

Sr. Joaquín Almunia  
Vice-President  
European Commission  
Directorate for State Aid  
B-1049 Brussels  
Belgium

4 April 2014

Dear Commissioner Almunia,

**State aid SA 34947 (2013/C) – UK Investment Contract for Hinkley Point C New Nuclear Power Station**

The World Nuclear Association is responding to the consultation exercise initiated by the European Commission in connection with its competition investigation into the proposals made by the UK Government to facilitate investment into nuclear power through its Electricity Market Reform (EMR). We have prepared the attached paper and I would like to emphasize the following:

- The UK's EMR and, in particular, the Contract for Difference (CfD) intended for Hinkley Point C are an important innovation in promoting a sustainable market-oriented electricity system that embeds a transition to low-carbon energy in a way that is technologically neutral. They have international significance.
- The facilitation of nuclear power is a common objective of the European Union according to the Euratom Treaty.
- The CfD addresses a market failure – potential investment in low-carbon technologies is not commercially viable at prevailing energy prices, with developers unable to secure a forward power purchase agreement. As the CfD measure is available to a range of low-carbon technologies and in the context of the UK's deregulated electricity market, there is little risk that HPC or other nuclear plant will 'crowd out' renewable energy sources. There will be a more 'level playing field'.
- The CfD is an appropriate, proportionate and non-distortive measure to remedy a clear market failure in the context of a deregulated electricity market.
- Affordable, reliable, low-carbon energy from nuclear supports industry, employment and exports.
- Nuclear power has comparable advantages to renewable energy sources in terms of its potential impacts on human health and the natural environment. Soundly-based and appropriate regulation already addresses the several mistaken objections often raised against nuclear energy.

Yours sincerely,



Agneta Rising  
Director General

## **Response by the World Nuclear Association to the Public Consultation initiated by the European Commission in connection with State aid SA 34947 (2013/C) concerning Hinkley Point C (UK)**

### **1. The World Nuclear Association**

1.1 The World Nuclear Association (WNA) is an international business association that supports the global nuclear industry, its people, technology and enterprises. WNA members include the full range of enterprises involved in producing nuclear power – from uranium miners to equipment suppliers and generators of electricity. With a secretariat headquartered in London, the WNA serves as a global forum for industry experts and an authoritative information resource on nuclear energy. It works to build worldwide understanding of the economic and environmental merits of nuclear power and to coordinate industry cooperation to strengthen human, organizational and technical capabilities. Amongst its activities, the WNA operates the World Nuclear News service and the World Nuclear University. WNA strongly supports the peaceful use of nuclear energy which contributes to a low-carbon society, affordability and security of energy supplies; which is also a central objective of the Euratom Treaty.

1.2 Among its 180 member, 55 are companies based in the European Union; other members, including reactor technology vendors and equipment and service suppliers are investing in the European energy sector or have firm intentions to do so. EDF and its technology partner AREVA are prominent members of the WNA. WNA's membership also embraces banks, insurers, shippers and professional and legal services. It should be noted that although the WNA's remit is to promote nuclear energy, many of its members are active in other forms of electricity generation, including renewable energy technologies.

1.3 This document reflects the views of industry experts. It has been prepared in consultation with WNA member companies but does not necessarily represent the policies of any or all of the WNA's individual member organizations.

### **2. International significance of the Hinkley Point C State aid investigation**

2.1 The WNA recognizes the international significance of the European Commission's investigation into the UK Government's proposed measures to support the intended investment by NNB Generation at Hinkley Point, Somerset, UK, of a nuclear power plant incorporating the EPR reactor technology. The government support measures envisaged in the UK represent an important innovation that is designed to embed the transition to a low-carbon energy system and provide security of electricity supply to customers at prices determined in a deregulated energy market.

2.2 If these measures – known as Electricity Market Reform – prove to be a success, other countries may well adopt similar arrangements, not only in Europe but elsewhere in the world.

2.3 At this point, the international community has not reached agreement on the Energy Services chapter of the General Agreement on Trade in Services (GATS). The example of the European single market for gas and electricity will undoubtedly influence the shape of international talks on energy market regulation in the future.

2.4 The UK's Electricity Market Reform (EMR) was initiated by a Labour administration to address identified shortcomings in the workings of the country's deregulated and private-sector driven

energy market and this work has been continued by the coalition government of Conservatives and Liberal Democrats following the 2010 general election. The set of measures proposed by the UK Government have cross-party support, representing 88 percent of votes cast by citizens. They also enjoy the backing of UK businesses and their design was the subject of lengthy and intensive public consultation. The Energy Act became law in December 2013 and granted powers to the UK Secretary of State for Energy and Climate Change to set a de-carbonization target for the electricity sector and to undertake a number of market interventions.

2.5 A key feature of the measures is the Contract for Difference (CfD), which is a mechanism to provide investor certainty in a deregulated energy market. The merits of the CfD mechanism include the following:

- It incentivizes investment in low-carbon generation that leaves much of the risk of the investment with the investor and does not transfer any of this risk to the tax-payer;
- It provides a route to market on bankable terms for merchant low-carbon generation plants, including nuclear power and renewable energy sources;
- It offers greater comfort to private investors as it is a legally enforceable contract providing an avenue to obtain redress and compensation in the event of policy change by government.

It is important to note that a generator still has to sell the power into the market in the normal way. The CfD only comes into play if the power generator makes a sale; there is no state-guaranteed price for the power generated, as is the case with a statutory Feed-in tariff. The CfD is a bet between the generator (the punter) and its counterparty (a special government-sponsored enterprise) on the outcome of the competition to sell power into the electricity market. If the outcome is a market price (the 'reference price') higher than the bet (the 'strike price') then the generator compensates the counterparty; if the market price turns out to be lower than the 'strike price', then the counterparty compensates the generator. The UK Government has stated that the reference price for a nuclear power plant will be a measure of the market price in the season-ahead market, or, if conditions allow, the year-ahead market for electricity.<sup>1</sup> The CfD does not 'reimburse' the generator; rather, it resembles a hedging operation in the absence of a futures contract for a commodity.

2.6 The UK Government has designed the CfD mechanism to attract a range of low-carbon generation technologies. It is a technologically neutral measure to facilitate investment into cost-effective low-carbon generation. Although there is a degree of consistency in terms of the indicative 'strike price' set for each type of eligible technology, the differences between technologies in terms of their economics and maturity of development mean that a uniform strike price for all forms of low-carbon generation is not possible without running the risk of disproportionality.<sup>2</sup>

2.7 The enforceability of the CfD through the courts is an important advantage in the absence of sufficient policy certainty for a major capital investment in a long life asset. The European Commission has included investor-to-state dispute settlement provisions in Comprehensive Economic and Trade Agreement with Canada and proposes to do so as part of the forthcoming negotiations for a Trans-Atlantic Trade and Investment Partnership. This provision would require the fair and equitable treatment of foreign investors by those parties acceding to the treaty. Such

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<sup>1</sup> UK Department of Energy and Climate Change, 2013, *Electricity Market Reform: Delivering UK investment*, Cm 8674, Appendix B, p. 15.

<sup>2</sup> The setting of a single 'strike price' – or a narrow range for the 'strike price' – through a public auction would be challenging in practice and lead to a position where too many eggs are placed in the same basket.

provisions are welcomed by the private sector and should prove helpful in creating a stable and predictable policy and regulatory environment. However, at this stage, such provisions are not generally available to EU-based investors operating within the single market.

This context is relevant to the CfD measure as it may be argued that a carbon tax might achieve the same purpose in de-carbonizing the energy system. From the private sector perspective a fiscal measure would not provide the same level of assurance – in the absence of a clear and robust investor-to-state dispute settlement mechanism for the single European market. The case of Australia is pertinent. There the Labor government established a carbon pricing scheme in 2012 but it is the intention of the incoming Liberal-led coalition government to remove this at the earliest opportunity and implement a major review of the renewable energy target scheme.<sup>3</sup>

2.8 A major merit of the CfD lies in the enhanced legal certainty it provides to an investor against political risk. The political controversy that surrounds nuclear energy – much of it mistaken – together with the contentious nature of debates over taxation and climate change mean that the CfD is an appropriate intervention instrument for government in a deregulated energy market.

### **3. Compatibility with EU common objectives**

3.1 The UK's Electricity Market Reform and the fostering of nuclear power in particular are demonstrably compatible with the common objectives of the European Union. (We submit evidence on this point at Annex A.) The EU seeks to create a low-carbon economy that ensures competitive and affordable energy to all consumers and which provides greater security of energy supplies and reduces the import dependency of the Union as a whole.<sup>4</sup> Without state intervention the electricity market would be dominated by thermal power plants burning fossil fuels, with coal supplying much of the base load and gas performing a load-following role. World prices for coal and gas are set rather differently but in both cases prices vary markedly across regions.<sup>5</sup> Coal prices have generally fallen since the start of the current financial crisis. European gas prices have fallen similarly, though not to the same extent as in North America, and separate gas markets exist for the continental market and for that in Great Britain, where there is more intensive competition between fuels. Although there is no certainty as to the trajectory of fossil fuel prices it is clear from investor behaviour that there would be little investment in new renewable energy sources or nuclear power in the absence of state intervention.

3.2 In the case of nuclear, the only nuclear power plants being constructed at this time are in regulated energy markets (with Finland being a special case, as explained below). A report by the Tyndall Centre for Climate Change Research at the University of Manchester concluded “nuclear plants have never been financed in a liberalised electricity market such as that currently in place in the UK. This explains why the government has proposed the negotiation of long-term contracts for difference with developers of nuclear and other capital-intensive low carbon technologies.”<sup>6</sup>

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<sup>3</sup> Disquiet has also been voiced in Spain where the government led by the Popular Party is dismantling the system of feed-in tariffs from solar power supplied to the national grid and plans to tax solar power generators, with widespread financial distress for the investors.

<sup>4</sup> European Commission, *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on a Policy Framework for Climate and Energy in the period from 2020 to 2030*, COM (2014) 15 final, Brussels, p. 3.

<sup>5</sup> International Energy Agency, *World Energy Outlook 2013*, Paris, pp. 45-47.

<sup>6</sup> Tyndall Centre for Climate Change Research, 2013, *A review of research relevant to new build nuclear power plants in the UK*, University of Manchester, p. 39.

3.3 Secondly, while it is regrettable that the European Commission was not able to include nuclear power among the technologies available to secure de-carbonisation in the draft Guidelines on Environmental and Energy Aid 2014-2020, this omission should not preclude nuclear energy from forming part of a Member State's energy mix on similar terms to those made available for renewable energy sources and energy saving measures.

3.4 Thirdly, although it may be tempting to second guess the UK Government's indicative energy strategy, such an assessment does not appear appropriate as part of a competition investigation. As the Commission's letter of 18 December 2013 to the UK Government acknowledges (paragraph 266), the Euratom Treaty provides a sound basis for aid measures aimed at promoting nuclear energy as an objective of common interest.

Commissioner Almunia goes on to make an important point:

“Especially in the context of liberalised and increasingly competitive markets, the role of State aid control is increasingly important in EU electricity markets. The commitment of the European Union to promote investment into nuclear must be carried out in ways that do not distort competition. The question therefore needs to be asked, whether there is a market failure in electricity in respect of the planned measure” (paragraph 267).

3.5 Issues pertaining to the safety of nuclear power plants, their decommissioning, the reprocessing and disposal of used fuel and radioactive waste, or the terms under which plants are insured and safeguarded are the subject of other regulatory mechanisms. Furthermore, the fact that alternative State aid mechanisms can be envisaged is beside the point.

For example, many elected representatives, commentators and experts agree that the introduction of a carbon tax would be an economically efficient means to effect de-carbonization.<sup>7</sup> It would also most certainly be preferable for the Emissions Trading Scheme (ETS) to be providing a carbon price that in practice sets the European economy firmly on a path to de-carbonization. But regulators and market actors have to deal with the world as it actually is and this means taking account of market structure and institutional factors. To illustrate this point, it may be recalled that the UK and Ireland have retained the custom of driving vehicles on the left-hand side of the road. The costs of continuing this practice for the European single market are non-trivial but as it has shaped the spatial organization of the two countries it would be expensive and unpopular to change it. The UK Government has prepared a set of measures that it considers, following public consultation, to be appropriate to its circumstances in meeting the common EU objectives in energy and environmental policy. Driving to the left is simply a different institutional arrangement to arrive at the same destination as its alternative (driving to the right). The same is true of the UK's package for Electricity Market Reform: it achieves the EU's common objectives for energy and environment in a different and innovative and technologically neutral way that is adapted for a deregulated energy market.

3.6 For these reasons the European Commission, in making its assessment as to the compatibility of the UK's proposed measures with EU law, should consider examining the measures in the context of the UK's deregulated energy market and any relevant institutional arrangements.

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<sup>7</sup> See, for instance, *The Economist* leader article of 5 December 2009: Stopping climate change – rich and poor countries must focus on setting a carbon price, p. 11; the *Financial Times* leader article of 3 November 2009: The deal we need from Copenhagen, p. 12; and Martin Wolf, Climate sceptics have already won, *Financial Times*, 22 May 2013.

#### 4. Evidence specific to the Hinkley Point C case

4.1 The European Commission has made a number of points in its letter of 18 December (C(2013) 9073 final) and requested evidence on certain aspects.

##### Services of General Economic Interest

4.2 The UK Government has made a case for assessing its proposed measures in the light of the criteria applied to Services of General Economic Interest. This makes sense in view of the fact that electricity supply is essential to a modern society.

4.3 The Commission suggests however that the tests applicable to State aid in respect of Services of General Economic Interest (SGEI) do not apply to the CfD mechanism as there is no reciprocal Public Service Obligation (PSO), which the operator is compelled to undertake. The Commission states that the Investment Contract fails to entrust an operator with “a particular task” which the operator would not otherwise undertake considering its own economic interest (paragraph 103) and therefore doubts that “the notified measure qualifies as a genuine SGEI” (paragraph 200). Commissioner Almunia’s letter suggests that the services in question (electricity supply) are already provided satisfactorily under normal market conditions (paragraph 201). In other words, the letter implies, there is no market failure to rectify.

4.4 WNA makes four points here:

- i. Electricity supply is normally considered to be a service and is essential in a modern economy. It is nonetheless an unusual commodity in that it is produced and consumed at the same instant. Options for electricity pumped or battery storage exist but the physical losses of energy involved have meant that economic operators have preferred to generate power at the time it is actually required by customers (that is, the costs of storage are usually prohibitive). A margin of reserve capacity is needed to cope with variability of electricity demand.
- ii. In the UK’s unbundled electricity supply sector, the Public Service Obligation takes the form of a universal supply obligation, whereby a retailer of electricity cannot refuse to supply a solvent customer. The obligation does not fall upon the generator so another means must be found to ensure that adequate investment in power generation is made. A vertically integrated industry does not face the same incentive issue as an unbundled nexus of enterprises. The UK Government has identified this as a market failure and proposes to establish a Capacity Market to provide the appropriate signals to generators.<sup>8</sup> However, the Capacity Market is not designed specifically to incentivize investment in low-carbon energy technologies and this is the role to be played by the CfD.
- iii. WNA has no doubt that the capitalist market system is capable of supplying electricity on a commercial basis but at prevailing prices the power will be generated from burning fossil fuels and this imposes an external cost upon society. Thus, another ‘market failure’ arises from the fact that thermal power plant operators have not internalized the costs to the planet’s atmosphere and oceans of CO<sub>2</sub> and other greenhouse gas emissions, or of the

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<sup>8</sup> By definition a capacity market is a market-based measure and is therefore unlikely – unless its operation is rigged in some way – to distort competition.

health impacts from the combustion of fossil fuels. (Nuclear power has internalized such costs, notably for decommissioning and responsible waste disposal.)

- iv. Renewable energy sources have been identified by the EU institutions as a “no regret” option for de-carbonization. However, they are not without their own impacts and external costs to the economy and society. The increasing penetration of these technologies has disturbed electricity markets and threatens to eliminate stable base-load generation due to the intermittency of certain of these sources.<sup>9</sup> State aid for intermittent renewable energy sources and their priority in the merit order have the perverse effect of dumping power onto the system at regulated prices (through a feed-in tariff) when the sun shines or the wind blows. This displaces base-load generation from other sources (including conventional, biomass and nuclear). As electricity demand rises or when the sun is not shining and the wind is not blowing, back-up generators (for instance, gas-fired) step in to load-follow. The electricity system can mitigate these effects by restructuring the transmission lines, constructing pumped storage (or, potentially, advanced electricity storage capacity) and by introducing smart grid technology. But the external costs created from the use of intermittent renewable energy sources are not normally internalized into their price. In other words, renewables may also be a source of ‘market failure’.

To avoid these problems the UK Government proposes a technologically neutral framework to support low-carbon generation with the CfD made available for biomass, wind, solar and for fossil fuels with carbon capture and storage in addition to nuclear power.

4.5 There are clear cases of market failure arising from the combustion of fossil fuels (the externalities of health damage and the greenhouse gas effect) and from well-intentioned policy intervention to promote renewable energy sources which a technologically neutral approach would avoid.

#### **Existence of market failure in relation to nuclear power**

4.6 The Commission also notes that nuclear power plants are under construction in Finland and France without State aid (paragraph 337).

4.7 WNA finds the examples cited by the Commission unconvincing:

- i. The nuclear power plants being built in Finland and France were initiated in energy markets that differ materially from that existing in the UK (or potentially in other Member States where markets are being deregulated).
  - a. In Finland, which like the UK is a deregulated market, the project risk is shared between the generator and the electricity customers under the Mankala cost-price model. In this institutional arrangement, major electricity customers (industrial and municipal) are shareholders in the generating company. The generating company sells the power and heat to its shareholders at cost. It is a type of joint venture with the power purchase agreement written into the generating company’s articles of association. The existing assets of a Mankala-type company support any debt taken on to finance a new power plant (or other type of asset, such as housing) and the

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<sup>9</sup> Nuclear Energy Agency, 2012, *Nuclear Energy and Renewables: System effects in low-carbon electricity systems*, NEA Report No 7056, Paris.

Nordea Bank claims that the model is “inherently bankable”. No Mankala company has ever defaulted.<sup>10</sup>

b. In France, the decision to build Flamanville 3 nuclear power plant was taken prior to the enactment of the NOME Law of 2011 to decontrol the electricity system.<sup>11</sup> Even today, the wholesale electricity price from nuclear generation is regulated by the energy regulator CRE through the ARENH mechanism (Accès Régulé à l'Électricité Nucléaire Historique) and small consumers, such as households, have a choice to contract for power at regulated prices in the retail market. The ARENH tariff aims to cover EDF's production costs during the nuclear plants' operational life (with a potential 10-year extension of the amortization period) and to offer end-consumers the advantages of a low cost electricity whatever their supplier. The effect of these measures is to reduce price volatility in the electricity market. Full liberalization of electricity tariffs is to be effected by 2016 but the ARENH mechanism will be maintained until 2025.

ii. Without state intervention the UK's deregulated electricity market is not able to build low-carbon generation plants. If nuclear and renewable energy sources, or fossil-fuelled thermal plants with carbon capture and storage, could generate electricity more cheaply than conventional thermal combustion then generators would already have switched over to them. A commercial power generator will always aim to choose the cheapest technology and fuel in a market economy.

4.8 The examples of France and Finland do not show that a nuclear power plant is a bankable project in a deregulated electricity market.

### Choice of instrument

4.9 The Commission has questioned the appropriateness of the CfD as a measure. It puts forward a suggestion that a Feed-in premium might be a more “market friendly” instrument than the CfD (paragraphs 328 and 406 (iii)).

4.10 WNA has considered these arguments and responds as follows:

i. It is standard commercial practice for a developer to establish a special purpose entity to build and operate an infrastructure asset. NNB Generation, Horizon and NuGen are such entities. The investors behind them are major companies: two French-based utilities, EDF and GDF Suez, and the well-known Japanese manufacturers, Hitachi and Toshiba. But until the asset is constructed, in these cases a nuclear power plant, NNB Generation, Horizon and NuGen have nothing to sell.<sup>12</sup> Without a forward power purchase agreement their projects are not bankable. A power purchase agreement would be possible if the plants were to be

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<sup>10</sup> See <<http://www.ben.ee/public/Tuumakonverentsi%20ettekanded%202009/Peter%20S.%20Treialt%20-%20Mankala%20principles.pdf>> retrieved on 20/02/2014. Debt is kept low as a result of the customers' equity in the generating company and the arrangement has enabled Finland to invest in a range of low-carbon energy technologies.

<sup>11</sup> Nouvelle Organisation du Marché de l'Electricité.

<sup>12</sup> The companies purchased the land and certain associated development permits that enable them to build a nuclear power plant at the sites concerned.

gas-fired, but at prevailing market prices for electricity the project developers cannot provide a robust business case sufficient to repay any finance or equity investment.

- ii. The UK Government has chosen the CfD as an instrument of market intervention because it is appropriate to a deregulated electricity market where merchant generating plants sell into the market. The CfD is a substitute for the 'missing' forward power purchase agreement, thereby enabling the investors' special purpose entity to raise the necessary finance on commercial terms.
- iii. In this context it may also be noted that the financial crisis has reduced investment activity in the UK – and elsewhere – and the UK Government has therefore introduced a loan guarantee scheme to help developers of infrastructure projects to raise capital. NNB Generation intends to make use of the loan guarantee scheme.
- iv. As already mentioned the CfD is, in addition, a form of intervention that carries a lower political risk, as compared to a fiscal measure.
- v. Lastly, an alternative instrument, such as a feed-in tariff, may not be as fit-for-purpose in the UK's situation. Feed-in tariffs have been used in several European countries as a means to promote investment in renewable energy sources. They may be attractive in the context of an energy strategy that seeks to maximize the use of such technologies and build a more decentralized system of electricity supply, but this, in turn, creates wider problems for society.

Some advocates of a decentralized energy system have an explicit goal to establish an economy managed exclusively by small organizations (family firms and cooperatives), whose failure will only cause local damage and minimal harm.<sup>13</sup> They argue that this transformation will make society more resilient against disasters and could generate large numbers of 'green jobs'.<sup>14</sup> The claims made for the creation of 'green jobs' in the energy sector are overstated, however, and rest largely upon the take-up of biomass and biofuels, which might come at the expense of forest conservation and the livelihoods of existing traditional agricultural and forest communities.<sup>15</sup>

Nor do such perspectives take account of maintaining reliable public transport, commerce and industry. Neither do they acknowledge that around half of peak demand for electricity is required as 24/7 continuous supply. They probably imply a transformation not just of the energy system but of production and consumption as a whole. Campaigners favoring a low consumption lifestyle and distributed small-scale production perhaps correctly criticize the consumer society for its wastefulness and pollution. But their efforts do not end with the advocacy of targeted measures to improve efficiency and to make polluters pay. From this frugal living perspective, nuclear power – and some other major industries – stands in the way of bringing about the general decentralization of production and consumption.

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<sup>13</sup> Charles B Perrow, 1984 and 1999, *Normal accidents: Living with high risk technologies*, Princeton NJ: Princeton University Press; and Charles B Perrow, 2011, Fukushima and the inevitability of accidents, *Bulletin of the Atomic Scientists*, 67/44.

<sup>14</sup> Ian Lowe, 2010, Nuclear power: yes or no?, *Physics World*, 23/10, October: p.24; Jeremy Rifkin, 2012, The future is lateral, *Green Futures*, January, pp. 26-27.

<sup>15</sup> UNEP, ILO, IOE and ITUC, 2008, *Green Jobs: Towards decent work in a sustainable, low-carbon world*, Nairobi: UN Environment Programme, pp. 126-128.

4.11 It is not the place of WNA to argue in favour of centralized or decentralized energy supply since these are political questions. There is a 'Green' constituency in the UK but it appears to be in a minority and current and past UK Governments have recognized that the transition to a low-carbon path of development can be achieved most efficiently by expanding the contribution of safe nuclear power. This does not necessitate either massive societal disruption or large-scale investment in a new infrastructure which will be necessary to accommodate intermittent renewable energy sources. In fact, the supply of affordable and reliable electricity from nuclear power plants will benefit industry and households, leading to more quality employment opportunities and enhancing the export potential of the UK and other EU Member States.<sup>16</sup>

#### **Coherence of the measures**

4.12 The European Commission has suggested that the CfD measure is not necessary since the Electricity Market Reform package includes other measures that could achieve the same result of decarbonization (paragraphs 110, 118, 321 and 326-328). The Commission notes that additional measures are in place or planned to encourage energy saving which might reduce greenhouse gas emissions (paragraph 251 and 254). The Commission fears that State aid to Hinkley Point C "has the potential to decrease the incentives to invest in demand side response measures, including storage, energy efficiency and energy saving" (paragraph 398).

4.13 In particular the Commission questions whether the CfD is required since a carbon floor price "would seem to have the same effects" in supporting investment in low-carbon generation (paragraph 331).

4.14 WNA responds as follows:

- i. WNA does not understand how the CfD can 'reduce the incentive' for energy saving or demand side response. An incentive exists in relation to a business case for a capital investment. If the business case analysis demonstrates that a project has a high risk of failure then the investment will not be made. If the business case is sound then the investor will be incentivized to undertake it.
- ii. As previously stated, the UK Government is offering the CfD measure to incentivize investment in a range of renewable energy sources in addition to nuclear power.
- iii. The UK Government has a number of directly funded expenditure programmes to encourage energy saving. But these are funded from its revenues, while the CfD involves no public expenditure. It does not imply that a zero-sum situation will be created.
- iv. The UK Government has in addition announced a 'floor price' for carbon that will apply to electricity generated from coal and gas. This measure is intended to address the failure of the EU Emissions Trading Scheme to establish a carbon price which reflects the environmental damage from greenhouse gas emissions. The floor price for carbon is

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<sup>16</sup> The UK Nuclear Industry Association believes that the UK nuclear program will be a major engine for growth for the European nuclear supply chain and the EU economy more generally. The delivery of new nuclear power stations is among the biggest construction projects expected to take place in Europe over the next few years. Around 30-40,000 high quality jobs could be generated, with about 500 graduates required each year to 2025. There would be training and career opportunities in engineering; manufacturing; construction; regulation; operations and maintenance.

intended to provide a long-term price signal to generators that will encourage them to switch over to low-carbon technologies. It is important to recognize that the carbon floor price will be implemented as part of the Climate Change Levy, which is a fiscal measure and carries a larger political risk than the CfD.<sup>17</sup> A CfD remains a necessary instrument in the deregulated electricity market.

4.15 The CfD measure envisaged by the UK Government appears to be an appropriate instrument to correct the failure of energy markets to internalize the pollution from fossil fuels and offer long-term future prices for electricity. At some stage, the carbon floor price may, in conjunction with an ETS that has been restructured to be fit-for-purpose, take over the role played by the CfD. At this point, however, no investor is ready to invest in a capital-intensive asset with a lengthy pay-back period on the basis that the present government (or the EU as a whole) have adopted targets for greenhouse gas emission reduction through fiscal measures not yet promulgated in law and which are subject to political risk.

### **Potential for market distortion**

4.16 The European Commission has raised questions regarding the potential distortions introduced into the single European market from applying the CfD measure to the Hinkley Point C project. The Commission states that it is not clear whether the Hinkley Point C project would ‘crowd out’ other low-carbon technologies, such as a biomass plant, and speculates that different instruments might achieve de-carbonization faster (paragraphs 244-245 and 423). The Commission goes on to note that while the UK Government has examined interconnection capacity (paragraphs 255-258) “it is unclear to what extent plans [for the construction of future interconnectors] might already internalise some of the incentives built into the EMR” and thus might not be built if the Hinkley Point C project goes ahead (paragraph 396).

4.17 Commissioner Almunia’s letter further asserts that State aid for Hinkley Point C “is likely to displace the exchanges of large quantities of electricity between the UK and its neighbours through the interconnectors in place” and crowd out “new investment in interconnectors” (paragraphs 395 and 397).

4.18 The Commission alleges that the CfD measure is “capable of severely distorting market dynamics ... because it shields the beneficiary from risks which other market operators need to face” (paragraph 326). It suggests that a Feed-in premium might be “more market friendly” (paragraph 328). The CfD for Hinkley Point C might also, it is suggested, not offer “the same level of revenue certainty” and risk mitigation to other investors in low-carbon generation capacity (paragraph 393).

4.19 WNA makes the following points in relation to the above issues raised by the European Commission:

- i. The likelihood that the Investment Contract (which will convert to a CfD) proposed for the Hinkley Point C project will ‘crowd out’ investment into alternative low-carbon generating technologies is remote since the UK Government has offered the same opportunity to a range of renewable energy sources at higher indicative strike prices.

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<sup>17</sup> This measure has been introduced by the Conservative-Liberal Democrat coalition government and had been rejected by the previous Labour Party government.

There is a common misconception – not shared by the European Commission – that the UK Government is “building expensive nuclear power plants” and the nation would be better served if the private sector (and ‘third sector’ social enterprises) invested in renewable energy sources. In fact the UK Government is putting in place a framework that provides the opportunity for commercial investors to build whatever type of power generation plant they want. There is no restriction on the amount of gas-fired capacity or wind turbine capacity that can be built. If a gas-fired plant is built and operated it must pay the Climate Change Levy, which incorporates a carbon floor price. A wind turbine array might be the beneficiary of the Climate Change Levy or could also be eligible for a CfD arrangement to reduce the risk of failing to pay back the original investment.

To be sure, the UK Government has stated that it wishes to encourage 16 GW of nuclear power capacity by 2025.<sup>18</sup> However, this is an example of indicative planning, not directive planning. To date, several investors have come forward, including EDF, GDF Suez, Hitachi and Toshiba, who are interested in constructing and operating nuclear power plants in the context of the UK’s Electricity Market Reform. But several investors have also walked away, notably RWE, E.On, and Centrica. Other investors are considering offshore wind turbine arrays and biomass generation. No one can say for sure that there will be 16 GW of nuclear capacity in 2025: the WNA currently projects 10 GW by 2025 in its Reference case scenario and only 6.8 GW under its Lower case scenario.<sup>19</sup>

- ii. Under the National Grid’s ‘connect and manage’ regime, a new generator’s connection capacity will be set at the signing of a connection agreement and will not be reduced as a result of other generators connecting to the grid, although generators can be asked to scale back supply at certain times. The ‘connect and manage’ regime was established in 2010 to facilitate access to the grid by new electricity providers. The CfD does not affect grid connection or the supply of power and system balancing as it will be an entirely separate transaction between low-carbon generators and the government-sponsored counterparty.
- iii. The issue raised by the Commission on interconnectors – which, clearly, promote the integration of the electricity market within the EU – appears to WNA to be an irrelevant consideration since the UK electricity market has been liberalized. The National Grid company, which part-owns the UK’s interconnectors, is a private business listed on the London stock exchange. Investments made in future interconnectors will be determined on commercial criteria in conjunction with the National Grid’s utility partners in continental Europe and Ireland.
- iv. There is no guaranteed market for the electricity from Hinkley Point C or any other nuclear or conventional thermal power plant. Therefore the State aid available to the Hinkley Point C project can never result in the ‘displacement’ of other power providers. Hinkley Point C’s generation will only displace the electricity generated from a *costlier* supplier. Nor is there any ‘certainty of revenue’ since the plants financed through the CfD measure must sell their electricity into the market (and it is possible that on a windy day Hinkley Point C might not sell any electricity as it will be competing with established off-shore wind turbine arrays in the Bristol Channel that are able to offer power more cheaply).

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<sup>18</sup> UK Government, 2011, *The Carbon Plan: Delivering our low carbon future*, p. 75

<sup>19</sup> WNA, 2013, *The Global Nuclear Fuel Market: Supply and demand 2013-2030*, London, Table 2.8.

- v. The allegation that the CfD shields the beneficiary from all risk is mistaken. The project developer shares in the risk that the investment may fail to generate a sufficient return to repay the financing costs with the counterparty, who will be a state-sponsored company. Sharing a risk is not the same as being shielded from all risk. In any case, as already explained, the CfD acts as a substitute for a 'missing' forward power purchase agreement. It is a remedy for market failure (at prevailing energy market prices).<sup>20</sup>
- vi. The UK Government, which is accountable to its citizens for its policy-making and is under political pressure to keep energy prices affordable, considered feed-in tariffs but following consultation concluded that the CfD measure was more appropriate. WNA sees no reason for the Commission to second guess this decision on the basis of its public consultation period of just one month around a competition investigation.

4.20 The proposals for Electricity Market Reform notified to the European Commission are unlikely to result in a distortion of trade in the single European market. The CfD measure will encourage investment into low-carbon electricity generating technologies (nuclear and renewable) in line with the common objectives of the European Union (see Annex A).

## 5. Conclusion

5.1 Both the current and previous UK Governments, though coming from differing political traditions, aimed to put in place a market and private sector friendly framework to embed de-carbonization. These innovative measures are designed for a deregulated energy market. Certain of the instruments have not been used before in other EU Member States and it remains a possibility that this initiative by the UK may not achieve the all goals set out for it. Notwithstanding the differences between the UK Electricity Market Reform and parallel interventions taking place in France, Germany or any other Member State, the same goal of de-carbonization is being sought. The UK is driving 'on the other side of the road', but it is going in the same direction.

5.2 WNA recommends that the European Commission approve the measures as compatible with the Treaties, including the Euratom Treaty.

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<sup>20</sup> There is no futures market offering to buy electricity to be generated many years ahead.

## **Annex A: The place of nuclear energy in relation to the common objectives of the European Union**

A clear legal basis exists for the role of nuclear power in achieving the common objectives of the European Union. The Treaties privilege nuclear energy and renewable energy sources as technologies to be promoted as common objectives of the European Union.

### **Euratom Treaty**

The Treaty establishing the European Atomic Energy Community, as amended, provides for the facilitation of nuclear energy in the EU.<sup>21</sup>

Article 1 states that “it shall be the task of the Community to contribute to the raising of the standard of living in the Member States ... by creating the conditions necessary for the speedy establishment and growth of nuclear industries.”

Article 2 states:

“The Community shall, as provided in this Treaty:

(c) facilitate investment and ensure, particularly by encouraging ventures on the part of undertakings, the establishment of the basic installations necessary for the development of nuclear energy in the Community;”

Chapter 4 of the Treaty empowers the European Commission to facilitate the coordinated development of investment in the nuclear field to stimulate persons and undertakings to invest in industrial activities (Articles 40 and 41). The “industrial activities” are defined at Annex II to the Treaty and includes “nuclear reactors of all types and for all purposes”.

Article 99 authorises the European Commission to “make any recommendations for facilitating movements of capital intended to finance the industrial activities listed in Annex II to this Treaty”.

The measures notified to the Commission by the UK Government in relation to Hinkley Point C are aimed at facilitating the growth of nuclear energy in the UK, which is a common objective of the EU under the Euratom Treaty.

Should the European Commission decide that the notified measures are also compatible with the Treaty on the Functioning of the European Union, it has the authority to recommend the Contract for Difference as an appropriate means to facilitate the financing of nuclear power plants in all Member States.

### **Treaty on the Functioning of the European Union**

The Treaty on the Functioning of the European Union gives a legal basis for energy policy and environmental protection.

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<sup>21</sup> Official Journal of the European Union, C 327, 26 October 2012, Consolidated version of the Treaty establishing the European Atomic Energy Community.

### *Energy policy*

Article 194 states:

“Union policy on energy shall aim, in a spirit of solidarity between Member States, to:

(b) ensure the security of energy supply in the Union;

(c) promote energy efficiency and energy saving and the development of new and renewable forms of energy.”

The Article adds that “such measures shall not affect a Member State’s right to determine ... its choice between different energy sources”.

Nuclear energy is not mentioned explicitly in the Treaty but as its promotion is already provided for in the Euratom Treaty it is unnecessary to do so.

For any Member State that chooses to accept nuclear energy as an element of its energy supply, nuclear energy may contribute to energy security since it is a resource with low vulnerability to external trade disruption. Nuclear fuel represents a minor part of plant operating costs and re-fuelling a nuclear reactor is normally undertaken on a cycle of a year or more, keeping downtime to a minimum. To buttress import security, since there is little by the way of economically recoverable reserves of uranium in Europe, the EU can draw upon the Euratom Supply Agency, set up to ensure a regular and equitable supply of nuclear fuel to EU users. Critics of the nuclear industry<sup>22</sup> have in the past raised the argument that uranium supplies could ‘run out’ or be disrupted, but there is no convincing evidence to suggest that this risk is in practice significant. WNA has surveyed global experience and concluded that “the current world market provides a considerable degree of security of supply, and has never to date failed to ensure continued operation of nuclear energy generation worldwide.”<sup>23</sup>

To be sure, securing a block of nuclear energy in the electricity generating system is not the only way of achieving energy security. But whether it is within the powers of the European Commission to second guess a Member State on its choice of instrument to secure the objective of energy security is questionable.

### *Environmental protection*

Article 191 states:

“Union policy on the environment shall contribute to the pursuit of the following objectives:

- Preserving, protecting and improving the quality of the environment;
- Protecting human health;
- Prudent and rational utilization of natural resources;

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<sup>22</sup> For example, Walter C Patterson, 1983, *Nuclear Power*, Penguin, p. 157.

<sup>23</sup> World Nuclear Association, 2011, *Ensuring Security of Supply in the International Nuclear Fuel Cycle*, London, p. 5.

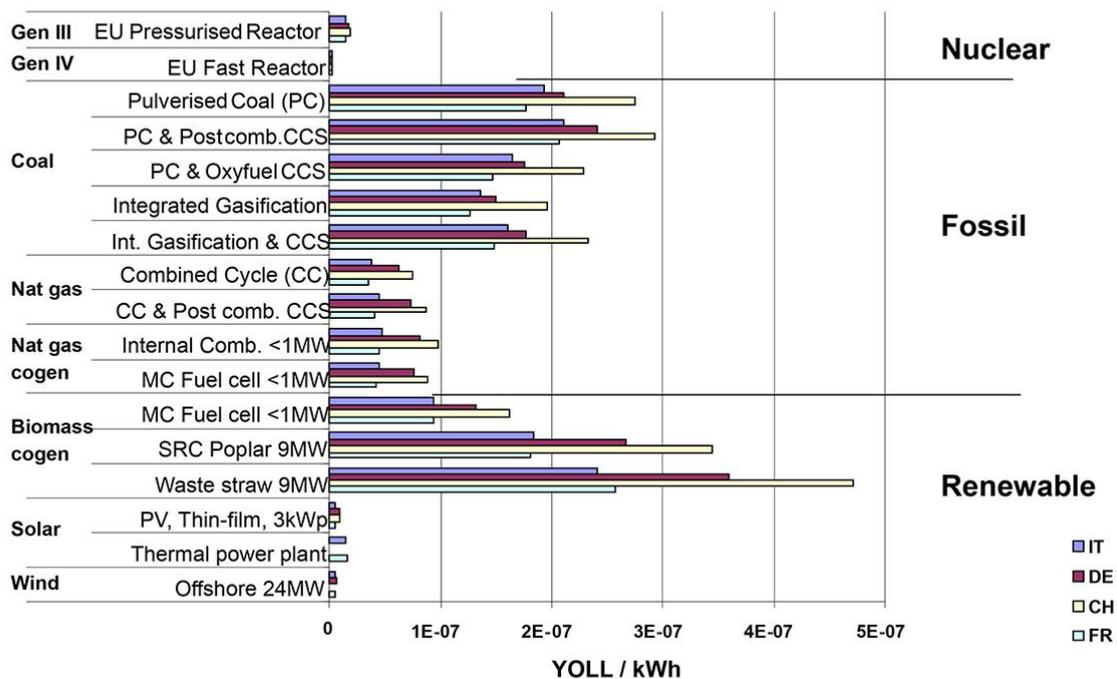
- Promoting measures at international level to deal with regional or worldwide environmental problems, and in particular combatting climate change.”

Article 2 adds that Union environmental policy “shall be based on the precautionary principle and on the principles that preventative action should be taken, that environmental damage should as a priority be rectified at source and that the polluter should pay.”

It goes without saying that nuclear energy must protect human health and the natural environment. The health impact from different energy systems has been studied by Dr Stefan Hirschberg of the Paul Scherrer Institute, Switzerland. This work indicates that nuclear, solar and wind present the lowest health damage in terms of years of life lost.<sup>24</sup> Nuclear power is not free from risks to health, but its relative impact is amongst the lowest, making it one of the best available technologies for electricity generation.



## Social: Years of Life Lost - YOLL (2050)



Source: Friedrich & Preiss, 2008

Energy Risk Management Workshop 2013

Laboratory for Energy Systems Analysis, Energy Departments

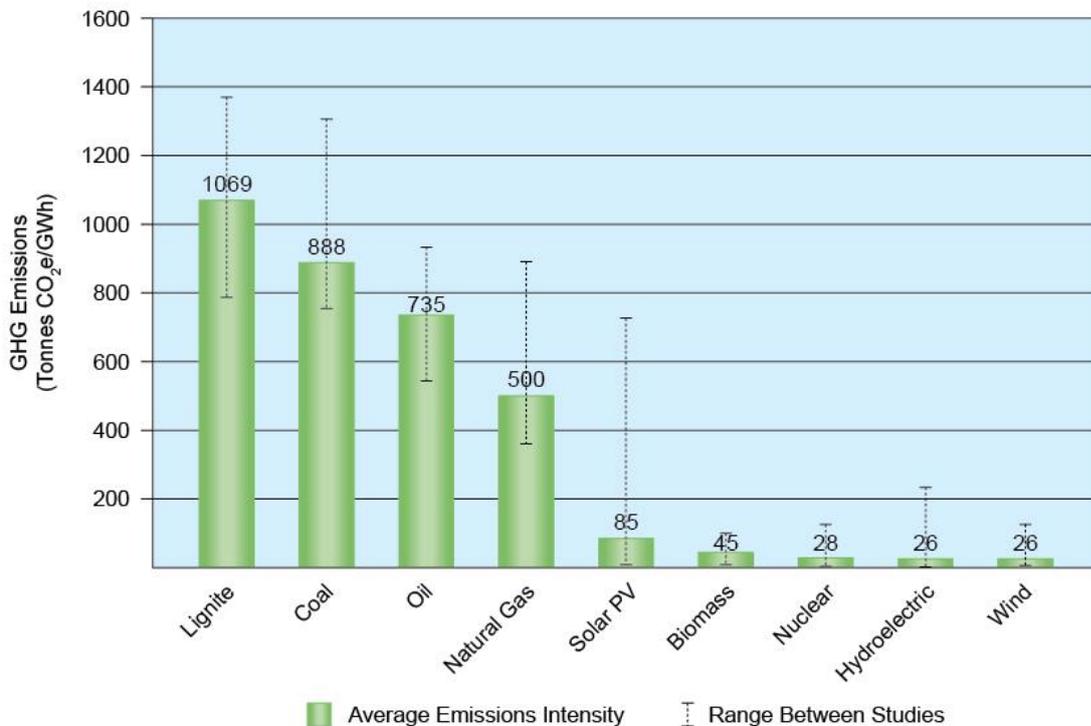
S. Hirschberg

WNA has compared the research on greenhouse gas emissions of different electricity generation technologies.<sup>25</sup> The study shows that greenhouse gas emissions of nuclear power plants are among the lowest of any electricity generation method and on a lifecycle basis are comparable to wind, hydro-electricity and biomass. The Inter-governmental Panel on Climate Change (IPCC) review of

<sup>24</sup> PSI, *Energie-Spiegel*, 20, June 2010 at <[http://www.psi.ch/info/MediaBoard/Energiespiegel\\_20e.pdf](http://www.psi.ch/info/MediaBoard/Energiespiegel_20e.pdf)> retrieved on 4/03/2014.

<sup>25</sup> WNA, 2011, *Comparison of Lifecycle Greenhouse Gas Emissions of Various Electricity Generation Sources*, London.

lifecycle assessments of greenhouse gas emissions from electricity generation reached similar conclusions.<sup>26</sup>



Source: WNA, 2011, *Comparison of Lifecycle Greenhouse Gas Emissions of Various Electricity Generation Sources*, Figure 2

Generating nuclear power creates waste products, of which a small proportion is highly radioactive and require special handling precautions and long-term safe disposal. Safe management practices and appropriate disposal arrangements are employed by the nuclear industry in accordance with regulations and government policies for hazardous wastes. These costs, along with decommissioning and dismantling of nuclear power plants, are factored into the prices charged for nuclear power. This is the case throughout the EU and the European Commission has a role alongside that of Member State governments in industry oversight and setting standards for protection. It is relevant to note that while certain radio-nuclides are very long-lived, the manufacture silicon-based solar panels for photovoltaic power generation creates waste products like silicon tetrachloride and lead, which remains highly toxic forever.<sup>27</sup> The deployment of nuclear power calls for mitigation measures to deal with waste products but in terms of scale and complexity this is no more challenging than the alternatives.

Finally, authoritative studies, such as those by the International Energy Agency in its *World Energy Outlook*, recognize the benefits that nuclear power could bring to an energy strategy that stands a

<sup>26</sup> IPCC, 2011, *Special Report on Renewable Energy Sources and Climate Change Mitigation*, Cambridge: Cambridge University Press, Summary for Policymakers, Figure 8, p. 19.

<sup>27</sup> Dustin Mulvaney (San Jose State University), Hazardous materials used in Silicon PV cell production: A primer, *Solar Industry*, November 2009, retrieved on 25/02/2014 from <[http://www.solarindustrymag.com/issues/SI1309/FEAT\\_05\\_Hazardous\\_Materials\\_Used\\_In\\_Silicon\\_PV\\_Cell\\_Production\\_A\\_Primer.html#](http://www.solarindustrymag.com/issues/SI1309/FEAT_05_Hazardous_Materials_Used_In_Silicon_PV_Cell_Production_A_Primer.html#)>.

fair chance of restraining greenhouse gas emissions to achieve no more than a 2°C rise in global warming.<sup>28</sup>

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<sup>28</sup> International Energy Agency, *World Energy Outlook 2013*, Paris, in the 450 Scenario to 2035; see also IEA, *Energy Technology Perspectives 2012 – Pathways to a clean energy system*, Paris, which presents scenarios to 2050.