FORATOM

FORATOM response to the EC Public Consultation on the UK Hinkley Point C (HPC) Nuclear Power Plant

The European Atomic Forum (FORATOM) is the Brussels-based trade association for the nuclear energy industry in Europe. The membership of FORATOM is made up of 16 national nuclear associations and through these associations, FORATOM represents nearly 800 European companies working in the industry and supporting around 800,000 jobs.

Introduction

1. The European Commission's Directorate General for Competition has invited interested parties to comment on its letter of 18 December 2013 to the UK Government expressing **reservations about the proposed investment contract for the Hinkley Point C** (HPC) new nuclear power station. Bearing in mind the pan-European spread of its membership, FORATOM focus in its answer on the broader issues rather than the UK-specific characteristics of the consultation.

   FORATOM is surprised that the analysis and remarks are not limited to the state aid and competition aspects of the HPC deal. FORATOM did not expect the EC to question the energy policy choices of a Member State (i.e. the UK) nor to express misgivings about the use of nuclear power *per se*. Such comments are in FORATOM's opinion, inappropriate - clearly the Commission should remain neutral when it comes to energy choices. In addition, as per the Euratom Treaty, the Commission, should be supporting the use of nuclear power. Statements, for example, about the risk of nuclear accidents, the environmental effects of radioactive waste management or of nuclear power possibly being incompatible with the Single Market are beyond the expected scope of the inquiry.

FORATOM and EU Energy Policy

2. The **EU's energy policy objectives** include decarbonisation, security of supply and hence diversity of supply at competitive prices. Nuclear power can contribute to meeting all these objectives.

   Nuclear power is currently providing nearly 60% of the EU's low-carbon electricity.
   It is a low carbon technology, similar in terms of life-cycle GHG emissions to onshore wind.
   It provides large, stable volumes of base-load capacity over a long period of time and therefore contributes to security of supply and at the same time reduces dependency on potentially unreliable energy imports.
   Nuclear provides low-carbon base-load capacity, and in addition can act as a flexible complement to intermittent renewable energy sources (RES) generation.

The small quantity of uranium (or potentially thorium) fuel needed is readily available and can be easily stockpiled providing diversity from dependence on fossil fuels, wind or sun.

3. Nuclear can bring a strong contribution to the global economy. It has been calculated that the EC Energy Roadmap 2050 scenario aiming at 20 % nuclear share of electricity, which includes safety upgrades, long-term operation, new build, decommissioning and waste management activities, would translate into about 350.000 more jobs by 2050.

4. Article 194(2) of The Treaty on the Functioning of the European Union (TFEU) underlines *"a Member State's right to determine the conditions for exploiting its energy resources, its choice between different energy sources and the general structure of its energy supply"*. Hence **Member States are entitled to choose their own energy mix**, including between the low carbon options: nuclear power, renewables or –if available– fossil fuel with Carbon Capture and Storage (CCS). In order to make these choices in the most cost-effective way, there should be no technology-specific low-carbon subsidy or, conversely, market impediment.

   There is a lot at stake in terms of EU energy policy riding on the outcome of the Hinkley Point C State aid case.
   There are currently 132 nuclear power reactors operating in 14 Member States providing 29% of the EU's electricity, virtually free of Greenhouse Gas (GHG) emissions. Many of these reactors will have shut down by 2030.
   Twelve of the 14 EU Member States have indicated that they intend to continue producing nuclear electricity beyond 2025 and two non-nuclear Member States (Poland and Lithuania) wish to start or restart a nuclear programme.
   Unless there is a major programme of new nuclear build, the decarbonisation challenge faced by renewables (with fossil fuel back-up) will be intolerable, both in terms of land use and especially cost[1]. The effects on the EU's competiveness versus the rest of the world will be unsustainable.
   All Member States operating nuclear power plants (NPP) or planning to do so are closely watching developments in the UK and a number have expressed interest in following a "contracts for difference" type of model.

5. All low carbon energy sources are characterised by **high upfront capital costs**. The market has to enable such investments to be made at acceptable risk to the investor; otherwise GHG emission reduction targets will not be met. The carbon price under EU Emissions Trading Scheme (ETS) is currently much too low to encourage such investments and will remain so for the foreseeable future; therefore there have to be other mechanisms in place to provide the necessary incentives. The financial recession exacerbates the difficult investment climate.

   The way the Single Electricity Market is set up at the moment, in the absence of any support measures for low-carbon alternatives, the choice would naturally be between coal and gas. This is **a clear market failure**. Nuclear power is competitive with fossil fuels over the 60 years life expectancy of a nuclear plant, even more so as the carbon price increases, but unless we can incentivise

[1] The level of RES subsidies in Germany has reached €23.6 billion per year (2014).

nuclear and other low carbon investments in the near term, we will have locked in a vast quantity of carbon emissions.

The answer is long-term contracts and a guarantee of minimum payback. One option is the Finnish "Mankala model", whereby a group of shareholders contract to pay for the entire output of the plant at cost price and then either use the electricity themselves or sell the excess to the market; another option is the "UK model" with contracts for difference. Both should be permissible under EU rules. Both are applicable to a range of low carbon options, not just nuclear power.

Background and objectives

6. Successive UK governments have publicly consulted on their plans to both consider nuclear energy and provide support for it. This is recalled by the EC[2]:

   (§16) In particular, the UK government undertook a consultation in May 2007, setting out the case for a policy framework considering the full range of low-carbon options, including nuclear energy. The conclusions of the consultation, following consideration of the responses to it, were published in January 2008, and stated the UK government's view that nuclear energy should play a role in the future low-carbon economy, and that the absence of nuclear energy would increase the costs of achieving the policy objectives mentioned above.

   FORATOM agrees with the UK assertion that the costs of achieving its decarbonisation objectives would increase in the absence of nuclear energy. Please refer to the table of strike prices for renewables published by DECC[3] in December 2013.

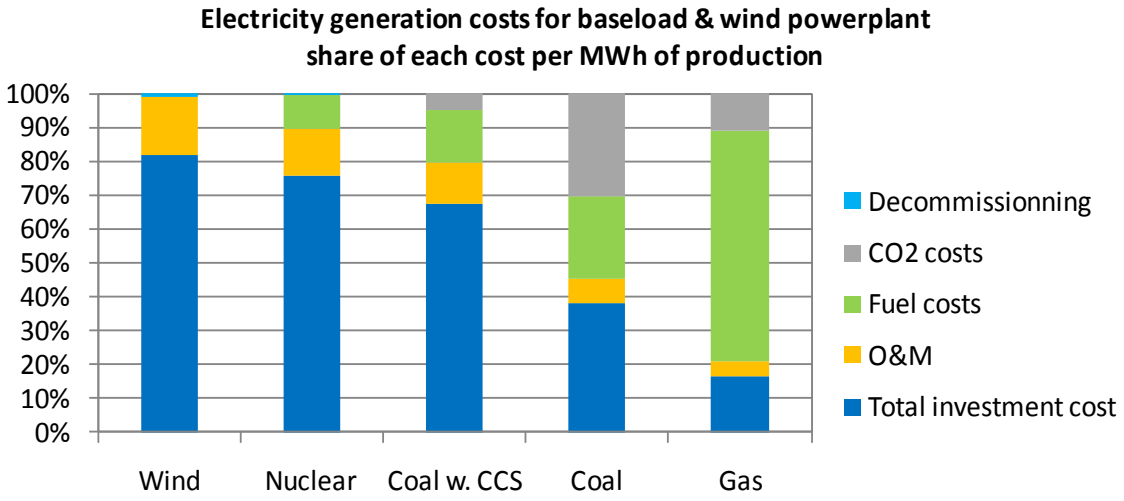
Affordability - Cost – Investment

7. FORATOM agrees with the EC that **there is a market failure** in the case of nuclear investment, but would argue that this failure applies to other low-carbon technologies as well and is not a specific feature of nuclear technology ***per se***:

   (§143) The second uncertainty is related to the discounting of fixed costs. The nature of nuclear production, which requires very high levels of capital for the investment in the construction and hence before revenues can be generated, while also being characterised by a relatively low level of operating costs once the plant has been built, has few, if any, equivalents in commercial activities. As will be discussed in Section 8.1.2 below, this feature of nuclear technology might in itself represent a form of market failure.

   According to IEA and OECD-NEA [4], the capital component of wind energy projects for example is higher in percentage terms than for nuclear (see diagram below). FORATOM recalls that industry has in the past built close to 200 nuclear power plants in the EU providing at times up to one third of the Union's electricity. For FORATOM, if the current Single Market cannot deliver investment in low-carbon technologies, then this is a failure of the current market design, not of the characteristics of the individual technologies.

[2] All quotations in the current document refer to the EC document "State Aid SA. 34947 (2013/C) (ex 213/N) – United Kingdom", C(2013) 9073 final, 18.12.2013
[3] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/263937/Final_Document_-_Investing_in_renewable_technologies_-_CfD_contract_terms_and_strike_prices_UPDATED_6_DEC.pdf
[4] "Nuclear Energy and Renewables – system effects in low-carbon electricity systems", OECD/NEA, 2012 http://www.oecd-nea.org/ndd/pubs/2012/7056-system-effects.pdf



source : IEA/NEA 2010 with 10% discount rate & CO2 price 30$/t.

(§276) Nuclear energy is characterised by extremely high fixed, sunk costs, and by very long time periods during which such costs need to be amortised. This implies that investors considering entry into nuclear energy generation will find themselves exposed to considerable levels of financing risks. Indeed, funding for the type of investment size and duration that characterise nuclear power plants might well be considered unparalleled.

As stated above, FORATOM believes that nuclear energy faces comparable challenges in terms of capital requirements to many other forms of low-carbon generation. Moreover, FORATOM notes that, in other sectors, market arrangements have been found to develop major infrastructure projects (motorways, airports, high-speed rail links) with similar funding challenges. We should not forget that France built 60 GW of nuclear capacity from 1980-2000 and that China is planning to install 200 GW by 2030. The IEA explored the inter-relation between the market risks and the possible difficulties of financing technologies with high capital demands. In this respect, the IEA concluded : "*The importance of managing uncertainty makes a strong argument for exploring the possibilities of public-private partnerships in order to improve the investment conditions in the electricity sector in general and for capital-intensive low-carbon technologies such as nuclear, renewable or carbon capture and storage, in particular.(…) even within the broad context of competitive electricity markets, there is a case to be made that the public sector has a role to play in enlarging the choices available to private decision makers*"[5].

8. In its letter, the EC fears that the proposed support might crowd out alternative investments in other technologies:

(§245) The Commission notes in this regard that a support mechanism which is specific to nuclear energy generation might crowd out alternative investments in technologies or combinations of technologies, including renewable energy sources, which may have occurred in the absence of the notified measure.

[5] "Projected costs of generating electricity", IEA/NEA 2010, chapter 8.4 , p.160
http://www.iea.org/publications/freepublications/publication/projected_costs.pdf

FORATOM underlines that **the support mechanism is not specific to nuclear energy**. The UK Government has made it clear that the CfDs to be provided under the Energy Market Reform (EMR) are aimed at securing a diverse mix of low-carbon generation, including renewable energy and CCS as well as nuclear. HPC just happens to be the first of many such agreements. As regards "crowding out of alternative investments, including renewable energy sources", FORATOM refers the EC to §252 quoting DECC analyses that the equivalent onshore wind generation would require around 7,000 turbines occupying an area up to twice the size of Greater Manchester (for which planning permission in Somerset could probably not be obtained, and almost certainly not in the required timescale) or offshore 2,000 turbines (for which the cost would be prohibitive). The wind power alternatives to HPC can therefore be judged to be impractical, even though both wind and nuclear are needed and are not mutually exclusive.

Specific features of nuclear energy

9. For the EC, some specific features of nuclear energy, e.g. potential nuclear accidents, liability, decommissioning, radioactive waste, create uncertainties of costs that question the commercial generation of nuclear electricity generation:

(§281) There are finally certain features of nuclear energy, which distinguish it from any other electricity generating technology, or, for that reason, from any other technology. This is particularly the case with the production of radioactive material as a side-product of the energy generation process, and of the potential for nuclear accidents, which might entail the leak of radioactive material.

(§282) Both these issues can result in costs, which can be substantial in certain cases, such as the possibility of serious nuclear accidents. However, both issues are also characterised by a high level of uncertainty, which translates into an uncertainty of the underlying costs. The current legislative framework does not appear to have fully addressed how such uncertainty should be dealt with, and how commercial activity in nuclear generation can take place in a context where some of the costs involved can be very difficult to quantify.

FORATOM acknowledges that nuclear energy does have certain distinguishing features, but the production of radioactive material as a side product is not different from the production of any hazardous industrial waste. FORATOM believes that **the techniques for managing radioactive waste safely are well established and well regulated** by international conventions, EU directives and national laws. FORATOM considers that radioactive waste is a much more manageable problem than the emission of greenhouse gases for example, or the potential underground storage of sequestered CO_2.

(§283) There are three costs which are particularly uncertain, and are caused by the production of radioactive material and the possibility of nuclear accidents: costs related to the decommissioning of the nuclear plant, costs related to the management and disposal of spent fuel and nuclear waste, and costs related to liability insurance.

With regard to the "particularly uncertain" decommissioning costs, FORATOM notes that the EC contradicts itself in §286 where it is stated that "the costs involved can be quantified to a large degree".
Over the past 40 years considerable experience has been gained worldwide in decommissioning various types of nuclear facilities. According to the IAEA PRIS Database[6] and the IAEA RRDB (Research Reactor Database)[7], 338 research

[6] http://www.iaea.org/PRIS/WorldStatistics/ShutdownReactorsByCountry.aspx
[7] http://nucleus.iaea.org/RRDB/RR/ReactorSearch.aspx

reactors have been decommissioned and a further 143 research rectors shut down; in addition, 142 commercial power reactors are at different stages of the decommissioning process (from green field status to being dismantled or in safe enclosure). Given the usual uncertainties in the timing of decommissioning (to allow for radioactivity decay) and in the availability of final storage sites for the wastes arising, estimates of decommissioning costs are variable. However, **wide variations in decommissioning costs have only limited impact on electricity costs.** In relation to the costs of decommissioning the French fleet of 58 reactors, the independent Cour des Comptes report stated[8]:

> By way of illustration, with a simplified calculation at an unchanged discount rate (5 percent):
> − if the estimate for dismantling increased by 50 percent: the annual cost of nuclear power generation would increase by €505 million, i.e. a 2.5 percent increase in the total generation cost;
> − if the estimate for dismantling doubled (a 100 percent increase): the annual cost of nuclear power generation would increase by €1 billion. However, this still only represents a 5 percent increase in the generation cost.
> As shown by these tests on sensitivity to variation in certain parameters relating to future expenses, based on the 40-year service life for the current fleet used to calculate these expenses, their impact on the annual cost of nuclear power generation is not negligible, but is fairly limited.

(§390) Finally, the costs of insuring NNBG from the liability stemming from accidents are extremely, and intrinsically, uncertain. The Commission will nonetheless have to assess whether the estimated costs that NNBG will bear to insure itself from liability can be deemed to be proportional. In relation to this cost element, it cannot be excluded a priori that a specific additional element of State aid might be involved in the form of implicit assurance that any 'top' risk, i.e. the portion of risk not specifically covered by NNBG or any market provider of insurance services, will be covered by the State.

FORATOM does not agree that the costs of insuring NNBG from nuclear liability stemming from accidents are "extremely, and intrinsically, uncertain". As far as nuclear liability is concerned, FORATOM would like to point out that the UK is a signatory to the Paris Convention under which the minimum amount of operator financial responsibility, to be covered by insurance or financial security, is clearly defined. Within the framework of this regime, the UK has decided to limit operator financial responsibility. Nuclear operators in all 14 nuclear Member States are covered by either the Paris Convention or the similar Vienna Convention. For FORATOM, there is therefore long experience of insuring operator liability, through the existence of an effective liability insurance market, and the insurance premiums are consequently quantifiable and predictable.

10. The EC considers that the specific reactor technology to be used in the proposed NPP would add to the uncertainties of the decommissioning costs of HPC:

(§286) The 'polluter pays principle' is therefore clearly envisaged for the decommissioning of nuclear power plants. The costs involved can be quantified to a large degree. They might however be subject to some uncertainty, in particular in relation to new technologies, such as the one, which will be used in the HPC plant.

For FORATOM, there is no reason why the decommissioning costs of the EPR should be any more uncertain that those of other reactor technologies. The EPR is an evolution of the PWR, the most widely used reactor type operating around the world, and **there is no fundamental difference of approach when it comes to decommissioning**. If anything, the reverse is true because successive evolutions of the technology have increasingly taken decommissioning into

[8] "The costs of the nuclear power sector", French Cour des Comptes, January 2012

account at the design stage, whereas this was not the case for the 1st generation reactors.

Decarbonisation and Impact on the environment

11. The EC seems not to correctly understand the advantage of nuclear vis-à-vis fossil fuels as a low-carbon source:

(§232) In addition, the Commission believes that the notified measure might have substantial repercussion on trade and competition (as also outlined in Section 8.1.7). In particular, NNBG will be providing a service which is difficult to distinguish from that provided by other generators of base-load electricity. The Commission refers to Section 8.1.7 for the examination of the impact of the aid on competition and trade.

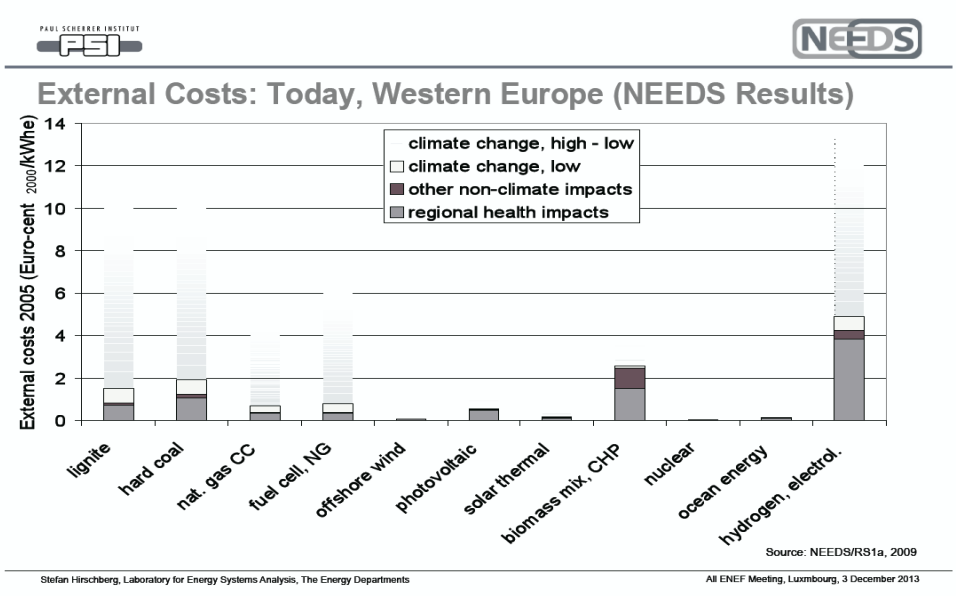
FORATOM disagrees that "NNBG will be providing a service which is difficult to distinguish from that provided by other generators of base-load electricity". Other generators of base-load electricity are using fossil fuels. Therefore there is a clear distinction in terms of low carbon generation and meeting GHG emission targets.

12. Having recalled the objectives of EU's environmental policy, the EC states that nuclear energy's impact on the environment might be considered substantial, but fails to bring any reasonable argument or data to support its belief:

(§240) The Commission notes that while Art 191 TFEU establishes that the preservation, improvement and protection of the environment must be regarded as objectives of EU policy, it is unclear whether such objective can be immediately applicable to low-carbon generation as defined by the UK. In particular, while certain generation technologies emit less carbon emissions, their impact on the environment might nonetheless be considered substantial. This seems to be particularly true of nuclear generation, due to the need to manage and store radioactive waste for very long periods of time, and the potential for accidents.

FORATOM **disagrees strongly that nuclear power might be considered to have "substantial impact on the environment".** On the contrary, nuclear power is a clean technology: the NEEDS Study[9] (commissioned by the EC) indicated clearly that the total environmental externalities of nuclear power are as low if not lower than those of renewables like wind and solar and especially biomass (see diagram below).

[9] http://www.needs-project.org/docs/Needs.pdf



The human and environmental impact of radioactive waste management and storage is closely controlled under Chapter III (Health & Safety) of the Euratom Treaty and in particular its Articles 35 (environmental monitoring), 36 (reporting the results of that monitoring to the EC) and 37 (informing the EC of any plan for the disposal of radioactive waste in order to determine its potential environmental impact) and by national laws implementing these provisions. **There is no evidence of any radioactive waste management practice in the EU having led to *substantial* damage to the environment or any indication that this will be the case in future**. Nor does the "potential for accidents" impart environmental damage. The safety record of the EU nuclear industry is demonstrably excellent, with no accident having occurred with significant off-site consequences in any civil nuclear installation over nearly 60 years of operation. In the introduction to its Communication[10] on the EU "stress tests" in response to the nuclear accident at Fukushima, the EC stated: *"There are currently 132 nuclear reactors in operation in the EU, grouped on 58 sites. Their safety record is such that although incidents have occurred and continue to occur, no major accidents have ever taken place. While the overall safety record is therefore good, EU citizens' confidence in Europe's nuclear industry hinges on continuous improvements of the EU nuclear safety and security framework, so as to ensure that it remains the most effective in the world, based on the highest safety standards".*
Statistics show that nuclear has **the lowest accident mortality rate of any commercial source of electricity generation** (see diagram below)[11]

[10] Communication from the Commission to the Council and the European Parliament on the comprehensive risk and safety assessments ("stress tests") of nuclear power plants in the European Union and related activities, COM/2012/0571 final
[11] http://www.oecd-nea.org/ndd/workshops/aecna/presentations/documents/StefanHirschberg-Assessingenergy-relatedsevereaccidentrisks.pdf

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Severe Accidents with at least 5 fatalities (1970-2008)

	OECD		EU 27		non-OECD	
Energy chain	Accidents	Fatalities	Accidents	Fatalities	Accidents	Fatalities
Coal	88	2313	45	989	164 1440 (a)	8153 25'821 (a)
Oil	179	3383	64	1236	351	19'376
Natural Gas	109	1257	37	366	78	1554
LPG	60	1880	22	571	69	2796
Biogas	—	—	—	—	2	18 (c)
Hydro	1	14	1	116 (b)	12	30,007 (d)
Geothermal	—	—	—	—	1	21 (e)
Wind (f)	54	60	24	24	6	6
Nuclear	—	—	—	—	1	31 (g)

(a) First line: coal non-OECD without China; second line: coal China
(b) Belci dam Romania (1991)
(c) Waste gas (13 fat., China, 2004), wastewater (5 fat., Pakistan, 2008)
(d) Banqiao and Shimantan dam failures alone caused 26'000 fatalities
(e) Guatemala (1991)
(f) Only small accidents
(g) Latent fatalities treated separately

Burgherr et al., 2010

OECD-NEA Workshop. Paris, 28-29 May 2013 — Stefan Hirschberg, Laboratory for Energy Systems Analysis, The Energy Departments

13. Moreover, well beyond the HPC case submitted by the UK government on the grounds of competition rules, the EC unfairly discredits nuclear energy:

(§241) *In this case, it is difficult to assess the trade-off between two potential common EU objectives, namely preserving the environment through the pursuit of low-carbon electricity generation while potentially increasing risks to the environment through the use of nuclear technology.*

FORATOM cannot see how this point is linked to the competition case submitted to the EC. As regards what the EC introduces as a trade-off between "preserving the environment through the pursuit of low carbon electricity generation while potentially increasing the risks to the environment through the use of nuclear technology", the EC fails to make any objective comparison. For FORATOM, it is widely demonstrated that the environmental risks of nuclear are orders of magnitude lower than the effects – real or potential – of climate change. The well-known climatologist James Hansen estimates that global nuclear power has prevented an average of 1.84 million air pollution-related deaths and 64 gigatonnes of CO_2-quivalent ($GtCO_2$-eq) greenhouse gas (GHG) emissions that would have resulted from fossil fuel burning[12].

[12] Pushker A. Kharecha and James E. Hansen, "Prevented Mortality and Greenhouse Gas Emissions from Historical and Projected Nuclear Power", NASA Goddard Institute for Space Studies and Columbia University Earth Institute, *Environ. Sci. Technol.*, 2013, 47 (9), pp 4889–4895.

A Support Mechanism is appropriate

14. In its proposal, the UK government justifies the need for long-term contracts, underlines the risk of undermining the investors' confidence and doesn't consider that competition to nuclear is either more expensive or less secure or both:

(§26) The UK believes that failure to bring forward HPC might translate into a complete lack of investment in new nuclear plants, as it might undermine the confidence of potential investors and industry about the feasibility of carrying out a project of such a financial scale.

FORATOM agrees with the UK that failure to bring forward HPC might translate into a complete lack of investment in new nuclear plants. In the current economic and ETS climate, this could apply to many other Member States. For FORATOM, the fact that in the absence of public intervention in favour of RES the choice would naturally be between coal and gas, definitely demonstrates **a clear market failure**.

(§83) The UK government compares the duration of the Investment Contract with NNBG to similar contracts, in particular CfDs, which are considered for wind farms. Such contracts are being considered for a duration of 15 years, to be compared with an operational lifetime of between 20 and 25 years. The UK mentions that payments in support of renewable energy sources are allowed by the Environmental Aid Guidelines16 ('EAG') until the plant has been fully depreciated according to normal accounting rules, which for the HPC project would take 60 years.

FORATOM supports the UK contention that a 35 year CfD for HPC, with a 60y expected lifetime, is a reasonable duration for pay-back as compared to support schemes for wind farms of 15 years duration out of a life expectancy of 20-25 years.

(§188) Both the Investment Contract and the credit guarantee have the potential to distort competition and affect trade between Member States. The Commission notes in this respect that the generation and supply of electrical power is liberalised. As in this case the notified measures will enable the development of a large level of capacity which might otherwise have been the object of private investment by other market operators using alternative technologies, from either the UK or from other Member States, the notified measures can affect trade between Member States and distort competition.

With regard to distortion of competition, FORATOM believes that when it comes to providing low carbon electricity generating capacity, either within the UK or from other Member States, the competition to nuclear is either more expensive or less secure or both, and therefore the UK is correct in choosing exclusively nuclear for the first CfD contract under EMR. The indicative strike prices[13] published by DECC confirm the cost advantage of nuclear. FORATOM recalls that CCS is not currently available as a commercial alternative.

EURATOM Treaty

15. In its letter, the EC refers to the goals of the EURATOM Treaty and its commitment to promote investments into nuclear:

(§267) *Article 107 TFEU obliges the Commission to investigate aid granted by Member States that distorts competition or threatens to do so. Especially in the context of liberalised and increasingly competitive*

[13] DECC press release, 27 June 2013 https://www.gov.uk/government/news/newinfrastructure-investment-to-fuel-recovery

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 which do not distort competition. The question therefore needs to be asked, whether there is a market failure in electricity in respect to the planned measure.

FORATOM recalls that Article 106a(3) of the Euratom Treaty states: "The provisions of the Treaty on European Union and of the Treaty on the Functioning of the European Union shall not derogate from the provisions of this Treaty." We share the opinion that the Euratom Treaty takes precedence over TFEU[14].

(§265) *In this regard the Commission notes that the Euratom Treaty establishes in Art 2(c) that the Community shall "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." Art 40 of the same Treaty envisages the Community publishing of illustrative programs "to stimulate investment, indicating production targets."*

(§266) *Aid measures aimed at promoting nuclear energy could therefore be viewed as pursuing an objective of common interest and, at the same time, can deliver a contribution to the objectives of decarbonisation and security of supply.*

We agree with the Commission that the Euratom Treaty Article 2(c) requires the Community to facilitate nuclear investment and that nuclear energy can therefore be considered as an objective of common interest. Facilitating the HPC investment would fall into this category. We would encourage the Commission to follow the recommendations of Article 40 and publish a new Nuclear Illustrative Programme (PINC) without delay.

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[14] http://www.academia.edu/1192754/The_Euratom_Treaty_v._Treaties_of_the_European_Union_limits_of_competence_and_interaction