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To: The Rt Hon David Cameron MP, Prime Minister

NUCLEAR POWER

- The first anniversary of the nuclear accident at Fukushima has drawn attention to the current policy of facilitating a large programme of new nuclear build in the England and Wales¹. It is now clear that the impacts on Japan were far more serious, longer lasting and more expensive than initially presented.
- This inevitably raises questions about the wisdom of continuing to rely on nuclear power for our own energy and climate security. Other G8 countries are confident that they can meet their energy and climate security needs with no, or a much reduced, reliance on nuclear power.² We must expect the strength of the UK's case for this policy to be tested more vigorously in coming months. This case is not as robust as you are being advised.
- There is a growing risk of policy failure. We are in danger of becoming over-dependent on decisions made in Paris for the delivery of our electricity decarbonisation strategy and thus our carbon budgets. Furthermore, there is a growing tension between the steps we may need to take to ensure investment by foreign- owned utilities and other key political imperatives, especially the need to exert downward pressure on energy bills.
- The Energy Bill is due for introduction into Parliament in May. This is a complex piece of legislation that will reform the electricity market. It will have significant implications for the future cost of electricity to British businesses and households. It will replace our current liberalised market with one that is much more heavily planned and regulated. It will be difficult to reconcile this with the UK's current commitment to deregulation.
- The primary objective of electricity market reform is to create sufficient confidence for investors to be willing to undertake new nuclear build. We can therefore expect this rationale to be subject to very intense scrutiny by Parliament, the media, business organisations and consumer and environmental bodies.

This paper sets out eight aspects of the political and economic risks inherent in our present course which may not have yet have been featured in the advice you have received from Ministers.

¹ The Scottish Government has made clear its intention not to permit new nuclear build in Scotland.

² Germany and Italy have decided not to use nuclear power. Japan will reduce its current use substantially and even France may reduce its use of nuclear if Hollande is elected.

1. The Current Economic Climate

- I. This is very risk averse. Doubts about the pace of recovery both nationally and elsewhere coupled with the need for banks to strengthen their balance sheets make any kind of high capital, long-life project more difficult to finance, let alone one with the capital intensity and inherent risk profile of nuclear with its exceptional policy dependence.
- II. It is doubtful that any of the current proposers, other than EDF, has the balance sheet strength to go ahead. They will wish to keep open the option, which costs relatively little, to see whether or not the UK government is prepared to accept enough of the financial risk to make their projects bankable. Until such time as they order the major reactor components, however, withdrawal is inexpensive so they will continue to talk up their projects. This should not be confused with commitment.
- III. Even EDF will not be able to finance new nuclear in Britain on its own balance sheet. It will need to create a special purpose vehicle which will be relying on at least an implicit guarantee from the French and/or UK governments to lower its cost of capital. If this is not forthcoming raising the £25 billion that will be needed for Hinkley and Sizewell will prove very difficult³. Indeed many independent commentators in the City are already deeply sceptical.

2. The 'No subsidies' Pledge

- I. The pledge to offer no subsidies for new nuclear is a key element in the Coalition agreement. Considerable ingenuity has subsequently gone into finding ways around this constraint. They have not been successful in convincing either Parliament or others that it is being kept. The Energy and Climate Committee has been explicit in describing the measures so far proposed to support new nuclear build as subsidies⁴.
- II. There has already been a complaint to the European Commission that this support is in breach of competition rules. Others may join this complaint when the full extent of its impact on energy costs becomes clearer during the passage of the Energy Bill. It may also be vulnerable on state aids grounds. Since the nuclear industry has itself admitted that no nuclear power station has ever been built without public subsidy it was always an implausible proposition that we would be able to do so.
- III. It cannot be ruled out that the Opposition will take advantage of this lack of credibility as a wedge issue to attract disaffected Liberal-Democrats since it plays into the broader 'broken promises' narrative that has already taken some hold on public opinion. This temptation will become greater if, as seems inevitable, the major engineering contracts do not go to British firms.

3. Centrica

- I. Centrica has an option to take 20% of the proposed EDF new build at Hinkley and Sizewell. This has provided useful political cover against the accusation that British taxpayers and consumers are being compelled to subsidise a French state-owned industry. Centrica currently has market capital of some £15 billion. Their share of a

³ There have been a number of recent reports by Citigroup, Rothschilds and others doubting that new nuclear can be financed in Britain.

⁴ These include the carbon support price, the cap on back-end liabilities, third party liability cover, revenue guarantees under emr.

joint venture with EDF would amount to at least £5 billion, assuming the reactors were built on time and to budget.

- II. This would be a very large risk to carry on Centrica's balance sheet. There have been several indications recently that Centrica's shareholders are questioning the wisdom of this commitment. Were Centrica not to take up their option it would undermine confidence in the government's nuclear strategy both here and in France.
- III. It is unlikely that Centrica would make any such decision until forced to by EDF ordering the major reactor components for Hinkley and Sizewell.⁵ This is currently due at the end of this year but has already been postponed twice. There is a clear and growing risk, however, that they would withdraw **after** we had made politically and economically expensive commitments to secure EDF's investment.

4. EDF

- I. EDF is 85% owned by the French state. It has been the most committed supporter of new nuclear build in Britain. Its project is the most advanced and preparatory site clearance will begin shortly at Hinkley. However, until they order the major reactor components there is no guarantee that they will actually proceed to construction since the financial penalties of withdrawal would be small.
- II. They intend to construct 4 Areva designed European Pressurised Reactors (EPRs) at Hinkley and Sizewell. The original French purpose in promoting new nuclear build in Britain was as a launch pad for the EPR into expanding global markets. However, the experience with constructing two EPRs in Finland and France has been woeful. Both are four years late already and cost nearly twice as much as projected.
- III. This is consistent with their experience since 1990. The four reactors completed since then took an average of 14 years to construct and 17.5 years after construction began to deliver electricity to the grid. Thus a reactor begun here next year might more realistically be expected to begin delivering electricity to the grid in 2030 and suggests there is little likelihood of the technology learning on which DECC's very optimistic cost assumptions are based.
- IV. The experience with the EPR led François Rousseley, the former head of EDF, to recommend to that the EPR be abandoned. This advice was endorsed by a recent report from the French National Audit Office which also found the EPR to be too complex and expensive.
- V. This will intensify EDF's desire to transfer most of the construction risk for British EPRs to British taxpayers and consumers. Should they not be able to secure a high enough level of comfort on this issue they may very well not be allowed to proceed by the French Government now that the prospect of a developing market for EPRs has effectively disappeared.
- VI. Two other factors increase this risk. As a result of Fukushima the French nuclear safety agency has mandated an expensive work programme on EDF's current reactor fleet. Furthermore, EDF has recently gained regulatory approval for a life extension programme for its reactors in France. This will lead to a prolonged capital intensive work programme competing for space on EDFs capital budget with investment in Britain.

⁵ The possible cost advantages of serial ordering create an incentive to decide on both Hinkley and Sizewell simultaneously. Conversely, a decision to separate the decisions would be interpreted as a lack of confidence in the stability of government policy.

- VII. The outcome of the French election will also bear on EDFs willingness to proceed. The re-election of President Sarkozy is unlikely to alter this significantly. The election of Francois Hollande, especially if he wins with Green support, would however create a much less favourable climate of opinion for new nuclear build in Britain.
- VIII. Since much of the benefit of building EPRs in Britain would accrue to Areva rather than EDF, and relations between the two companies remain strained, there is some reason to believe that the election of Hollande would lead to a re-ordering of priorities with EDF. This factor would be strengthened if the French government came to believe that Centrica would not take up their option to participate.

5. The Double Bind

- I. It is an uncomfortable feature of our nuclear power strategy that it is wholly dependent on decisions by the French Government. This faces us with an awkward double bind. On the one hand there is a political imperative to exert downward pressure on energy bills to address competitiveness and fuel poverty concerns. On the other hand, delivering on our high profile commitment to new nuclear build will require British consumers to accept sufficient risk to ensure favourable decisions in Paris.
- II. Should the French decide not to proceed we would be faced with a humiliating reversal of a high profile policy which you would want to avoid. This is an invitation to EDF to bargain very aggressively for an agreement that transfers the greater proportion of the financial risk of new nuclear to British taxpayers and consumers. They will feel they have us over a barrel.
- III. This negotiation will take place under intense scrutiny as the Energy Bill will be our principal policy mechanism for granting the necessary assurances. There will be concern in HMT to limit the upward pressure on energy bills for broader economic reasons. It will be shared by the consumer organisations. To this must be added the anxiety in the customer-facing energy suppliers who are already unpopular and distrusted by their customers. Those who do not themselves have nuclear generated electricity will be reluctant to accept the blame for rising energy bills caused by the need to transfer the much of the risk of new nuclear build from EDF.
- IV. Responsibility for managing the complex and difficult negotiations to avoid being trapped by the double bind will fall to officials in DECC. It will take place in the context of a growing realisation that HMG's experience with PFI does not inspire confidence that Whitehall has mastered the skills of risk sharing bargains on capital projects. Caught between the immediate negative impact of EDF refusing to invest and the delayed consequences of securing the investment at any price there will be a great temptation among officials to accept the best deal they can get, whatever it costs.

6. Electricity Market Reform(EMR)

- I. These tensions are intensified by electricity market reform. This will restore a strong measure of central planning to the operation of the electricity market. This is justified on the grounds that this is necessary in order to provide the certainty needed to secure the necessary flows of private capital to meet our energy and climate security goals.

- II. This is a highly complex piece of legislation many details of which have yet to be fully worked out. This, too, has become a source of uncertainty for investors. Its central measure is intended to reduce revenue risk. It will do this by the use of so called CfD/FiTs.⁶ These are likely to take the form of a regulation that will set a strike price for electricity generated by each source. It will then require the sellers of electricity to make up the difference between the market price and the strike price from their customers.
- III. This will require some public body, likely to be DECC itself, to specify how much electricity it wants from each generation source over given periods⁷ of time, presumably under guidance from both the government and National Grid. This represents a very big shift away from our current liberalised market. There are obvious difficulties flowing from the role of government becoming, in effect, a dominant procurer of electricity trying both to drive down bills and to ensure security of supply.
- IV. There could be a significant loss of transparency, fear of unwarranted political interference in the operation of the market and reduction of competition. The continued role of DECC in shaping the electricity market is likely to be of particular concern in Brussels.
- V. The level of assurance required by EDF to secure nuclear investment, which will require CfD/FiTs with a very long life for very large amounts of electricity potentially introducing considerable rigidity in the generation mix, will inevitably suppress innovation.
- VI. There is a growing risk that EMR will be widely seen simply as a device for driving up energy prices in order to subsidise nuclear and off-shore wind. It is true that the current policy proposal does make provision for incentivising demand response and demand reduction measures that would help drive down bills. However, these measures are not as well developed as the supply side measures and are not likely to be introduced until later.
- VII. This seems to be at odds with the current imperative to drive down electricity bills. It will be seen by some as perverse in the light of the recent announcement by Centrica and others of mothballing of gas fired generation owing to lack of demand. There are clear presentational difficulties in arguing for putting electricity prices up in order to finance new generation at a time when we are closing down generating sets.

7. Fukushima

- I. As more information about what actually happened in Japan and about the scale and cost of the consequences becomes available distrust both of the industry and governments on nuclear issues has increased. There will be renewed attention to issues such as radioactive waste disposal and emergency response planning around nuclear sites where the industry has been unconvincing in its efforts to build public confidence.
- II. In particular, Fukushima has already focussed attention on the issue of liability for the consequences of a high-category nuclear accident. This has already been raised in the context of nuclear subsidies as the industry has been relieved of responsibility of all but a small fraction of the likely cost. It is argued that this represents an unfair

⁶ This stands for 'contracts for difference/feed in tariffs'

⁷ This is likely to be as long as 30 years for nuclear

advantage against other generators who have to bear the full cost of their third party liability.

- III. Be that as it may, the issue that may well arise is 'Who will pay?' in the event of an accident. If recent proposals by DECC are agreed then the industry and HMG between them will assume responsibility for some £1.6 billion of potential liabilities. In the light of the cost to Japan of a Category 7 accident being of the order of \$300 billion according to some published estimates, this will not be seen as adequate. There will be little confidence in the willingness or ability of HMT to make up the difference

8. Acts of Faith

- I. Our current policy is based on two beliefs: that nuclear is necessary to meet an expected shortfall in generation capacity by the middle of this decade and that nuclear represent the cheapest way to decarbonise our electricity system. Neither of these beliefs can be substantiated.
- II. It has now become clear that, even on optimistic assumptions, no new nuclear electricity is likely to be generated in the current decade. Furthermore, demand has fallen as has the long run outlook for gas prices reducing anxiety about security of gas supply. This has led to Centrica mothballing a number of gas powered generators at a time when there are some 30GW of new generating capacity planned or under construction. EDF has also announced life extension for its current AGR fleet that will keep much of it operating well into the next decade.
- III. The evidence for the belief that nuclear is the cheapest option for decarbonising our electricity supply is thin. Efforts to assess the relative cost to consumers of different forms of generation are notoriously difficult and depend disproportionately on assumptions about the capital costs and costs of capital⁸. Nuclear generation costs are particularly difficult to assess because of the capital intensity and long construction period for nuclear projects. It is already clear that DECC's assumptions both of capital cost and of the cost of capital for new nuclear build are unrealistically optimistic.

Conclusion

- I. The path to nuclear new build in Britain will be much harder and more expensive than the government has yet recognised. It is vulnerable to the argument that the costs are concrete, immediate and come at a very difficult time for the British households and businesses that will have to bear them whereas the potential benefits are intangible, remote and most of them will flow to France. It will be hard to explain why we are buying a reactor type that France itself is abandoning. Nor is there a plausible, let alone compelling, case that this is necessary for security of supply⁹.
- II. Furthermore, there is a growing risk of policy failure due to the decisions of others and constraints on our ability to meet investor expectations. The biggest risk is that EDF will prevaricate, continuing to delay its investment decision while repeating its

⁸ The California Energy Commission published a multi-year analysis in 2010 of the levelised cost of a large suite of electricity generation technologies and came to the conclusion that the level of uncertainty was too high to make firm conclusions.

⁹ There have been a number of recent announcements about gas stations being mothballed because there was insufficient demand to run them economically.

promises in order to negotiate a more favourable shift of risk to us. Meanwhile we would be deterred from moving ahead more aggressively on our efforts to reduce electricity demand and other measures to drive down electricity bills.

- III. It is likely that the price of securing a decision to proceed by EDF, with or without Centrica, will require acceptance of terms that amount to a cost-plus contract. Given the level of scrutiny that we can expect this will be difficult to disguise. In the light of Areva's current and prior track record this will also be difficult to defend to British homeowners and businesses who will face the prospect of continually rising bills.
- IV. It has always been the Government's position that the decision whether or not to build new nuclear power stations was one for companies, not the government. The Government should publicly set an explicit cap on the price it is prepared to make homeowners and businesses pay for nuclear electricity. If this is too low for EDF to proceed, that is their decision. Without such an explicit red-line we run the risk of being held to ransom by EDF and the French government and boxed into a position of having to pay whatever they ask.

Viable options to meet our energy and climate security goals are available at much lower political and economic risk. You should now ask DECC to develop an exit strategy from our current policy. It should prioritise the energy efficiency, demand response management and demand reduction that would help drive electricity bills down. It should accelerate the deployment of carbon capture and storage to allow for decarbonised gas to provide the balancing power needed to maximise our ability to use the increasingly cheap renewables.



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Cc: In view of the wide public interest in this issue and its implications across government we are copying this note to:

- The Rt Hon Nick Clegg MP, Deputy Prime Minister
- The Rt Hon George Osborne MP, Chancellor of the Exchequer
- The Rt Hon Edward Davey MP, Secretary of State for Energy and Climate Change
- The Rt Hon Vince Cable MP, Secretary of State for Business, Innovation and Skills
- Sir Jeremy Heywood, Cabinet Secretary
- the media.