: Reducing disadvantage

... energy policy also raises a range of social issues...

9.1 Most of us take for granted being able to turn the lights on and keep our homes warm. But some people can't afford to meet even their basic energy needs. We need to ensure that as we address the security, environmental and competitiveness aspects of energy policy we also take account of social impacts, especially on the poorest. And in a changing world, people move jobs more often we need to be sensitive to those who have to face change after a lifetime in specific industries.

... we are making good progress on tackling fuel poverty ...

- 9.2 Some households spend 10% or more of their income to heat their homes adequately: the "fuel poor"⁷⁴. Fuel poverty is mainly caused by three things high energy prices, low incomes, and energy inefficient homes. So we need competitive energy prices, increased incomes and better energy efficiency in houses. The Government was the first to commit itself to the eradication of the blight of fuel poverty. It has a legal obligation under the Warm Homes and Energy Conservation Act 2000 to specify a target date by which, as far as reasonably practicable, this will be achieved. The UK Fuel Poverty Strategy was published in November 2001, and set out the policies to meet the Government's joint commitment with the Devolved Administrations to ending by 2010 fuel poverty in vulnerable households older households, families with children and householders who are disabled or have a long-term illness. We further aim that, as far as reasonably practicable, nobody in England should be living in fuel poverty by 2016.
- 9.3 In 1996 there were 5.5 million UK households in fuel poverty. Today there are around 3.5 million 2.5 million of them vulnerable households. This two million reduction is due mainly to energy price reductions and increased benefits.
- 9.4 On current forecasts, we expect economic growth to take [up to 1 million] more households out of fuel poverty by 2010. We will also work to encourage more households to take the benefits to which they are entitled.
- 9.5 Eradicating fuel poverty sustainably, particularly for the most vulnerable households, requires action in the home better insulation, more efficient heating systems, and minimising draught. Together with the Devolved Administrations we fund a number of grant schemes to support this activity: Warm Front in England, Warm Deal in Scotland, New HEES in Wales, and Warm Homes in Northern Ireland. These provide help for people on income or disability benefit. The Energy Efficiency Commitment directs half its benefits to this priority group. Social housing policy also helps. By continuing these initiatives in their current form and at their current levels we expect to remove up to another 1 million vulnerable households from fuel poverty by 2010, in addition to those who move out of it through economic growth.

... but we need to do more ...

Different definitions of fuel poverty apply in each country and there are also two methods of assessing income – either to include or exclude Housing Benefit and Income Support for Mortgage Interest. The figures quoted take account of the income. The numbers in fuel poverty are greater if this income is excluded

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- 9.6 An evaluation of Warm Front in England and progress on the Energy Efficiency Commitment (EEC) will be completed during 2003. We will then establish the best way of tackling the remaining vulnerable fuel poor households and making the best use of our resources.
- 9.7 We are also exploring new ways of tackling fuel poverty. Five pilot "Warm Zones" were established in 2001 in Stockton, Sandwell, Hull, the London Borough of Newham and Northumberland bringing together the deliverers of Warm Front, energy suppliers, local authorities, health officials and others to provide a co-ordinated approach in a local area. [weblink]. [We are also considering ways to encourage the elderly to use some or all of their winter fuel payments towards subsidised energy efficiency improvements.]
- 9.8 To advise on progress and recommend improvements in delivering its strategy, the Government established the Fuel Poverty Advisory Group in England. The Group's first annual report [weblink] has argued that current programmes will on their own not be sufficient to meet the Government's 2010 targets. [We will respond to these within the next year.] A similar Group advises the Scottish Parliament on progress on tackling fuel poverty in Scotland.

... and there is a need to tackle rural issues ...

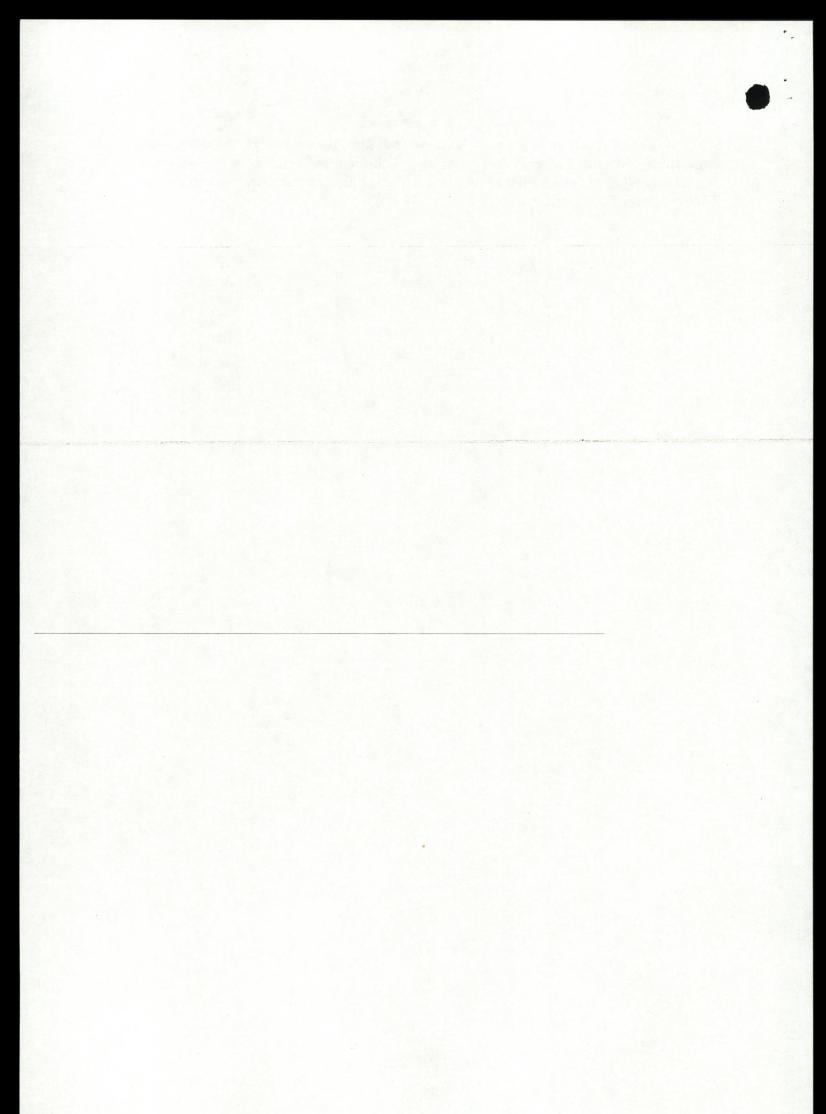
- 9.9. Fuel poverty affects urban areas. But it can be more acute in the countryside, where houses tend to be older, less energy efficient and harder to heat. The Warm Front programme and the Energy Efficiency Commitment address this. The Warm Front programme also encourages people to claim their full state benefit entitlements. Underclaiming is thought to be worse in rural areas. We will address this.
- 9.10 Many people in rural areas do not have mains gas. Fuel oil, solid fuel, electric heating or liquid petroleum gas (LPG) can be more expensive and less convenient. The DTI is therefore working with Transco to identify areas where extensions of the gas network might be justified. [We will provide £25m over three years to fund pilot projects on gas extension]. The DTI will also work with other gas transporters who have an interest in similar projects.
- 9.11 People living in rural areas are particularly dependent on cars, and can be affected by higher fuel prices and closure of filling stations. We have set up a taskforce with industry on services for rural motorists to look at issues such as the costs of environmental measures for small filling stations and schemes to support rural filling stations.

... and, more widely, internationally ...

9.12 International development has an important part also to play in promoting energy security in the medium to long term. The UK government's domestic objectives of alleviating fuel poverty and supporting rural development while minimising damage to the environment apply equally in an international context. The recent DFID "Energy for the Poor" paper sets out the importance of access to energy services as an underpinning factor for achieving international development goals for reducing the number of people in poverty. DFID aims to build upon the recommendations of this paper to work with the international community to improve the delivery of energy services for the poor.

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9.13 We shall continue to promote international dialogue on energy and development – including equitable access to energy for all – including through NEPAD [glossary] and WSSD follow-up activities such as the Global Village Energy Partnership and the EU Energy for the Poor Initiative.



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Section 10: Competitiveness

... achieving competitive energy prices is one of our four energy policy goals ...

- 10.1 Energy must be affordable, for businesses and consumers. Access to energy supplies is of little use if the price is too high. The cost of energy must not threaten our overall competitiveness or discourage inward investment: the energy sector represents 3.5% of UK GDP and has a significant impact on the other 96.5%. So energy prices must be competitive.
- 10.2 The introduction of competition has led to lower prices. For industrial users, real electricity prices fell by 25% between 1996 and 2001, as measures like the introduction of NETA and the reduction in the fossil fuel levy fed through to contracts. For domestic consumers average prices in real terms fell by 23% for gas and 27% for electricity between 1991 and 2001. Competitive markets are one of the primary drives of productivity and growth.
- 10.3 An important indicator of our energy competitiveness is to compare UK prices with those in other European countries. Our industrial gas and electricity prices were the second and fourth lowest respectively in the EU in 2001. Our domestic gas and electricity prices similarly were also the second and fourth lowest.
- 10.4 There is a wide variation in gas and electricity market structures across Europe. These structures will be changing over the coming months and years as other EU countries follow our market opening measures through their implementation of the EU liberalisation Directives (see Security section...) that we have championed.
- 10.5 A key change in the UK has been the introduction in 2001 of NETA (glossary) to replace the Electricity Pool. Under NETA the bulk of electricity is traded forward through bilateral contracts and power exchanges. NETA also has a balancing mechanism to ensure supply meets demand at all times. Its primary aim is to create a more competitive wholesale market. Recent reductions in traded wholesale electricity prices are equivalent to a reduction of £ 3 billion or 0.3% of GDP in the costs borne by the rest of the economy some [20-25%] below those that would have been produced by the Pool. The market is now much more liquid with a [threefold] increase in the number of trades, and a [doubling] of the number of contracts struck compared to under the Pool.
- 10.6 There has been criticism of NETA, in particular that the balancing mechanism imposes high costs on generators who are out of balance and is unfair to smaller generators, particularly to renewables and CHP. We have worked closely with OFGEM to try to make the balancing mechanism more genuinely "cost reflective" and a number of amendments have been made since NETA was introduced. We are also working to make it easier for small generators to consolidate their output. OFGEM has also agreed to introduce in February 2003 a further amendment which should substantially reduce the costs being recovered through the balancing mechanism and, therefore, the burden on those who are out of balance. We will continue to work with OFGEM on refining NETA and making the balancing mechanism easier to use, but we do not consider wholesale change is needed.
- 10.7 There have been other changes including in the number of competing firms in the market and the switching of suppliers by consumers as they exercise their choice under open markets. A report by OFGEM in December 2002 on electricity competition confirmed that

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the importance of customers switching supplier to make the most savings. The number of companies generating electricity has risen considerably since privatisation from 6 to 35 by October 2002. The pressures of competition are eroding the market share of companies who charge more than their competitors. By March 2002, 8.2 million electricity customers – 34% of the total – had switched electricity supplier. So had just under 7 million domestic gas consumers – 35% of the total. Although the pace of switching is developing quickly – nearly 90,000 electricity customers change their supplier every week – the market is not yet mature. We are working with OFGEM and Energywatch to ensure that consumers have confidence in switching, supporting their efforts to stamp out mis-selling of electricity contracts, improving the customer transfer process, and ensuring that mistaken transfers are corrected quickly.

10.8 Our recent white paper on "Productivity and Enterprise" set out the benefits of liberalisation of energy markets. Competitive markets allow resources to be allocated efficiently to the areas of greatest potential, either by driving down costs or by stimulating innovation. That white paper also identifies the establishment and maintenance of appropriate market frameworks as being key drivers for competitiveness. Manufacturing standards - be they quality, environmental, health, safety or security - also have a vital role to play in delivering the overall objective.

TEXT BOX

The measures proposed in this white paper seek to ensure that all our objectives are achievable through market mechanisms or otherwise, reflecting the Government's broader economic strategy.

We want to raise the UK 's productivity and competitiveness. Productivity is a key determinant of economic performance and living standards. We aim that over the long-term Britain will achieve a faster rate of productivity growth than our main competitors, closing the productivity gap. Productivity measures how effectively the economy uses resources to generate economic outputs. Energy is one of our key resources: without it the economy and national infrastructure would not function.

Our programme of micro-economic reform targets historic weaknesses in five key drivers of productivity:

- strengthening the <u>competition</u> regime, to encourage firms to innovate and minimise costs, and to deliver better quality goods and services to customers. This white paper reaffirms the Government's commitment to competitive energy markets in the UK, the EU and globally. Increased competition has also reduced the need for regulation, and price controls were removed from domestic electricity and gas supply in April 2002. This white paper also reaffirms the Government's commitment to better delivery, including though initiatives such as OFGEM's information incentives project;
- promoting enterprise, to help new and established businesses start-up, develop and grow. This white paper sets out a path towards a low-carbon economy that offers considerable opportunities for business investment and innovation in the short,

⁷⁵ Productivity and Enterprise: A World Class Competition Regime: DTI July 2001

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- medium and longer-term. The energy system in 2020 is likely to look very different from that today;
- supporting <u>science</u> and <u>innovation</u>, to utilise the potential of new technologies and to
 develop new ways of working. This white paper recognises the importance of science
 and innovation, and research, development and deployment of technologies: areas like
 renewables, fuel cells and hydrogen offer considerable potential as we move towards
 cleaner technologies that will be vital in addressing climate change;
- improving skills, through better education for young people and greater training opportunities for those already in the workforce. This white paper recognises that the energy industries face many of the same skills challenges as other sectors of the economy. And that there are a number of specific issues for individual sectors of the industry. The white paper outlines work underway to address these issues;
- encouraging <u>investment</u> to improve the stock of physical capital in all sectors and industries. Investment in the energy sector is vital, not only in the plants that supply our power but in the supporting infrastructure that enable its transmission and distribution. A high quality infrastructure is a prerequisite for a developed economy that supports a competitive business environment and a productive workforce. This is particularly true of energy, given its interdependence with all sectors of the economy, and its supply to all consumers.

... but price isn't everything ...

10.9 But low energy prices cannot be our only yardstick for success. Although energy markets have achieved low prices in recent years, they have been less effective in factoring in the Government's wider objectives in respect of environmental impacts – particularly carbon emissions - and the effective valuation of innovation. There are also issues as to whether the market, looking forward, attaches sufficient value to energy security. There is a risk that the private sector may not attach sufficient value to medium/long term risks, particularly of low risk, high impact events. Equally, the market may undervalue energy efficiency: consumer reluctance to invest may partially reflect market failures. We have set out elsewhere in this white paper our proposals to address this.

...higher resource productivity helps...

10.10 Each of our energy goals contributes to competitiveness. Reliable supplies are vital for UK business. And the Government's recent Manufacturing Strategy⁷⁶ noted that one facet of higher productivity is improved resource productivity – using less energy and other natural resources, and producing less waste, per unit of economic output. Achieving this will involve new technologies, better design, new processes and new ways of doing things. Energy prices are not in the long run necessarily linked to overall energy costs. Cost reduction strategies will more generally contribute to improved competitiveness. Many of the measures in this white paper will have the effect of encouraging greater resource productivity in energy use, and helping UK business to prepare for changes in the energy system that the UK and other countries are likely to face in the future.

...but environmental gains must be achieved cost effectively...

⁷⁶ The Government's Manufacturing Strategy, DTI, May 2002 (www.dti.gov.uk/maufacturing/strategy.htm) **RESTRICTED**

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10.11 We recognise that the impact of energy prices on energy intensive industries will be more significant than on other businesses or the economy more widely. But the use of market based instruments, combined with a commitment to pursue international action on climate change, will help to ensure that the effects are managed in a way that does not unduly disadvantage UK business. We will ensure that industry is fully consulted on proposals as they are developed to ensure that maximum environmental gain is achieved costeffectively. We also recognise the need to take account of the disproportionate impact policy decisions may have on certain regions.

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Chapter 11: Innovation and Skills

11.1 To achieve our objectives we need to exploit existing and develop new technologies. Industry will need to innovate to maximise the opportunities offered by a low carbon economy and by global markets in environmental goods and services. And we need to improve our skills base.

Government is keeping innovation policy under review ...

In November 2002 we began a broad review - including energy - that will by July 2003:

- assess the UK's relative innovation performance;
- identify strengths and weaknesses and where market or institutional problems inhibit innovation;
- identify how Government policies can help; and,
- set out a new strategy, involving key stakeholders, to improve the UK's innovation performance.

We have also set up an independent review on strengthening links between business and universities. It will feed into the Innovation Review and will look at how to build on measures such as tax credits for research and developments and the University Challenge and Higher Education Innovation Funds.

... we need to spend more on innovation in the energy sector ...

- 11.2 We agree with the Chief Scientific Adviser's Energy Research Review Group (ERRG) that public spending on research, development and innovation should increase. Spending is increasing. DTI's Energy Group spent around £40 million supporting sustainable energy-related research and technological development in 2001/02. Our support for renewables has increased to over £260 million over the next three years. The recent Comprehensive Spending Review allocated a further £38m to renewable energy.
- 11.3 We set up the Carbon Trust in April 2001 to lead on low carbon technology and innovation. It is spending £75m over the next three years. Funding for energy-related technology has also been available via the DTI's Innovation and Business Support programmes, and though various European programmes. The Research Councils will spend over £11m on energy related research in 2002/3. They have been allocated an additional £28m under spending review 2002 for further research in support of a sustainable energy economy.

... but prioritise our resources ...

11.4 We support the ERRG's research priorities: C02 sequestration; energy efficiency; hydrogen production and storage; nuclear (particularly waste); solar PV; and wave and tidal power – all these can contribute to carbon reductions.

... basic research is critical ...

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11.5 We also agree with the ERRG that basic research is critical for sustaining innovation over the longer term, to generate the maximum number of options for development and commercial application.

... and we must properly co-ordinate our efforts ...

- 11.6 A new Energy Research Network is being developed by the Research Councils. This will establish interdisciplinary teams with expertise in the scientific, technological, social, economic, environmental and health aspects of energy, providing much needed coordination and cohesion. A new UK Energy Research Centre will also be established and will act as the "hub" of the network.
- 11.7 The PIU called for a fundamental review of low carbon support programmes aimed at business, particularly the Carbon Trust and the Energy Savings Trust. We consider that some of these bodies and programmes are too new to review now. But there should be a review of low carbon delivery programmes and associated support bodies by 2005, in the context of a review of low carbon instruments more generally in advance of the introduction of the EU Emissions Trading scheme.

... and help business access support ...

- 11.8. Meanwhile, we need to simplify access for businesses seeking funding, particularly smaller businesses, who often lead development of new technologies. DTI is reforming its general business support schemes, replacing them by fewer, streamlined schemes. This will help businesses to seek funds for the purposes of energy innovation. We will complement this by developing a single web-based portal for businesses seeking access to energy support schemes as part of a single portal for all DTI Business Support schemes.
- 11.9 We will also work to increase local support for business, including through local Energy Efficiency Advice Centres that can advise on national sources of funding. We are exploring pilot projects for Small and Medium-sized Enterprise Energy Advice Centres (SMEACs).

... and to work with others internationally ...

- 11.10. A number of countries are developing low carbon technologies. We need to focus on areas where UK industries can deliver innovations before or better than others. But international collaboration is important where pooling resources can encourage innovation at lowest cost.
- 11.11 Science and technology are key to resolving climate change. We are promoting an international initiative to develop the link between them, initially through the G8. We will also continue to collaborate in International Energy Agency work in areas such as renewable, end use and fossil fuel technologies, fusion, and exchange of scientific and technical information on energy technology. In our relations with the United States, we will build on the Memorandum of Understanding on energy R&D between the DTI and the US Department of Energy to develop a more strategic collaboration on energy technologies.

The European Framework Programme

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The European Framework programme supports R&D projects across a range of science and technologies.

The new programme, beginning in 2003, gives more emphasis to renewables. The Government will continue to assist UK applications for support from this programme. The DTI has also commissioned a study on how Germany, Spain and the Netherlands promote the programme and organise energy research, especially in relation to small and medium sized companies.

The ENERGIE programme supports R&D in the three broad categories of renewables, rational use of energy and fossil fuels. UK participants have received nearly €180m, from this programme, around 20% of its budget.

The UK also participates in nuclear research under the EURATOM Programme, primarily on fusion research.

... we must address skills as well as innovation ...

11.12 Skills, research and innovation are linked – skills tend to drive innovation; in turn innovation creates more demand for new and established skills. A healthy research base is crucial to nurturing the skills needed to manage the effective application of emerging new energy technologies. Not all research training in our universities will produce radical new technologies but the skills and expertise developed will equip people for the vital task of implementing and maintaining new energy infrastructures.

11.13 We need to address skills development, training and an ageing workforce in the energy industries. Many employers invest in training, but finding time and resources can be difficult, particularly for smaller companies. Skills and expertise from UK research bodies need to equip business to apply new technologies. The Government's Manufacturing Strategy also emphasised the importance of a skilled workforce to a productive and competitive economy – not only technical skills but leadership and management skills. It also highlighted the need for a demand-led approach, combining government investment, access to best practice support and increased support for the science base.

11.14 The problems are widespread:

Nearly a third of staff in offshore oil companies are over 45 and only 6% under 25.
 20% of companies provided no regular staff training - nearly 40% for smaller companies⁷⁸;

• Even without new build, the nuclear fuel cycle, power generation and environmental restoration sectors are likely to need around 19,000 graduates and skilled trades people over the next 15 years to replace retirements and satisfy demand growth in environmental restoration⁷⁹;

^{77 &}quot;The Government's Manufacturing Strategy", available on DTI's website at [ref]

⁷⁸ Based on 1999 OPITO survey of member companies of UKOOA [need to get this properly referenced]

⁷⁹ "The Report of the Nuclear Skills Group", published by DTI on 5 December 2002. The figure of 19,000 is based upon the age profile that currently exists in the sector and the assumptions that the fuel cycle will remain stable, the planned closure programme of Magnox and AGR power stations will proceed and that the numbers

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- The Gas and Water Industry National Training Organisation (GWINTO) has
 predicted that there could be a major shortage of skilled gas installers in the coming
 years⁸⁰; and
- Key skills in companies building major infrastructure such as power stations and refineries are concentrated in the over-50s⁸¹

... Government is addressing similar skills needs across the economy ...

- 11.15 Such problems are not energy-specific. The Government is already addressing common problems across the economy⁸². In particular it is:
 - investing an extra £100 million per year by 2005-06, through the Office of Science and Technology (OST) to improve the development of the UK's science and technology skills base;
 - targeting science and mathematics teaching in schools to ensure that we have the right mix of teaching skills at primary and secondary level and also providing resources (including £60 million between 2000 and 2002) to modernise and upgrade science laboratories;
 - commissioning an independent review, to report in summer 2003, into how business can draw more effectively on university expertise;
 - publishing a new skills strategy in June 2003, aimed at reducing the UK's productivity gap with its major competitors. It will cover both demand (from employers and their investment in skills and training) and the supply of skilled people. Government, business, the new Sector Skills Councils (SSCs), the Sector Skills Development Agency, the Learning and Skills Council, Regional Development Agencies, other public and private bodies and employers will need to work together to identify skill needs and measures to deliver them. Resources for SSCs will increase to nearly £30million in 2003/04 [DN this figure may change later]
 - raising the profile and attractiveness of apprenticeships with a £16 million marketing campaign to promote Modern Apprenticeships. A new National Modern Apprenticeship Taskforce has been set up to report on issues including the involvement of small businesses in the scheme; and
 - extending training for lower-skilled workers, helping highly skilled individuals to enter the UK, and to encouraging take up of Investors in People in small firms.
- 11.16 The Government will ensure that these cross cutting initiatives take proper account of energy issues, such as the move to a low carbon economy, which will affect businesses across the economy.

engaged in environmental restoration will double over the next 15 years. No allowance has been made for potential new build.

⁸⁰ [Reference to report]
⁸¹ [Reference source]

Links to more detailed information about the measures set out in this paragraph can be found on [website link]. This is an area where we can either provide a direct link to the DFES site, or a couple of page summary setting out the measures, with further links to specific strategies etc as appropriate

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... the energy sector has specific needs ...

11.17 The Government is committed to working with employers in the energy sector, both through the new Sector Skills Councils and the Sector Skills Development Agency, also involving government and other bodies at central, devolved, regional and local level and also education and training providers.

This includes the Sector Skills Council for the oil and gas extraction and chemical manufacturing sector (Cogent) set up in April 2002. It also includes the developing SSCs for the Technical, Engineering and Science sector, and for the Process and Manufacturing sector, which will address some energy related areas.

[Text box.:

COGENT works with employers, government and education and training providers. It aims to stimulate action at all levels of industry and emphasises that skills and training has to be a board-level concern. It has already launched:

- an offshore technician training scheme to bring in 150 new trainees each year;
- a programme aimed at engineering undergraduates, promoting careers in the oil and gas sector;
- interactive web-based material for schools, featuring young people talking about their jobs in the industry.]
- 11.18 The Government, through the SSDA, is working closely with employers to ensure that the energy industry is fully represented in the emerging SSC network. This will build on existing work in the energy industry (in many cases undertaken by the former National Training Organisations) and new ideas and proposals. For example:

the Electricity Training Association is commissioning a Skills Foresight Project to identify the skills requirements of the renewables industry to 2010:

GWINTO has made proposals to address shortages of gas installers including a pilot project with EAGA to deliver around 400 qualified central heating installers.

11.19 We will encourage greater collaboration through supply chains - for example on energy efficiency. And we will work closely with industry and the training providers to review the skills and research capabilities required to manage more distributed generation in the future.

... we need to support action by others ...

11.20 We aim to achieve a better and more appropriately skilled workforce to meet our energy objectives. This means connecting supply and demand skills development. It will only happen if it is driven by employers, working with education and training providers. Innovative thinking will be needed, for example to make the most of transferable skills. Offshore construction and engineering skills can be adapted to development of offshore windfarms; engineers leaving the armed forces can be retrained to work in a variety of energy sectors. Employers could encourage older workers to stay on to help meet skills shortages and to assist with succession planning or training.

... but there is much to build on ...

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- 11.21 The work of COGENT and the former NTOs are good examples. Companies are also playing their part. Centrica has committed to train 5,000 new gas engineers by 2007 and Transco is recruiting and training staff for emergency operations, gas mains replacement and central heating installation.
- ... together we can make progress ...
- 11.22 Overall, these measures aim to improve co-ordination between the demand for and supply of skills, to encourage exchange of good practice across industry. They will provide an opportunity for the industry to adopt a strategic approach to energy skills issues and enable employers, through the SSC network, to articulate their skills needs.

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Chapter 12: Delivering change together

... Government needs to work in partnership with others ...

- 12.1 People gave us a very clear message in the public consultation leading up to this white paper. They told us that they care about the environment and that they want to play their part in tackling climate change. But they need practical leadership and help to understand what they can do.
- 12.2 We have set a lead in this white paper. We have set out new objectives for energy policy, including a clear commitment to move towards a low carbon economy. And we have set out new measures to deliver our objectives.
- 12.3 We will have to work with others to achieve these goals. The products and services needed in future will depend on business enterprise and innovation. Local authorities and regional bodies are pivotal in delivering change in their communities. We will continue to need a sound basis of academic research and information. Independent organizations and voluntary bodies can communicate messages to the public and help them to get involved in decision making.
- 12.4 And Government itself must change, so that energy policy is looked at as a whole. Our challenge is achieve all our objectives together, rather than pursuing them as separate streams. And this approach needs to be reflected in how energy markets are regulated.

... to prepare for a very different future ...

- 12.5 This chapter sets out how we will take this forward. We need to prepare for an energy system likely to be quite different from today. A broad vision of what it might be is described below. This is a scenario. It draws on several sources, including modelling work for the white paper, the DTI's Foresight programme, and the Shell scenarios (web reference http://www.shell.com/home/Framework?siteld=royal-en&FC1=&FC2=&FC3=%2Froyal-en%2Fhtml%2Fiwgen%2Fabout_shell%2Fscenarios%2Fscenarios_home.html&FC4=&FC5=). It does not in any way close off options for the future. Innovation will surprise us with options that we cannot even imagine now. The scenario will need to be updated in the light of experience.
- 12.6 This scenario envisages changes which will widen diversity of supply and reduce carbon emissions. It has major implications for our infrastructure, particularly the electricity grid and local distributed networks. Current local networks are 'passive', passing current only from the grid to the consumer. In future, they may well need to carry current in both directions. This will present a major infrastructural and investment challenge for Distributed Network Operators. Net metering, in which the meter measures electricity taken from the network and electricity generated back out, will need to become much more commonplace.
- 12.7 It will be for the market to develop and invest in these opportunities. But Government needs to set a long term framework within which the market has the confidence, ability and sense of long term commitment to do so. And we need to help provide a stimulus and help to show that such a system could work.

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We envisage the energy system in 2020 being much more diverse than today. At its heart will be a much greater mix of energy, especially electricity sources and technologies, affecting both the means of supply and the control and management of demand. For example:

- much of our energy will be imported, either from or through a single European market embracing more than 25 countries;
- the backbone of the electricity system will still be a market-based grid, balancing the supply of large power stations. But some of those large power stations will be offshore marine plants, including wave, tidal and windfarms. Generally smaller onshore windfarms will also be generating. The market will need to be able to handle intermittent generation by using backup capacity when weather conditions reduce or cut off these sources;
- there will be much more local generation, in part from medium to small local/community
 power plant, fuelled by locally grown biomass, from locally generated waste, from local
 wind sources, or possibly from local wave and tidal generators. These will feed local
 distributed networks, which can sell excess capacity into the grid. Plant will also
 increasingly generate heat for local use;
- there will be much more micro-generation, eg from CHP plant or fuel cells in buildings.
 This will also generate excess capacity from time to time which will be sold back into the local distributed network;
- energy efficiency improvements will reduce demand overall, despite new demand for electricity, for example as homes move to digital television and as computers further penetrate the domestic market. Air conditioning may become more widespread;
- new homes will be built to very high (perhaps even zero emission) standards of energy efficiency. The existing building stock will increasingly adopt energy efficiency measures. Many buildings will have the capacity at least to reduce their demand on the grid, for example by using solar heating systems to provide some of their water heating needs, if not to generate electricity to sell back into the local network;
- gas will form a large part of the energy mix, as the savings from more efficient boiler technologies are offset by demand for gas for CHP (which then displaces electricity demand);
- coal fired generation will either play a much smaller part than today in the energy mix or be linked to CO₂ capture and storage in depleted north sea oil wells (if that proves practically and economically feasible);
- the existing fleet of nuclear power stations will almost all have reached the end of their working lives. If needed by then to help meet the UK's energy security and carbon aims, new nuclear plant may be coming on stream towards the end of the period;
- fuel cells may be starting to play a greater part in the economy, initially in static form in industry or as a means of storing energy, eg to backup intermittent renewables. The hydrogen will be generated primarily by non-carbon electricity;
- in transport, hybrid (internal combustion) vehicles will be commonplace in the car and light goods sectors, delivering significant efficiency savings. Hydrogen may increasingly be fuelling the public service vehicle fleet (eg buses) and local authority vehicles. It is unlikely to have penetrated sufficiently to be making a mark on the car fleet but could be on the verge of a breakthrough into the market;
- nuclear fusion will still be at the research, rather than commercial demonstration, stage;
- people generally will be much more aware of the challenge of climate change and of the part
 they can play in reducing carbon emissions. Carbon content will increasingly become a
 commercial differentiator as the cost of carbon is reflected in prices and people choose lower
 carbon options.
- 12.8 [Accordingly, we will [with the industry] establish a [£90 million] fund to which local authorities and communities can bid in partnership with business, developers,

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distribution network operators, and generators (including renewables generators) for support for innovative projects that demonstrate a wide range of potential demand and supply side technologies.]

... so we need new ways of doing things in government ...

- 12.9 We are showing leadership in our own performance. We will be setting new targets for in 2003 for the energy performance of the Government estate. Our review of sustainable procurement has considered how to build energy efficiency into Government procurement and contract strategies. ⁸³ [To be updated in light of review conclusions]
- 12.10 We also need to ensure our future policies and measures take full account of their carbon impacts, that they are transparent and that information about them and about energy policy choices is available to business and the public in a format that they will find accessible. [To this end, we will include a carbon analysis in the regulatory impact assessments of all major policies].
- 12.11 We will also create the right institutions to support delivery of our ambitious programme. The PIU recommended that an enhanced central capability to support energy policy, by monitoring key developments in energy use and supply and assessing implications for policy on energy, transport and climate change. We agree with this.
- 12.12 This work cuts across traditional departmental boundaries. To deliver this, a single body is needed to take responsibility for:
 - advising the government on energy security targets (including longer term international trends) and on carbon emission targets,
 - monitoring the putting in place of policies to deliver those security and carbon targets;
 - monitoring performance against the targets:
 - reporting periodically (quarterly?) to Ministers on performance against the targets and any policy adjustments needed; and
 - reporting publicly (annually?) on performance against the targets.
- 12.13 It is essential that the new body should be
 - strategic and long term, ie demonstrably independent of short term pressures;
 - transparent;
 - · very well informed.
- 12.14 To meet these aims, we will create an Energy Strategy and Analysis Unit. It will report to an interdepartmental group of senior Ministers, thereby assuring its broad strategic and cross-government focus, and will report publicly on an annual basis. The Government will consult publicly on any major changes of direction resulting from the advice of the strategy unit. [Further work needed on institutional conclusions.]

⁸³ Details will be set out in the Framework for Sustainable Development on the Government Estate, which is the main vehicle for assessing, managing, reporting on and improving the performance of the Government estate **RESTRICTED**

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- 12.15 The new unit will be expected to acquire expert input from a range of sources, to be staffed by both civil servants and external secondees, and to subject its analysis to extensive peer review. [As part of that, we will give the Sustainable Development Commission a formal role in commenting on progress against objectives.] [The post of the head of the unit will be filled by public competition.]
- 12.16 To strengthen the lines of communication between energy efficiency policy (including the policy on combined heat and power and fuel poverty) and energy policy more generally, the Government will also review at an appropriate time the scope for bringing energy efficiency policy into [one place.] The new combined organisation would have a very clear mandate to develop and implement policies to drive down the carbon intensity of the economy.

... linking to the work of OFGEM.

[To be added]

- ... We must also work closely with the Devolved Administrations ...
- 12.17 We will continue to work closely with the Devolved Administrations on energy policy objectives, in particular through the new Sustainable Energy Policy Unit. We are encouraged that the Devolved Administrations are developing strategies and targets on devolved aspects of energy policy. [Add specific references]
- ... and regional and local leaders ...
- 12.18 Local authorities, regional chambers, RDAs and other local bodies make decisions for example on planning, regeneration and development, procurement, housing, transport, and sustainable development which are vital for energy policy. Specific examples are set out throughout this White Paper. And in future, there is likely to be greater emphasis on local and regional approaches in delivering our energy objectives. Local authorities have a growing role as community leaders. Elected regional assemblies will in future provide additional political leadership.
- 12.19 We will develop with local and regional bodies in England a new package of measures to promote national objectives through local and regional decision-making, to better reflect local and regional priorities in national policy, and over time to develop a more proactive role for local and regional bodies in energy policy. Local policy is devolved, and the devolved administrations will wish to consider whether to take action in their respective areas.
- 12.20 Several regions already have energy or renewables strategies. We propose to build on these by requiring a strategy for energy to be developed and implemented in each region. It will bring together the regional chamber, RDA, Government office, local

⁸⁴ The approach builds on policy set out in the recent White Papers on regional policy and on local government [reference]

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authorities, and other stakeholders; outline action they will take; and link national, regional and local priorities on energy issues, including through regional targets (for example, on renewables and energy efficiency) negotiated by the region and central government. It will link closely with existing strategies, and might take the form of a common theme within them, rather than a discrete document. We expect regional chambers to lead on these strategies, in partnership with RDAs and GOs. In the longer term elected regional assemblies will lead. We will consult later this year on the details of the regional strategy.

- 12.21 We will also assess the need for new resources for strategy development. [As a first step, we will provide around £10 million a year to allow each local authority to designate a single officer to be responsible across the board for energy issues⁸⁶.]
- 12.22 RDAs will have a key role in implementing the strategy, guided by their role as drivers of regional economic development. We will therefore produce specific guidance for RDAs on the implications of the white paper.
- 12.23 Many local authorities and regional bodies are already developing innovative initiatives and strategies that go beyond their statutory functions. In the longer term, we want to see more taking a pro-active role in this way. To help this, we will:
 - establish a new beacon councils theme on sustainable energy, to promote innovative local approaches on generation and demand-side measures;
 - promote new targets on energy which local authorities can consider for local public service agreements – e.g. on domestic energy efficiency or roll-out of new technologies.
 - [set up a new team within Government to work with local and regional bodies on energy issues. It will include seconded experts from local authorities and the regions.]
 - consider with the LGA whether, at the next review, to include energy as a shared central-local priority;.
 - [explore the scope to extend Climate Change Levy agreements to local authorities, regional bodies and other public sector bodies. As well as reductions in their own energy use, agreements could be based on facilitating reductions elsewhere within their areas of responsibility.]
 - consult on arrangements to collect and make available data on the pattern of energy usage in local areas, to enable local authorities to target activity more effectively.

Local and Regional Initiatives:

⁸⁵ In regions that choose to establish them

⁸⁶ These resources will be added to the Local Government Finance Settlement; local authorities will be able to commit the new resources as they see fit.

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The Northern Energy Initiative, an independent organisation supported by the Government Office, the RDA, academic institutions and business, has developed an energy strategy for the North East of England. This sets regional targets for business energy efficiency, job creation in the energy sector, renewables and CHP. It has set up support for smaller businesses, a renewable energy agency, and a 'clean coal' project.

The South West RDA and Government Office have, with local government and business, drawn up a Renewable Energy Strategy, addressing issues such as skills and awareness, markets for renewable energy, and planning.

Calderdale District Council's initiatives to improve domestic energy efficiency include Warm Front Grants for insulation to people over 60, an energy efficiency scheme for the 'fuel rich', and a partnership with business to install subsidised PV. It is collecting information on the energy efficiency of all houses in its area to help target its schemes.

Woking Borough Council is the only UK local authority to supply customers with electricity, heat and cooling on a private district energy network, using fuel cells, CHP and solar power. It also supplies energy services to homes and businesses, financed through a public/private joint venture energy services company.

12.24 We will set out details of these initiatives later in the year, alongside our consultation on a regional strategy.

... and business can help ...

12.25 Many of the measures set out elsewhere in this paper are designed to encourage action by business in general, as well as by companies in the energy generation, distribution and supply industries. Companies can also encourage action by others by, for example, reporting publicly on their own performance and by encouraging their customers and stakeholders to act themselves. For example:

we have already called on businesses to report on their environmental performance, and have produced guidance to help them, including on greenhouse gas emissions.⁸⁷ We have put forward proposals in the Modernising Company Law white paper that would require leading companies to report on environmental issues where they are relevant to an understanding of the business. We have appointed an independent group of experts to provide guidance on how directors can assess whether an item is material and would have to be included in the annual report.88

businesses can encourage their customers to take up opportunities on energy efficiency. Energy suppliers, for example, are required to offer their customers incentives to encourage energy efficiency, and should provide information about practical steps to reduce energy consumption. Retailers are working within the Energy Efficiency Partnership on how to promote more efficient products to consumers.

⁸⁷ The greenhouse gas emissions guidance and other reporting guidelines are available at -

www.defra.gov.uk/environment/envrp/index.htm

88 The Modernising Company Law white paper is available at www.dti.gov.uk/companiesbill/index.htm RESTRICTED

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- ... developing a consistent and coherent message ...
- 12.26 Our consultations featured a strong message that there should be wider and more sustained public debate about energy policy. We can facilitate that at both national and local level. This means consulting about key decisions and reaching out actively to key stakeholders on a regular basis. It also requires an effective and consistent joining up of the messages on energy across government.
- 12.27 The new [sustainable energy policy unit] will accordingly bring together a cross-sectoral group of interests to agree on low carbon messages which can consistently and coherently be carried forward to stakeholders. This will include the Small Business Service, the Energy Savings Trust, Energywatch, the Carbon Trust, Going for Green, non-governmental organisations and business groups, the Environment Agency and others.
- ... that takes forward action for the long term ...
- 12.28 We regard the publication of this White Paper as the start of a long-term process to engage stakeholders and the public in energy policy issues. The public want to be engaged. And their engagement is essential in achieving the ambitious programmes we have set out. So in partnership with a range of regional, local and advisory institutions, we will launch an information campaign to disseminate and encourage debate about the key messages of the white paper as implementation is taken forward.

To:	Secretary of State

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Brian Wilson
Robin Young
Professor King
Joan MacNaughton
Energy HMU's

The folian

The fol

Adrian Gault Mark Hutton Nigel Devereux

Peter Brunt SPAD

as pap (A) for signetine

Tel: 020 7215 5044 020 7215 2890 Fax:

From: Terence llott

Date: 18 December 2002

DRAFT ENERGY WHITE PAPER: CIRCULATION

Energy White Paper Team

PA 2/12

Issue and recommendation

1. Lattach:

a. a draft letter for you to send to the Deputy Prime Minister, copied to the Prime Minister and members of DA(N) with a draft of the White Paper for consideration over Christmas

b. a copy of the draft White Paper. — /citty's cm

Timing

2. Urgent, the draft White Paper needs to be circulated before the end of the week.

Background

- 3. As well as presenting the draft White Paper, the letter accompanying the draft White Paper deals with three key issues:
- 4. White Paper timescales in particular, the need to make an announcement on the nuclear elements of the White Paper well in advance of the decision of the British Energy bondholders on 14th February. In addition, it emphasises the need to publish the White Paper as soon as possible after Parliament returns after its recess on 24th February.
- 5. The letter from the Chief Secretary to the Treasury. In a letter the Chief Secretary sent to DA(N) yesterday, he notes that the White Paper should not commit the Government to multiple interim targets that might damage industry and damage our long term goals on climate change. (We knowthat he is particularly concerned about a 20% target for renewables.) He also states that neither the draft White Paper nor the paper on measures and costs should contain references to possible spending commitments over and above Departments' agreed spending review settlements. Nor should they anticipate decisions on spending in future spending reviews. The text of his letter is attached (at C).

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- 6. Treasury officials have emphasised that the Chief Secretary is particularly concerned about figures for renewables, such as capital grants over several years to support offshore wind and biomass, and is likely to react badly if figures are put in a draft copied to the Prime Minister. But we believe the draft does need to highlight where new resources might be needed in future deliver the objectives set out in the draft. The draft therefore indicates the general scale of resources that would be needed for these large grants, and when they would be needed, without setting out specific figures which could imply that officials had reached consensus. The draft letter to DA(N) notes a full discussion of resources will be needed in January, including discussion of exactly what could be delivered from existing departmental budgets. We will put up a further submission later today with a specific draft reply to the Chief Secretary's letter.
- 7. Finally, the letter to accompany the draft White Paper asks for views on the way forward on sharing the emerging text with officials from Devolved Administrations. A paper on this was circulated and was due to be tabled at the DA(N) meeting that cancelled 11th December. Whilst the White Paper sets out proposals on areas that are non-devolved or for England only, it is clearly important that we engage with the Devolved Administrations on issues that affect the whole of the UK, and in areas where devolved matters will have a significant impact on the achievement of our objectives.
- 8. We have been talking to officials from the DAs at regular bilaterals, but have so far been unable to share emerging text & proposals with them, which has handicapped their ability to comment in specific areas or ensure that the text is 'devolution proof'. With elections for the devolved assemblies imminent, this is clearly a sensitive time. The draft letter asks for views from recipients on what approach should be taken.

TERENCE ILOTT

Hewitt MPST

Frc...: Marshall Gill (Mrs GM)

Sent: 18 December 2002 13:33

To: Hewitt MPST

Cc: Wilson MPST; Young MPST; King MPST; MacNaughton Joan (Ms JM); Energy HMU Only;

Gault Adrian (Mr AR); Hutton Mark (Mr MR); Devereux Nigel (Mr N); Brunt Peter (Mr PL);

SPAD MPST; llott Terence (New Accounts); Wright Rob (Mr RDJ)

Subject: energy white paper: circulation

Importance: High

Please see the attached submission and attachments from Terence Ilott to Secretary of State.

Gill

PA/Rob Wright

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1. PR 2. FILE Enorghing #7

From: Geoffrey Norris

Date: 20 December 2002

PRIME MINISTER cc: Jonathan Powell

Jeremy Heywood Sally Morgan Pat McFadden Andrew Adonis

Martin Hurst Jo Key

Oliver Jones Liz Lloyd

ENERGY WHITE PAPER: A FIRST CANTER ROUND THE COURSE

The first readable drafts of the Energy White Paper are finally emerging from the DTI. There is still a long way to go – some quite significant policy issues are yet to be resolved, there are disputes about money and better drafting is needed. But the shape of the argument is becoming clear and the outlines of the policies needed are emerging.

Attached are the first couple of chapters of the current draft of the White Paper and a commentary on the key issues by Oliver, Jo and Martin. To flag the big issues:

Carbon reduction is at the core of the White Paper. The draft proposes that we say:

We will take measures now, and in the next few years, to put the UK on this path using our influence around the world to encourage other countries to adopt similarly challenging targets."

This isn't quite a unilateral commitment to 60%, but is quite close to being one. Is that sensible?

What is the cost of carbon reduction? The so-called "Markal Model" we are using to assess the economic impact of a 60% reduction in emissions suggests that the "price" would be negligible. By 2050 GDP is expected to triple, Markal

suggests that the cost of meeting 60% could be just a small fraction of that figure. Markal makes a lot of assumptions and forecasting so far ahead is fraught, but the figures look to relatively robust.

The draft proposes that we put in place strategies to cut carbon emissions by 15-25 million tonnes by 2020. To achieve them we will need a big increase in renewables (20% of electricity generation compared with a couple of per cent today) – and that will mean a hike in electricity prices. We will also need a big increase in energy efficiency – and that will mean more regulation on building and product standards. And we will need significant cuts in emissions from transport- and that will mean much cleaner cars and starting to tackle aviation (and low fairs).

Security of supply is also a central issue for the White Paper. The basic analysis is the same as in the PIU report. The facts are that we are going to be an importer of energy and heavily dependant on oil and gas. The analysis is that we shouldn't be that worried about it – there are no big proposals to intervene in the market to "secure" reliability of supply. Our gas in the near term will come primarily from Norway and in the longer term from a variety of sources. Supply looks fairly secure, but price volatility may be more of a problem.

The future of **nuclear power** is being side stepped. The policy issue is that our present fleet of nuclear power stations has a finite life. The analysis shows that they make a significant contribution to carbon reduction, but doesn't conclusively say we need them to achieve the 60% reduction target. The draft doesn't rule out building new nukes at some point the future, but says we aren't going to build any now.

This conclusion reflects the balance of ministerial opinion. Brian Wilson and Dave King have be lone voices in arguing for new nuclear build. Margaret Beckett is stridently opposed and Patricia H is deeply uncomfortable. Larry Whitty is a nuclear sceptic, HMT (rightly) don't see how the sums add up without a big public subsidy or intervention in the market. As we step through the debris of the demise of British Energy it doesn't look credible to me for us to be saying anything more positive about new build, for now at least.

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Security of supply

The WP is clear that security of supply is the bedrock of energy policy. This must be right: ensuring the <u>ongoing physical availability</u> of oil, gas or electricity for consumers except in the most extreme circumstances – e.g. a temporary black out after a violent storm – is fundamentally important to our economy and to living standards. However, there is a second aspect to energy security: <u>access to energy at a reasonable cost</u>, that is we should not only be concerned about enough oil reaching the UK, but also that if oil cost (e.g.) \$100/bl then this would be as unacceptable as a physical shortage. In reality, high prices are linked to shortages, and so the mitigation measures are the same.

The WP follows a period in which the UK had the most diverse mix of fuel ever – coal, gas, oil electricity, nuclear, and renewables. We remain net exporters of oil and gas. However, this is set to change. We will become increasingly dependent on gas for electricity generation. We start to become a net importer of oil and gas in the next few years. And we will continue to be reliant on oil for transport for at least two decades.

However, none of this is a necessarily a problem. Only the UK and Canada in the G7 are self-sufficient. Therefore the WP – as did the original PIU energy study - currently takes a fairly relaxed view of threats to security of supply. The WP argues that there are clear risks, such as our reliance on OPEC and the relatively small number of gas import terminals, but that the nature of these risks is that the cost of the necessary steps to avoid the risks are not justified.

We think this is broadly right. There is certainly no room for any complacency, and the WP is right to say we should continue to work hard to diversify away from OPEC for oil and gas, and to diversify our fuel mix. We should also monitor carefully the robustness of the UK transmission networks, to guard against mechanical or terrorist disruption, and to ensure that adequate capacity is maintained to deal with peak demands.

In more detail:

(i) Getting oil and gas to the UK

The projections in the WP make clear that we are going to remain reliant on oil and gas for a major part of our energy needs for many decades to come. Transport is still heavily dependent on oil. Gas heats our homes and will in time

produce the majority of our electricity. The WP notes that, as North sea production reduces, the UK becomes ever more reliant on imports - we are likely to become a net importer of gas on an annual basis by around 2006 and of oil by around 2010 and by 2020, we are likely to be importing around 75% of our energy needs.

For oil, this doesn't really change much, since it is traded on an open market and we have international commitments: only in the most extreme geopolitical circumstances would we have been able to insulate ourselves from a global shortage by refusing to sell our production onto the world market. This means our goal should still be to diversify production away form OPEC, and to work with OPEC to ensure they supply oil at reasonable prices (Oly Jones' separate note covers this area in much more detail).

Gas is more interesting, since at the moment it is regionally traded (because transmission is via pipelines rather than ocean tankers that ca travel anywhere). The WP notes that we will become increasingly reliant on three sources for the great majority of our gas: Norway; Russia and the Caspian region, and Algeria. The WP argues we need to do four things: work with these states at a political level to ensure they keep exporting; work to develop Liquid Natural Gas transport and terminal facilities so that gas becomes an globally traded commodity, so reducing our reliance on any particular source; pursue liberalisation of the EU gas market through which much of our oil will need to travel; and monitor the pipeline and terminal infrastructure to ensure the system is robust and capacity is adequate.

Again, we think this is right, although our view is that not enough attention is being paid to the geopolitics of gas given its importance, and we will look to strength this area of work.

(ii) Transporting oil, gas and electricity from ports, pipelines terminals and power stations to the consumer.

There are important domestic issues too. We do not want a repeat of the Californian power crisis in the UK. Ensuring that the infrastructure is well maintained, robust and carries adequate capacity to meet peak demand is a balancing act in liberalised markets. The WP sets out three specific risks:

- a concentration on just two gas terminals
- lack of gas storage capacity to deal with mechanical problems

 concerns over the provision of enough electricity capacity to meet the peak of winter demand

On each, the WP concludes that there is not yet a problem which merits intervention now. The market is expected to encourage greater diversity of investment gas terminals and it will be important that the market provides more gas storage as the UK's gas output falls and the ability of the UK gas fields to meet short-term periods of high demand declines in parallel. The electricity capacity margin in England and Wales is currently running at around 19%, close to historical standards of 20%. The WP rejects the case for a capacity margin instrument (CMI) to seek to secure a fixed level of capacity margin. A CMI could increase the cost to consumers by around 1% but not entirely eliminate the risk of shortfalls. The argument is that suppliers are already obliged in their license conditions to 'take all requisite steps, so far as is reasonably practicable, to secure the necessary supply of electricity'. This is backed up by the development of forward looking markets 2 – 3 years ahead, which allows companies to take action to achieve their obligations and gives a price signal about future shortages.

Nevertheless, the WP recommends that these and other domestic issues are kept under review. The regulator, Ofgem, plays a key role here. The WP is clear that the DTI/Ofgem Joint Energy Security of Supply (JESS) group, whose mandate is to monitor the market and take action if necessary, is responsible for this area.

60% target and Markal

There is a broad consensus amongst all the world's top scientists that we need to reduce carbon emissions globally by at least 60% by 2050 to prevent the most extreme impacts of climate change (for example the Intergovernmental Panel of Climate Change, the Royal Commission on Environmental Pollution, even the US National Academy of Science). If we are to take a science-based approach to policy making we have to accept this evidence. And if we are to lead, we need to take a firm position soon. The 1997 Manifesto commitment of a reduction of 20% sent a real signal to the international community.

Germany has said that they will reduce emissions by 40% by 2020, with steeper cuts by 2050, if the EU as a whole signs up to a 30% reduction target. France has said they believe a [75%] reduction in emissions by [2050] is necessary by developed countries.

The cost of achieving a 60% reduction in emissions in the UK has been estimated using the DTI's Energy Model, "Markal". Markal works by using information about the costs of particular technologies, and trend rates of growth and innovation, to plot a path of expected take-up of different technologies in the UK.

Markal predicts that we can achieve 60% at relatively low cost. The costs are estimated to be between 0.5% and 1.5% of GDP in 2050. This is roughly equivalent to delaying the UK's growth by about 6 months over the fifty-year period (against an overall tripling of GDP between now and then).

Why are the costs so small? The main reason is because the model allows the changes to take place slowly – over a fifty year timeframe - so new investment is simply built into normal investment cycles. The model also 'chooses' the cheapest technology options with perfect knowledge and foresight. Of course there is no guarantee that business or governments will be able to achieve this in practice. Having said that, the Markal results are not very different to those predicted by other (mainly US) models, which use similar assumptions.

Given the strong scientific basis, the positions taken by other countries, and the low estimated costs of taking action over the medium term, we think the EWP should commit to a UK target of a 60% reduction by 2050 and to argue internationally for others to do the same.

What does achieving a 60% target mean in practice? DTI's modelling shows that to reach 60% by 2050 at lowest cost to the economy means:

- <u>nuclear power</u> supplying between a third to a half of generation this means replacing existing nuclear power stations when they close down;
- <u>increase in renewable energy</u> to between 25% and 40% of generation (from less than 5% now);
- continuing transport growth, but a significant switch to hydrogen after 2030;
- significant increases in energy efficiency.

[nuclear. One point to mention is that the modelling shows no significant increase in costs if we do not build any new nuclear stations. But there is a significant increase in costs if we cannot build new nuclear <u>and</u> we cannot do sequestration.]

Renewable energy

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More renewable energy will be essential if we are to achieve 60%. The Energy White Paper suggests that – in addition - we adopt a target that 20% of our electricity supply come from renewables by 2020, with further increases to 2050. This is what the Strategy Unit proposed in their Energy Review.

Chart 1 below shows the contribution renewables will make to the electricity generation mix by 2050 under 1) business-as-usual; 2) with a 60% target and 3) with a 60% target but assuming no new nuclear.

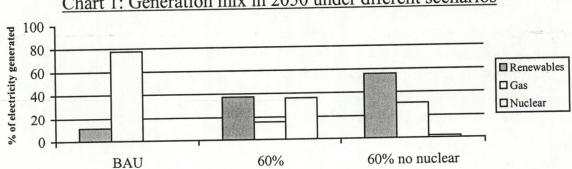
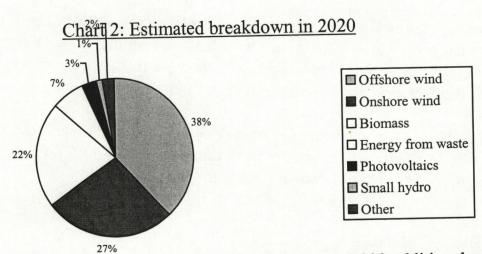


Chart 1: Generation mix in 2050 under diferent scenarios

As the chart shows, under business as usual, renewable energy makes up about 10% of our generation in 2050. With a 60% target, this increases to nearly 40%. But if no new nuclear stations are built, renewables take up the slack, rising to nearly 60%.

A key question is what this means in practice. Chart 2 below shows the estimated breakdown between the different types of renewable energy in 2020. As you can see, the bulk of the contribution to a 2020 target would come from wind, particularly offshore wind, with biomass also making a significant contribution.



To give you an idea of scale, this would mean around 6,000 additional onshore wind turbines, equivalent to about 300 new wind farms, between now and 2020. There are currently about 50 wind farms in the UK, so this represents a significant, but not unrealistic, increase. The first offshore wind farms are still under construction in the UK; we would have to build 100 such wind farms offshore by 2020 to meet the 20% target.

Energy efficiency

The EWP analysis shows that energy efficiency making a significant contribution – over [x]% - to meeting the 60% reduction. This equates to raising the historic rate of energy efficiency improvement from 2.1% to 2.6% per year. There is ongoing discussion about whether we should include a separate target for energy efficiency in the White Paper.

All are agreed that there is plenty of scope for improving energy efficiency. A new home in the UK uses three times as much energy as Denmark; 75% of new boilers in the Netherlands are the more efficient condensing boilers, compared to only [10%] in the UK.

But we do not have a very good record of making people improve their energy use. Exhortation is a weak tool when energy prices are at an historic low. So the EWP suggests a number of stronger measures: improving building regulations, including those for renovation; introducing energy certification for buildings; tightening standards for appliances; and boosting the Energy Efficiency Commitment (the obligation on energy suppliers to improve energy efficiency of their domestic customers). We agree that legislating to raise energy efficiency standards is the only way to achieve the kind of reductions that are necessary, but

we will inevitably run into criticisms of imposing a greater regulatory burden on business and consumers.

Planning

Probably the single main reason why onshore wind power in particular has been slow to get of the ground has been the difficulty of getting planning applications through, against well organised NIMBY protest. While this is most true in Wales (which has its own planning system), it has also almost certainly discouraged applications more widely. This has not been helped by the number of times MoD has protested against proposed development.

And this is not solely a problem for onshore wind. Offshore wind has suffered as well, and it is far from clear that other technologies would get a clear run.

DTI and ODPM have, belatedly started talking. And it is hoped that the new planning guidance will be much more permissive (albeit with greater restrictions in places like the greenbelt – although is even this needed?). We could say something much more positive about renewables in the green paper if these discussions bear fruit.

DTI have also had a specific idea about how to expedite planning consent for offshore wind – preidentifying designated sites. This could be a good way forward.

A final issue concerns the infrastructure needed to support new technologies. In particular, widespread take up of fuel cells vehicles may require new refuelling sites. Our experience with gas powered vehicles is that local planning is much more likely to be a delaying than an enabling factor in achieving a decent coverage of refuelling sites, unless we explicitly tackle this.

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Chapter 1: Introduction and Summary

- 1.1 Energy affects everyone. We expect it to be around when we need it literally at the flick of a switch. We expect it to be available at an affordable price. Whether for heating, cooking, lighting, powering computers, powering industry, fuelling transport, or as a raw material secure, affordable energy is fundamental to the economic and social well being of people and businesses throughout the UK. Energy policy is also the cross-roads where people's daily lives meet urgent global challenges climate change, international security and economic competitiveness.
- 1.2 Until the 1990s, the energy system in the UK and most other countries was largely owned and controlled by government. Today, the UK has one of the most open energy markets in the world. That has brought real benefits, including lower prices and better customer service and choice. But it also raises new questions: will our energy markets deliver the UK's environmental goals? Do they offer the right incentives for the long-term investment that energy systems need? Are recent company failures just the normal operation of the market, or a sign of deeper problems?
- 1.3 In this White Paper we examine our framework for energy policy and set out the changes needed to ensure we can meet these larger challenges while continuing to provide people and businesses with safe, reliable and affordable energy.
- 1.4 In future, our energy policy will be conducted in a much more international context. The EU is increasingly important in energy and environmental policy. Our businesses operate in international markets. The UK will become a net importer rather than exporter of energy. We are likely to face tougher climate change commitments, negotiated internationally. And we shall need international collaboration to promote the innovation required to develop new technologies to help us achieve carbon emission reductions. The policies set out here demonstrate our willingness to take a leading international role.

Our goals

- 1.5 Our energy policy has four goals.
- 1.6 First, to achieve **energy reliability**, so that people and businesses can rely on secure supplies of energy, gas, fuel and electricity at predictable prices delivered through the market. Reliable energy supplies are an essential element of sustainable development.
- 1.7 In a wealthy country like Britain, we take it for granted that we will have safe and reliable energy. Only when something goes wrong for instance when thousands of families in the East of England were left without heating and light after severe storms, or when the lights went out in California do we realise how much modern, industrialised counties depend upon an extremely complicated energy system. We need to ensure that this system supplies the power we need.
- 1.8 Second, to achieve **competitive energy prices**. Having access to energy supplies is of little use if the price is too high. It is important for our economy and for our productivity that that the cost of energy does not threaten the overall competitiveness of UK business or discourage inward investment. Equally it is important to business and consumers generally

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that energy for manufacturing processes, heating, lighting, cooking, powering IT and so on, is affordable.

- 1.9 Third, we use energy policy to achieve our wider **social objectives**. We can shape the market to help us achieve our aims as a government in areas such as poverty reduction and employment through such measures as fuel poverty policy and the promotion of training and skills.
- 1.10 And fourth, we want to use our energy policy to achieve our environmental goals.
- 1.11 These objectives need to be achieved simultaneously. We are not prepared to compromise on any of them. We believe this can be done, and that in so doing energy policy will in future play a significant part in achieving the government's overall goal of sustainable development. We aim in this way to make social progress that meets the needs of everyone, effectively protects the environment, uses natural resources prudently and maintains high and stable levels of growth and employment.
- 1.12 In many cases the objectives can reinforce each other. For example, improving the efficiency with which we use energy will reduce greenhouse gas emissions, help those in fuel poverty, cut energy bills for businesses and households, and support energy security by reducing demand. And other measures, such as those to encourage renewable energy, can help create new markets and new industries, alongside environmental and energy security benefits.

... progress so far ...

- 1.13 We believe that our actions to date as a government have lead to some success in the achievement of the first three goals. Where further measures are needed to ensure our success is consolidated in future years, these are proposed in the chapters that follow. In summary:
- 1.14 **Reliable energy supplies**. In the short-term we already have sophisticated mechanisms in place to ensure that the lights stay on and that gas supplies are uninterrupted. We legislated in 2000 to ensure that is the case, by giving the regulator the primary duty to ensure safety of supply. Where problems occur they are the exception rather than the rule, and tend to be quickly resolved. In the long-term there is an understanding that we are likely to become a substantial net importer of gas, and this will have implications for our foreign policy. We need to reassure ourselves that we have the put in place mechanisms to avoid any potential interruptions to supply. Chapter 8 sets out measures to reinforce this.
- 1.15 Competitive energy prices. The UK already has one of the most competitive energy systems in the world. For industrial users, real electricity prices fell by 25% between 1996 and 2001. Domestic customers are now able to choose their electricity and gas suppliers. So successful has our policy been that the European Union as a whole has decided to follow the UK's example, agreeing in November 2002 to liberalise energy markets across the Union. We believe our policies have been a success and consequently are not proposing any major reform to the liberalised, competitive energy market that we have at the moment. The changes that are required are discussed in chapter 10.
- 1.16 Social objectives/fuel poverty. Most of us take for granted being able to turn the lights on and keep our homes warm. But some people can't afford to meet even their basic

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energy needs. We need to ensure that as we address the security, environmental and competitiveness aspects of energy policy we also take account of social impacts, especially on the poorest. The UK Fuel Poverty Strategy sets out the policies to end fuel poverty in vulnerable households by 2010.

Our environmental objective

- 1.17 The quality of the environment has always been important to us. But we now believe we can achieve a step-change in how we use energy to benefit the environment in which we live, and contribute markedly to our overall objective of sustainable development in Britain.
- 1.18 Climate change is now a reality. It brings the threat of temperature increases, drought and flooding which will harm people's health and way of life, and rising sea levels which threaten the existence of some small island states and put millions of people at risk. And the first effects will be felt by countries that are least able to deal with them.
- 1.19 But it does not have to be like this. The worst effects of climate change can be avoided if concentrations of greenhouse gases in the atmosphere are stabilised. That requires international action to cut global emissions well below current levels. Already policy-makers around the world have begun to respond to these challenges. The agreement at Kyoto demonstrated it is possible to reach a global agreement although, as we have also seen, it requires political will to put that into practice.
- 1.20 This government possesses that political will. It is time to put climate change at the heart of our energy policy. This white paper explains how we put that commitment into practice.
- 1.21 Our starting point is that we accept the recommendation of the Royal Commission on Environmental Pollution that the UK should put itself on a path towards 60% reductions in carbon dioxide emissions, from 1990 levels, by 2050. We will take measures now, and in the next few years, to put the UK on this path using our influence around the world to encourage other countries to adopt similarly challenging targets.
- 1.22 On the basis of current policies, we would expect UK carbon dioxide emissions to amount to some 135tC in 2020. Our aim is to put in place strategies that would reduce that by some 15-25mtC by 2020. This will put us on track to a 60% cut by 2050.
- 1.23 It is our view, based on the analysis we have undertaken, that it is possible to achieve our 2020 goal by reducing the amount of energy we consume, combined with a rapid acceleration in electricity generation through renewable energy. That is a hard task but it is our preferred option. We believe that by making our intentions clear we not only provide the signals that are needed for firms to invest but we also ensure that British manufacturers are ahead of the game in developing the green technologies that can play such a large part in our future prosperity. The policy measures we outline in chapters 3-5 of this white paper put forward our proposals in this area.

A role for nuclear?

1.24 Projections over an 18-year time period, are, however, inevitably uncertain. We have therefore considered carefully whether there is a need for action now to encourage building of

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new nuclear power stations to help deliver our carbon reduction and security objectives by 2020.

- 1.25 We do not believe that there is currently a case for Government to put measures in place to support the building of new nuclear power stations now. The private sector remains free to bring forward proposals for new nuclear build, and we will not stand in their way. Nuclear generation will also benefit from the introduction of the European emissions trading scheme.
- 1.26 But we need to keep the situation under review, and be able to respond if, in future, it appeared more likely that further Government support for nuclear power would be needed to deliver our overall objectives. It would be unwise to rule out new nuclear build entirely as a means to deliver carbon reduction and energy security objectives.
- 1.27 New nuclear power could not suddenly be brought on stream. It could take around 15 years to approve, construct, and commission nuclear power stations. We will therefore take steps to ensure that the framework for regulatory and planning approvals would permit investors to bring new nuclear plant on stream, in the second half of the next decade, if it proved necessary to do so. Chapter 6 sets this out in more detail.
- 1.28 We would not expect to take a decision on whether to give more proactive support or resources to support new nuclear build before around 2006/07, by when progress on renewables and energy efficiency, and on potential long-term solutions to nuclear waste, will be clearer. If we reached a view that new nuclear build was necessary to deliver our energy policy objectives, we would publish a further White Paper, setting out the case, before taking action.

A role for coal?

- 1.29 In a low carbon economy, the future for coal must lie in cleaner coal technologies and carbon capture and storage. For coal to play more than a marginal role in the energy mix beyond around 2015, ways need to be found cost-effectively to handle deal with its carbon emissions. If this could be done, keeping coal-fired generation in the fuel mix would offer significant security and diversity benefits.
- 1.30 One option is to capture and then store the CO2. The most promising approach at present would be to lock the gas away in geological structures such as depleted oil and gas fields. The UK North Sea offers a potentially very valuable resource in this respect. Chapter 7 examines this in more detail.

Conclusion

1.31 We believe the changes we outline in this white paper will take us to a very different energy system by the end of the next decade. That is our intention. Large scale generation will increasingly be replaced by distributed generation. Carbon emissions will be reduced through renewable technology and energy efficiency. Policy will be even more international. Our vision of the energy system of the future is laid out in our concluding chapter, which also describes the institutional changes within government that we believe are required to achieve it. Our aim is a low carbon economy, where prosperity and sustainability go hand in hand.

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1.32 Many policies in this White Paper cover the UK as a whole. However, significant aspects of energy policy in Northern Ireland, Scotland and Wales are the responsibility of the devolved administrations, so that decisions are made in light of each country's particular circumstances. Where matters are devolved, the White Paper focuses on measures in England, but some references are included to related policies in Northern Ireland, Scotland and Wales. The Government will be keen to work with the devolved administrations in addressing the energy challenges that we all face.

Consultation

- 1.33 Many of the policies set out in this white paper take as their starting point the Energy Review published by the Cabinet Office's Performance and Innovation Unit (now the Strategy Unit) in February 2002. In publishing the review, the Prime Minister said that he wanted to launch a thorough debate on the issues it raised. In February 2002 the Trade and Industry Committee published a report on Security of Energy Supply and the House of Lords Select Committee on the European Union published a report on European energy issues (Energy Supply: how secure are we?). The Committees' recommendations have been taken into account in drawing together our conclusions in this white paper.
- 1.34 In response, we launched a major stakeholder and public consultation in May 2002. This:
 - stimulated a wide range of workshops, meetings, conferences and seminars, some run by stakeholders, some run by government departments and other public bodies;
 - prompted over 2,500 written submissions to the team working on the white paper;
 - launched a wide reaching and innovative public consultation process, commissioned by the DTI, involving focus groups, deliberative workshops, outreach to school students, and a web-based questionnaire;
 - provided the basis of a web-based stakeholder debate.
- 1.35 In total, over 6500 individuals and groups have made an input to the consultation. This represents the most significant consultation on energy policy ever undertaken in the UK. It has provided an immensely rich source of views and information to help guide the development of policy options. We are very grateful to all those who participated in the consultation.
- 1.36 Most of the material submitted to the white paper team is on the DTI's website (at www.dti.gov.uk/energy/developep/pub_con_rep.shtml). Only where those submitting information asked for it not to be made publicly available has the material not been put on the website. In addition, the website includes summary reports on many of the meetings held by various bodies, and of both the stakeholder and the public consultations.
- 1.37 In parallel, the DTI and other government departments have undertaken a significant programme of analytical work to inform the work on policy options. Much of this work has been carried out by expert groups outside the government. It has wherever possible been peer reviewed either formally (eg through the Government's Energy Advisory Panel) or informally, for example by making the material available through the internet for comment. All the relevant outputs from this work are available on the DTI website (web reference, as above).

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SECTION ONE: CREATING A LOW CARBON ECONOMY

Chapter 2: The environment

... climate change is happening ...

- 2.1 There is now strong scientific evidence that climate change is happening and that it is being accelerated by human activity. The world is getting warmer. The earth's temperature rose by 0.6°C during the last century, and is forecast to rise by about 3°C during this century. The 1990s included seven of the ten warmest years on record and 1998 was the warmest year in a 140 year record.
- 2.2 There is increasing evidence that this is the result of an increase in atmospheric concentrations of greenhouse gases notably carbon dioxide released by burning of fossil fuels such as coal, oil and gas. By absorbing heat, these gases keep the earth's temperature warmer than it otherwise would be. As greenhouse gas concentrations rise well above their natural levels, the additional warming that will occur could threaten human society.
- 2.3 Climate change research has looked at how far changes in temperature over the past century are due to human activities. Natural effects, such as variations in the sun's output and volcanoes, are insufficient to account for the observed warming, which can only be explained by greenhouse gases from human activities.
- 2.4 The rate at which the climate is changing will affect the world in extreme and unpredictable ways. Its impacts include:
 - temperature increases, drought and flooding which affect people's health and way of life, and cause the irreversible loss of many species of plants and animals;
 - rising sea levels which threaten the existence of some small island states and put millions of people at risk;
 - in the UK, rising sea levels threaten our coastal communities and environment; higher temperatures, increased and more intense rainfall will bring droughts and flooding.

[Include diagrams of historic emissions and of potential impacts]

- 2.5 We cannot avoid some climate change. Greenhouse gases which have already built up in the atmosphere mean that some temperature rise is inevitable. But the worst effects of climate change can be avoided if concentrations of greenhouse gases in the atmosphere are stabilised, rather than increasing as they are now.
- 2.6 There is as yet no international consensus on the level at which concentrations of greenhouse gases should be stabilised. But in 1997 the EU member States agreed that we should be aiming for a level below 550 parts per million (ppm) of carbon dioxide (CO2) about twice the pre-industrial concentration to prevent the most damaging effects of climate change.

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- 2.7 Even at this level, there will be negative impacts¹. The majority of the world's population are likely to experience some consequences. At the upper end of the possible temperature rises, there would be severe impacts on natural systems and on all sectors of society, a significant increase in extreme climatic events and a high risk of major geographical changes in ice sheets or in ocean currents. Higher concentrations would be likely to pose even greater risks.
- 2.8 If we are to stabilise CO₂ concentrations in the atmosphere at 550ppm, global emissions will need to drop well below current levels. Action needs to begin now, because of the scale of change required and because gases emitted now will affect the climate for decades or centuries to come.

... and has prompted a global response ...

- 2.9 Climate change is a global problem. It requires a global response. Working together we can solve this problem. Already, policy-makers around the world have begun to respond to these challenges. The UN Framework Convention on Climate Change (UNFCC) and the Kyoto protocol are the starting point for international efforts to cut emissions.
- 2.10 The UNFCC aims to prevent dangerous man-made climate change. Developed countries agree that they should take the lead in tackling climate change, and the Kyoto Protocol set legal targets for them to reduce greenhouse gas emissions by around 5% of 1990 levels in the period 2008-2012. To help meet targets, countries can use international emissions trading or receive credits for reductions achieved by supporting projects in developing countries. Discussions on action beyond 2008-12 must begin by 2005. In the long term, developing countries are most at risk from climate change and need to be helped to become a part of the global response to it.
- 2.11 The UNFCC demonstrated it is possible to reach global agreement on the nature of the problem. But it requires political will to put the solutions into practice. This government possesses that political will. It is time to put climate change at the heart of our energy policy. That is what we propose to do.
- 2.12 The quality of the environment has always been important to us. But we now believe we can achieve a step-change in how we use energy to benefit the environment in which we live, and contribute markedly to our overall objective of sustainable development in Britain.

... so we must act ...

- 2.13 Our starting point is that we accept the recommendation of the Royal Commission on Environmental Pollution that the UK should put itself on a path towards 60% reductions in carbon dioxide emissions, from 1990 levels, by 2050 and we will work actively with others to encourage them to adopt similarly challenging aims. We will take measures now, and in the next few years, to put the UK on this path. This will now be a fundamental goal of our energy policy.
- 2.14 We can get to a 60% cut in emissions by 2050 in a number of ways. But leaving action until the last minute is not a serious option. Carbon dioxide stays in the atmosphere

¹ Based on conclusions of the Third Assessment Report of the InterGovernmental Panel on Climate Change, 2001

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for many years. If action does not begin now, more dramatic and more disruptive change would be needed later on. We need early, well-planned action to provide a framework within which businesses - and the economy generally - can adjust to the need for change. This will for example allow business to plan to act in the course of normal capital replacement cycles. It will also encourage new technologies to come forward to meet the challenges we face.

- 2.15 To be consistent with our longer term aims, we need to plan to reduce greenhouse gas emissions beyond the level we already expect to reach at the end of the first Kyoto commitment period (2008-2012). On the basis of current policies, including the full impact of the climate change programme, we would expect our carbon dioxide emissions to amount to some 135 mtC in 2020. Our aim is to put in place strategies now which will reduce that by some 15-25 mtC in 2020. This will put us on track to reduce our carbon dioxide emissions by 60 per cent from 1990 levels by 2050.
- 2.16 If we are to cut emissions this much, we will need to achieve a fundamental long-term shift in the way energy is supplied and used. Already we have decoupled economic growth from carbon emissions. Over the last 20 years, the economy has grown by X, energy demand has grown by Y, yet carbon emissions have fallen by Z.
- 2.17 In order to achieve our aims we must accelerate this trend. If the UK economy were to grow at an average of 2.25% a year between now and 2050 it would be three times as large then as it is now. Reducing carbon emissions to around 83 million tonnes (mtC), 60% of the 1990 level²] in the same period would require an x fold improvement in the ratio between emissions and economic output. We will achieve this by raising the resource productivity of our economy producing more with less pollution.
- 2.18 Table a, below, shows how cuts of between 15-25 mtC by 2020 can be achieved. Some of the policy framework is already in place. The additional steps that are needed are set out in more detail in chapters 3-5 of this white paper. These are not precise targets the balance of measures could change somewhat to reflect, for example, technological innovation. But they indicate the scale of reduction we are expecting to achieve from various measures.

Table a: Measures to reduce carbon emissions to 2020

	estimated mtC reductions
Energy efficiency in industry and	[around 5]
commerce	
Energy efficiency in households	[around 5]
New voluntary agreements on vehicles	1.6 - 2.8
Biodiesel and bioethanol for road	around 1.2
transport	
Increasing renewables to 20% of	[around 4]
generation	
EU carbon trading scheme	[around 4]
Total	20.8 - 22

² 1990 emission levels are currently used as the baseline for the Kyoto protocol and for the UK's own domestic goals

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... maintaining our competitiveness at the same time ...

- 2.19 We have analysed carefully the likely impacts on the UK economy of cutting emissions by 60% by 2050. A good deal of caution needs to be exercised in looking at economic changes over such a long period. But an extensive review by the Intergovernmental Panel on Climate Change suggests that action aimed at stabilising carbon dioxide atmospheric concentrations at 550ppm would lead to an average global GDP loss of around 1.5% in 2050. This outcome of our UK analysis is consistent with that review. It suggests that, while there are likely to be some costs, the overall impacts over 50 years need not be prohibitive.
- 2.20 Moreover, the more other countries commit to move in the same direction, the less direct impact there will be on the UK. These impacts need to be monitored and managed, both across the economy and sector by sector. And there will also be some economic benefits, for example through increasing energy efficiency or through enabling UK firms to benefit from new opportunities in manufacturing, servicing and exporting lower carbon and renewable energy technologies. We will ensure that the Department of Trade and Industry continues to work closely with businesses to develop strategies to enable them to adapt to, and as appropriate exploit, these changes.

Analysis and modelling work

The Department commissioned Future Energy Solutions to use the MARKAL energy model to look at the costs of substantial CO₂ reduction by 2050. MARKAL is a 'bottom-up' model of the UK energy system which chooses, subject to constraints imposed on emissions, the least cost technologies to meet assumed energy demands.

The results reflect the assumptions - on technology availability and costs - that are made in the model. The assumptions used, however, reflected expert opinion, informed by workshops with industry experts.

The work did not seek to create a single view or forecast. Rather, a wide range of sensitivity analyses was carried out to assess which technologies and measures might be crucial to minimising the costs of emissions reduction, and to assess how costs change if assumptions are varied. The analyses covered business as usual cases as well as reductions in CO₂ of 45%, 60% and 70% by 2050.

For most analyses the cost of reducing CO₂ emissions by 60% by 2050 was in the range £200-300/tC. GDP in 2050 was reduced by 0.5-1.5%, equivalent to an average annual reduction of between 0.01 and 0.02 percentage points from a business as usual GDP growth rate of 2.25% per annum.

Higher costs resulted if innovation in low carbon technologies was limited, if energy efficiency improved only in line with past trends, or if certain technologies (new nuclear build and carbon capture and storage) were completely excluded in the longer term.

Full details are at [website reference]

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- 2.21 Against this background, we take the view that the potential consequences of climate change are so severe that, within a policy framework that keeps costs to a minimum, we should take steps ourselves, and work closely with other countries, actively to reduce our greenhouse gas emissions.
- 2.22 The UK cannot solve this global problem alone. UK emissions of carbon dioxide currently account for only about 2% of the global total. Our own actions will have no impact on climate change unless they are part of a wider, concerted international effort. A wider effort is also necessary, for example in bringing forward technological changes, to keep down costs to the UK and to avoid disproportionately compromising our competitiveness. We will continue to work very closely with other countries to establish both a broader consensus around the need for change and firm commitments to take action to reduce carbon emissions worldwide within the framework of the Kyoto protocol. A key objective of the UK's foreign policy will be to secure international commitment to the same targets as we ourselves have set.
- 2.23 Some countries, including some of our larger European partners, are already moving in this direction. We need, with them, to lead others internationally. It is clear that substantial cuts are needed in the longer term. Delay will only compound the problem. We therefore believe that the time is now right to reinforce our commitment to the achievement of significant long term cuts in emissions in the UK.

... within a clear long-term policy framework ...

- 2.24 To deliver these outcomes, we need to provide industry with a clear and stable policy framework. In practice, we need a mix of measures, including fiscal and regulatory instruments. But we are seeking a framework which, as far as possible, simplifies the mix of measures and reflects the cost of environmental damage from carbon emissions. This will give the market the flexibility to determine the best way to reduce carbon emissions, and drive action on both the demand and supply sides of the economy.
- 2.25 On 9 December 2002, the European Union Council of Ministers reached initial agreement on a new European carbon emissions trading scheme. This is expected to begin in 2005. From the outset, it will cover CO2 emissions from heavy industry, generators and refineries. In the scheme, each participant will be set a cap a target level of emissions. Each will then receive tradable allowances equal to its cap. To comply with the scheme, each participant must hold allowances at least equal in number to its emissions. Participants will therefore have three choices:
 - meet their cap by reducing their own emissions;
 - reduce emissions below their cap and sell or bank the excess allowances; or
 - let their emissions remain above their cap and buy allowances from other participants.
- 2.26 The best strategy for each participant will depend on the price of allowances in the market compared to the costs of reducing their own emissions. In this way, emission reductions will be achieved at minimum cost across the European Union.
- 2.27 We will make new trading scheme a central plank of our future emissions reduction policies, through which the traded carbon market can set a signal for the

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value of carbon reductions in the economy. It will be a mechanism for delivering part of the carbon savings we need to make, perhaps [around 4] MtC by 2020. We will continue to work proactively with the European Commission, European Parliament and other member States to secure detailed plans for the implementation of the scheme which help to deliver this aim, in particular to encourage its harmonised expansion throughout the EU.

2.28 But emissions trading will not, on its own, be sufficient to deliver the carbon reductions that we need to achieve. Other measures will continue to be necessary, as described later in this white paper. But wherever possible, we will link those measures to the carbon trading scheme to establish a means through which a common Europe wide value can emerge for carbon savings, enabling business and consumers to choose themselves how best to achieve their economic and commercial aims against that background. This will include the need for transitional arrangements from the existing UK emissions trading scheme and from the existing Climate Change Levy regime. We will come forward with appropriate proposals on these arrangements in due course.



From: Joanna Key

Date: 20 December 2002

cc: Jonathan Powell

Jeremy Heywood Martin Hurst Geoffrey Norris Oliver Jones

Liz Lloyd

JONATHON PORRITT'S NOTE ON THE ENERGY WHITE PAPER

I attach a short letter and note from Jonathon Porritt on the Energy White Paper. You agreed that he would write to you on this at your recent meeting. Geoffrey Norris has also given you a note on the range of Energy White Paper issues.

Jonathon's note gives a good sense of how the green lobby will judge the Energy White Paper. His judgement is that the EWP should commit to:

- a <u>60%</u> reduction target for carbon (climate change) emissions by 2050, with an interim 30% target by 2020;
- a 25% renewables target by 2020;

PRIME MINISTER

- a 20% energy efficiency target for 2010.

Jonathon also says that – rightly or wrongly - the White Paper will be judged by what it says about nuclear. He believes that we must not be seen to give nuclear special treatment; all energy sources should be judged on the same set of criteria. He does not think that new nuclear is not necessary to achieve our commitments, and may leave us at greater risk of terrorist attack. DTI's modelling also indicates that we may not need nuclear to achieve 60%, (see Geoffrey's note) although as you know Dave King strongly disagrees.

Finally, Jonathon recommends we establish a "Sustainable Energy Agency" to take forward work on the shift to a low carbon economy.

As you will see from Geoffrey's note – Jonathon's proposals are not too far away from the draft Energy White Paper. And his argument that we need to judge all energy sources against the same set of criteria is hard to argue with, and could be easily incorporated into the EWP. However the renewables target he proposes is higher than in the EWP, which 20% by the same date.

Having interim (e.g. 2020) targets would be welcomed by many, especially in industry, as providing greater certainty – and it will help keep up the momentum. But we need to be careful that we don't unnecessarily increase the costs. And the modelling shows that even a 20% renewables target will be difficult to achieve by 2020 – let alone a 25% target.

Finally, you may wish to be aware that the Sustainable Development Commission has done an 'audit' of the UK climate change programme, which indicates that our 20% carbon reduction target and our 10% renewables target by 2010 are both at risk. DTI admit that the renewables target may be missed, though not by much. Defra deny that their programme is insufficient to deliver the 20% target. But I guess this also acts as a timely warning that we should not promise more than we can deliver.

I will draft a response from you to Jonathon in the light of your comments on Geoffrey's note. But do you have any additional comments on Jonathon's proposals at this stage?

We certainly don't want pro mulear Joanna Key dager, dut we shout meat it JOANNA KEY differently. Hav it we marage a 80%. 100 metris without the west huest is new teelnohofy that would be done on a reversably on noterneutrement basis? 18. can we terrandly fay we co. do it irrepetime of the global position. Or showe at least fint it is the Context of a major push quisally an climate charge he must bework of taying things that just weit creditole.

The Rt Hon Tony Blair MP 10 Downing Street London SW1A 1AA

19 December 2002

Dear Tony

ENERGY WHITE PAPER

As suggested at our meeting back in October, I'm attaching a personal briefing for you on the Energy White Paper.

It's almost impossible to overstate the importance of getting this right. With policy on waste and transport (inevitably) a bit of a muddle for some time to come, and Food and Farming still held back by difficulties in reforming the CAP, future energy policy provides the single most important test of this Government's ability to put sustainable development at the heart of its overall strategy.

I have therefore constructed this personal briefing in terms of a set of "success criteria" for the White Paper - ie criteria that will need to be satisfied for the White Paper to meet that test.

Above all, the White Paper has to be seen as marking a definitive turning point. The UK is rightly held up as one of the very few countries in the world today seriously addressing the challenge of climate change. Reinforcing that leadership role is something we believe you are uniquely well-placed to do (as exemplified in your speech in Mozambique).

Increasingly, however, we will be judged on our own performance in delivering a sustainable energy strategy, and here the signs are not all good. The Commission has recently completed an audit of the Government's Climate Change Programme, and has come to the disturbing conclusion that although we are still likely to meet our initial Kyoto targets, without further measures we will be a long way short of the 20% target for CO₂ emission reductions by 2010. Even the renewables target of 10% by 2010 is in severe doubt. And beyond 2010, it's going to get even trickier without a considerable reinforcement of the Programme.

We are in discussion with officials and ministers in DEFRA and DTI about these findings, which will not be released (given their potential impact) until we are agreed how best to handle that process.

As discussed with your officials, I'm copying this briefing note to Patricia, with whom I have a meeting about the White Paper on January 20th.

Very best wishes

JONATHON PORRITT Chairman



SUSTAINABLE DEVELOPMENT COMMISSION

SUCCESS CRITERIA FOR THE ENERGY WHITE PAPER

1. Envisioning a Low Carbon Economy

At a time when a lot of other countries and bodies like the CBI are seeking to delay the introduction of measures to address climate change, there is an opportunity here for real national/international leadership in mapping out a vision and accompanying strategy for moving to a low carbon economy, purposefully and cost effectively.

Along with many others (including the PIU itself) we believe that the adoption of stretch targets will be the most important affirmation of that approach. The targets which we are recommending are as follows:

- A strategic commitment to meet the Royal Commission on Environmental Pollution's recommendation for a reduction in carbon dioxide emissions by some 60% from current levels by around 2050
- A 20% improvement in the domestic and commercial sectors' energy efficiency by 2010, and similar amounts again by 2020, with major contributions coming from urban renewal programmes and partnerships involving social housing, the energy industry, and local authorities.
- In support of our call for developing micro/domestic CHP and easing the path for larger scale CHP, we wholeheartedly endorse the Government's target of achieving 10 GWe of good quality CHP by 2010.
- 25% of our electricity from renewable sources by 2020 (this is higher than the PIU's recommendation of 20%, but not as high as most NGOs)
- Unambiguous confirmation of the CO₂ reduction target of 20% (on 1990 levels) by 2010, and a 30% reduction by 2020.

2. Delivering a Low Carbon Economy

The advice from ourselves, the Carbon Trust and the Energy Saving Trust (strongly endorsed by the PIU Report) is that the surest way of securing a sustainable energy strategy for the UK is getting behind the troika of renewable energy, energy efficiency, and combined heat and power. The focus has to be on both the demand and the supply side.

But here's the rub: this will only work if each is pursued vigorously and consistently over the next twenty years, with <u>all</u> policy instruments working together rather than ending up in conflict with each other. That will require inspired political leadership inside Government and with the general public.

There are massive opportunities here to create synergies with other key Government priorities:

- the elimination of fuel poverty as a fundamental part of Labour's commitment to social equity;
- more efficient transportation strategies;
- making the UK economy more competitive and more productive, particularly by realising the employment opportunities presented by the transition to a low carbon economy;
- creating the right kind of platform for UK businesses to benefit from a low carbon global economy, in terms of the export potential of new technologies and engagement in carbon trading;
- the Clean Development Mechanism and other aspects of the Kyoto Protocol;
- using the tax system to deliver environmental objectives (including we hope increasing cost internalisation);
- driving forward a revolution in sustainable housing (with a particular emphasis on affordable housing);
- promoting renewable energy crops/biomass, as recognised in the new Sustainable Farming and Food Strategy;
- sustainable regeneration more broadly.

3. Avoiding the Nuclear Trap

Rightly or wrongly, a lot of the attention will be focused on the nuclear issue. Our analysis clearly demonstrates that <u>if</u> the option outlined in 2 above is pursued in the right way, there is no need for a new generation of nuclear reactors. On cost grounds alone, the PIU report demonstrated how onerous a new nuclear programme would be; using their figures, the level of subsidy required could easily be around £1 billion a year - on top of the £1 billion a year (at the very least) which is likely to be required by the Liabilities Management Authority for the decommissioning and clean-up of nuclear sites.

Moreover, physical security issues in terms of terrorist threats are clearly much more important than before, and cannot be glossed over in the interests of "not scaring people". The cost of trying to "proof" our nuclear facilities against possible terrorist attacks in the future will be enormous - and with what guarantee of success?

This would not be "the end of the road" for the nuclear industry. Research should continue into new technologies which may be more appropriate and able to make a bigger contribution in the future; more importantly, the UK should build on its unparalleled expertise in nuclear legacy issues, which could become a multi-billion dollar industry in its own right, and secure the employment of the majority of those currently employed by the nuclear industry.

4. Reducing Dependence on Hydrocarbons

It is crucial that the White Paper stresses the role of demand-management measures. People need a much clearer sense of the benefits a low carbon economy offers in terms of improving the quality of people's lives in both urban and rural contexts.

As you will know, in the light of Alistair Darling's recent announcement, there is growing anxiety about the UK transport strategy. Now that any targets for reducing road traffic have been dropped, at the same time as emissions from aviation look set to rise steeply over the next two decades, it's clear that a great deal more is going to have to be done if transport policy is to make <u>any</u> positive contribution whatsoever to the UK climate change strategy.

5. Establishing a Sustainable Energy Agency at the highest level

Another recommendation in the RCEP's report. Responsibilities are simply too dispersed across Government at the moment; there needs to be a powerful driving force behind this strategy:

- To sustain momentum on all implementation issues, and to drive this strategy forward across all Government departments
- To secure real ownership of the low carbon challenge both in the private sector and at regional and local levels
- To generate a wholly different kind of public awareness and engagement strategy which just isn't happening at the moment.

6. Ensuring absolute clarity and transparency in determining technology choice

One of our principal recommendations to DTI was that <u>all</u> future supply options must be appraised against the set of identical criteria, and that those criteria must be based on an integrated sustainable development framework.

It sounds boring, but unless all options are assessed against the same criteria (cost to consumers, cost to the Government, security of supply, CO₂ and other greenhouse gases, level playing field issues, broader environmental impact, community impact, physical security, export potential and so on), then one can guarantee that the vested interests that dominate the energy industry in the UK will turn this lack of consistency to their advantage.

JONATHON PORRITT Chairman Sustainable Development Commission

19.12.02

From: Geoffrey Norris
Date: 19 December 2002

cc: Jona

Jonathan Powell

Jeremy Heywood

Sally Morgan Pat McFadden Alastair Campbell

David Hanson MP

PRIME MINISTER

THE FUTURE OF THE UK COAL INDUSTRY

Prospects

Coal generation provides about a third of the UK's electricity output, with UK sources providing about half of the coal that is burnt. UK coal production splits about 55%/45% between deep mined and open cast.

For environmental reasons coal's share of electricity generation is set to decline. First, new EU emission standards on sulphur dioxide and nitrogen oxide will restrict output from coal stations unless they make significant investment in abatement equipment. Some investment will be made, but some coal-fired stations will be closed. Second, measures to tackle global warming will hit coal as it is a major source of carbon emissions. Carbon sequestration might tackle this problem, but it would come with a price tag and is as yet unproven. Against this coal's flexibility (loads can be varied relatively easily) may provide it with a niche in the market place to meet peaks in demand.

So the market for coal in the UK is likely to shrink. By 2020, coal generation's contribution to the UK's power output could be as little as 5%. At the same time UK sources will struggle to win a share of what market there is. Although UK has coal reserves of around 200-300 million tonnes and our mines are more economic than those in other EU states they find it hard to produce coal to match world coal prices. These economics mean that in the absence of a sharp rise in world coal prices it is virtually certain that no new UK deep mine will ever be commissioned. And existing pits will struggle as existing seams are exhausted and significant new investment is needed. The prospects for the industry surviving beyond 2010 are not good.

The UK industry today

Following the announcement this summer that the Selby complex will close in 2004, with the loss of a couple of thousand jobs, the UK's remaining deep mine industry consists of 9 pits owned by UK Coal (formerly RJBudge). They employ just over four thousand people. In addition there is Hatfield colliery (owned by Coalpower) employing a couple of hundred people and Tower colliery in south Wales employing 450. Scotland's last pit, Longannet, closed earlier this year after severe flooding.

The prospects for UK Coal's 9 pits are mixed. Production at Clipstone in Nottinghamshire (230 people) will end in March 2003. And the possibility of early closure faces two other pits: Maltby in Yorkshire (520 people) and Howarth in Nottinghamshire (590 people). Of the rest: Ellington (430 people) in Northumberland is doing OK, against expectations a couple of years ago that it wouldn't survive for long; Thoresby (480 people) in Nottinghamshire looks unlikely to have a future beyond four years; and Wellbeck (500 people) could be alright for the next five years. Two of UK Coal's pits, subject to avoiding geological setbacks, have reasonably good medium-term prospects: Kellingley (520 people) in Yorkshire and Daw Mill (550 people) in Warwickshire.

For the other two pits: Hatfield is in financial difficulties and its medium term future would require significant additional investment for which there is no prospect of private sector financing. And Tower (450 people) is regarded by our advisers as OK until 2004, but could face problems thereafter.

Government support

In the spring of 2000 we announced the introduction of a time limited operating subsidy scheme for the coal industry. The public rationale for the scheme was to provide support during the period of the uncertainty as we introduced the new electricity market arrangements and lifted the moratorium on building new gasfired power stations.

Absent of the subsidy there had been the threat by RJBudge (now UK Coal) to close half or more of its deep mine capacity by 2002 (the Selby coalfield; Ellington; Clipstone; Welbeck; Prince of Wales and Kellingley).

The subsidy ran between April 2000 and July 2002 at a cost of about £165 million. Originally we had expected to spend £110 million (in UK terms this a big number, but it compares with annual German operating aid to its industry of about a £1 billion).

Was it worth spending the money? A large round of early closures was avoided, although Prince of Wales has subsequently shut and a closure date for the Selby complex has been announced. However, the subsidy was paid at a time when the market environment for coal was good. High gas prices raised world coal prices (which helps UK coal) and increased demand for coal to generate electricity. However, the UK industry didn't win any of this extra demand with it being met by imported coal and UK output was flat.

We decided not to renew the operating subsidy scheme when it came to an end this summer. We also decided not to offer a subsidy to keep the Selby complex operating beyond 2004. We did however announce that we would consult on an investment aid scheme for the industry. This potentially tackles the anomalous situation where because of EU rules coal investment has not been eligible for regional selective assistance type assistance. As part of this process we have managed to get the EU rules changed.

The consultation is now complete. What it has found is that to have any impact on investment levels in the coal industry assistance would have to be on a much larger scale than £5,000 per job created average for RSA (£20k is probably needed). And that for schemes like Hatfield's proposal to access new coal fields from its pit the Government would have to provide 100% of the financing, with some of it repayable as a loan.

Support on this scale raises three questions:

Do we have the money?

DTI originally had a sum of £60 million in its budget to provide assistance at RSA-type levels for coal investment over the next three years. The consultation strongly suggests that support as this level wouldn't have many, if any, takers. And that support at a higher level would have takers, but we wouldn't have the money.

On top of this problem the need to provide support for British Energy from within DTI's existing budget has now put a question mark over whether even the £60 million is available? The DTI's cupboard looks bare- does HMT have any money?

Would it be worth spending money on coal?

The energy case for spending money on coal doesn't look that strong. Some diversity of energy sources is desirable, but there are plentiful supplies of coal we

can import rather than spend money to dig our own. On environmental grounds coal is not a good source of energy and to make it OK involves spending money on emissions abatement. SOX/NOX abatement is quite expensive and carbon sequestration looks costly and is as yet unproven. And as a way of protecting employment it also looks expensive, as well as begging the question what is so special about the remaining several thousands of coal jobs compared to any other iobs?

What happens if a serious level of investment aid isn't available?

There are going to be some closures over the next few years, without an investment aid scheme the number will be higher. However, it would not necessarily spell the end of the UK industry. Five or six pits, employing three to four thousand people could still be in production in two or three year's time.

That I we can proposed the sure of the sur What do you think?

GEOFFREY NORRIS

02072702326**DENTIAL**





Foreign &

Commonwealth

Office

King Charles Street London SW1A 2AH

Telephone: 020-7008-2207
Facsimile: 020-7008-2326
Michael.Arthur@fco.gov.uk
Director General EU and Economic

18 December 2002

Jeremy Heywood Esq No 10 Downing Street

EL OS GN MR DFH DM LL

De Tegen

Joan MacNaughton and I, with Oli Jones and others, had the senior level group discussions on the UK/US energy dialogue this morning. In the margins, Joan and I mentioned to the US DoE and State Department delegation leaders that we had done some work here on OPEC and oil prices. They were very interested.

I think it would be sensible to share our thinking on this - the papers I put to you recently - with the Americans on a private and restricted basis. I happen to be seeing Al Larson in Washington this Friday (on climate change and extractives) with Liz.

If you have no objection, I would like to leave him copies of the papers, under cover of the attached letter (broadly what I wrote to you, but suitably amended). We have screened the detailed papers to ensure there is nothing in them which we would not want the Americans to read. I would ask Al to keep this to a close circle.

Is this okay by you?

Michael Arthur

Encs.

cc: Joan MacNaughton, DEFRA Christopher Segar, AMED Richard Lindsay, EcPol D. cleater fr

6=c, 0 =

02072702326**DENTIAL**



Office
King Charles Street
London SW1A 2AH

Telephone: 020-7008-2207
Facsimile: 020-7008-2326
Michael.Arthur@fco.gov.uk
Director General EU and Economic

19 December 2002

Al Larson Esq Under Secretary of State

OPEC AND OIL

I thought you might be interested to see some recent work we have done in Whitehall about the future of oil prices. I would be grateful if you would handle this on a suitably restricted basis.

The background is as follows. At a brainstorming with Jeremy recently we started exploring whether there is any way we could break the OPEC producers' stranglehold on oil prices. We wondered whether a free market would produce prices at below \$10 a barrel, given the basic supply and demand equation and the low marginal cost of production in certain fields. We then asked whether the lowest possible oil price was necessarily in our best interests. So we did some quick background work on this. We are still working on some more sophisticated modelling of different oil prices as they affect the UK economy.

This is not rocket science. There is masses of much more detailed statistical and forecasting analysis available, both in the IEA and in the marketplace. Our economists drew on this of course.

I thought you might like to see the output. So I attach three short papers. In commenting to Jeremy, I chanced my arm in saying that a stable price in the upper teens \$ per barrel would probably be in the widest overall UK interest. Please do not give that guestimate undue status, even if colleagues around Whitehall who are more expert than I seem to accept the analysis leading to it.

The three papers cover:

1) The global impact of low oil prices. A fall from \$25 to \$15 a barrel would boost global GDP by about 1% over a 2-year period, with inflation in OECD countries falling initially by up to 2%. Key oil exporters (including Saudi, Nigeria, Russia) would face economic crisis in varied degrees. Some case studies attached.

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- 2) HMG's wider policy objectives: environment; security of supply; political stability in producer countries; wider development goals. A price in the range \$18-22 would be consistent with these wider goals (e.g. helping to stimulate alternatives to oil; encouraging sustainable growth in emerging economies).
- 3) Achieving greater oil price stability. This examines the options between the two extremes of leaving the outcome to pure market forces and some tight consumer/producer price fixing.

We conclude that some degree of price volatility is inevitable - in the nature of a market for a commodity. While prices at \$25 are not sustainable (due to in-built downward pressure from non-OPEC producers) a price below \$15 is likely to be accompanied by greater not less volatility.

It will be primarily market forces which deliver sustainability in a price bracket of about \$15-\$20. We think that a quite likely outcome. But we can impact on this a little. Our principal policy tools for this are:

- (a) Encouraging diversity of production outside OPEC, partly through support for investment and sustainable development in Africa and FSU;
- (b) Working to avoid collaboration on supply restraint between OPEC and near-OPEC producers (eg Russia);
- (c) Further developing the consumer/producer dialogue, both multilaterally and in our bilateral work. This should not be aimed at specific price fixing (not achievable) but at encouraging better understanding by both sides of a mutual interest in sustainable prices and supplies in the \$15-\$20 range;
- (d) Demand management (fiscal; energy efficiency), not least to keep up the pressure on OPEC;
- (e) Encouraging (non-oil) diversity of energy supply a key goal of our forthcoming Energy White Paper in order to keep downward pressure on OPEC and to mitigate the increased global demand for Middle East oil, which, driven by transport needs, is inevitable over the next decade.

We do <u>not</u> think that long term contracts are a solution. Given the unavoidability of some price volatility, who would bear the risk? - ultimately governments. This would not be acceptable.

Nor do we think that market intervention through increased IEA oil stocks is a viable policy instrument. IEA stocks - and it is hard enough to keep them up to the present level - were designed to correct short-term supply interruptions, never seen as a price fixing tool. To have a price impact, the scale of stocks would have to be far higher than governments are



likely to want to finance; and even then, in a real war of supply, the OPEC/Middle East

This week we had a senior level meeting of our bilateral US/UK energy working group.

This week we had a senior level meeting of our bilateral US/UK energy working group.

There are interesting points arising from this work stream, and a wide range of topics and There are interesting points arising from this work stream, and a wide range of topics and There are interesting points arising from this work stream, and a wide range of topics and There are interesting points arising from this work stream, and a wide range of topics and There are interesting points arising from this work stream, and a wide range of topics and There are interesting points arising from this work stream, and a wide range of topics and There are interesting points arising from this work stream, and a wide range of topics and There are interesting points arising from this work stream, and a wide range of topics and There are interesting points arising from this work stream, and a wide range of topics and There are interesting points arising from this work stream, and a wide range of topics and There are interesting points arising from this work stream, and a wide range of topics are stream.

I would be interested to hear your reactions to the specific OPEC/oil ideas, if you have time. But anyway, we should follow closely the wider UK/US energy dialogue as it approaches a report to the President and Prime Minister on the anniversary of Crawford.

Michael Arthur

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EROM MICHAEL APTHUR

TO 902078399044

OTOTAL DEPENDENT AND STREET ALL

020 7238 6465

Telephone 08459 335577

Email secretaryofstate@defra.gsi.gov.uk
Website www.defra.gov.uk

The Rt Hon Jack Straw MP Secretary of State Foreign and Commonwealth Office King Charles Street London



December 2002

Food and Rural Affairs

0) ((C) 1K

From the Secretary of State
The Rt Hon Margaret Beckett MP

Dear Jack.

NEGOTIATING POSITION FOR A DIRECTIVE ON THE PROMOTION OF COGENERATION BASED ON A USEFUL HEAT DEMAND IN THE INTERNAL ENERGY MARKET

I am writing to seek your agreement and that of colleagues to a UK negotiating position on the EC proposed Directive on the promotion of cogeneration. The main purpose of the proposal is to promote the cogeneration of heat and power in order to reduce energy demand as a means to both reduce dependency on external energy supplies and contribute to the achievement of carbon-saving targets.

I would be grateful for a reply by 6 January.

I propose that we support the stated aim of this proposal and in particular its emphasis on the promotion of high efficiency co-generation based on useful heat demand. However, as currently drafted, the proposal would hinder rather than promote cogeneration in the UK by placing additional barriers in the way of achieving our domestic target of at least 10,000MWe of Good Quality CHP capacity by 2010. The two key issues of most concern are: a) the proposed definitions of CHP (Article 3); and b) the proposed restriction on public support for schemes greater than 50MWe (Article 7).

I am therefore seeking your agreement to this negotiating position which is designed to help secure an outcome that delivers a Directive that does not constrain the development of cogeneration capacity in the UK.

Background

The Government has committed to achieving a target of at least 10,000MW of Good Quality CHP capacity by 2010 and on 15 May 2002 published a draft CHP Strategy for consultation setting out the support measures thought sufficient for the target to be met.

Content of proposal

The purpose of the Directive is to create a framework for promotion of cogeneration (more commonly known in the UK as Combined Heat and Power or CHP) based on a useful heat demand in the internal energy market. There are several key areas where the Commission proposes action:

- · The adoption of common definitions for cogeneration;
- The introduction of a "guarantee of origin' for electricity from cogeneration;
- The development of criteria to determine the energy efficiency of cogeneration based on a common methodology;
- Analysis of national potentials for high efficiency co-generation and barriers to its realisation;
- Evaluation of support schemes for co-generation;
- Access to the electricity grid system for electricity from cogeneration.

Costs and benefits

A Partial RIA has been prepared and is enclosed.

Proposed negotiating position

I propose that we support the proposal but negotiate to ensure that it delivers on its stated aim of promoting cogeneration to deliver carbon savings without imposing unnecessary burdens on consumers, businesses and Government.

I recommend the UK takes the following line on the main elements of the proposal.

The adoption of common definitions for cogeneration (Article 3)

This Article defines certain key terms used in the Directive.

The definition of 'co-generation' is one of our key concerns as it is ambiguously worded and needs clarification. Firstly, the power to heat ratio is not clearly explained. Secondly, it is unclear whether there is any relationship between the definition of cogeneration electricity and the definition of high efficiency cogeneration (eg should the first be used to calculate the second?). Thirdly, the division of cogeneration into various types based on both the sector in which it is used and the quality of the heat output

does not allow for CHP installations serving mixed markets or with a variety of heat outputs. The UK has many CHP installations that cannot be so simply categorised.

Furthermore, the definition of 'useful heat' as determined by the methodology in Annex II seems to suggest that useful heat output is confined to that produced by the CHP engine. Yet many CHP installations include additional boilers or supplementary firing to meet specific site requirements. In many cases the sub-metering necessary to measure heat output from the cogeneration unit alone would have to be installed at considerable cost to comply with the proposed Directive – possibly costing in the region of thousands of euros per installation. Such costs would be particularly punitive for smaller operations.

I propose that we support the principle of harmonising definitions for CHP but seek changes which would help promote rather than constrain the support for CHP in the UK

The introduction of a "guarantee of origin' for electricity from cogeneration (Article 4)

This Article sets out requirements for the guarantee of origin of electricity from cogeneration based on the proposed definition of 'cogenerated electricity' to increase transparency of choice for consumers between electricity from cogeneration and electricity generated by other means.

I propose that we support this in principle but argue that the requirement should only apply to those CHP schemes in receipt of public support. A requirement for a 'guarantee of origin' from all CHP plants would be an extra burden with little apparent gain for operators not eligible for or wishing to claim public support.

In the UK a large proportion of the data required for the guarantee of origin is already provided by operators in order to meet the requirements of the CHP Quality Assurance programme (CHPQA). However, this programme is voluntary and this requirement would make the scheme or an alternative mandatory. For schemes not able or willing to benefit from any of the public support schemes (eg not high efficiency schemes) this would be an additional burden for no apparent benefit.

The development of criteria to determine the energy efficiency of cogeneration based on a common methodology (Article 5)

This Article requires Member States to develop criteria to determine the energy efficiency of cogeneration on the basis of a common methodology set out in Annex III of the Directive.

I propose that we support the proposal for common principles for determining the criteria for high efficiency cogeneration. The main options include a common European methodology and a general framework which allows Member States to develop their own methodologies. I propose that we work for the adoption of a general framework

which would allow Member States to develop their own methodologies for defining high efficiency cogeneration. This framework should ensure that the definitions of high efficiency cogeneration developed by Member States are all set at a consistent level. Such an outcome would cause the least disruption to our existing CHPQA programme by ensuring that the criteria are compatible.

National potentials for high efficiency co-generation (Article 6)

This Article requires Member States to publish reports analysing the national potential for high efficiency cogeneration and barriers to its realisation.

I propose that we should support this proposal but make it clear that we would not want to see the information about national potentials supplied to the Commission to be used as the basis for introducing mandatory or voluntary national targets in the future.

As part of the development of the Government's draft CHP Strategy to 2010, and the setting of a target of achieving 10,000 MWe of installed Good Quality CHP capacity by 2010, the UK has already undertaken an assessment of the economic potential for CHP in the UK and assessed the barriers to realising the benefits CHP has to offer. We would, in any case, expect to update this assessment at periodic intervals.

Support schemes (Article 7)

This Article requires Member States to ensure that support for cogeneration is based on the useful heat demand. The preamble to the Directive and the accompanying Explanatory Memorandum suggest that support should not be given to installations with a capacity greater than 50MWe.

I propose that we support the requirement for support schemes to be based on useful heat demand but argue strongly against the limiting of support to schemes under 50MWe.

Cogeneration only delivers benefits if there is a real heat demand to be fulfilled. The Commission proposal recognises this and reflects current best practice in the UK. In the UK, there is currently no size threshold placed on government support such as exemptions from the climate change levy. At present 57% of all installed capacity in the UK comes from installations over 50MWe and around half of the extra 5,000 MWe of capacity needed if the UK is to meet its CHP Target by 2010 is expected to come from plants in excess of 50MW capacity.

The CHP industry in the UK is already under economic pressure due to rising gas prices and lower electricity prices arising from new trading arrangements. Undermining support for larger schemes (over 50MW) could make them (existing and planned) economically unviable leading to operations closing or not being built. This would have serious implications for the UK target and is at variance with the stated purpose of this

proposed Directive. Support should be offered to schemes according to their social and environmental benefits, irrespective of their size.

Electricity Grid System Issues (Article 8)

This Article requires Member States to ensure that electricity network system operators guarantee access to electricity produced from cogeneration.

In principle we should support efforts to ensure access to the network system for cogeneration electricity as other generators. However, we are concerned that it might not always be technically feasible for a network operator to give access to the network. In cases like this an option might be to provide financial compensation where access cannot be provided. Also, we have some concerns over how the Article's provisions could force the sharing of connection costs between first and latecomers where this may not be practicable or appropriate. The rules on the bearing of costs should perhaps include 'cost-reflectivity' as well as objectivity, transparency, and non-discriminatory criteria.

The provision that Member States may require transmission or distribution system operators to meet connection costs is appropriate as long as it is drafted as a power rather than a duty. The particular facilitation proposed for a given classes of generator is a difficult concept for our approach to network access and needs to be reconciled with what is said elsewhere in the Directive about accurately reflecting costs and benefits.

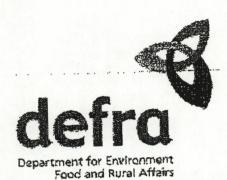
I propose that we support in principle but to argue to ensure that our concerns are met and that the Directive is drafted in a way that is compatible with the liberalised UK market and regulatory framework.

I hope that you will be content with the initial negotiating position I have proposed above and would be grateful for your early agreement to it.

I propose that we should brief MEPs in line with this strategy.

I am copying this letter to the Prime Minister, EP Committee members, Sir Andrew Turnbull and Sir Nigel Sheinwald. I shall be writing separately to the devolved administrations.

ly ands of any over MARGARET BECKETT



Partial Regulatory Impact Assessment on a Proposal for a Directive on the Promotion of Cogeneration based on a Useful Heat Demand in the Internal Energy Market

> 24/10/2002 Department for Environment, Food and Rural Affairs

	020	7238	6465	

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- The European Commission's 1997 Cogeneration Strategy set an indicative i. target of doubling the share of electricity production from cogeneration (CHP) in total EU electricity production from 9% in 1994 to 18% by 2010. However, recent years have not seen a significant increase in the share of CHP in the EU.
- The need for policy action on CHP at EU level was reinforced in the ii. Commission's Communication on the implementation of the European Climate Change Programme and a Directive on the promotion of CHP is one of the elements in the package of measures needed to comply with the Kyoto Protocol to the United Nations Framework Convention on Climate Change.
- The purpose of the proposed Directive is to promote CHP wherever an iii. economically justified potential is identified in order to save energy and reduce CO₂ emissions. It proposes to do this by creating a framework, which can support and facilitate the installation and proper functioning of CHP where a useful heat demand exists or is foreseen.
- Pending the internalisation of external costs of energy production, the iv. proposed Directive notes that regulatory certainty and support are needed in order to exploit the potential for CHP. The proposed Directive attempts to lay down a framework, which addresses the above issues through a set of common principles for the promotion of "high efficiency" CHP.
- The UK Government broadly welcomes the proposal, and its emphasis on the development of high efficiency cogeneration. This is consistent with the UK target to at least double Good Quality CHP capacity to 10,000 MWe by 2010.
- Overall, the assessment shows that, as drafted, the Directive would place vi. additional barriers in the way of achieving the UK Government's target for installed Good Quality CHP capacity in the UK by 2010.
- This conclusion is based on assumptions about the meaning and measurement of a number of key parameters used in the proposed Directive. The current draft does not provide a sufficient level of clarity to provide complete confidence that these assumptions are correct and therefore clarification will be a key objective for the UK Government in negotiations.

1. INTRODUCTION

- 1. This document presents a Partial Regulatory Impact Assessment of a proposal for a Directive of the European Parliament and of the Council on the promotion of cogeneration based on a useful heat demand in the internal EU energy market. The UK Government broadly welcomes the proposal, and its emphasis on the development of high efficiency cogeneration. This is consistent with the UK target to at least double Good Quality CHP capacity to 10,000 MWe by 2010. However, the UK has concerns that the proposal as drafted may not have the desired effect:
- 2. The Commission adopted a formal proposal 2002/0185 (COD), which was published on 22 July 2002 (COM(2002) 415 final) as a proposal to the EU Council and Parliament. The proposal followed a preparation phase involving a number of meetings and working groups.
- 3. A Full Regulatory Impact Assessment will be developed after the views obtained from the UK public consultation on the proposed Directive, which is due to close on 21 December 2002, have been received and analysed.

2. PURPOSE AND INTENDED EFFECT

Objective

- 4. The overall objective of the proposed Directive is to promote the cogeneration of heat and power in order to reduce energy demand as a means to both reduce dependency on external energy supplies and contribute to the achievement of carbon-saving targets.
- 5. The proposal covers the following main elements:
 - <u>guarantee of origin</u> of electricity produced from CHP, based on a proposed definition of cogenerated electricity, to increase transparency for consumer choice between CHP electricity and that produced by other techniques;
 - provisions obliging Member States to analyse <u>national potentials for</u>
 "high efficiency" CHP and barriers to realisation, including a proposed
 definition of "high efficiency." This is to allow monitoring of Member
 States' progress towards realising their potentials;
 - provisions for <u>evaluating support mechanisms</u> for CHP used by Member States to assess the success, including cost-effectiveness, of the support systems in promoting the use of high efficiency CHP in conformity with national potentials;
 - provisions laying down the principles for <u>interaction between CHP</u>
 operators and the electricity grid or network to provide a level playing
 field for all existing and potential new producers of electricity and to
 facilitate access for renewables-fired CHP and small-scale CHP below
 1MWe capacity;

 provisions requiring Member States to evaluate current administrative procedures with a view to reducing administrative and regulatory barriers to CHP development.

Devolution

The proposed Directive would apply throughout the UK.

Background

- 7. Due to its efficient use of fuel, the cogeneration of heat and power (commonly referred to in the UK as Combined Heat and Power or CHP) can offer significant energy savings and avoided CO₂ emissions compared with the separate generation of heat and power. However, despite promising potential for cogeneration throughout Europe, neither capacity nor output have increased significantly over the past few years. This is due in large part to unfavourable market and economic conditions (in particular, high gas prices and low electricity prices), but also to institutional barriers (e.g. the interaction between small CHP operators and electricity networks).
 - 8. Pending the completion of the internal market for energy with the full internalisation of external costs, the proposed Directive is intended to secure a level playing field by providing a framework in which cogeneration can be promoted by Member States through financial support and removal of institutional barriers.
 - 9. The UK has developed a robust, determinate and auditable methodology (known as the CHP Quality Assurance programme, CHPQA) for assessing and monitioring CHP. The methodology allows public support measures to be targeted only at CHP intallations that provide significant energy and environmental benefits. Development of this methodology began in 1998 and involved detailed testing and public consultation before becoming operational during the year 2000. Unlike the definitions of cogeneration contained in the proposed Directive, the CHPQA methodology values electricity more than heat. This means that it provides a more robust assessment of the environmental benefits of cogeneration.
 - 10. There are approximately 1,500 CHP installations in the UK, of which 1,200 are registered with the Government's CHPQA programme. Of these, around 1,000 have completed the assessment process and are certified in respect of their fuel inputs, power outputs and capacities qualifying as Good Quality CHP.
 - 11. The operators of the majority of these CHP installations are in receipt of one or more benefits under the Government's package of public support measures introduced to promote Good Quality CHP. Key measures include exemption from the climate change levy and the Enhanced Capital Allowance scheme. The value of the climate change levy exemption is estimated to be in excess of £175 million per annum. Enhanced Capital Allowances could be worth a further £200 million for new developments, assuming the Government target of at least 10,000 MWe installed Good Quality CHP capacity by 2010 is met.

Risk Assessment

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- 12. The proposed Directive could helpfully promote CHP wherever an economically justified potential is identified in order to save energy and reduce CO₂ emissions. However, the main risks to the UK if the proposed Directive is implemented in its present form are:
 - reduced growth of CHP capacity due to the costs of compliance associated with additional metering;
 - disproportionate burdens on SMEs due to the costs of compliance;
 - possible undermining of existing UK Government support measures for Good Quality CHP (the UK term for high efficiency cogeneration), in particular the withdrawal of support for schemes over 50 MWe capacity;
 - costs to Government. Although the proposed definitions of CHP appear simple, they could require the introduction of a new assessment methodology;
 - a potential reduction in reported UK CHP capacity.
- 13. If these risks are realised, the Directive may not have the desired effect. The CHP industry in the UK is under severe economic pressure at the moment, mainly due to high gas prices and low electricity prices.

Organisations affected

The CHP industry consisting of designers and developers, equipment suppliers and engineering and technical consultants will be most affected. All sectors of the UK economy could be affected to some degree, however, since the non-environmental benefits of CHP - increased competitiveness, security of energy supply and alleviation of fuel poverty - can be widely realised.

Issues of equity and fairness

- 15. If adopted, the proposed 50 MWe capacity size limit for public support could be unfair for some operators. Depending on how the limit is applied, it could result in the withdrawal of public support for schemes over 50 MWe capacity.
- 16. Participation in the UK's Combined Heat and Power Quality Assurance programme (CHPQA) is voluntary. However, as certification under CHPQA is a prerequisite for access to a range of financial support measures, it is recognised that there will be an administrative burden associated with accessing this support. Every effort is made to keep the burden to a minimum whilst ensuring that it is commensurate with the risk of inappropriate disbursement of public funds. This is especially so for smaller CHP installations, where simplified procedures apply.
- 17. Adoption of the proposed Directive, we believe, will make it mandatory for all CHP operators to provide data and be assessed and it is perceived that some will be concerned that this will place an unfair burden on their operations for little or no perceived benefit.

Consultees are invited to comment on the risks identified and suggest others that might exist.

3. OPTIONS

- 18. If adopted, the Directive would not be optional, but obligatory for all Member States. Three possible options are outlines below:
- 19. Option 1: the Directive does not get the support of Member States and is not adopted. Early indications are that Member States are broadly supportive of the aims and objectives of the proposed Directive and whilst there are concerns over some of the detailed content, it is likely that the Directive will progress.
- 20. Option 2: the proposed Directive is adopted as drafted.
- 21. Option 3: In negotiation, a number of modifications to the proposed Directive could be suggested by Member States. There appear to be two areas where key modifications could be made. These modifications include:
 - A) The defintions of CHP proposed in the Directive are modified to allow Member States to develop national definitions and assessment methodologies which are consistent with agreed Europe-wide principles;
 - B) The proposal is modified so that there is no size limit for public support.

Consultees are invited to comment on the above options and suggest any other broad options that have not been included.

4. BENEFITS

- 22. The costs in this section are built up from the individual costs discussed in the next section.
- 23. Option 1: cost neutral and benefit neutral. The UK will continue to promote CHP, making use of the CHPQA to promote high efficiency CHP.
- 24. Option 2: it is expected that no benefit would accrue (other than a common basis for gathering European statistics). Indeed, there is a significant risk that the proposed Directive would further damage prospects for UK CHP. For example, the proposal in the Directive to specify a simple, common definition for cogeneration could lead to additional costs and reduced public support for some CHP operators in the UK because it only considers CHP electricity. This is estimated to be worth £46 £57million per annum. Furthermore, the proposal to limit support to output from CHP below 50MWe could further reduce public support by between £35 £50m per year.

25. Option 3:

- A) modification of the proposed definitions of CHP: The implications of modifying the proposal to allow Member States to develop national definitions and assessment methodologies for cogeneration (such as CHPQA in the UK), which are consistent with agreed Europe wide principles, could prevent the reduction of UK public support for cogeneration by between £46million and £57 million per annum.
- B) modification of the proposal to remove the capacity size limit of 50MWe for public support would prevent the reduction of public support for larger cogeneration installations by between £35million and £50million per annum.

Consultees are invited to comment on the above benefits and suggest any others that have not been included.

5. COMPLIANCE COSTS FOR BUSINESSES, CHARITIES AND VOLUNTARY ORGANISATIONS

- 26. The main cost to CHP operators that could arise from adopting the Directive as presently drafted (Option 2) is associated with the loss of public support already being given to operators of Good Quality CHP. (The two main causes for loss in public support would be the new definitions of CHP and the proposed size limit of 50 MWe for public support).
- 27. Under current arrangements in the UK (some of which remain subject to a Commission State aid ruling) fuel inputs to and electricity outputs from Good Quality CHP are either outside the scope of, or are exempt from, the climate change levy.
- 28. Any reduction to the amount of benefit that operators of recently commissioned or soon to be built installations have accounted for in their business case could seriously undermine the on-going viability of the installations.
- 29. All CHP installations are different and it is difficult to make generalisations about the scale of this effect. By way of example, of the 175 CHP installations commissioned since 1 January 2000, or expected to be commissioned before 1 January 2004, 130 would probably be unaffected in terms of benefits received whilst 45 could lose an estimated £6 7 million/year in climate change levy exemptions on input fuel alone.
- 30. Not being allowed to count fuel for supplementary firing and auxiliary boilers as input to CHP may mean that this portion of fuel is not eligible for climate change levy exemption. This is estimated to be worth £40 50 million/year, in addition to the loss in levy exemption discussed in the above paragraph.
- 31. This could also have a bearing on the value of levy exemption on electrical output, since the methodology proposed in the Directive gives a value for cogeneration electricity between 10% and 15% lower than the Qualifying Power Output determined under CHPQA.

- 32. Taken in isolation, this effect could reduce levy exemption benefit currently received for Qualifying Power Output by £13 - 15 million/year. However, the interaction between fuel inputs and fuel outputs is complex and it would not be correct to simply add the losses of exemption for inputs and outputs together. A more accurate assessment could only be done on an installation by installation basis.
- 33. Although no mention is made of any capacity size limit for public support in the articles of the proposed Directive, reference is made to a 50 MWe limit in both Section 4 of the Commission's Explanatory Memorandum and paragraph 16 of the preamble to the proposed Directive. The rationale given for imposing a limit is that operators of large CHP installations have easier access to more favourable financing and fuel prices and therefore do not need public support.
- 34. The proposal to limit public support in some way to output from CHP below 50 MWe capacity could lead to £35-50 million/year of public support being withdrawn. To achieve the Government's CHP target will require the deployment of over 5,000 MWe of additional capacity by 2010, around half of which is expected to come from CHP installations in excess of 50 MWe. Under current arrangements, the UK provides support for Good Quality CHP that is assured to provide significant energy efficiency and environmental benefits regardless of the size of the installation.
- 35. For organisations that benefit from the UK's public support measures, there will be additional costs associated with the proposed Directive as currently drafted. The first of these is associated with the installation of additional metering necessary to comply with the proposed definition of cogeneration. This definition, unlike the UK's CHPQA standard, does not allow heat produced by supplementary firing or in auxiliary boilers to be counted.
- 36. The implication of this is that the heat output from just the CHP prime mover (engine or turbine) must be monitored. The costs of the additional metering required could range from a few thousand pounds for a relatively simple single fuel, single prime mover installation up to £50,000 or more for complex sites with multiple prime movers running on a variety of fuels.
- 37. The cost estimates below relate to installations already registered under the CHPQA programme:
 - installations below 2 MWe, £5k per scheme
 - installations in the range 2-10 MWe, £15k per scheme
 - installations in the range 10-50 MWe, £30k per scheme
 - installations above 50 MWe, £50k per scheme.
- 38. Clearly such costs could be disproportionately punitive where they apply to installations operated by small to medium sized businesses.

- 39. The total cost could be as high as £10 million if the majority of installations had to install extra metering. In annual terms, the total cost would correspond to about £1.2 million per year.
- 40. Charitable organisations are outside the scope of the UK climate change levy. Since certification under CHPQA (the 'passport' to public support for Good Quality CHP) is voluntary, very few charitable organisations choose to register with CHPQA and be assessed. The requirement for all CHP installations to have their performance assessed under the proposed Directive would therefore have a marked affect on charitable organisations operating CHP installations. It is estimated that the annual cost of compliance, not counting the one off costs of additional metering, could be in the range of £500 -£1,500 per organisation, depending on the size of the CHP installation.
- 41. Renewable fuels and any electricity generated from them are also outside the scope of UK climate change levy. The costs of compliance for operators of renewable-fired CHP are estimated to be higher at £1,000 - £2,000 per annum. The total of the costs in this and the above paragraph could amount to £0.5 - £1 million per year.
- 42. As discussed above, negotaitions with Member States could lead to the proposal being modified. This RIA will be updated at intervals to ensure it reflects the latest version of draft Directive.

Consultees are invited to comment on the above assessment of compliance costs and suggest others that have not been included.

OTHER COSTS (COSTS TO GOVERNMENT) 6.

Revamp of CHPQA

- 43. If the Directive were adopted as currently drafted, the CHPQA programme would have to be significantly modified to accommodate the new definitions and methods of assessment. This would involve a public consultation with industry and other stakeholders and discussions within Government. The cost of this is estimated to be in the range of £300,000 - £500,000.
- 44. The requirement for all CHP installations to have their performance assessed under the proposed Directive would add around £150,000 - £250,000 per year to the running costs of CHPQA or its successor, due to the increased number of installations to be processed. The costs of assessment under the CHP Quality Assurance programme is currently borne by Government.

The annualisation of this and other one-off costs assumes a 6% discount rate and a regulatory cycle of 12 years.

Assess CHP potential and barriers

- 45. The Directive requires that Member States assess the potential for and barriers to high efficiency CHP, according to the definition in the Directive, broken down into at least three segments: Industrial CHP, Heating CHP and Agricultural CHP.
- 46. Although CHP potential is assessed in the UK, it is not done on this basis and therefore additional studies would be required. It is estimated that these would result in costs of £50,000 £200,000 in the first year and then £50,000 £100,000 every three years thereafter. Over the regulatory cicle, this corresponds to an annual cost of £20,000 £60,000.

Monitoring progress and reporting

47. The Directive places a duty on Member States to monitor progress towards realising the potential and report results to the Commission. The Government already monitors and reports UK CHP capacity and output, but monitoring the effects of various support measures could result in additional costs of £25,000 • £50,000/year.

Consultees are invited to comment on the above assessment of cost to Government and suggest any others that have note been included.

020 7238 6465

Cost Summary Table

48. The costs of compliance set out in Section 5 and the other costs discussed in this section are summarised in the table below.

Table: Central Estimates of Annual Costs

Organisations Affected	Description of Costs	Type of Cost	Annual Costs ² (£m)
Business, charity & voluntary	Loss of public support due to CHP definition (a)		46 – 57
a voiania, y.	Loss of public support due to 50 MWe limit (b)		35 – 50
	Additional metering	P	1.2
	Switch from voluntary to mandatory registration affecting 500 installations	1	0.5 – 1
	Total annual costs to CHP users/developers		83 – 109
Government	Savings due to reduced public support (a) + (b)		(81 – 107)
	Revamp of CHPQA	P	0.04 - 0.06
	Additional costs of CHPQA due to compulsory registration	I	0.15 - 0.25
	Assessment of CHP potential and barriers ³	P	0.02 - 0.06
	Monitoring progress and reporting	1	0.03 - 0.05
	Total annual costs to Government		(81 – 107)

- Notes: 1) P = policy, i.e. those costs that are directly attributable to the policy goal
 - 2) I = implementation, i.e. those costs associated with compliance
 - e.g. monitoring/inspection
 - 3) Figures in brackets indicate a cost saving

Annualised NPV of research costs over regulatory cycle. NPV assumes a 6% discount rate.

² The annualisation of one-off costs assumes a 6% discount rate and a regulatory cycle of 12

7. COMPETITION ASSESSMENT AND EFFECT ON SMALL BUSINESS

Competition Assessment

- 49. A competition filter⁴ has been carried out for organisations that will be affected by the Directive. This examines market structure in order to establish whether any particular operator might be substantially more vulnerable than any other.
- 50. Because of the complexities of the market for CHP, the nine competition filter questions have been answered both from the perspective of the end users of CHP and from that of the developers, third party operators and equipment suppliers.
- 51. It can be concluded that there is unlikely to be a significant detrimental impact on competition as a result of the introduction of the Directive. That is not to say that firms may not be affected, but that any effect will not be felt by particular types of firms whilst others remain unaffected. The rationale for this conclusion is as follows:
 - The market is characterised by a large number of users and potential users in almost all sectors of economic activity. This market is serviced by a wide variety of developers, equipment suppliers and consultants. At the time of writing, there are two major developers/suppliers each with a share of 10-12 per cent of the current installed CHP capacity.
 - As drafted, the Directive will affect some CHP users more than others for a variety of reasons:
 - operators of large CHP installations would stand to lose considerable benefits if the 50 MWe size limit for public support was adopted;
 - operators of particular CHP installations would be required to install additional metering in order to report the heat output as defined under the proposed Directive;
 - some users are not in a position to benefit from the public support measures currently in place for CHP and so the cost burden of compliance would not be offset by any clear benefit.
 - 3. As drafted, the proposed Directive will affect the structure of the CHP supply market because it is likely to lead to a reduction in the number of CHP installations, both those currently operating and potential new developments. This could cause further rationalisation amongst suppliers and service providers (already happening due to the difficult market conditions for CHP).
 - 4. The administrative costs of complying with the proposed Directive will fall equally on new and existing CHP plant operators. Furthermore, the proposed different definitions of high efficiency CHP for existing and new plant will affect all firms equally.

⁴ See "Guidelines for Competition Assessment", p. 15, Office of Fair Trading, February 2002.

- 5. Although improvements in both technology and application will continue for many years to come, these will be steady and incremental in nature. The market, therefore, is not characterised by rapid technological development.
- 6. The definition of CHP in the proposed Directive as drafted would affect the specification and price of CHP installations, which will impact on both users and suppliers, but it is not thought that it would disadvantage any particular type of firm over another.

Effect on Small Businesses

- 52. In assessing the impact of this draft Directive on SMEs, it is apparent that any additional costs of compliance will be particularly hard felt. This is especially true for owner-operators of small scale CHP installations such as might be found in private hospitals, hotels, leisure facilities and small retail businesses.
- 53. Whilst there are not many of these (many small business opt for an Energy Services approach involving third party financed and operated CHP installations), the effect will be disproportionately felt when compared to larger operations.
- 54. Whilst the consultancy sector could perceive the introduction of the Directive as an opportunity in the short-term to provide value-added services, any down turn in the market resulting from additional costs of compliance or additional bureaucracy would affect CHP consultants in the long-term. This effect would be felt hardest by small consultancy organisations.

Consultees are invited to comment on the Competition Assessment and analysis of the effect on small businesses and suggest any other factors that have not been included.

ENFORCEMENT AND SANCTIONS 8.

- 55. Upon adoption of the Directive, it will be necessary as part of the transposition process to publicise any changes required to the current UK system for monitoring and assessing Good Quality CHP. Effort would be made to provide help and guidance to enable firms to comply with the Directive at minimal cost and disruption.
- 56. This section will be modifed in the light of ongoing negotaiations.

9. MONITORING AND REVIEW

57. This section will be drafted in the light of ongoing negotiations.

- 58. Within Government the Government line has yet to be agreed.
- Public consultation the formal views obtained from the UK public consultation on the proposed Directive, which closes on 21 December 2002, will inform development of a Full Regulatory Impact Assessment. However, to inform the development of this Partial Regulatory Impact Assessment, informal views on the proposal have been sought mainly via telephone from a variety of CHP operators, developers, suppliers and consultants.
- 60. In general the aim of the proposed Directive is welcomed although there are some specific concerns. In particular, the proposed 50 MWe limit for public support. It is felt that the potential for significant growth in installed capacity is closely linked with larger CHP installations and such a limit would result in many large opportunities not being developed. These installations have to compete with the big CCGT power stations yet require 25-40% more investment because of the additional heat recovery plant, connections to heat distribution networks and the operating requirement to follow variable heat loads.
- 61. Some respondents suggested that the Directive as drafted could lead to perverse behaviour. For example, the 50 MWe limit might encourage developers to build more than one installation, each individually within the limit but adding up to meet the overall requirement.
- Concern was also expressed over the definition of CHP and the methodology proposed for the calculation of efficiencies. In particular, the use of supplementary firing and auxiliary boilers in a CHP installation that is designed on the basis of the local heat and power requirements often provides the best carbon saving benefits practically achievable, yet would be penalised under the Directive as drafted. CHP installations that are built to make environmentally beneficial use of waste fuels could also be penalised under the proposed arrangements.
- 63. There was support for the intention to address connection issues although some respondents felt that the Directive was not clear enough in stating the obligations of network operators. A similar comment was received concerning local authority planning and development criteria to promote CHP, where it was suggested that more emphasis should be given to pushing property developers towards connection to CHP and district heating networks.

11. SUMMARY AND RECOMMENDATION

64. Recommendations are to be decided in the light of the analysis of reponses to the public consultation and discussions with Other Government Departments, industry and other stakeholders.



HM Treasury, I Horse Guards Road, London, SWIA 2HQ RESTRICTED – COMMERCIAL AND MARKET SENSITIVE

The Rt. Hon. John Prescott MP
Deputy Prime Minister and First Secretary of State
Office of the Deputy Prime Minister
26 Whitehall
London SW1A 2WH

18 December 2002

Dear Deputy Prime Minister,

BE LEGISLATION

I am writing in response to Brian Wilson's letter seeking DA policy clearance for a short Bill to address urgent matters arising from British Energy.

2. This Bill is key to the successful restructuring of British Energy in line with the Government's objectives of nuclear safety, security of supply and value for money for the taxpayer. Recognising the exceptional circumstances of the British Energy restructuring proposal, and in particular the unique nature of the tax liability which arises as a direct result of this, the Chancellor and I recommend the inclusion of a provision into this urgent legislation to disregard the tax liability arising from payments under Schedule 12 of the Electricity Act 1989.



RESTRICTED - COMMERCIAL AND MARKET SENSITIVE

- 3. I know that Brian Wilson's officials have been working closely with mine to prepare instructions to Counsel and trust that this joint approach will continue.
- 4. I am copying this letter to the Prime Minister, members of DA Committee, the Paymaster General and Sir Andrew Turnbull.

Graham Cloater

pp PAUL BOATENG

(agreed by the Chief Secetary
and signed in his absence)

CONFIDENTIAL

From: Oly Jones

Date: 18 December 2002

PRIME MINISTER

cc:

Jonathan Powell Jeremy Heywood David Manning Simon Virley

Anna Wechsberg David Hallam
Matthew Rycroft Andrew Adonis

Arnab Banerji

COULD WE BREAK OPEC 2

My note to you a few weeks ago argued that not only would it be difficult to break OPEC, but also that the likely result of succeeding - low oil prices – would not be in our wider interests. That note and the accompanying FCO paper suggested that a stable price at something like \$15-20 barrel made most sense from a UK perspective.

We asked FCO to provide extra analysis to back up this conclusion. Attached are three papers in response. They support the initial conclusions, concluding that a price at the top end of the \$15-20 range would be optimum from the UK's perspective. The main arguments are set out below:

Global economic impact of a fall in prices

- a sustained fall in price from \$25 to \$15 would deliver a small (1%) boost to world GDP and reduce inflation by up to 2% in OECD countries. But the long term negative economic and political impact of low prices on key countries threaten those gains:
- Saudi Arabia: prices at \$15 would cause a fiscal deficit of 10% of GDP, leading to rising debt, and probably devaluation and inflation. \$10 would pose insurmountable budgetary problems, threatening the regime. Russia: a moderate decline may spur further economic reform, but \$15 or below could cause an economic crisis and make reforms harder. Sustained prices at \$10 would be catastrophic. Nigeria: given its already perilous finances, a fall to \$15 would make a severe financial crisis close to inevitable. A potential silver lining would be that in the long run, the crisis may force the pace of economic reform and diversification away from oil exports. India and Germany, as importers, would stand to gain: 1.5% on Indian GDP, and a timely boost the struggling German economy. But on a smaller scale, low prices would cause Angola, Algeria, Yemen, and Syria difficulties.

Impact of a fall on our wider policy objectives

low prices would also have a negative impact on our wider environmental, security of supply and in some cases development goals. Lower prices undermine our environmental objectives by increasing demand and discouraging the development of alternative technologies. They undermine security of supply by concentrating production on low-cost Middle East sites, at the expense of higher cost sites in Russia, the Caspian and Africa. On development issues, low prices have important benefits for the majority of developing countries (which are oil importers), but threaten political instability in some developing nations - caused by economic difficulties, as described above.

What are our options for achieving stability at the optimum price band?

- in the absence of OPEC support, the tools we have for achieving stability at the right price level are <u>limited</u>. The use of long term fixed price contracts, the release of consumer nations' oil stocks and taxation do not look promising:
- Long term, fixed price contracts are possible in theory, but Governments would have to be the purchasers, a highly interventionist move. We would have to take the financial hit if oil prices fell below the agreed price; it would increase volatility in the market outside the contracts; and it would give only producers and not consumers stability. Using variable taxation levels to control demand is difficult. It would be blunt, politically unpopular; fiscally damaging; and probably just serve to make crude more volatile as supply tried to match volatile demand levels. The release of western/consumer oil stocks to smooth prices would be an expensive strategy and requires careful international co-operation. There is also no guarantee the market would not react badly to a stock release. Stocks remain an important tool in the case of severe short-term shortage, but look too difficult to manage for long term global market stabilisation.
- what we can do: work to diversify oil production away from OPEC to Russia, the Caspian, Africa and South America to reign in OPEC market power; work to ensure 'near OPEC' states do not join OPEC; maintain a positive but firm dialogue with OPEC to persuade them that a lower price band is in their interests; continue incentives to lower demand in the UK; and continue to encourage non-oil diversification e.g. the development of renewables.

We think that the conclusions are right, and have asked FCO to think about the practical policy implications.

They are still working these through, and the results will be fed into the emerging Energy White Paper, and into ongoing FCO and DTI activity. We have already shared our thinking with the US, and plan to do so with key partners in due course, including with the Russians as part of our ongoing energy dialogue. Our strategy is to raise this privately with key oil market allies, to seek their agreement to the conclusions and to agree co-ordinated action to help deliver the outcome we want. We don't, however, plan to argue publicly for the new price band, since we don't want to give tacit support for the continuation of the OPEC cartel.

It is worth you reading the papers if you have the time. In particular, do you have any strong views on how we should play this with the US and other consumer nations (including China, India, Japan), and with OPEC and non-OPEC producers?

OLY JONES

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GLOBAL ECONOMIC IMPACT OF LOW OIL PRICES

INTRODUCTION

- This paper looks at the impact of low oil prices on the world economy, looking in detail at six key countries Saudi Arabia, Russia, Nigeria, China, India and Germany. It concludes by examining the tools that might be used to provide support to key producers to cope with low oil prices.
- Our analysis is broadly based on two scenarios, a main scenario of oil prices sustained at around \$15/barrel, and an extreme scenario of oil prices at \$10/barrel. Both are measured against a base case of \$25/barrel. The scenarios are not forecasts, indeed it is unlikely that oil prices could stay as low as \$10/barrel for long as the decline of higher cost supplies and / or greater producer co-operation would soon bring the price back up. But an oil price sustained around \$15/barrel for a number of years is entirely feasible.

SUMMARY

- A sustained fall in oil prices from \$25 to \$15/barrel would deliver a small (roughly 1%) boost to the world economy over a 1-2 year period. Major contractions in oil exporters would be offset by more widely dispersed gains in the rest of the world. Inflation in OECD countries would initially fall by up to 2%, followed by gentle rises due to faster economic growth.
- Key oil exporters would face economic crises as foreign exchange earnings and government revenues collapsed. Looking at specific countries:
 - *Saudi Arabia* is facing growing social and economic pressures. Oil prices at \$15/barrel would lead to fiscal deficit of at least 10% of GDP, leading to rapidly escalating government debt, and probably devaluation and inflation. Oil prices at \$10/barrel would pose insurmountable budgetary problems, fuelling rising social tensions which might threaten the current regime. A major political crisis in Saudi Arabia would have significant regional implications, with the potential for the spreading of political instability.
 - Russia has built up significant reserves and is running a small fiscal surplus, both of which will help it cope with oil price declines. A moderate decline may even spur faster economic reform. But experts agree that a fall to \$15/barrel or below could cause an economic crisis and would probably make reforms harder, with anti-reform parties more likely to do well in the 2003 Duma elections. Sustained oil prices at \$10/barrel would be catastrophic and investment in Russian oilfields would no longer be financially viable. But Russia's manufacturing industry would become more competitive at lower oil prices due to the inevitably weaker currency.

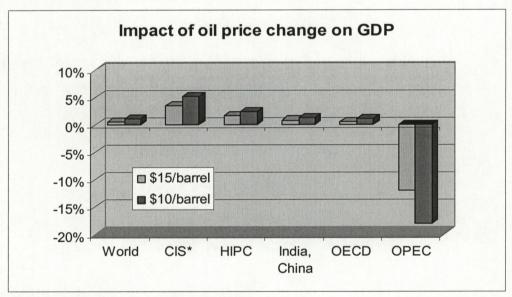
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- *Nigeria* is currently running large fiscal and current account deficits despite the high oil price. With oil accounting for 45% of GDP, over 70% of government revenues, and 95% of exports, it is extremely vulnerable to any falls in the price. If oil prices were to fall to \$15/barrel, never mind \$10, a severe financial crisis would be almost inevitable. But the crisis might finally force the implementation of economic reforms. These, combined with an inevitable fall in the currency, should help to stimulate the growth of the non-energy sector, hopefully setting Nigeria on a more sustainable and broader-based growth path.
- **China** has only recently become a net importer of oil. As such, oil at \$15/barrel will deliver relatively small gains to GDP growth (up to 1%). And there would be negative impacts: a worsening of deflation; a deterioration in the already weak fiscal situation; slower development of offshore oil production sites; and increased environmental damage, both at the global (carbon emissions) and local (air pollution) levels.
- *India* is a major oil importer and, as such, can expect to see GDP gains of 1-1.5% from lower oil prices. The government could use the opportunity to increase fuel taxes, thereby strengthening its weak fiscal position, although this would obviously reduce the short term economic benefit of the lower oil price. The impact on CO₂ emissions is not clear as higher oil consumption would be partially offset by lower consumption of dirtier fuels.
- *Germany* is currently facing stagnation and deflation. As a major oil importer, lower oil prices would deliver a timely boost to the economy. But they might also reduce the pressure on the government to push through much needed structural reforms.
- Whilst our analysis focuses on large countries, a sustained low oil price could push a number of countries towards becoming failed states. Experience in Somalia and Afghanistan have shown that even relatively small failed states can still present serious international problems. The most vulnerable include Angola, Algeria, Yemen, Syria, and a post-conflict Iraq.
- A number of tools are available to provide support to key oil producers: fixed price contracts could offer a partial solution, albeit it one with significant practical difficulties and potentially high costs for the purchasing government. The financial tools of aid, debt relief, and IMF support could, at best, ease the transition to a world of lower oil prices. They would not remove the need to make this painful transition. The cost of these options would be high, tens of billions to support a key producer like Russia. As such, any serious attempt to support key oil producers would require international agreement. Such agreement would probably be difficult to achieve for the large scale programmes that would be needed to make a significant difference to the producers.

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IMPACT OF LOW OIL PRICES ON THE WORLD ECONOMY

- 1. A fall in oil prices would affect the world economy through five main channels:
 - A transfer of income from oil producers to oil consumers
 - A one-off reduction in inflation
 - Increased demand for oil
 - Financial market impacts
 - Longer term impact on oil production
- 2. A fall in the oil price from \$25 to \$15/barrel would **transfer income from net oil exporters to oil consumers**, amounting to about \$130bn over a year (0.3% of global GDP). Historically, oil consumers have spent the income gains, whilst oil producers have been slow to adjust spending to their lower incomes. The net effect is a temporary boost to demand as world spending increases. This will increase world GDP by 0.6% over a 1-2 year period. It is possible that, with most major oil producers facing severe budgetary constraints, they would have to reduce spending more rapidly than they have done in the past, limiting the net benefit to the world economy. The economic impact depends on the intensity of oil use and the ability to take advantage of growing export demand (see chart). The countries that would gain most are CIS oil importers (high oil intensity), emerging Asia (major oil users, open to trade), and some HIPCs (high oil intensity, commodity exporters).



Source: Based on IMF simulations 2000

Impact to end of year 1, except world and OECD (yr 2)

3. The second major impact would be **lower inflation**. The IMF model suggests a \$10 fall in the oil price will produce a one-off reduction in inflation of roughly 1.2% in industrial country, with variations between countries depending on the pricing regime for fuel and energy, the oil intensity of output. In countries with inflation targets, monetary policy could

^{*} excludes oil producing CIS economies

be loosened providing additional benefits to growth and employment. Whilst falling inflation is generally considered beneficial, the falling oil price would aggravate the deflation currently facing Japan and China (and threatening Germany), although as a one-off event, the impact would be limited. Most oil producers would see large increases in inflation due to significant currency depreciation.

- 4. A major fall in oil prices would inevitably affect **financial markets**. Oil producers would find it harder to borrow, and investors would demand higher interest rates to reflect their worsening fiscal and external balances. This could present a serious problem for non-Gulf producers such as Nigeria, Indonesia, Russia, Egypt, and Venezuela, with the reduced availability of credit coming when their need for credit is greatest. Financial crises would be almost inevitable in these economies (see Russian and Nigerian case studies for details). In contrast, oil importing countries would find it slightly easier to borrow reducing pressures on their economies.
- 5. A lower oil price would lead to increased oil consumption. Oil consumption is relatively price inelastic, but major price changes do have a significant impact on demand when the oil price fell by about half in 1986, global oil consumption rose almost 10% over three years (1986-88). In the previous three years of high oil prices (1983-85), oil consumption did not grow at all, despite similar growth in global GDP (roughly 12% in both periods). Since the mid-1980s, oil intensities have fallen, petrol taxes have risen, and the oil price is lower, so the impact of price changes on demand will be weaker, but a sustained major price change would definitely increase oil consumption, with implications for climate change targets (see separate paper for a discussion of environmental impacts).
- 6. Much of the increase in oil consumption would come at the expense of other fuels, producing downward pressures on their prices. Gas prices, where market-determined, tend to follow oil prices, albeit with a lag, and prices in many gas contracts are explicitly linked to oil prices. Coal prices are also, to a lesser degree, influenced by oil prices. The resulting downward pressure on broader energy prices would increase the economic impact of the lower oil price the output and inflation impacts set out above are underestimates as the IMF model on which they are based assumes only oil prices change.
- 7. Sustained low oil prices would soon have an impact on investment decisions in the industry. Investment in high cost production sites would be cut and, as a result, **the growth of global oil production capacity would slow**. The vast majority of existing production sites will remain profitable at \$15/barrel, but at \$10/barrel, most offshore production would become unprofitable (implications for security of supply are discussed in a separate paper). The UK is particularly exposed rates of return on North Sea production fall to just 2% at \$15/barrel due to high development and production costs. In the medium term reduced supply, combined with the increase in demand described above, would put upward pressure on oil prices, making \$10 oil prices difficult to sustain.

SAUDI ARABIA

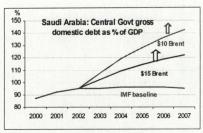
The Saudi economy and the Saudi government are highly dependent on oil - in 2001, 89% of export earnings and 81% of budget revenues came from oil. Controlling the budget in the face of volatile oil prices has been a recurring problem for the Saudis. There are strong upward pressures on spending as a result of rapid population growth, while the lack of a significant non-oil tax base severely limits their ability to compensate on the revenue side. The budget balance has gone back into deficit in 2001 and 2002 despite relatively high oil prices and looks likely to remain under strain.

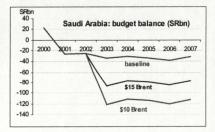
With a protracted period of \$15/barrel oil, the budget would be under intense pressure, with deficits of the order of 10% of GDP or more, unless the authorities take tough offsetting action. Past experience suggests that they would make some spending cuts early on, but their ability to make the necessary unpopular tax rises and maintain spending austerity over a run of years – at a time when unemployment is emerging as a very serious problem – is very questionable. Even if the deficit did not rise quite as far as the chart suggests, or domestic debt build up quite as rapidly, a serious deterioration looks probable, with in due course pressure emerging on the exchange rate. If oil prices were to fall to \$10/barrel for more than a brief period, this would pose insurmountable budgetary problems and probably devaluation and inflation.

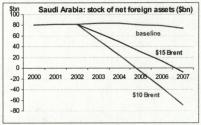
The balance of payments is a less pressing problem. There is no sovereign debt and official foreign assets have been rebuilt to about \$80bn over the past few years if pension fund and other assets are included. But the current account is expected to be in substantial deficit soon even if high prices are maintained. Low oil prices would push the current account more rapidly and deeply into deficit. With oil prices at \$15/barrel, the reserves would give a fair number of years' buffer before hard choices were forced on the authorities. At \$10/barrel, time would be far more limited. Devaluation and foreign borrowing, itself sensitive for the authorities on religious grounds, would both look on the cards.

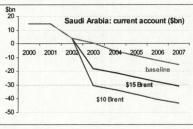
At either \$15 or \$10/barrel, the combination of rising unemployment, falling incomes, and deteriorating public services

would increase social tensions. The Al Saud regime manages a delicate balancing act between its domestic (including the powerful religious establishment) and international interests. A drop in the oil price would make this balancing act considerably more difficult and, if dramatic or over a prolonged period, would put the Al Saud regime at significant risk. Our assessment is that any home-grown alternative regime would be less friendly to the west and therefore likely, at least initially, to flex its oil muscles against the West.









RUSSIA

Russia is a hydrocarbon dependent economy. Oil and gas account for:

- 20-25% of GDP
- 55% of exports
- 60% of government revenues
- 5-10% of the world's oil reserves & 30% of world's gas reserves

Large oil price declines would have a major negative impact on the Russian economy. In addition to being the world's third largest oil producer, Russia is also the world's largest gas producer. As such, it is doubly-exposed to an oil-price shock as gas prices are frequently indexed to oil prices. This fact is incorporated into the estimates provided below:

Key economic forecasts for 2003 under different oil price scenarios

	Oil at \$25/barrel	Oil at \$15/barrel	Oil at \$10/barrel
GDP growth	4%	-1%	-3.5%
Fiscal balance (as % of GDP)	1 %	-2%	-3.5%
Current account (as % of GDP)	6.9%	2.7%	0.3%
Currency value	Stable	Depreciation	Major depreciation

A small drop in oil prices to, say, \$20/barrel, may actually have some positive effects. Although there would be negative effects on growth and government finances, crisis would probably be avoided due to Russia's significant level of reserves (c. \$40 billion, or 6.5 months of import cover). Debt, at 40% of GDP, is also manageable., while persistently low oil prices could provide the necessary incentive for the government to enact tough economic reforms, such as energy price liberalisation and tax reform, that have not been urgent while oil revenues have been high.

But a larger sustained drop in oil prices would have a serious economic and political impact and would probably make reforms less likely. At \$15/barrel, growth, the currency, and government finances would come under considerable strain, and inflationary pressures would build. Borrowing on international markets would become more expensive and might tip Russia into financial crisis — market sentiment, the level of external support, and the government's policy reactions would all be critical. If oil prices were to fall to, and stay at, \$10/barrel, a financial crisis would be unavoidable. Such a crisis could strengthen conservative, anti-reform parties in the 2003 Duma elections, limiting further economic liberalisation and potentially jeopardising Putin's good relations with the West.

Russia's oil & gas industry would suffer badly from low oil prices, particularly if they approached the industry's average cost level of roughly \$10/barrel. At 20-25% of GDP and 40% of investment, this would have negative implications for Russia's medium term growth prospects. The one benefit of low oil prices would be improved competitiveness of the Russian manufacturing sector due to the inevitable currency depreciation.

NIGERIA

Oil is the backbone of Nigeria's economy, accounting for roughly 45% of GDP, over 70% of government revenue, and 95% of exports. Even with current high oil prices, Nigeria's lack of macroeconomic prudence has contributed to a rising fiscal deficit (roughly 5% of GDP), a high current account deficit (currently 8.6% of GDP), falling foreign exchange reserves (down 10% this year to \$7.2bn), and double-digit inflation (currently 13.2%). It is therefore highly vulnerable to external shocks.

A fall in oil prices to \$15 or \$10/barrel would reduce government revenue as a percentage of GDP by roughly 10% and 15% of GDP respectively annually. Given the enormous cut in spending required to offset this, and Nigeria's poor track record of controlling spending, a severe financial crisis would be almost inevitable.

Nigeria currently manages its currency, using an official alongside a parallel market rate. In the event of lower oil prices, the market rate would fall rapidly, putting the official rate under intense pressure. **Reserves would quickly be depleted forcing a major devaluation**. Import prices would rise producing strong inflationary pressures. In the likely absence of prudent policies, inflation would rise to at least 20% at \$15/barrel and 25% at \$10/barrel.

But there might be some positive outcomes. First, the Nigerian government subsidises domestic fuel at fixed prices, at a cost of \$0.6bn this year. A fall in oil prices would reduce the subsidies and provide the government with an opportunity to reform the subsidy system, and bring retail prices in line with market prices. Second, currency depreciation should improve Nigeria's export competitiveness, particularly in basic industries such as textiles and food, where domestic production could substitute for imports. These industries will, however, continue be constrained by other factors such as poor infrastructure and weak governance. Third, the economic crisis might force the government to introduce key economic reforms that would promote longer term growth and stability, such as a sound fiscal framework, civil service reform, foreign exchange liberalisation, and privatisation. Such reforms would improve the prospects for FDI, and open the door to IMF support, and possibly debt relief.

Nigeria is a medium cost oil producer, with onshore oil production costing roughly \$4/barrel and offshore oil production costing \$8-\$10/barrel. As such, oil production plans would be largely unaffected if oil prices were to stay above \$10/barrel.

The main issue in the medium term will be whether or not Nigeria will adhere to OPEC quota restrictions in the face of declining oil prices and rising domestic production capacity. Nigeria's OPEC quota is 1.8m barrels per day (bpd). But Nigeria's current capacity is 2.6m bpd and is expected to reach 3-4m bpd by 2010. Nigeria is already cheating on its quota and the new capacity will put enormous pressure on the government to either get a higher quota or abandon OPEC constraints completely. Either action would risk precipitating a much lower oil price, which is clearly not in Nigeria's interests.

CHINA

China's oil demand more than doubled in the 1990s during which time it became a net importer of oil. It is now the world's third largest consumer of oil (after the US and Japan). As such, **China will be a net beneficiary of lower oil prices**, both in terms of the real income effect, and through increased export demand as world growth rises. The IMF estimates that these two channels would combine to boost China's GDP by 0.8% within a year of a \$10 fall in the oil price, with a further, smaller gain in the second year. Although beneficial, this benefit is relatively small for an economy consistently growing at 5-7% pa.

China would also see a one-off decline in consumer prices of roughly 0.8%. But **lower** inflation would be a mixed blessing as China is currently suffering from mild deflation – consumer prices fell 0.8% in the year to October 2002. Falling prices would increase the pressure on indebted firms and the troubled banking sector, and might also affect growth as consumers postponed spending in the hope of lower prices in future. The impact would depend primarily on whether the oil price impact amplified deflationary expectations. As an event that is clearly a one-off, it hopefully would not, but the risk of a negative impact remains.

China is a significant oil producer, producing slightly more oil than the UK. The sector, although liberalising, remains dominated by state owned companies. A fall from \$25 to \$15/barrel oil prices would reduce annual oil revenues by roughly \$10bn (1% of GDP). This could have a significant impact on the government's fiscal position, although it would be partially offset by improved profitability at oil consuming state owned enterprises, and faster economic growth generally. Nevertheless, high and rising government debt is one of key challenges facing China, so any deterioration would be unwelcome.

In the medium term, a low oil price will limit the prospects for developing China's significant offshore reserves, particularly if the price falls significantly below \$15/barrel. Production from China's mature onshore fields has already peaked and Chinese production will decline more rapidly if new sites do not come on stream. Having said this, China may use subsidies to maintain / expand oil production (with obvious fiscal implications) as they do not want to become too dependent on imports. But even if they allow the oil industry to decline, it accounts for only 3% of Chinese GDP so would have only a marginal impact on growth prospects.

China is the world's second largest CO₂ emitter after the US (relative to population, Chinese emissions are slightly below the global average). Lower oil prices would lead to higher oil consumption and higher emissions. China is a signatory of the Kyoto Protocol but, as a developing country, is not required to reduce or control emissions. As such, the government would be unlikely to take action to curb the emissions growth resulting from cheaper oil. Indeed, its current efforts to develop fuel cell technologies and reduce domestic air pollution could be jeopardised by lower oil prices.

INDIA

India is becoming increasingly dependent on oil imports:

- Oil demand growing at 6% pa (2000 2020)
- Oil import dependence will increase, from 65% in 2000 to 94% in 2030
- Some domestic oil & gas production (1.5% of GDP)
- Oil imports are currently 3% of GDP

There will be significant one-off benefits from a lower oil price. The fall in oil price would stimulate domestic demand and world demand, with multiplier effects for the wider economy leading to a 1-1.5% increase in growth (see table below). We would expect to see some strengthening of the rupee as the current account surplus increases. And the lower cost of oil would produce a one-off fall in inflation. Given India's projected increases in oil imports over the next 30 years, lower oil prices will continue to deliver benefits in the longer term, particularly to the external balance.

	Oil at \$25/barrel	Oil at \$15/barrel	Oil at \$10/barrel
GDP growth	4.2%	5.2%	5.7%
Fiscal balance (as % of GDP)	-6.3%	depends on policy response	
Current account (as % of GDP)	0.3%	0.9%	1.2%
Inflation	4.5%	3.7%	3.3%
Currency	Gradual weakening	Stable / slight	Strengthening
		strengthening	

The economic impact depends largely on the government's policy response. The above analysis assumes that the government leaves energy taxes unchanged. But in the past, the government has offset increases in oil prices by lowering oil consumption taxes. Given the serious public debt problems (debt/GDP ratio of 85% and rising) the government could take the opportunity to raise oil consumption taxes, maintaining the post-tax price of oil. In this case, the impact on inflation would be negligible and the impact on GDP would be reduced.

India is one of the largest CO₂ emitters in the world. **But cheap oil would have little impact on India's CO₂ emissions** which are set to double by 2030. Cheaper oil would lead to higher oil consumption (unless the govt imposes offsetting taxes) and thus higher CO₂ emissions. This would be offset by cheaper oil (and cheaper gas via price links) will also encourage movement from CO₂ intensive coal-fired power stations to these cleaner alternatives.

Although the Indian economy as a whole would benefit, the impact on poverty levels would be limited as India's poor use biomass rather than fossil fuels for most of their energy requirements (biomass is 40% of the country's total energy use). The poor would see some benefit if the price of kerosene were to fall. But the price of kerosene is fixed by the government at a subsidised level, and the government would probably maintain the price and save on the cost of the subsidy (0.5% of GDP) rather than pass on the lower crude oil prices.

GERMANY

With virtually no oil production of its own, **Germany is the world's third largest importer of oil**, after the US and Japan. It imports about 2.7m barrels per day at an annual cost of roughly \$25bn. This is 4% of total imports and equivalent to 1% of GDP.

According to a study by RWI Essen Research Institute, a decline in the price of oil to \$15/barrel would initially raise GDP growth by some 0.3%, largely due to strengthened domestic demand. Germany has an open, export-orientated economy - exports of goods and services accounted for 33% of GDP in 2000. Therefore, the strengthening of global activity resulting from the lower oil price would raise demand for German exports, providing further economic stimulus. Germany should also benefit from improved competitiveness as energy costs fall – many of its main competitors are less dependent on oil and gas for energy supplies, eg, France relies on nuclear power for much of its power generation. Germany is also a significant consumer of natural gas, and as gas prices tend to follow oil prices with a short lag, the actual economic benefit would probably be slightly larger.

With all these effects combined, German GDP would rise by about 1% after two years of oil at \$15/barrel, and 1.5% if oil were to fall to \$10/barrel. Although this number seems fairly small, it would provide an important boost to an economy threatened by stagnation.

Oil-related fiscal revenues are not a significant source of government revenue, so the fiscal impact would be small, but probably positive as faster growth would boost overall tax revenues. But even a small fiscal improvement would be of critical importance to Germany at the current time as it struggles to stay within the 3% limit of the eurozone's Stability and Growth Pact.

Inflation would experience a one-off fall of about 0.5%. This would increase the risk of deflation in Germany, currently a major concern. Germany's monetary policy response would be constrained as monetary policy is set by the European Central Bank, but with lower oil prices reducing inflationary pressures across the eurozone, one would expect monetary policy to be loosened slightly. But it is not clear that this would be sufficiently large to alleviate deflationary concerns in Germany. Deflation is most damaging if it leads to consumers postponing purchases in the expectation of lower prices in the future. As with China, this suggests the danger is limited - as a one-off event, the oil price declines would probably not have a significant impact on inflationary expectations.

Taking a broader perspective, the improvement in growth may alleviate the sense of crisis currently facing Germany, lessening the pressure for much needed structural reforms. If this were to happen, the short term boost to growth would be more than offset by the failure to realise higher potential growth in the longer term.

HOW CAN WE MITIGATE THE IMPACT ON OIL PRODUCERS?

The preceding analysis suggests that Saudi Arabia, Russia and Nigeria would all struggle to cope with oil prices at \$15/barrel. They are not alone. A number of smaller producers would also face economic crises which could threaten their political stability. The most vulnerable appear to be Angola, Algeria, Yemen, Iraq, and Syria. In all five of these countries, oil accounts for more than half of government revenues and more than 75% of export revenues.

There is a clear case for providing targeted financial support to selected oil producing countries in order to prevent the regional instability and global costs associated with failed states. The international community has a number of financial tools and resources at its disposal to assist economies in distress. The key ones, briefly examined below, are fixed price contracts, IMF support, aid flows, and debt relief.

Fixed price contracts would provide protection from oil price volatility for both producers and consumers, provided a price could be agreed. Such contracts are certainly feasible, and could probably be agreed with one or two key producers, but they would probably add to volatility in the rest of the market, and might be difficult to enforce when market prices diverged widely from the contract price. In addition, the government would probably have to be the purchaser, with significant financial cost if the market prices moved against them. These issues are explored in more detail in a separate paper on oil stability.

The IMF was created to provide short term support to countries coping with external shocks. Large loans from the IMF and other international financial institutions (IFIs) could be made available to oil producers in the event of a major oil price decline. But they could not replace oil revenues – the resulting accumulation of debt (10% of GDP annually for many producers) would simply not be sustainable. At best, they could be used to cushion the impact and help these countries in their adjustment to lower prices. Their programme conditionality might also provide a useful lever to help government's push through unpopular reforms – the IMF frequently provides a useful scapegoat.

Aid flows could, in theory, replace lost oil revenues for selected key countries but the cost of this would be extremely large – \$60bn to fully compensate Saudi Arabia, Russia, and Nigeria for a \$10 decline in the oil price, ie, a doubling of OECD aid flows, eliminating much of the economic benefits to the OECD of lower oil prices. It would be difficult to gain the agreement of the international community for such a large programme. There would also be legitimate complaints that increases in aid flows should be targeted at poverty alleviation in the poorest countries rather than relatively wealthy, oil producers.

Debt relief could benefit some major oil producers, particularly Nigeria, Egypt, and Indonesia. And the cash cost for creditors would be limited as the debts being forgiven might never be repaid anyway. For this reason, debt relief would be of only limited benefit to the debtor countries. And it could not be used to help Gulf producers as most of them have no significant debts to forgive.

Impact of oil prices on our wider objectives

Summary

The oil price impacts upon wider government goals for the environment, security of supply, political stability and sustainable development. A price range of \$18-\$22 / barrel is judged to be consistent with achievement of these wider goals.

Environment

Cheap oil (below \$20/barrel) undermines the goal of stabilising and then reducing international emissions below 1990 levels by:

- · Increasing overall energy demand
- Discouraging innovation into non-fossil fuel alternatives
- Increasing emissions in developing countries by putting them on a high fossil fuel development trajectory

Security of supply

- Oil fields already in production could be operated at prices as low as \$10/barrel, so there would be no immediate impact on diversity.
- But exploration and development of much non-OPEC oil could not be sustained at \$10 - \$15 / barrel; production would hence become more concentrated in OPEC countries.

Political stability

- The economies of most major oil exporting countries including Saudi Arabia, Russia, Nigeria, and Venezuela are overwhelmingly dependent on oil revenues.
- A price range of \$10-\$15 would destabilise these economies threatening substantial social and political turmoil, even regime change

Development goals

- In oil importing countries lower energy prices would reduce the costs of modern energy sources bringing health, development and local air quality benefits. Low prices could also contribute to economic development, for example by stimulating manufacturing industries.
- But low oil prices could lock economies into fossil fuel dependency and slow the
 uptake of low carbon technologies. This could prove more expensive and
 environmentally damaging in the medium to long term.

Over the longer term, low oil prices work against UK's goals on climate change, security of supply and political stability. This has to be balanced, certainly in the short term, with the benefits which low oil prices bring to development and certain local environmental issues in oil importing states. Overall a range of \$18-22 would provide an appropriate balance.

Detail

The price of oil impacts upon four wider objectives:

- Environment
- Security of Supply
- Political Stability in Producer Countries
- Development Goals

All of these objectives are inter-linked and the optimal price range will require managing the synergies and trade-offs between them.

Environment

Low oil prices reduce the incentive for innovation in support of non-fossil fuel technologies

Low oil prices, which tend to be accompanied by cheaper gas and coal, discourage investment in the development of low carbon climate technologies and in energy efficiency. In the developing world, the incentive to invest in fossil fuel infrastructure locks out emerging low carbon options. The only low carbon technology consistent with low fossil fuel prices would be carbon storage and capture.

Case study on technological lock-out: Photovoltaics in South Africa

Many developing countries are still in the process of establishing their energy infrastructure. Cheap oil will encourage investment in fossil fuel infrastructure which will tend to 'lock-in' existing fossil fuel technologies. Low carbon and decentralised energy production technologies are still at an earlier stage of development, and prices are high – though falling fast. With oil at \$20+ a barrel they become increasingly competitive. The cost of photovoltaic panels fell six-fold between 1978 and 1998 and is forecast to drop further. In South Africa decentralised photovoltaic competes with conventional power, provided the connection cost of \$315 is subsidised. This subsidy is related to the full avoided cost of supplying conventional power to outlying areas (new plant plus the cost of strengthening / laying power mains). Early commitment to fossil fuels could lock out technologies that might ultimately benefit the developing countries both economically and environmentally.

Profitable development of renewable technologies could be consistent with low oil prices through greater use of taxes on energy, ie, carbon taxes. Such taxes, by making the use of fossil fuels more expensive, could offset the effect of low oil prices, and strengthen incentives for the development and adoption of cleaner energy sources. The tax could be variable in order to provide a degree of price stability, the certainty of which would also promote investment in alternative energy supplies. And the revenue from such taxes could be used to support low carbon technologies.

To have a significant impact, these taxes would have to be widely applied internationally. Co-ordinating this might be difficult, as taxes on energy are politically controversial.

Cheap oil would also stimulate energy demand

Cheap oil stimulates energy demand. The extent to which this translates into higher greenhouse gas emissions varies between countries depending on their current fuel mix. In some countries, like the UK, the impact of a rise in fossil fuel consumption on greenhouse gasses would be offset to some extent, as gas would replace coal power.

From a global environmental perspective crude oil prices of \$20 are too low to meet the global climate change challenges. Any further fall in prices will compound the problem. The EU (Shared Analysis Project) modelled the effect of high (\$19.3) and low (\$16.9) oil prices on global CO₂ emissions. In both scenarios CO₂ emissions in 2010 remain higher than 1990 levels. At the high price global emissions would be 42% above 1990 levels; at the low price emissions are 43.6% higher.

Cheap oil could improve developing countries' local environmental air quality in the short-term but could lock out even more beneficial technologies in the long-run.

In the short term low crude oil prices are likely to displace the use of traditional biomass fuels (like wood and dung). Such fuels give rise to many environmental problems including, for instance, poor local air quality and degradation of forests and water tables. A switch to kerosene, on the back of low oil prices, could, in the short-term, benefit these environments. But it worth stressing that this type of short-term improvement could *lock-out* the long term environmentally benign and more economic low carbon solutions.

Security of Supply

What is the optimal price range for oil in terms of energy security?

The key issues are the price needed to sustain production in a wide range of producers; and the price necessary to sustain economic growth and maintain political stability in those countries and wider regions. Many producers are heavily dependent on oil revenues and economic and political stability in these countries is thus linked closely to the oil price.¹

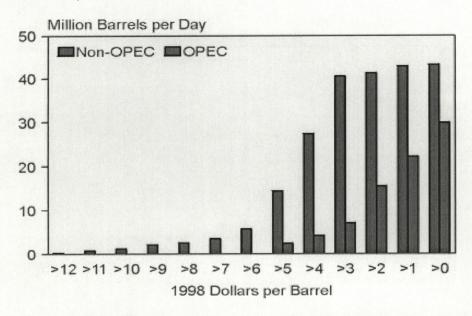
OPEC production costs are almost without exception lower than non-OPEC. To sustain diversified sources of oil, a range of non-OPEC countries need long-term prices to be high enough to cover their marginal production costs, and to ensure investment for future exploration and development.

Figure 1 shows the marginal operating costs of OPEC and non-OPEC oil producers. Non-OPEC costs are significantly higher than OPEC costs: 95% of OPEC oil can be produced for less than \$5 per barrel while 60% of non-OPEC production is this cheap. At a world oil price of either \$10 or \$15 almost all marginal operating costs for the world's oil would be covered. Unless prices dropped well below \$10 for a long time,

¹ It should be noted that this paper refers to long-run real average price of oil not the nominally traded price.

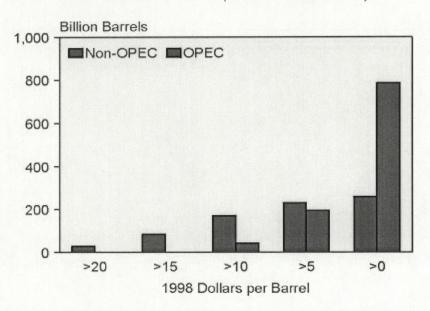
it is unlikely that energy supplies would be threatened from existing infrastructure in established fields.

Figure 1 Marginal Operating Costs of OPEC and non-OPEC production (Source: US EIA 2000)



But long-term low prices would threaten the development of new reserves threatening UK security of supply. The exploration, development and operating costs of bringing new sources of crude oil into production are shown in Figure 2 below.

Figure 2 Exploration, Development & Operating Costs for Proven Recoverable Oil Reserves OPEC and non-OPEC (Source: US EIA 2000)



Again, OPEC enjoys a significant advantage over the rest of the world. OPEC could develop approximately 90% of its proven reserves at a world price of \$10 per barrel. This contrasts sharply with the rest of the world for whom over 60% of proven reserves would require a price higher than \$10 per barrel and over 30% would require a price above \$15 per barrel. Figure 3 confirms OPEC's cost advantage, and also

highlights the relative high cost position of the UK. At a price of \$15/barrel, exploration and development of new wells ceases to be viable in a number of non-OPEC countries.

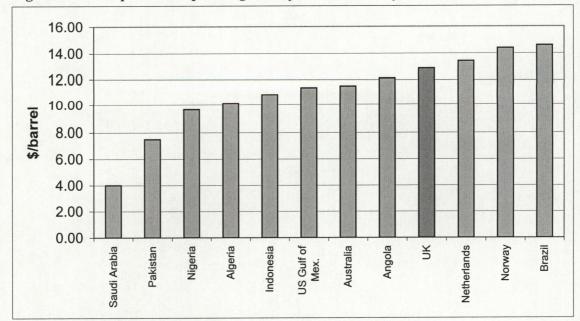


Figure 3: Development & Operating Costs for a selection of nations

Source: Wood Mackenzie 2000; Saudi from IEA, World Energy Outlook, 2001

Future technological progress may enhance oil recovery techniques making more of the world's oil economic to produce at a given price; but OPEC countries will maintain a significant cost advantage. If oil recovery techniques do not improve quickly, a long-term fall in the average oil price would lead to a significantly increased concentration of world production in existing OPEC countries. Losing diversity of supply would increase our exposure to cartel price manipulation, and to the impact of political or economic instability among producers.

Thus without radical technological progress \$15 per barrel would seem to be the minimum that could secure long-term diversity. A price closer to \$20 per barrel would ensure that the majority of proven reserves in non-OPEC countries could be exploited providing much greater diversity of sources of supply. But whether this oil can be exploited on a sustainable basis at \$15-\$ 20 depends on whether these prices are adequate to maintain political stability in producer countries. This is explored further below.

Political Stability in Producer Countries

A fall in world oil prices would affect economic and, potentially, political stability in key producers. The economies of most major oil exporting countries, including Saudi Arabia, Russia, Nigeria, and Venezuela are overwhelmingly dependent on oil revenues. Apart from Indonesia, oil accounts for at least half of government revenue in all OPEC member states, and for three-quarters in most. A world price of \$10-\$15 would destabilise these economies – threatening substantial political turmoil, even regime change.

Iran, for example, has little chance of meeting its financial obligations if oil falls below \$22. Saudi's budget is in deficit at this price. Russia's budget is based on assumptions of at least \$20; Nigeria's financial planning would fall apart under \$20. Any long-term fall in oil prices will precipitate major economic and social change in most of the key producers. This unrest could lead to significant short to medium term disruption in energy flows, so increasing price volatility. There can be no scientific assessment on the price level that would deliver political stability in these countries; in fact risks of instability will be present at almost any oil price. However, low oil prices would be a major factor in exacerbating tensions already present in key producing nations.

We can conclude that in order to satisfy security objectives the long-term average oil price range should be above \$20, with a price closer to \$25 being preferable to avoid destabilising effects in producer countries. This "high" price does have a short term GDP cost and also an impact on global inflation. However, more important than the price range is price stability. Volatile prices create investor uncertainty and economic shocks to both producers and consumers. Thus, a price level that provided greater stability would be preferred by all except the most aggressive and short-term producers to a higher, more volatile, less reliable price.

Development goals

In oil importing countries, a fall in the price of oil would help the UK's wider development objectives – reducing the cost of providing modern energy services to the 2 billion people that presently lack them. But short-term gains need to be balanced with longer-term investment and environmental difficulties.

Developing counties are very exposed to changes in oil price as they are reliant on energy intensive manufacturing sectors to spur economic growth and often have relatively poor access to substitutes for oil. Net importing developing countries would unambiguously receive a one-off significant boost to their economies if oil prices where reduced to \$10-\$15 per barrel. A fall in oil price would improve the balance of payments position for developing countries and improve access to energy for industry and people. Developing countries would also benefit from the one-off increased global economic growth and trade flows that would follow a fall in world oil prices.

However, low energy prices alone will not provide access to energy. Addressing institutional, political and social problems in developing countries would have to accompany a fall in oil prices in order for the full benefits to be achieved. There may also be longer-term trade-offs with global environmental objectives. As described in the environment section lower oil prices may delay investment in renewable technologies and path dependency issues could lock developing countries into using fossil fuel based systems of generation.

OPTIONS FOR ACHIEVING GREATER OIL PRICE STABILITY

SUMMARY

- 1. Oil price stability would be in the interests of both producers and consumers. A degree of price instability is inevitable, and indeed desirable to keep supply and demand in balance. But there is scope to reduce instability through government action to influence both oil market fundamentals (supply and demand) and the factors which cause short-term price volatility. OPEC producers already attempt to do this by varying production levels.
- 2. Consumer governments currently don't intervene directly, but a number of policy options are available to us, although all except the first would represent a major departure from our hitherto market-based approach to the oil market:
 - > Steps to **improve market information** are already underway and may reduce short-term price volatility, but will not have a significant impact on more fundamental price movements.
 - ➤ Oil stocks could be used actively to smooth oil prices. But the level of stocks required would be expensive, international co-operation amongst consumers would be needed, interventions could only hope to iron out extreme movements and, even then, would have no guarantee of success.
 - > Consuming countries could manage oil demand through **taxation**, although this is a blunt instrument, is politically difficult to use, and if aimed at stabilising retail prices, would probably increase volatility in crude oil prices.
 - Fixed price contracts are possible in theory but governments would have to be the purchasers (if oil retailers wanted such contracts they would already exist), a highly interventionist role which few governments would be willing to play. This would expose governments to major financial risks, whilst not providing price stability for consumers as the government would simply sell its oil purchases into the market. Such contracts would also increase price instability outside of these contracts. The only benefit of such contracts would be to enhance stability in producer countries.
- 3. Given the difficulties with these policies, the best hope of reducing price volatility lies in co-operation between producers and consumers. We already have an active dialogue with oil producers, which has to date been focused on building confidence and improving understanding. The problem with explicit co-operation on oil prices is that, although we share an interest in price stability, we have conflicting interests in the level, and underlying trend, of prices. In theory, it might be possible to agree to a broad price range, but implementation would face a number of significant practical difficulties, not least opposition from other key consumer countries.
- 4. We have various levers our policies on renewables, taxation, oil stocks, and non-OPEC oil production which we could use to put pressure on OPEC to reduce prices. But **taking a confrontational approach would carry serious risks**, eg, of provoking retaliation, potentially producing greater instability in oil prices.

DETAIL

- 5. There will always be instability in oil prices due to weather, supply outages, geopolitical concerns, and the slowness with which underlying demand and supply respond to price changes. Such price movements are essential to keep demand and supply balanced. But instability clearly damages the interests of both producers and consumers. Greater stability would provide both the oil industry and its main customers with the certainty to make major investments, helping governments to make sustainable public spending plans, and making the management of the global and individual economies considerably easier. How might we achieve this?
- 6. Price instability has two broad causes: long term instability occurs due to changes in demand and supply, with volatility in oil markets increased by inelastic demand and long lead times in supply responses. In the short term, market instability is caused by changing information and market speculation.
- 7. As our ability to influence oil production is limited, there are four main tools that the UK might use in pursuit of oil price stability:
 - try to reduce short term volatility by improving the functioning of the market;
 - make active use of oil stocks to smooth price peaks;
 - manage demand through taxation to influence prices;
 - by-pass the market altogether and use fixed price contracts with producers.
- 8. Each of these options are examined in turn below.

Improving the functioning of the oil markets

- 9. HMG has to date attached strong importance to a market-based approach to oil markets. Improving the functioning of the markets is a solution which works with markets rather than against them. As such, it would preserve or even enhance the advantages of transparency and efficiency which come from having crude oil prices freely determined in a single, competitive global market.
- can make to reducing short-term price fluctuations is to reduce uncertainty. One avenue is by improving the quality and timeliness of basic oil market information, indeed producers and consumers are already addressing this via the international Oil Data Transparency exercise. Another possible avenue would be to make OPEC policy shifts, presently the source of intense speculation, more predictable although there would still likely be uncertainty about compliance to OPEC policies.
- 11. Although the market is very liquid there are suggestions that it works imperfectly. Some commentators see problems in basing the whole of global crude pricing on a handful of reference crudes with relatively small production volumes Brent, WTI and Dubai. Although these benchmarks are being broadened, eg Dubai to Dubai/Oman average, they remain traded in fairly narrow, regionally based markets.
- 12. Others see the markets as open to manipulation by major players, including Shell and BP, who account for a disproportionate share of the crudes in question. It is hard to know if

this is a serious problem - further investigation might be helpful. The UK is in a key position to influence these market developments because we host one of the two main oil markets, the Brent market at the International Petroleum Exchange, in London. However, the FSA monitors the market and has so far found no reason to act.

- 13. One way of reducing futures market activity would be a (Tobin-type) tax on oil trading. This would reduce volumes and *might* reduce price fluctuations as well. But it would only be a starter if introduced internationally to prevent trading simply migrating to other untaxed markets. Even if achievable, it might, by reducing transaction volumes and market liquidity, actually increase price volatility. And it would also make hedging (a main way of protecting against price fluctuations) more expensive. It would also meet fierce resistance from the US and the City of London as they would fear it as a precedent for a Tobin tax on currency transactions.
- 14. Ultimately, these market-oriented solutions would offer only a marginal improvement in oil price stability, perhaps reducing some of the short term volatility. It would not, however, have any significant effect on the larger price movements that occur in the medium to long term. For that, other tools would be necessary.

Active use of oil stocks

- 15. Globally, most oil stocks are privately held. However, governments do hold, or mandate the holding of, significant stocks. OPEC producers use stocks intermittently and on a small scale in support of their implicit price objective. **Major oil consuming countries currently hold stocks to provide security of supply** the International Energy Agency (IEA) recommends its members hold 90-days worth of net oil imports for this purpose.
- But oil importers have never tried to use stock changes proactively as a means of stabilising prices. In principle very large discretionary stocks of crude and products, deployed flexibly in the markets with this as a deliberate end, might be able to reduce price fluctuations. But the effect could only be limited and temporary as stocks are finite. There are also a number of other constraints to this policy being effective:
 - there would have to be clear rules for intervention, otherwise interventions might add to volatility as investors feared that governments knew something they did not;
 - there would have to be sufficient oil stocks such that investors did not fear that interventions might lead to reserves running out, otherwise such interventions might again be counter-productive. Holding these reserves would be expensive, firstly for the cost of the oil (the US needs over \$20bn worth of oil just to meet IEA guidelines), and secondly, to build and maintain the storage infrastructure it is estimated that the infrastructure costs of increasing the UK's stocks by 30 days would be a one-off £1bn plus around £100m pa;
 - such a policy risks antagonising OPEC which might attempt a one-way bet against any
 rules based system, much as speculators attack unsustainable currency regimes. This
 risk of deteriorating relations would be reduced if the policy was merely aimed at
 ironing out extreme price movements, rather than challenging OPEC's own price
 target;
 - it would also require a high level of international co-ordination amongst consuming countries. US participation would be critical and yet President Bush has committed not

to use the Strategic Petroleum Reserve to manipulate oil markets. An expansion of the IEA to include non-OECD members would also be important, especially given the emergence of large net importers in non-OECD Asia. With the exception of Japan, the major Asian oil importing countries do not have significant oil stocks, although China is planning them;

- using stocks is not a precise instrument so could not be used to fine-tune the market. Aside from the difficulties of knowing precisely how much oil the market needs, physical limitations mean that stocks can only be released on a fairly large scale and on a limited number of occasions. E.g. the walls of the salt caverns which contain the US Strategic Petroleum Reserve become thinner every time oil is released and then replaced.
- 17. The European Commission has draft proposals which would increase the level of stocks held by EU countries. We think the Commission may have ambitions to use these stocks to influence prices. HMG has so far opposed these proposals.
- 18. At best, active use of reserves could temporarily limit excessively high oil or low prices once a 'rule' was successfully established, this credibility might itself limit volatility as speculators realised that price levels outside the 'rules' would not last. But the cost could be high and there would be a significant risk of failure.
- 19. There is a long history of groups of countries trying to achieve price targets for selected commodities. Such attempts have almost always ended in failure as the cost of maintaining the target price becomes unsustainable and / or co-operation breaks down.

Taxation

- Taxation already accounts for roughly 75% of the retail price of petrol in the UK. Governments, individually or collectively, could reduce fluctuations in retail prices in their markets through the active use of taxes and subsidies. For example, as crude prices rise, petrol taxes could be reduced to maintain price stability for consumers. In the UK, VAT on petrol actually exacerbates retail price fluctuations. There are a number of risks with this policy:
- 21. Firstly, it would require a high degree of flexibility in taxation policy frequent changes in taxation might be required which would complicate tax planning for the retailers and budget planning for the government. It would also be highly political as recent UK experience demonstrates. Indeed, HMT examined, and dismissed, the option of changing the oil taxation regime at the time of the fuel protests.
- 22. Secondly, price smoothing interventions would obscure the price signals from the market, thereby preventing the natural demand reduction which puts downward pressure on prices and returns the market to equilibrium. Such interventions would therefore exacerbate volatility in crude oil prices.
- 23. The more sensible option in principle is for tax changes to be used proactively to move demand in ways which reduce fluctuations in crude prices. But this would require the government to take pre-emptive action based on guesswork about prevailing market forces. And it would be something of a blunt tool since demand responds only slowly to changing prices. It might, however, form part of a sensible policy response in the event of a crisis leading to a major shortage of crude.

Fixed price contracts

- 30-40 years ago, the oil majors effectively set global crude oil prices. Oil was largely traded on fixed-price long-term contracts, and prices were stable for long periods. Could we revert to such stability? In practice control of global crude prices looks a non-starter without abandoning free markets and forcing globalisation to take a huge and damaging step back.
- 25. But long term fixed price contracts are technically feasible, although there are a number of difficulties to be overcome. Most importantly, who would be the purchaser? If such contracts were in the interests of oil purchasers, they would already be common place in the market. They do not enter into them because they would have to take the risk of the market price turning out significantly lower than the contract price. This would leave them seriously exposed against competitors purchasing at the market price. Centrica, the UK gas supplier, experienced exactly this sort of undercutting when gas prices were liberalised (from 1996) leaving it expensively disadvantaged by long term contracts at non-market prices. This is a recurring problem when fixed price contracts exist alongside market prices. Arbitrage opportunities would undermine the fixed price contracts if market prices departed significantly from the contract price, there would be a strong incentive for one of the parties to break the contract.
- 26. If oil purchasers won't enter into these contracts, then the government would have to be the purchaser. But, assuming the state is not to become a major oil retailer, the government would simply sell its fixed price oil into the market (potentially making significant profits or losses). Retail prices would remain market determined, so fixed price contracts would not deliver stability to consumers.
- 27. In addition, fixed price contracts would increase volatility in the rest of the market, as they would cut off a part of the market from the price signals required to keep supply and demand in equilibrium, forcing the 'free' portion of the market to make proportionately more adjustment.
- 28. The main advantage of fixed price contracts would be the guaranteed price for producers. As such, they could be used as a tool for promoting stability in key producer countries. But this could only be achieved by governments in consumer countries taking on the price risk, at a potentially huge cost. And it would probably be one-sided risk as the producer country may not meet its obligations if market prices moved heavily in its favour. In conclusion, the level of market intervention, financial commitment by governments, and international co-ordination required to provide guaranteed prices to a strategic producer, such as Russia, make it highly unlikely that governments would agree to such a scheme.

Relations with OPEC

29. From the above analysis, it seems that the policy options over which the UK has direct influence are either not feasible, not desirable, or of limited effectiveness. The remaining tool for actively trying to counter oil price instability is the management of global oil production (although even this could never deliver anything approaching full price stability). In order to achieve this, co-operation with OPEC is critical. In theory, there is common ground in the desire of both consumers and producers for price stability. The problem of course is that OPEC seek stability at a higher price than we would like – and that they act as a cartel to try and achieve it.

- 30. As explored in the previous paper "Could we break OPEC?", our leverage over OPEC is limited. But we have, in recent years, developed a productive dialogue with OPEC and other key producers, both bilaterally and through the International Energy Forum (IEF) which has improved mutual understanding and goodwill. We could use this to encourage them to move to a lower price band although we would have to carefully consider whether this involved explicitly condoning use of a price band mechanism.
- 31. OPEC will face considerable difficulties in the next few years as non-OPEC production rises and pressure grows within OPEC for increased quotas. Many OPEC producers already realise that the \$25/barrel is not sustainable and has long term costs for them in terms of encouraging non-OPEC exploration and production. Indeed, OPEC's inhouse analysts, in their most recent published assessment, assume a figure of \$20/barrel (in 2001 prices) for the medium to long term. So a dialogue about prices may be productive.
- 32. Oil consumers have a number of carrots and sticks to use with OPEC:
 - Our renewables programmes are a major threat to oil prices in the long term;
 - Our oil companies are rival producers, responsible for developing much of the new capacity that is undermining their market share (although they are also potential investors in OPEC capacity);
 - Our oil stocks could be used to affect prices; and
 - Our high taxes on fuel reduce demand for oil and hence reduce the price.
- 33. We could use these levers to threaten OPEC. But taking an adversarial approach to OPEC would carry significant risks. The change to confrontational rhetoric with OPEC would probably lead to an immediate rise in oil prices. And OPEC might become more aggressive. The Saudi's, for example, are currently willing to use their surplus production capacity to offset any production losses due to war in the Gulf. But they could easily decide to exacerbate any shortfall, which would produce a dramatic rise in prices.
- 34. It would be safer to use carrots. Using the renewables programme as a carrot, ie agreeing to postpone the development and adoption of renewable energy technologies, is not feasible without compromising our environmental objectives. In addition, progress on renewables will continue even without government support, albeit at a slower pace. Discouraging our oil companies from expanding production would be an unprecedented intervention in the investment plans of private companies, and would only be effective in the unlikely prospect of all companies globally agreeing otherwise producers from other countries would simply take up the profitable opportunities that our companies had been forced to abandon.
- 35. In principle, governments in oil producing and consuming countries could cooperate in adjusting both production, taxation and stocks to reduce oil price
 fluctuations. Given all the uncertainties this could never be a question of fine tuning prices.
 At best we could hope for co-ordinated action to prevent prices going below a floor or above
 a ceiling the range between the two being broad enough to accommodate both producers'
 and consumers' different underlying price objectives. Such co-operation ought to be more
 effective than unilateral action by either producers or consumers; but it would face many of
 the practical difficulties and expenses outlined in this paper, and would still be of only limited
 effectiveness in containing price fluctuations. Furthermore, it would represent a major
 departure from our (and other consuming countries) current market-orientated approach.

From: Oly Jones

Date:

12 December 2002

cc:

Jonathan Powell Jeremy Heywood Andrew Adonis Arnab Banerji

Geoffrey Norris Anna Wechsberg

PRIME MINISTER

OPEC MINISTERIAL

OPEC met today. The Organisation agreed to cut production, but to increase quotas - the net effect is that there will be less oil on the market (explained below!).

The immediate impact was a slight rise in oil prices.

Recent oil price movements

Following Security Council agreement about sending weapons inspectors to Iraq - and hence a widespread perception in the market that military action would be put off for several months - the oil price dropped to around \$22 in November.

However, the general strike in Venezuela aimed at removing President Hugo Chavez has brought the country's oil production and exports to a near standstill. Venezuela is the world's fifth largest oil exporter - 3mbl - and this has impacted on the world market, forcing prices up in recent weeks to above \$26.

Today's announcement to cut production was broadly expected by the market. The market rose slightly, just below \$27 this evening.

How can OPEC cut production but at the same time raise quotas?

In recent months most OPEC members have been cheating on their quotas: i.e. they have been producing more oil than they had agreed to under the OPEC quota system. Overproduction had reached around 2.6 million barrels per day, which is a significant amount: total OPEC production is about 22mbd (global output is about 75mbd). As a result, supply was close to outstripping demand: and almost certainly would have done so as soon as the northern hemisphere winter ended - causing the oil price to fall.

OPEC therefore needed to rein in this overproduction. They have partly succeeded: agreement has been reached to cut production by around 1.5mbd.

-2-

Whilst this is a real terms production cut, it leaves production at 1.2mbd above the existing quota levels. Therefore, largely for credibility reasons, at the same time OPEC quotas were increased by around 1.2mbd. The end result is that production levels should now match the new, higher, quota.

The production cut, but quota increase, is a mixed signal to the market. It will sustain prices in the short term but in the longer term (and setting aside any military action in the ME and ongoing Venezuelan disruption) OPEC will probably want to cut production again in Q1 or Q2 next year.

onlan

OLY JONES

CONFIDENTIAL



- MATRIX INBOX
ce's as attached

10 DOWNING STREET LONDON SW1A 2AA

From the Principal Private Secretary

12 December 2002

Dear Michael,

COULD WE BREAK OPEC?

Thank you for your letter of 5 December, enclosing the three follow-up papers to your original work on OPEC and the future of the world oil market.

It is clear that the additional analysis strongly supports the initial conclusion that driving oil prices down to the very bottom would not be in our wider interest. As you say, our aim should be a balance between stable and sustainable prices and a reduction of OPEC's dominance.

We will put the papers to the Prime Minister over the Christmas break, so that he has an opportunity to read them in full.

In the meantime I think it would be sensible to proceed on the basis that the broad conclusions are right, and I agree with you that we should now look to drive forward the policy follow-up. It is important that the conclusions feed into both the policy recommendations and the overall thrust of the Energy White Paper, and into the FCO's ongoing work in this area. We should certainly try out these ideas on our G8 and IEA partners – the UK/US energy dialogue plenary meeting on 18 December offers a good first opportunity.

I am copying this letter as yours.

7m, U~

JEREMY HEYWOOD

Michael Arthur FCO



Wales Office | Swyddfa Cymru

Office of the Secretary of State for Wales
Gwydyr House
Whitehall

London SW1A 2ER

Ysgrifennydd Gwladol Cymru Secretary of State for Wales

Rt Hon Peter Hain MP

Tel: 020 7270 0549 Ffon: 020 7270 0549

Fax: 020 7270 0568 Ffacs: 020 7270 0568 Swyddfa Ysgrifennydd Gwladol Cymru Tŷ Gwydir Whitehall

Llundain SW1A 2ER

Our ref: POH/213

December 2002

Sa John,

DA(N) 11 December – Issues for the Energy White Paper

I am concerned that the White Paper as drafted postpones rather than meets the choice between even greater reliance on new forms of renewable energy on the one hand, and nuclear fission on the other. In particular, on the role of nuclear in the medium term I do <u>not</u> agree with the proposition in paper DA(N) (02) 16. I would like the additional options of nuclear plant extensions and nuclear fusion to be considered. I do not believe that our renewables targets are bold enough and we are under-estimating the potential of other renewable energy sources. I am concerned at the approach to building regulations and efficient building design. I think the draft underplays the future role of clean coal and lacks sufficient international perspective. I do not think the draft confronts the spending choices we have to make.

I am sorry that I cannot make the meeting of DA(N) on 11th December due to a meeting of the Convention on the Future of Europe in Brussels on social policy.

The White Paper is the culmination of a huge amount of work both inside and outside of Government. There are great expectations of the agenda it will set and as drafted I am concerned that it does not advocate the radical change that I believe is essential. In my view it postpones rather than meets the choice between even greater reliance on new forms of renewable energy on the one hand, and nuclear fission on the other.

Wales Office | Swyddfa Cymru



Nuclear

- It seems to me that new build nuclear is not deliverable. Whether on safety, environmental or planning grounds, it would not win support politically. Indeed I am worried that this recommendation will overshadow the otherwise welcome policy thrust of the White Paper.
- 2. There are huge uncertainties surrounding the proposition to "leave the nuclear option open" in terms of reactor design, the likelihood of private sector financing and overall cost. According to calculations based on DTI and PIU figures, the level of subsidy required for new build at the height of the programme would be £900m £1800m per year, for at least 20 to 30 years. In my view this is unacceptable.
- 3. However, given that existing nuclear power stations contribute approximately 20% to UK requirements, it is essential that current reactors are properly managed for the next 10-20 years to ensure maximum availability, reliability and safe operation. Furthermore, the potential for extending the life of existing nuclear reactor plant should be considered ahead of new build. I accept that the nuclear industry's low carbon profile will be a key component of the government's for some time to come.

Security of nuclear

- 4. Nuclear power generation presents a number of security implications. Firstly, new nuclear stations would make an attractive target for terrorist attack whereas a non-nuclear scenario would see increasing numbers of stations being decommissioned. Secondly, a decentralised generation format would be harder to disrupt and more resilient to attack.
- 5. Furthermore, there is no domestic source of uranium. Sourcing uranium in place of gas would not reduce levels of import dependence.

Nuclear fusion

6. I am surprised that little serious attention is paid to the potential for nuclear fusion which potentially offers all the CO² advantages without the environmental waste and safety problems of nuclear fission. We should be willing to substantially increase research funding for nuclear fusion – a step which could well reduce the forecast delay for its likely practical contribution. This is the 'clean, safe' side of nuclear which the Government should be supporting.

Wales Office | Swyddfa Cymru



Renewables targets

7. Maintaining the nuclear option discourages confrontation of the real policy challenge, which is to drive forward renewables to fill the gap left by nuclear. Although I support the draft White Paper commitment to a substantially greater contribution from renewables, I am not persuaded that the targets are bold enough. Do we want Britain to be a world leader in renewables or not? There would be great benefits for us, not just in energy and environmental terms, but also economically and technologically, giving a boost to businesses and jobs in this area both for domestic and export opportunities.

Other renewable energy sources

- 8. I believe that we are under-estimating the potential of other renewable energy sources, including renewable-derived hydrogen. For example, the assertion that a renewables target of 30 per cent by 2020 is 'uneconomic' is not substantiated.
- The potential contribution of 'clean' energy from pyrolisis and high spec gasification of waste linked to extensive re-cycling (itself energy saving) needs to be factored in.

Building regulations and efficient building design

- 10. I am disappointed that we are not even endorsing the PIU recommendation that all new build and renovation must design in Photo Voltaics and Solar. As you know, I have consistently argued this in our discussions and understood there was a consensus for this policy. Also the target date of 2006/7 for a review of regulations is too late review should happen in 2003.
- 11. It is key that the UK considers the "bottom up" impact of micro-generation and efficient building design. A clearly articulated argument addressing technology availability, commercialisation/competitiveness and infrastructure/system design would be very compelling and could lead to a competitive edge internationally.



Clean coal

- 12. Although I welcome the emphasis on exploring CO² sequestration, the paper does not reflect the strong support in both the PIU Report and our discussions as a Ministerial team for clean coal. The fact is the rest of the world especially, China and India is going to be massively dependant on coal for a long time. Furthermore the UK has extensive coal reserves which could and should be exploited to fill our energy gaps on a clean coal basis. Both this international and domestic perspective offers the opportunity of UK companies being leaders in clean coal technology.
- 13. Clean coal is one of the technologies which will enable us to meet short-term demand fluctuations. The White Paper needs to emphasise the fact that we will need more "peaking capacity" in future. Clean coal, together with bio-fuels, demand side load management and energy storage systems, will provide this. I believe that we should invest substantially in these types of power generation.

International perspective

14. The international perspective is limited. I think we need a concerted strategy at European Union, OECD and G8 levels to internationalise our policy. The EU level needs much more focus because it has the capability to put in the drivers needed to transform the world's richest single market into a force for progressive energy policy. At the same time, we need to make clear that the proposal of a 60% emissions cut by 2050 was explicitly based on a 'contraction and convergence' scenario which would involve full global emissions trading. This implies that the UK would not need to make all of the necessary emissions reductions at home – and still further reduces the case for new nuclear.

Spending choices

15. Although I accept the limitations of the CSR settlement to 2006, the reality is that this draft White Paper does not confront the spending choices we face to support a sensible energy policy. To go down the renewables road in the way I believe we need to, will involve up front subsidies – for PV, solar, renewables generally, clean coal and nuclear fusion. These will be more than recouped by subsequent long- term savings – both environmentally and in the boost to jobs, business innovation and exports in frontier technology.



I am copying this letter to the Prime Minister, members of DA(N) committee and to Sir Andrew Turnbull.

The Right Honourable John Prescott, MP Deputy Prime Minister 26 Whitehall

London

SW1A 2WH

From: Geoffrey Norris **10 December 2002** Date:

cc:

Jeremy Hewood

Pat McFadden **Caroline Adams David Hanson MP**

MEETING WITH COAL MPS

PRIME MINISTER

You are meeting with the coal MPs on Wednesday. A DTI briefing is attached.

With the announcement earlier this year that the Selby complex will close by 2004, we are now left with just a hand full of large mines (largely owned by UK Coal) and a clutch of small, niche pits. In the absence of new large-scale investment the long-term prospects for the remaining large mines are poor.

The MPs will want to lobby you on:

- Financial support for the industry: they want HMG to provide support for new investment. We have published a consultation paper on the possibility of an RSA-equivalent for new investment in coal mines (coal is currently excluded from the RSA scheme). They are likely to say the kind of funding levels we are talking about (up to 30% of cost of new investment) will not be sufficient to make new investment viable (Mr.Budge appears to asking for 100%). DTI doesn't have the money for an expensive scheme and the energy/economic case is weak. They may well try and draw parallels with our support for British Energy (the answer is that it would have cost us far more to close the nuclear power stations than to have them running- because with the taxpayer has to pay for the nuclear liabilities). It is worth reminding them that our coal operating aid scheme cost £170 million.
 - Energy White Paper: they are likely to want the White Paper to include a declaration about the importance of UK deep mined coal to meeting our energy policy objectives. They will be disappointed. As we move to a low carbon economy coal's contribution is inevitably going to shrink. The coal

lobby's answer is carbon sequestration – we are looking at it but it doesn't look economic and it is unproven.

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GEOFFREY NORRIS

PRIME MINISTER / COALFIELD MPs MEETING - 11 DECEMBER

1) Investment aid

Line to take:

 We have recently completed a consultation exercise on the case for an investment aid scheme and are considering responses. We hope to issue a response to our consultation shortly.

Background:

- 1. If we are to have a scheme we need to submit details to the European Commission by the end of the year and in practice by 20 December. Policy is still undecided, not least because the costs of British Energy have left DTI with little financial flexibility. If there is a scheme, it will be based on a regional aid rationale. It may fall rather short of what the coalfield MPs will be hoping for.
- 2. The European rules limit aid to 30% if investment costs. There has been some pressure for HMG to provide the remaining 70% in the form of a loan. This is very problematic, but without it the use of an investment aid scheme for the industry will be limited.

2) Operating aid

Line to take:

- No plans to extend operating aid beyond this year. Our view, confirmed by consultation with the industry last year, is that operating aid is not the most useful way to support the coal industry.
- No plans to lift the £75m cap on UK Coal. The company has not announced conclusions from their pit reviews, so we don't know that further operating aid is *necessary* to save any given pit. Nor, for that matter, do we know that aid at the levels that raising the cap might allow would be *sufficient* to save any pit if UK Coal felt that closure was appropriate.

Background:

1. If we had wanted to introduce a new operating aid scheme from 1 January 2003 we would have had to submit a plan to the Commission by 31 October. Under

the European rules, receipt of operating aid after 1 July would also preclude a mine from receiving investment aid.

2. Under the operating aid scheme there is a cap of £75m on all applicants. In practice this bites only on UK Coal. In theory they could have received c£40m more without the cap. In reality the figure would probably be very much less due to ineligibility of some of their applications.

3) UK Coal pit closures

Line to take:

- UK Coal has not made any final decisions on any of its pits other than Clipstone.
 Nor has the IMC review of deep mines been completed. So too early to say pits are going to close.
- It is the Coal Authority's practice to seek to identify other parties who may wish to work the relevant coal when an operator ceases mining at a pit.

Background

1. UK Coal have been reviewing all their pits, and it is expected that they will shortly announce the closure of Harworth (Yorkshire, 590 men) and perhaps Maltby (Yorkshire, 520 men). IMC, independent mining consultants, are also conducting a review of reserves at deep mines on behalf of DTI in the context of the possible investment aid scheme. Neither have yet announced conclusions of their reviews. UK Coal has however announced that it will cease mining at Clipstone (Notts, 230 men) early next year.

4) Energy White Paper

Line to take:

• The White Paper is due to be published in the New Year. Can't comment on its conclusions yet.

Background:

1. The current draft of the White Paper envisages little long term role for coal unless carbon capture and storage proves workable. It also finds there to be no security of supply justification for maintaining a given level of UK coal production. This is consistent with the PIU's findings, but will of course be unpopular with the coal lobby.

5) TXU / British Energy

Line to take:

- The future of TXU Europe is a matter for the administrator and its creditors. Solutions to the difficulties are best found through market mechanisms.
- Any significant problems at Drax, TXU or any other source of coal demand are
 likely to have impacts on suppliers, including coal companies. In the first instance
 this is a commercial matter for the companies concerned, but we are monitoring
 the issue closely.
- If British Energy were to go into administration, all its nuclear liabilities would fall to the taxpayer. That is why we are supporting the company, and those issues simply do not arise in the coal industry.

Background:

1. The coal lobby has not been slow to suggest that the coal industry should receive similar levels of support to the nuclear industry.

6) Selby

Line to take:

- We've done lots to help: £43m operating aid; £10m to allow UK Coal to extend generous "British Coal" redundancy payments to cover closure; commissioned
 Selby Task Force to advise on what needs to be done to combat impact of closure.
- We are due to receive the Task Force's report imminently, and will consider it urgently.

Background

1. UK Coal announced in July that Selby Complex (Yorkshire, 2000 men) would close by end Q1 2004. Deterioration in trading conditions since may bring closure forward to October 2003. The Task Force, chaired by Lord Haskins, is due to get its report to us this week.

62 534 AA



From Callum McCarthy
Chairman of the Gas and Electricity Markets Authority,
Chief Executive of Ofgem
10 December 2002

Our Ref: cm506-02cfl

The Rt Hon Margaret Beckett MP Secretary of State for Environment, Food and Rural Affairs DEFRA Nobel House 17 Smith Square London SW1P 3JR

Bringing choice and value to customers

Dear Margaret,

Contributing to the Energy White Paper

I read with interest the speech you gave recently to the Combined Heat and Power Association Conference in November. I, like you, recognise the large amount of work that needs to be done if Government is to meet its domestic target of a 20% reduction in carbon dioxide emissions by 2010. In your speech you also said that we needed to recognise the adverse impact which NETA was having on the CHP industry and to identify ways to overcome this. There have been many useful discussions with Michael Meacher and officials to discuss NETA and the performance of CHP where precisely this issue has been considered. I thought it would be helpful to fill you in on these discussions as the drafting of the Energy White Paper nears its conclusion. I would of course be very happy to meet and discuss this further if you would find it helpful.

2. NETA was introduced in March 2001. As a result of the introduction of NETA, and other measures, we now for the first time since privatisation have a competitive wholesale market for electricity. As a consequence, electricity wholesale prices have fallen considerably to the benefit of consumers throughout England and Wales. Since 1998 when government first announced its intention to reform electricity trading arrangements prices have fallen by a total of 40%, with a reduction of approximately 20% occurring in the period since their introduction. These price falls reflect the overcapacity which now exists in the electricity generation market, which built up under the previous arrangements for buying and selling electricity, known as the Pool. At the same time Government has also implemented a very successful renewables policy in the form of the Renewables Obligation which has stimulated, through subsidy, investment in renewables generation. Under this combination of circumstances, we face continuing surplus capacity, and it is to be expected that low prices will continue. Low prices and continuing spare capacity mean that we should expect investment in new generating capacity without subsidy to be unattractive to investors.

From Callum McCarthy Chairman of the Gas and Electricity Markets Authority, Chief Executive of Ofgem



Bringing choice and

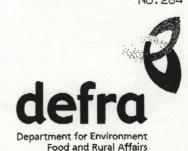
- 3. For CHP the prospect of new capacity being brought on stream and the ecomotives to finers existing capacity being fully utilised are diminished further because it is simultaneously exposed to gas prices which have increased in recent years while wholesale electricity prices have fallen. The differential between gas and electricity prices is volatile and may of course change in future to the advantage of CHP operators, but the present economics are squeezing CHP.
- 4. It is against this background that the interaction of NETA and CHP needs to be examined. You have suggested that changes to NETA are required to remedy the problems now faced by CHP. I should make clear that a number of changes have been made to NETA since its introduction where it was felt that the arrangements unfairly disadvantaged particular types of generator and in the light of experienced gained by NGC in operating under this new set of arrangements. One of the most important of these changes was to reduce the amount of time NGC is given to balance the network from 3.5 hours to 1 hour. As a result generators now only have to specify their contracted output 1 hour before it is dispatched. This has been particularly helpful for renewables and CHP which typically find it harder to predict their level of output in advance and as a result had greater exposure to imbalance charges. Other changes have been made to imbalance calculations to ensure that imbalance prices reflect only the cost of electricity balancing actions taken by NGC and do not cover transmission system costs which should be recovered from all users of the system. A further significant development in this area is due to take effect in February 2003. In the meantime, Ofgem will continue to monitor the market and consider modifications brought forward by participants in the market.
- 5. But these changes will not and indeed cannot reverse the fundamental economic issues affecting CHP - the relative price of gas and electricity together with over-capacity in the electricity generation market, which together explain the problems facing CHP at present. You may decide that special policies are warranted to support CHP, as the route to adopt since it would tackle the real problems facing CHP in the most direct manner, and would minimise the risk of undermining other government objectives for energy policy.
- 6. I am copying this letter to Michael Meacher, Brian Wilson and Geoffrey Norris.

Callenn

CALLUM McCARTHY

Nobel House
Smith Square
London SW1P 3JR

Telephone 08459 335577
Email secretaryofstate@defra.gsi.gov.uk
Website www.defra.gov.uk



The Rt Hon John Prescott MP Deputy Prime Minister 26 Whitehall LONDON SW1A 2WH

O December 2002

From the Secretary of State
The Rt Hon Margaret Beckett MP

25: CV 25: CV

Dear John,

ENERGY WHITE PAPER

As you will appreciate, it is not my practice either to minute or send letters if there are other ways of handling issues which raise sensitivities for the Government. However, I have now seen a copy of a second letter from David King about the issue of nuclear new build. Apart from his expressed views, Brian has also on many occasions made it public that this is also his view.

I bow to no-one in my desire to see Britain effectively tackle the dangers that climate change presents, and I am extremely conscious of how much more there is to do. However, I find myself utterly unconvinced by the case that has been put for nuclear new build, or for the steps which those who now propose new build insist must be taken to actually keep this option open. You were unfortunately unable to attend the very interesting and useful seminar held at DTI, but for my part the arguments presented were almost breathtaking in their inadequacy. What is more to the point, is that the figures then presented did not show a substantial carbon gap that we need now address by means other than the pursuit of energy efficiency, renewables and transport emission savings, to which we are already supposed to be committed. If we are to argue in the White Paper that a gap is opening up, we will be saying publicly that our policies on each of these issues are wrong or inadequate, and that that is why we need nuclear new build.

So, it is, I do not accept that the case has been substantiated that we need to take action on this now. There are three simple points which seem to be being ignored by the

proponents of nuclear new build, and which seem to me to present the Government with enormous dangers.

First, Britain is rightly seen as a leader in the world on the issue of climate change. If <u>we</u> announce that the only way we can meet our commitments is by nuclear new build, that is the advice and example that we are giving to the rest of the world. The fact that I do not believe for a second that this is true, pales into insignificance beside the effects of such a signal, especially among developing countries.

Second, as you know, I believe that responsible Government requires us to be more proactive in tackling the issue of radioactive waste. However, we already have waste arisings which will require disposal and possible repeated handling over literally hundreds of thousands of years. The notion that we should add to this seems to me folly of a high order.

My third and final point, is that I think a very important criterion is being overlooked. As a Government we are supposed to be committed to sustainable development. That means that we take account of the impact of what we do on future generations in the broadest possible sense. Nuclear power is unquestionably a low carbon technology. Unfortunately, though, it seems to me to be beyond question that it is about as unsustainable as you can get. If leaving stockpiles of highly dangerous waste for hundreds of thousands of years is not unsustainable, I do not know what is.

I regret having to deploy these arguments at this stage, without the opportunity of further private discussion, but I feel driven to do so by the way in which there seems to be an attempt to set the agenda irrevocably.

I am copying this letter to the Prime Minister, Members of DA(N) Committee, and to Sir Andrew Turnbull.

Regards Hang over

MARGARET BECKETT



Office of Science and Technology

1 Victoria Street, London SW1H 0ET
Telephone 020 7215 5000 Direct Line 020 7215 3825 Fax 020 7215 0314
E-mail: mpst.king@dti.gsi.gov.uk

From the Chief Scientific Adviser and Head of the Office of Science and Technology Professor David King ScD FRS

RESTRICTED

Rt. Hon. John Prescott MP Deputy Prime Minister 26 Whitehall London SW1A 2WH

9 December 2002

Dear Deputy Prime Minister

ENERGY WHITE PAPER

I have seen a near final draft of the DA(N) paper "The role of nuclear power in the medium term" DA(N)(02)16, which we are due to discuss at our meeting on 11 December. This paper asks the Committee to decide what the Energy White Paper should say on this vital issue. I am not convinced by the paper's arguments or recommendations and thought it would be helpful to you if I set out my views prior to the meeting.

In order to explain my position, I need to set out briefly my views on several of the key scientific issues affecting energy policy. As you know, my priorities are tackling climate change and ensuring that our energy supply is secure. To do this, the UK must retain a good energy mix, improve efficiency and pursue a range of options to reduce carbon dioxide emissions including renewable energy, nuclear power, carbon sequestration and hydrogen powered transport.

We must reduce our CO₂ emissions by at least 20% by 2020 and 60% by 2050 as the RCEP recommended. The consequences of failing to meet those targets do not bear thinking about. We must redouble our efforts to increase the amount of renewable energy on the grid and work hard at our energy efficiency. However, all the evidence I have seen, including the analysis in the DA(N) paper, "Moving to a Low-Carbon Future," which we discussed at our last meeting, suggests that we cannot possibly rely on these to meet our targets. If I thought we could, I would not advocate nuclear new build at all. If we don't grasp the nettle now on nuclear, it may be too late to come back to it on a timescale to meet our needs. These needs include CO₂ emission reductions and ensuring security of supply. Increased investment in research and fiscal incentives to take up renewable technologies or use energy more efficiently should be a key part of our energy policy. In my view, we should push for new build alongside renewable sources and greater energy efficiency now.

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Department of Trade and Industry

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Nuclear energy, like all energy sources available today, has its pros and cons. The price of zero carbon emissions is a high build and clean-up cost. However, the costs of failing to tackle climate change will be higher. BNFL's nuclear liabilities for the next 150 years are about £40bn. That roughly equates to the cost of one severe flood to London, if it were to breach the Thames Barrier. If we fail to tackle climate change now, we risk a more frequent occurrence of severe flooding within this century. Radioactive waste causes public concern, so we need a clear strategy to deal with our legacy. However, a new generation of efficient nuclear power stations, if run for forty years, will only add 10% to our current waste stockpiles, which would be of a type easier to deal with than the legacy waste.

We must also push ahead with a move to low carbon transport. Road vehicles make up 25% of our CO_2 emissions and that number is rising. Their emissions are also a major contributor to harmful urban air pollution. More energy efficient vehicles and hybrid technologies are already on the market, but to tackle climate change and pollution in the long term hydrogen powered vehicles are the best solution. They will be on the market in 10 to 20 years, so we need to begin planning now to supply them with electricity from non-carbon emitting sources. If all the cars and trucks in the UK were hydrogen powered, we would need roughly double the generating capacity we have today.

The first recommendation of my Energy Research Review Group refers specifically to non-technical policy drivers, including regulatory as well as social, commercial and economic drivers. This happened in California, where new legislation on car exhaust emissions provided the incentives for private companies, particularly in this case the British company Johnson Matthey, to invest in the appropriate R&D. The incentives need to be put in place to encourage industry to invest in R & D in order to bring on stream sequestration, hydrogen production, renewable energy, nuclear fission and fusion and improved energy efficiency. I think it might be worth reviewing the climate change levy in light of these priorities.

In fifty years time, when the last of the nuclear stations we build now reaches the end of its life, we should not need to replace it. By then renewable technologies should have advanced significantly and clean fusion power should already be available. Most, if not all, of our vehicles will be hydrogen powered, with the hydrogen made using water and clean energy from the grid. The UK will be well on the way to zero net CO₂ emissions and the most severe consequences of climate change will have been avoided.

I am copying this letter to the Prime Minister, members of DA(N) Committee and Sir Andrew Turnbull.

pp. Fred Shanorh

APPROVED BY PROFESSOR NWG AND SIGNED IN HIS ABGENCE

Professor David King

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Department of Trade and Industry



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Foreign & Commonwealth

5 December 2002

Jeremy Heywood Esq No 10 Downing Street then some of the continue of t

Office
King Charles Street
London SWIA 2AH

Telephone: 020-7008-2207
Facsimile: 020-7008-2326
Michael.Arthur@fco.gov.uk
Director General EU and Economic

Ira Jeveny

COULD WE BREAK OPEC?

- 1. Thank you for your letter of 19 November which asked for some follow-up work to my earlier letter of 15 November.
- 2. As you recognise, there are strong arguments against seeking to drive oil prices down to the very bottom we need a delicate balance between stable, sustainable prices, and a reduction of OPEC's dominance.
- 3. The follow-up work we have done, which excludes the pivotal issue of the impact on the domestic economy, suggests that a price in the upper end of a range \$15-20 a barrel probably meets the widest range of UK interests. I say upper end because the risks are greater at the lower end of that range. The analysis underpinning that judgement is attached. We also address the question of how much HMG can do to help achieve that target.
- 4. One piece of work Treasury have not been able to do in the time available, partly due to PBR pressures, is an analysis of the impact of different price bands on the UK economy. The Treasury plan to examine this shortly, with interdepartmental guidance from the Brooks oil group. Treasury have been involved in the rest of our work and are content with the broad conclusions these papers reach.
- 5. In answer to your questions, I attach three short papers:
 - 1) The global impact of low oil prices. A fall from \$25 to \$15 a barrel would boost global GDP by about 1% over a 2-year period, with inflation in OECD countries falling initially by up to 2%. Key oil exporters (including Saudi, Nigeria, Russia) would face economic crisis in varied degrees. Some case studies attached.
 - 2) HMG's wider policy objectives: environment; security of supply; political stability in producer countries; wider development goals. A price in the range \$18-22 would



be consistent with these wider goals (e.g. helping to stimulate alternatives to oil; encouraging sustainable growth in emerging economies).

- 3) Achieving greater oil price stability. This examines the options between the two extremes of leaving the outcome to pure market forces and some tight consumer/producer price fixing.
- 6. We conclude that some degree of price volatility is inevitable in the nature of a market for a commodity. While prices at \$25 are not sustainable (due to in-built downward pressure from non-OPEC producers) a price below \$15 is likely to be accompanied by greater not less volatility.
- 7. It will be primarily market forces which deliver sustainability in a price bracket of about \$15-\$20. We think that a quite likely outcome. But we can impact on this a little. Our principal policy tools for this are:
 - Encouraging diversity of production outside OPEC, partly through support for investment and sustainable development in Africa and FSU;
 - Working to avoid collaboration on supply restraint between OPEC and near-OPEC (b) producers (eg Russia);
 - Further developing the consumer/producer dialogue, both multilaterally and in our bilateral work. This should not be aimed at specific price fixing (not achievable) but at encouraging better understanding by both sides of a mutual interest in sustainable prices and supplies in the \$15-\$20 range;
 - Demand management (fiscal; energy efficiency), not least to keep up the pressure on OPEC;
 - Encouraging (non-oil) diversity of energy supply a key goal of our forthcoming Energy White Paper - in order to keep downward pressure on OPEC and to mitigate the increased global demand for Middle East oil, which, driven by transport needs, is inevitable over the next decade.
 - 8. We do not think that long term contracts are a solution. Given the unavoidability of some price volatility, who would bear the risk? - ultimately governments. This would not be acceptable.
 - 9. Nor do we think that market intervention through increased IEA oil stocks is a viable policy instrument. IEA stocks - and it is hard enough to keep them up to the present level were designed to correct short-term supply interruptions, never seen as a price fixing tool. To have a price impact, the scale of stocks would have to be far higher than governments are



likely to want to finance; and even then, in a real war of supply, the OPEC/Middle East producers would ultimately win.

- 10. If you agree the broad conclusions of my two letters and the attached papers, then HMG's policy follow-up can be taken forward through
 - the Energy White Paper;
 - the range of FCO and DTI policy actions in our dialogue with key OPEC and non-OPEC suppliers;
 - the wider range of foreign policy tools available to us (Russia/WTO etc).

 Energy security is one of the top seven priorities we are setting for the FCO for the coming few years;
 - trying out these ideas on our G7 and IEA partners too, not least in the ongoing UK/US energy dialogue (next Plenary Meeting on 18 December). And we should work more closely perhaps as part of G8 outreach -- with China, India and the other big energy consumers of the future.

Your even

Michael Arthur

cc:

Sir David Manning, No 10 Oliver Jones, No.10 Martin Donnelly, Cabinet Office James Kidner, Cabinet Office Catriona Laing, Cabinet Office Niall Creed, Cabinet Office Stephen Pickford, HMT Andrew Kilpatrick, HMT Andrew Crook, HMT Joan MacNaughton, DTI Ann Eggington, DTI Neil Hirst, DTI Paul Bailey, DTI Sir Michael Jay FCO Peter Ricketts, FCO Edward Chaplin, FCO Creon Butler, EcPol, FCO Simon Fraser, DSI, FCO

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Christopher Segar, FCO Charles Gray, FCO Nick Archer, FCO Simon Butt, FCO Guy Gantley, FCO Neil Kenward, FCO Richard Lindsay, FCO Matthew Findlay, FCO

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RightFAX :Prime Minister

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HM Treasury, I Horse Guards Road, London, SWIA 2HQ

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The Rt. Hon. Patricia Hewitt MP Secretary of State Department of Trade and Industry 1 Victoria Street London SW11H 0ET

December 2002

BRITISH ENERGY: RESTRUCTURING COSTS

Thank you for your letter of today, setting out the expected costs of British Energy.

- Your letter shows that you are planning on the basis of £23m in 2002-03, £112m in 2003-04, and £202m a year from 2004-05 onwards.
- 3. Clearly, these numbers are predicated on the sale of Bruce in 2002-03. As such, it is important that your Department continues to pursue an outcome to these negotiations, which secures the best available price.

:Prime Minister COMPANY .



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- I understand your figures assume that some of the costs of restructuring fall in 2003-04, assuming state aids I understand that a more approval is received early. sensible planning assumption would be that the timing of approval is most unlikely to mean that costs are incurred in 2003-04.
- 5. On this basis, the costs that you incur before the start of the 2004 Spending Review period should be containable within your existing non-science EYF entitlement and underspends on programmes.
- 6. Your Department has a large stock of non-science EYF. against a relatively small amount of further resource EYF draw-down that we understand is being planned in 2002-As you mention, you also have a history of underspends, which have built up over the last few years into the current EYF stock.
- 7. Our officials have discussed at length your suggestion that you cannot rely on continued underspending. Rather than underspends arising in the Department by default, it will of course be necessary to plan to meet emerging Given the £23m pressure you identify in 2002pressures. 03 and a likely zero cost in 2003-04, it should be feasible,

:Prime Minister COMPANY .



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given current EYF and likely underspends, to plan for a £202m pressure by 2004-05.

- 8. In this context, I welcome the efforts you are making to improve business planning in the department, which will help you to plan to meet these pressures effectively, from a combination of EYF, anticipated underspends and, where you judge to be appropriate, adjustments to your provisional allocations to programmes.
- 9. You are quite right that there is a high expectation around the Science Budget and the high profile commitment to increasing science spending in real terms in both the 2000 and 2002 Spending Reviews. As such, it is very important that we proceed with the announcement of the science allocations without further delay.
- 10. I am copying this letter to the Prime Minister, the Chancellor of the Exchequer, and the Cabinet Secretary

PAUL BOATENG

RESTRICTED - POLICY

The Rt Hon Patricia Hewitt MP Secretary of State for Trade and Industry

The Rt Hon Paul Boateng MP Chief Secretary to the Treasury HM Treasury 1 Horse Guards Road LONDON SW1A 2HQ

4 December 2002



Secretary of State Department of Trade and Industry

1 Victoria Street London SW1H 0ET

Direct Line 020 7215 6272

DTI Enquiries 020 7215 5000

URL http://www.dti.gov.uk. e-mail mpst.hewitt@dti.gsi.gov.uk

GN CC 05 570 5514

Dear chief Levetry

BRITISH ENERGY: RESTRUCTURING COSTS

Your letter of 28 November agreed to my proposed approach on the restructuring of British Energy, but it said that this was subject to the cost being funded from DTI's DEL with no claim on the Reserve.

The joint DTI/HMT work on British Energy restructuring costs indicates that, on optimistic assumptions, the costs to DTI of solvent restructuring are currently estimated at £23/112/202/202m over the four years 2002-03 through to 2005-06. The costs could however turn out to be considerably higher than this.

I need to make immediate preparations if I am to be able to absorb budget hits of this size over the SR2002 period. I am therefore writing to propose that we postpone publication of the science budget allocations for the SR2002 period until I have made more detailed plans, because these plans may entail some reductions to the proposed science allocations as well as to other discretionary budgets. I have already made clear that the publication of these allocations cannot go ahead today.

I recognise that the science budget is ring-fenced and that any reductions to SR2002 allocations would create a storm of protest. As the attached chart shows, however, the DTI's programme and capital budget next year will be some £4.6bn, of which science accounts for 50% - and by 2005-06 it will account for closer to 60%. Around 25% of the DTI's £4.6bn budget is for non-discretionary expenditure (on nuclear and coal non-health liabilities, nuclear safety, providing public expenditure cover for ERDF etc). And much of the rest has significant forward commitments. So I think I have to keep open the prospect of some modest reductions in the level of the SR2002 increases for science as a contribution towards finding £200m a year for British Energy related costs by 2004-05 from within my SR2002 settlement – all the more so as the Treasury's position appears to be that I should find all British Energy related costs from within my DEL, even if they turn out to be much higher than the figures cited in paragraph 2 above.

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I know that your instinct will be to exempt science from any budget reductions which may be required. Let us be clear however that this would mean any reductions falling on around 25% of the DTI's budget i.e. some £200m a year or more, even if things go well, on a falling budget of a little over £1bn with significant forward commitments. Let us also be clear that the main components of that 25% are our support for the Small Business Service, for RDAs, for RSA, for knowledge transfer and commercial best practice, for consumers, and for renewables technologies. These are all important to the Governments agenda and they are all politically sensitive. There are no painless cuts to be had. Moreover, since British Energy related costs will almost all require resource rather than capital funding, my options for budget cuts will be further constrained unless you are willing to provide some flexibility for capital to resource transfers.

The Treasury has argued that the DTI has End Year Flexibility (EYF) which could be utilised. As my officials have explained to yours, however, this is needed to meet commitments which have been slower than expected to materialise but still exist (e.g. the delays to launching regional venture capital finds caused by the process of getting EU clearance) and unfunded commitments (e.g. additional money for the Competition Commission in 2003-04, which it was agreed would be covered by EYF in discussions on SR2002). There may however be scope for releasing almost £50m from particular ring-fenced underspends which would help with British Energy related costs at least for 2003-04 if they could be applied to current rather than capital expenditure.

The Treasury has also argued that the DTI has a history of underspends and should "budgetise" such underspends for future years. It is true that there is a recent history of underspends. I cannot guarantee that there will not be more, although we are improving our business planning, which should help to address this problem in future. Future reductions cannot however be relied upon unless turned into planned budget reductions. We could not sensibly run the Department simply hoping that there would be future underspends on a scale sufficient to meet BE related costs.

Of course I accept that DTI will have to bear some pain. But a budget of less than £1bn a year simply cannot absorb a shock of the size of BE's collapse. If your position continues to be that DTI's DEL must bear all British Energy related costs, therefore, I do not think it would be sensible to proceed with the planned science budget allocations, thus in effect committing over 50% of DTI's budget for the next three years. I hope you will see the logic of this argument.

I am copying this letter to the Prime Minister, the Chancellor of the Exchequer and the Cabinet Secretary.

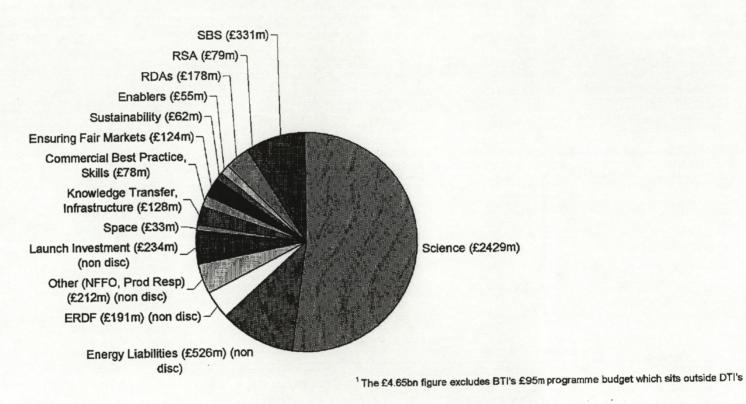
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PATRICIA HEWITT

(Approved by the Secretary of State

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DTI DEL 2003-4 Programme and Capital (£4.65bn¹)



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RT HON ROBIN COOK MP

LEADER OF THE HOUSE OF COMMONS
2 CARLTON GARDENS
LONDON SWIY 5AA
TEL: 020 7210 1025

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Our Ref: LP/02/311/N

- 3 DEC 2002

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LP CORRESPONDENCE: ELECTRICITY (TRADING AND TRANSMISSION) BILL

Thank you for your letter of 19 November seeking LP's agreement to the timetable for the Electricity (Trading and Transmission) Bill, namely introduction around the time of publication of the Energy White Paper, early in 2003. We spoke on 25 November and agreed that, given the pressures on this session's programme, particularly early next year, it would be sensible to adopt a slightly different approach.

As you know, the Bill was scheduled for introduction during the first week of this session, and drafting is largely complete. However, as a result of the uncertainty arising from the situation at British Energy, your Department sought to delay introduction of the Bill until the new year. Since that decision was made, pressure on the legislative programme has grown considerably, including the addition of the National Minimum Wage (Enforcement Notices) Amendment Bill. It is of course also likely that there will be a need for urgent legislation arising from the problems at British Energy.

These pressures mean that it is now very difficult to accommodate the Bill in this session's programme. The best way to proceed therefore might be to publish the Bill in draft for pre-legislative scrutiny as soon as possible, with a view to introducing it later in the session if possible and perhaps carrying it over. I can, of course, offer no firm guarantee that space will be found towards the end of the session to introduce the Bill, particularly as both Houses are likely to face considerable pressures throughout the session and no firm plans have yet been made about how carryover may be used. However, publication in draft now would offer real benefits in terms of the Bill's future handling and demonstrate that momentum on this important issue was being maintained.

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I am copying this letter to the Prime Minister, Cabinet and LP colleagues, Sir Andrew Turnbull and First Parliamentary Counsel.

Yours sincerely

ROBIN COOK

The Rt Hon Patricia Hewitt MP Secretary of State for Trade and Industry

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-- RD(OS)
-- FA)ARS(MR)

Foreign & Commonwealth
Office

The Rt Hon John Prescott MP Deputy Prime Minister 26 Whitehall London London SW1A 2AH

From the Parliamentary Under Secretary of State

29 November 2002

Dear John,

SW1A 2WH

As recommended at DA(N) on 9 October, I am now circulating a paper prepared in the FCO and with members of the Strategy Unit in the Cabinet Office, and cleared with the DTI, which sets out the wider aspects of international energy policy.

Entitled International Energy Strategy it reflects the increasing interdependence between domestic and international policy in the energy sector. It takes account of the priorities already recognised in the White Paper exercise attaching to global environmental targets, affordable energy supplies and energy security. It sets our future policy in the contexts of the EU and of global multilateral institutions, and at the bilateral level.

I hope it will give an indication how international energy policy can be taken forward in the future. It will have implications for the way the FCO and our overseas posts tackle energy issues while assisting the DTI and DEFRA to achieve their international policy objectives.

I am copying this letter to the Prime Minister, all members of DA(N) and Sir Andrew Turnbull.

Bill Rammell

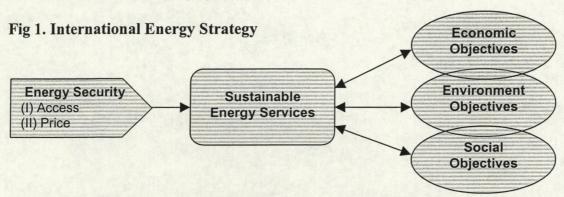
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DA(N) Paper – International Energy Strategy

- 1. Trends in energy markets have been relatively benign over the past 10-15 years: the UK has been self-sufficient in energy, commercial decisions have resulted in changes in the fuel mix that have reduced UK emissions of greenhouse gases, and trends in world markets have reduced most fuel prices. Over this period the focus of our energy policy has not surprisingly been domestic.
- 2. The next 10-15 years and beyond will look very different. The UK will become a net importer of gas by about 2006 and oil by 2007, making us more directly dependent on international energy markets (and particularly supplies from the Middle East). By 2020 half the world's gas and oil will come from countries which are now politically unstable. The world will face increasingly demanding greenhouse gas reduction targets. Within the EU, a single liberalised energy market expected by 2007/8 raises questions about how this should be regulated in the future, and how an integrated and liberalised market will affect UK interests on security of supply.
- 3. These developments challenge the way HMG approaches international energy issues. Our domestic energy strategy must be fully consistent with our international energy strategy as well as other international government objectives. This paper sets out a proposed approach starting with a simple framework for considering how enhanced energy security can be achieved in a sustainable way, through action taken at an EU, global and UK level.

Framework for International Energy Strategy

- 4. Energy security is dependent on access to primary energy sources at an affordable and stable price. Energy security must also be delivered in an environmentally sustainable way. An energy policy that does not protect the environment will not indefinitely deliver economic and social gains: it will be self-defeating. But the link between energy and the environment can only be tackled seriously at the international level.
- 5. Energy is not an end in itself rather a means to an end. It translates into economic and social welfare only through the energy services, such as the heat, light and transport which it provides. Achieving sustainable energy services is itself dependent on balancing economic, social and environmental objectives domestically, and globally in producer and consumer countries. Developed countries must take full account of the concerns of developing nations in framing environmental and energy goals.



6. Using this framework for international energy strategy it is possible to develop a vision for energy policy:

Vision for International Energy Policy

Our proposed vision for international energy policy is:

Secure and environmentally sustainable energy services for all

Secure: to achieve uninterrupted access to energy at affordable prices

Environmentally sustainable: to avoid dangerous climate change effects

For all: to provide modern energy services to all including the 2 billion people who currently lack them in support of the UN Millennium Development Goals

Challenges to International Energy Policy

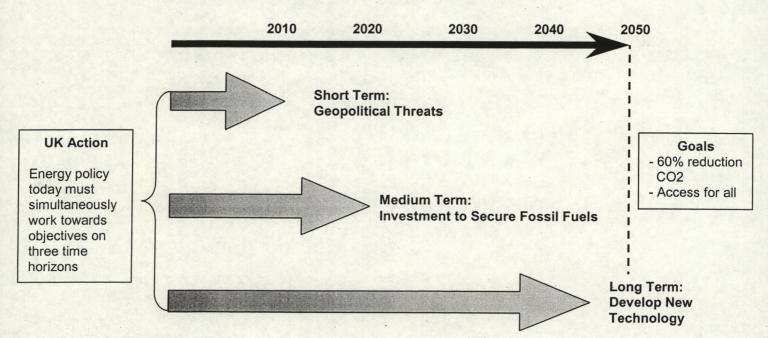
- 7. In order to realise this vision for energy policy there are a number of challenges that must be overcome. World demand for energy services is projected to rise rapidly. IEA reference projections (which do not take account of climate change measures) show that over the next 30 years global primary energy demand will increase by 1.7% per annum, reaching an annual level of 15.3 billion tonnes of oil equivalent. There will be an important switch in the driver of this growth with over 60% of the increase in energy demand coming from developing countries, particularly Asia. China will grow to become the world's second largest consumer of energy as economic growth drives demand for imports.
- 8. Although resources are adequate to meet demand, security measures to mitigate both supply and price shocks will need to be reviewed given the changing security context of the future. The key security challenge is likely to be securing adequate supplies at *stable prices*. The most likely risk to price stability is in the form of geopolitical events e.g. regional instability or political unrest which the markets perceive as threatening key oil supply routes, like the Straits of Hormuz, or a terrorist attack on the two key gas entry points to the UK: Bacton and St Fergus. Saudi Arabia, as the key swing oil producing state, will remain a major influence on short-term prices. The Kingdom's political stability, and its commitment to stable markets, will be crucial for some time to come. Given the international nature of oil and gas prices the UK should act to ensure that it is not at a competitive disadvantage relative to others in Europe and the rest of the world.
- 9. Challenges to secure energy services also interact with the three pillars of sustainable development: economic, environmental and social.
- Economic: While the world's energy resources are adequate to meet the projected growth in energy demand, the challenge will be to meet this demand at stable prices. Without, for example, effective liberalisation and competition within the

- EU gas and electricity markets, and promotion of adequate investment in diversified production infrastructure, guaranteeing these dependable prices will be difficult. And we need to see economic development of producer countries as central to the pursuit of energy security, something not embedded in current UK energy policy.
- Environmental: Increasing use of fossil fuels and thus growing carbon emissions may threaten environmental objectives. The White Paper is likely to endorse a global target of 60% reduction in greenhouse gasses by 2050 and unilateral action by the UK to set our economy on this path to a low carbon future. A reduction on this scale can only be achieved through radical changes in the global energy system itself. The role of key energy consuming third countries, particularly the US and the big emerging powers like China, India and Brazil will be central to the achievement of this goal.
- Social: Access to energy for people in developing countries is a key issue: nearly two billion people do not have access to modern and affordable energy services, with serious economic, developmental and environmental consequences. Internationally agreed development and poverty reduction objectives are unlikely to be achieved without adequate access to energy services, which is also essential for economic growth. We need to build on DfID's recent Energy for the Poor paper in addressing these issues. We also need to see economic development of producer countries as central to the pursuit of energy security.

A Pathway for International Energy Policy

10. Reconciling energy security with sustainable development, and integrating better our energy and climate change objectives, will require action today to deliver results over different time horizons: the short, the medium and longer term.

Fig 2. Time Horizons for Energy Policy – the UK must work now to deliver short-term, medium-term and long-term linked objectives



• Results in the short-term from actions now:

We must act now to tackle geopolitical threats from failed states and terrorism that jeopardise our access to fossil fuels and thus global energy security. We also need to work now to gain wider political acceptance of the need for emission reductions, and energy market liberalisation. And to promote the integration of development objectives with wider energy policy objectives.

• Results in the medium-term from action now:

We will be dependent on fossil fuels for the medium term. So we must work to secure investment to develop sufficient new reserves to meet growing demand. We must also act now to ensure that steps are taken to move the global energy system away from fossil fuel dependence and onto a more sustainable longer-term path. This will require ensuring adequate investment in the infrastructure (e.g. pipelines and the adoption of a number of enabling technologies such as storage and embedded generation).

• Results in the long-term from action now:

Action will also be required now to develop new technologies that will enable us to meet both our sustainable development objectives and provide an alternative to dependence on imported fossil fuels from unstable regions. Increased innovation levels will require us to consider the development of new international mechanisms to promote research and development.

HMG Priorities for Action

11. To set the UK on a pathway to achieving its vision, we need to co-ordinate our policy in the three main arenas through which the UK interacts with the world: the European Union; global institutions such as the G8, the IEA, and the WTO; and at a bilateral UK Government level. The following is not intended to be a comprehensive list but is intended to set out some of the key areas for action.

Action at the EU level

- The EU is now a primary theatre for our energy policy. The liberalisation of EU energy markets, carbon trading, environmental and renewables policy are all areas where the Commission has a leading role. The UK needs to be on the front foot in leading developments in Europe and will need to recognise that this means an increasing role for the Commission in certain key areas. In particular the EU has a crucial role in developing an open and competitive European gas market and in creating the right conditions for investment in infrastructure and new capacity to serve it. However there are other areas, such as oil security, where the IEA is better able to address global issues. Ministers are invited to agree that we should regard Europe as a key theatre for our energy policy including, where appropriate, an enhanced role for the Commission
- We need to ensure and safeguard the benefits of liberalisation. The successful opening up of EU energy markets is central to future energy security. Liberalisation should also support the development of sustainable energy and energy efficiency. We need, particularly through our dialogue with the EU and

with Russia, to ensure that liberalisation is consistent with the very large investments that will be required in Russian energy resources and infrastructure. Ministers are asked to agree that we should continue to give a high priority to the liberalisation of EU energy markets. We should also work with the EU and with Russia to monitor the adequacy of infrastructure and capacity and to ensure that necessary investments are not inhibited. Ministers should promote the UK experience of energy liberalisation, while recognising the practical difficulties that we have experienced, and also highlighting the measures we are adopting to secure social and environmental objectives.

- As a large consumer of fossil fuels, the European Union provides a valuable market for energy producers. However, the EU could take a more pro-active and consistent role with major energy producers. Ministers are therefore asked to support the development of a concerted external EU policy (both national and EU level action) on issues like long-term contracts, infrastructure investment priorities, promotion of economic reform and WTO accession in order to maximise weight in oil and gas negotiations with producers and to ensure consistency with other external EU objectives
- We need to ensure that there is sufficient support from member states for the EU
 Energy Initiative, which was an important outcome from WSSD. Ministers are
 asked to support the programme in order that substantial new resources to
 promote energy access in developing countries are released.
- We need to ensure the EU Intelligent Energy Programme delivers. The programme provides a strategy for integrating the EU's medium and long term energy security objectives with the Community's Strategy for Sustainable Development (SDS). Ministers are asked to continue to support this programme.

Action at the global level

We need more Ministerial engagement in international institutions. Specific issues that need more active involvement from Ministers are:

- Greater support should be given to the initiatives developed at WSSD to support
 greater access to energy services including the Global Village Energy
 Partnership and the Renewable Energy and Energy Efficiency Partnership
 Initiative. These initiatives should be developed in parallel to the EU energy
 Initiative.
- Large reserves of gas mean that Russian production will be central to future energy supplies. However, economic reform is needed to develop oil and gas production efficiently. There are three key issues: energy market liberalisation within Russia (including the two tier pricing system); transit countries and third party access through Russia to the European market (including the monopoly position of Gazprom); and Russia's position in managing the regional supply of gas from Central Asia and the Caspian into the European Market. Ministers are asked to endorse the further development of our energy dialogue with Russia to be pursued bilaterally and also through EU and WTO channels.

- The International Energy Agency (IEA) has a key role in promoting global energy security, not least through its establishment of oil stocks (agreed in 1974). In the light of growing demand by emerging and Far Eastern economies, we should continue to work through the IEA to promote adequate stockholding in key non-member countries, like China and India, and other stockholding arrangements on a regional basis. Ministers are asked to agree to continuation of work being carried out with the IEA to encourage better regional and non-member stockholding arrangements.
- While OPEC will continue to be a major source of oil production in the future, its dominance will come under increasing pressure from growing non-OPEC production and Kyoto-driven constraints on energy consumption. The possibility of an OPEC collapse cannot be ruled out. Ministers are asked to agree to further work being undertaken to consider (a) the future UK approach to OPEC with the IEA and through the International Energy Forum, and (b) the potential consequences of an OPEC breakdown and implications for UK energy security, particularly in light of possible developments in Iraq.
- Increasing international trade in gas as well as oil could lead to the emergence of a gas exporters' cartel. The EU has a special role in relation to regulation of the gas market in Europe, to be carried out in association with the IEA where appropriate. Ministers are asked to agree that we should encourage the IEA and member states to explore how best to address gas market issues effectively.
- We need new international mechanisms for promoting technology. Ministers are asked to give priority in the EU and other international for a like the NEA, the IAEA and the G8 to co-ordinate better international energy Research and Development: renewables, nuclear fusion, carbon sequestration etc.

Action at the UK level

- We need strengthened and more effective, joined-up HMG structures on international energy and environment issues. These cut across the work of many Whitehall departments DTI, DEFRA, FCO, HMT, DfID. It is vital that the work of governments departments when addressing energy issues like security and the environment is co-ordinated effectively. Ministers should note that proposals for better co-ordinating this work will be put forward in the White Paper exercise.
- Continued support should be given to the Prime Ministers Transparency Initiative, which was launched at WSSD. Ministers are asked to work to encourage new partners to join the initiative.
- The UK is taking a leading role in the development of international carbon trading
 markets through our own carbon trading scheme, through our engagement in the
 Kyoto process, and through our influencing the draft EU carbon trading directive.
 Ministers are invited to agree that the UK should continue to take a leading
 role in this area to promote early mover advantage for UK companies and
 the City.

- The UK has the advantage of hosting three of the world's major energy companies. The UK also has a successful scheme, through PILOT, for working with companies to maximise our own oil and gas potential. Ministers are asked to endorse continued engagement with these companies to maximise our own resources and to pursue other energy security goals.
- We need better bilateral engagement with key producers and consumers. The UK has recently established bilateral dialogue with critical producer countries (like Russia, Saudi Arabia and Kuwait) as well as consumer countries (like the US) to focus on energy matters. Ministers should maximise the results of these discussions, including by making sure that international environmental objectives are fully integrated into these agendas, as well as wider UK talks with key third countries, especially G8 and the leading emerging economies.
- The role of the US is crucial. They are by far the most influential player in international energy politics, and major importers of oil and gas, and they share most of the UK's objectives for global energy markets. Ministers are invited to agree that the UK should make the best possible use of the US/UK energy dialogue for pursing its international energy objectives.
- The UK should act to promote its vision of energy policy internationally.
 Ministers are asked to consider areas of particular importance such as
 transportation systems, power sector reform and distributed generation in
 developing countries, where there are currently huge energy losses and
 inefficiencies.
- Ministers should also consider the value of extending dialogue on energy issues to other key countries such as China and India (given their projected large increases in demand for fossil fuels, and key roles in negotiating future climate change mitigation measures).

FCO/SU/DTI

November 2002

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THE PRIME MINISTER

27 November 2002

ten brân,

I want to congratulate you on the excellent outcome of this week's Energy Council. The agreement on energy liberalisation meets all our objectives and should lead to the creation of a genuinely competitive European energy market, benefiting both consumers and industry. It is also a welcome sign that the economic reform agenda agreed at Lisbon is really beginning to deliver. I know you and your officials put in many months of hard work to get this deal and I hope you will pass on my congratulations and thanks to the whole team.

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Yang en,

Mr Brian Wilson MP

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PART 1 OF 2

DTI FOR MACNAUGHTON, HIRST, BAKER, DAWSON, HARRISON, IRVING, GYSIN. CABINET OFFICER FOR BAKER.

FRAME ENERGY SUBJECT: ENERGY COUNCIL, BRUSSELS 25 OCTOBER

ENERGY LIBERALISATION

SUMMARY

- 1. Agreement to full electricity and gas market opening by 2007, including legal unbundling of distribution systems. Any derogation will need to be on the basis of Commission proposals subject to co-decision, following a Commission report. A big step forward on the Lisbon/Barcelona economic reform agenda.
- 2. Agreement on budget for intelligent energy programme of 190 million euros. Warnings of serious difficulties over the Commission's nuclear package.

DETAIL

- 3. Brian Wilson represented the UK.
- 4. A points agreed as in Doc 14287/02
- 5. The Presidency (Bentsen) presented its compromise package on electricity and gas market opening, noting that the Council had less than one month to take a final decision if it was to meet the deadline set at Barcelona. The key remaining issues were the date for full market opening, unbundling of network systems from generation and production in vertically integrated companies (legal unbundling), and public services obligations (PSO). They should be taken together as a single package, along with the

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Regulation on cross-border electricity sales.

- 6. The Commission (de Palacio) said the Council had to reach a decision today, including a firm date for full market opening, as well as a clear date for full legal unbundling. The Commission was willing to produce a review of the directives' effects but this should not be linked to the dates for either market opening or legal unbundling. The legal separation of distribution system operators (DSOs) and transmission system operators (TSOs) was a minimum requirement of a liberalised market, but legal unbundling did not require separate ownership of distribution and production. Existing contracts would not be retrospectively affected by the proposals.
- 7. Germany (Clement) agreed with the overall objective of the proposals, but felt that the means should be left to subsidiarity. It was important to recognise the different social, legal and industrial structures in each Member State. Germany remained to be convinced that legal unbundling of DSOs was the only approach to achieving the overall objective of establishing a single liberalised market. Member States should be allowed to retain measures that had an equivalent effect to legal unbundling. Germany could, however, agree to legal unbundling of TSOs. The priority should be a fixed date for full market opening. But they were open to finding an acceptable compromise.
- 8. France (Fontaine) sang a similar song. France fully accepted the principle of a single liberalised market, but they did not wish to see sudden change in this socially sensitive sector. A final date for full market opening was acceptable, subject to an interim review by the Commission. She did not object in principle to legal unbundling, but proponents of this approach needed to show that other solutions would not deliver the objectives of market transparency and access to networks. Under subsidiarity, the choice of means should be left to Member States. France also wanted to retain the Gas Transit Directive to give legal certainty for existing contracts and to guarantee gas supplies from Russia.
- 9. The UK agreed with the Commission's analysis and welcomed the commitment by France and Germany to an early decision. The test should be whether specific elements advanced or hindered the overall aims, about which there was no dispute. Liberalisation was uneven, with some Member States fully open while others were not, which created serious political difficulties. The key issue was legal unbundling: there was overwhelming evidence that it was essential to the development of a liberalised market, while there was little evidence that alternative approaches would work as effectively. Legal unbundling was an essential part of the final package, along with a firm date for full market opening.

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- 10. The UK view was shared by Finland, Portugal, Belgium, Sweden, Spain, Italy, the Netherlands, Austria and Denmark. Greece agreed that a fixed date and legal unbundling were key issues, but felt that a compromise solution, based on alternative approaches, ought to be possible. Luxembourg tended towards the German view.
- 11. Spain, Italy and the UK had difficulty in accepting negotiated access to gas storage except where there was clear competition. All Member States maintained their position on PSOs.
- 12. Discussion over lunch resulted in agreement to a compromise package (text available from Harrison, DTI) with the following main elements (in addition to those in the Presidency compromise, e.g. on PSOs).
- non-domestic market opening by 1 July 2004

- full market opening by 1 July 2007

- legal unbundling of distribution by 1 July at latest
- Commission report by 1 January 2006. This report will include consideration whether equivalent measures have in fact been as effective as legal unbundling in open markets. If not, the Commission may propose earlier implementation. Alternatively, if the report concludes that certain obligations (i.e. legal unbundling) are not proportionate, the Member State concerned may request an exemption. The Commission then has to adopt an Opinion and where appropriate make proposals to the Council and Parliament to amend the Directive.
- 13. The cross-border regulation was agreed provided as part of the overall compromise. The UK sought confirmation that existing infrastructure would not be affected. The Commission gave a clear assurance that it would make such a declaration.

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PART TWO OF TWO

DTI FOR MACNAUGHTON, HIRST, BAKER, DAWSON, HARRISON, IRVING, GYSIN. CABINET OFFICE FOR BAKER

SUBJECT: ENERGY COUNCIL, BRUSSELS 25 OCTOBER

ENERGY TENS

14. Revised criteria on support to projects under the Trans European Network programme were agreed without debate.

INTELLIGENT ENERGY FOR EUROPE

15. This proposal provides for a new 4-year programme of support for renewable energy and energy efficiency. The only issue remaining was the budget. The Presidency noted that the Parliament was asking for 255 meuro while some Member States wanted a much lower figure. The Commission's proposal of 215 meuro was a good compromise. The Commission said that this was the minimum needed. Germany, Austria, the Netherlands, and Sweden all wanted a figure in the range 150-160 meuro. France and the UK could not accept 215 meuro but were open to a reasonable compromise. Over lunch, agreement was reached on a compromise figure of 190 meuro. Germany and Austria dissented when this was finalised in the Council.

COGENERATION

16. This proposal seeks to harmonise support and market access conditions for combined heat and power. Most Member States supported the objectives, but to varying degrees found the 50 MW upper limit on support restrictive and counterproductive, and that the proposal involved bureaucratic and costly compliance burdens. Most offered to comment in detail in writing. The proposal will now be taken forward by the Greek Presidency.

FOLLOW-UP TO JOHANNESBURG

17. Presidency conclusions agreed without discussion.

NUCLEAR PACKAGE

18. The Commission made a presentation on its package of nuclear proposals, comprising directives on nuclear safety and waste

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management, together with a proposal for an agreement between Euratom and Russia covering trade in nuclear materials. De Palacio justified this largely on the grounds of enlargement and the need to reassure public opinion on safety and waste management. Germany, Austria, Belgium and Finland all expressed doubts about the Treaty base for the proposals, with Germany and Belgium stressing the political sensitivity. Finland observed that the Euratom Treaty did not provide the Community with competence on nuclear safety, and challenged the proposals as unrealistic. Ireland and Greece welcomed the package.

OTHER ITEMS

The Council noted without debate Commission progress reports on: -EU-Russia (together with adoption of conclusions)

-Energy Charter

-Northern Dimension.

GREEK PRESIDENCY

- 19. Greece gave a short presentation on the priorities of their Presidency. They will concentrate on four main areas:
- security of energy sources (energy Tens and the proposed oil and gas stocking directives)
- sustainable development strategy (cogeneration directive and follow-up to Johannesburg)
- co-operation with third countries (EU-Russia, energy charter, Euro-Med and North Eastern Europe). This would be a priority. continuation of work on nuclear package.

COMMENT

20. With Germany signalling flexibility on legal unbundling, France bowed as gracefully as possible to the firm pressure from a large majority of Member States and the Commission. The Commission's 2005 review will allow them to argue at home that full market opening and legal unbundling if DSOs is not inevitable, but the possibility that the Commission will propose derogation is purely theoretical-let alone the prospects that the Council and Parliament would ever adopt it.

Contact: Ian Holt +322 287 8253 Ian. Holt@fco.gov.uk

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Foreign & Commonwealth
Office

London SW1A 2AH

From the Parliamentary Under Secretary of State

29 November 2002

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The Rt Hon John Prescott MP Deputy Prime Minister 26 Whitehall London SW1A 2WH

Dear John,

As recommended at DA(N) on 9 October, I am now circulating a paper prepared in the FCO and with members of the Strategy Unit in the Cabinet Office, and cleared with the DTI, which sets out the wider aspects of international energy policy.

Entitled International Energy Strategy it reflects the increasing interdependence between domestic and international policy in the energy sector. It takes account of the priorities already recognised in the White Paper exercise attaching to global environmental targets, affordable energy supplies and energy security. It sets our future policy in the contexts of the EU and of global multilateral institutions, and at the bilateral level.

I hope it will give an indication how international energy policy can be taken forward in the future. It will have implications for the way the FCO and our overseas posts tackle energy issues while assisting the DTI and DEFRA to achieve their international policy objectives.

I am copying this letter to the Prime Minister, all members of DA(N) and Sir Andrew Turnbull.

Bill Rammell

Bill Rammell

Nobel House 17 Smith Square London SW1P 3JR

11/2002

020 7238 6465

Telephone 08459 335577 Email-secretaryofstate@defra.gsi.gov.uk Website www.defra.gov.uk

Brian Wilson Esq MP Minister of State for Energy and Construction Department of Trade and Industry 1 Victoria Street London SW1H OET



November 2002

From the Secretary of State The Rt Hon Margaret Beckett MP

Dear Bran.

ENERGY WHITE PAPER

Your letter dated 14 November 2002 requested views from DA(N) members on two papers, an Outline of the Energy White Paper and Energy Security. I am grateful for the opportunity to comment and agree that there is no need for substantive discussion of these papers at a DA(N) meeting. Whilst I am broadly content with both papers, I do have some comments on each.

In the Outline of the Energy White Paper, the 'objectives of energy policy' section rightly reflects the agreement we reached at DA(N) on 9th October that future policies for the energy system needed fully to reflect our overarching sustainable development goals. But the subsequent structure of the text may not achieve this; in particular, the 'policy context' section of the paper relates only to liberalised markets and the failures which exist within them, and would be better recast as an 'economic context' section.

I am concerned that environmental references in the Outline paper seem to be limited only to climate change and carbon reductions. Other environmental impacts, such as local air quality and nuclear waste, clearly need to be taken account of and will need to be fully brought out in the White Paper. I am also concerned that transport and its impacts appear to receive scant coverage in the Outline.

The paper on Energy Security raises a number of issues which could have implications for my Department's responsibilities, such as the impact of any capacity margin measures on CHP, and on which I will comment further when I see the first full draft of the White Paper itself. I look forward to receiving this soon.

I am copying this letter to the Prime Minister, members of DA(N) and to Sir Andrew Turnbull.

Regards

MARGARET BECKETT

per 26/11



Foreign & Commonwealth Office

London SW1A 2AH

From the Parliamentary Under Secretary of State

26 November 2002

The Rt Hon Brian Wilson MP Department of Trade and Industry 1 Victoria Street London SW1H OET

Dear Brian.

ENERGY WHITE PAPER

Thank you for your letter of 14 November enclosing DA(N) papers on the outline of the Energy White Paper and on energy security.

Energy – and particularly energy security – is a prime example of the increasing interdependence between foreign and domestic policy. So I was pleased to note that the outline of the Energy White Paper makes appropriate reference to bringing in the international aspects of the various elements of energy policy as they are developed. In addition, I was pleased to note that wider international energy issues such as promoting sustainable energy worldwide will also be brought into the paper.

Similarly, the energy security paper you enclose looks both at the domestic and international dimension. It takes a comprehensive look at the issues which will raise when we become more dependent on imported energy, and I am happy to agree to the recommendations on further work and on issues to be included in the White Paper.

As recommended at DA(N) on 9 October, I shall shortly be circulating a paper setting out the wider aspects of international energy policy and ways in which the UK's interests in this important field can be promoted bilaterally and through multilateral organisations.

I am copying this letter to the same distribution list as your letter, i.e. the Prime Minister, members of DA(N) and to Sir Andrew Turnbull.

Bill Rammell

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