WWF-UK Response to Electricity Market Reform Consultation

February 2011

[redacted]

WWF welcomes the opportunity to respond to DECC's consultation on the electricity market reform.

Executive Summary

We welcome the Government's recognition that substantial changes need to be introduced to current market arrangements if the UK power sector is to play its full part in helping the UK meet its emission reduction commitments under the Climate Change Act 2008. **We believe that the main objective of the EMR should be to substantially decarbonise the UK's power sector in the most environmentally sustainable way and in a way that could maximise benefits for the UK economy. We believe that for this to be the case, the EMR needs to consider measures on both the generation and demand side of the electricity industry and be explicit about which generation technologies should or should not benefit from the low-carbon incentive measures being proposed.** We have briefly summarised below our key thoughts on electricity market reform proposals, before answering some of specific questions raised in the consultation.

a. The importance of reducing energy demand is absent from the EMR

We are concerned that the EMR consultation paper is overwhelmingly focused on proposals that seek to incentivise investments in low-carbon generation and does not seek to address the equally important question of how the UK can substantially reduce its demand for energy. We believe that for the EMR to deliver an effective and cost-efficient package of measures to help decarbonise the power sector, proposals need to be put forward to both incentivise low-carbon generation (in particular renewables) and substantially reduce the UK's demand for energy. Research shows that there is a substantial potential for reducing energy demand in the UK. For instance, the UK Energy Research Centre recently found that demand in the homes and transport sector could be feasibly reduced by 50% compared to BAU levels by 2050, which would reduce the costs of introducing a low-carbon power system in the UK by up to £70bn1. Not only is there great potential for reducing energy demand in the UK2 but experience shows that by treating a business' ability to reduce energy demand on a par with investment in low-carbon generation, energy savings can be reliably delivered. Experience in the PJM

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1 Making the transition to a secure and low-carbon energy system, UK Energy Research Centre, UKERC Energy 2050 Project, April 2009, http://www.ukerc.ac.uk/Downloads/PDF/U/UKERCEnergy2050/0906UKERC2050.pdf, page 104

2 Our response to the 2050 Pathway Analysis, which is attached to this response, provides more detail on the potential for reducing energy demand in the UK.

market in the United States shows for instance that incorporating energy demand reduction targets under long term contracts can result in energy savings being delivered 90% of the time.

We are concerned that the potential for reducing energy demand is not being sufficiently addressed as part of the government's 2050 Pathway analysis and would urge government to take further action in this area.

b. The EMR should aim to deliver a specific decarbonisation target

We are concerned that the EMR consultation is not addressing the target carbon intensity which the UK power sector should aim to deliver by 2030. We believe that the EMR should introduce a formal decarbonisation objective for the power sector by 2030, as this will help provide a clear sense of direction to the electricity market framework and ensure that the framework as a whole is focussed on delivering a low-carbon power sector over the next 20 years. We would recommend that a carbon intensity target for 2030 should be set at or as close as possible to the recommendations made by the Committee on Climate Change (CCC) in the Fourth Carbon Budget Report3.

c. The carbon floor price is a useful tool but it is not a substitute for a strong EPS

A carbon floor price could be used as a useful additional tool as part of the overall EMR package, in particular in providing the Government with a helpful source of revenue from the UK's most polluting power stations (consistent with the "polluter pays principle"), a significant proportion of which could and should be reinvested in the capitalisation of the Green Investment Bank to support energy efficiency and renewable energy projects. **However, as explained in our response to the carbon floor price consultation (attached), the effectiveness of the carbon floor price in promoting a greater deployment of renewable energy and acting as a disincentive to investment in unabated fossil fuel plants is likely, without strong complementary regulatory policies, to be limited and is therefore likely to be expensive in terms of the cost per tonne of carbon abated.** This is mainly because a carbon floor price will be one of many variables (such as coal and gas prices) which investors will take into account prior to making key investment decisions. As a result, the carbon floor price cannot without a complementary regulatory tool offer the clear regulatory certainty necessary to ensure that the UK power sector will reach a specific level of decarbonisation by a particular date. As such, **we believe that a carbon floor price should be accompanied by a strong emissions performance standard, without grandfathering and with a gradually decreasing level of permitted carbon intensity. A strong emissions performance standard would be able to drive investment decisions away from unabated fossil fuel plants and send a strong and long-term sales volume opportunity signal to the marine renewables and CCS supply chain.**

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3 In its fourth carbon budget report (2023-2027), the CCC recommended an average carbon intensity of 50gCO2/Kwh by 2030 compared to approximately 490gCO2/Kwh currently. Fourth Carbon Budget Report (2023-2027), the Committee on Climate Change, December 2010, http://www.theccc.org.uk/reports/fourth-carbon-budget. See executive summary in particular.

As explained in our response to question 26 below, we also believe that a windfall tax should be introduced alongside the carbon floor price to capture the windfall profits that will be made by existing nuclear power stations as a result of that policy. The credibility of the carbon floor price mechanism would be undermined if it was seen to result in windfall profits for a group of power stations which have already been substantially subsidised by the UK taxpayer. An amount equivalent to the proceeds of such a windfall tax could then be reinvested through the Green Investment Bank to support energy efficiency and emerging renewables projects, which would make great economic sense at a time of severe restrictions on public spending.

d. We support the introduction of long-term contracts for renewables and other emerging technologies

We support DECC's proposal to introduce long-term contracts to support renewables, other forms of emerging low-carbon technologies and the most efficient forms of CHP generation. As explained in our response to question 4, we believe that a Fixed FiT would be the best form of feed-in tariff to introduce as part of the EMR, in particular in terms of supporting renewables. Whilst it does require greater implementation work than the other 2 FiT options, it has the following advantages over other forms of FITs once implemented: (i) it protects revenues for low-carbon generators in the event of low gas prices and protects consumers from increases in electricity prices beyond the agreed tariff in the event of high gas prices (a benefit shared with the CfD option), (ii) it is less open to manipulation than the FiT with CfD, (iii) it removes the offtake risks from generators which is key if the UK wants to see the arrival of new entrants (and increased competition) in the renewable energy market, and (iv) it is easier to administer on a day to day basis given that there is no need for regular financial settlements to be made under the long-term contracts.

e. New nuclear should not be insulated against long-term price risk

As explained in our response to question 5, **we do not agree that a transfer of risks (in particular long-term electricity price risk) from electricity generators to Government should apply to new nuclear power stations**. Regardless of whether or not the tariffs that are set under long-term contracts with nuclear power generators would amount to a subsidy, we believe that removing long-term price risk from nuclear generators would be highly unreasonable given the maturity of the nuclear industry (we strongly disagree with the Redpoint report's reference to nuclear being "an established technology"), the environmental risks inherent to that technology choice and the very limited economic benefits which building a new fleet of nuclear power stations, mainly imported from overseas-based suppliers, would bring to the UK. This is all the more the case given that the nuclear industry will already benefit from the introduction of a carbon floor price and that the minimum caps on third party liability per nuclear site, even though revised upwards, will still be substantially below the true costs of dealing with

a nuclear accident (should an accident occur, the difference would ultimately have to be borne by the UK taxpayer)4.

f. The level of support under long-term contracts should be technology specific & should be awarded in the context of an ambitious 2030 target for renewables

Regardless of the type of feed-in tariff that will eventually be introduced, it is key that the level of support given under each long-term contract be specific to a particular technology. In particular, the level of support granted under a long-term contract should be reflective of the maturity of a technology and of its current ability to benefit from economies of scale. For instance, marine renewables (some forms of which are still at the emerging development stage) should be getting more support than onshore wind (which still requires further support to benefit from greater economies of scale), which in turn should be getting more support than other more mature technologies.

In the case of renewables, **we are strongly of the view that long-term contracts for low-carbon generation should be granted within the context of an ambitious 2030 target for renewables deployment.** Such a target will play an important role in providing a strong signal to the supply chain in terms of the UK's renewable energy ambitions.

g. The Scottish Government should retain flexibility for existing support mechanisms

With respect to the applicability of the EMR to Scotland, the Renewables Obligation Scotland Order allows for some flexibility in the scope it offers the Scottish Government to target support at particular renewable technologies. Scotland has clearly adopted the UK CCC's advice of securing a near decarbonised power sector by 2030 and has set achievable but ambitious renewable generation targets for 2020 (80% target). Any future FiT scheme should explicitly support both ambitions and offer sufficient flexibility to ensure the Scottish Government is about to continue to support the emerging offshore wave and tidal energy industry in particular. To remove this option would threaten the current growth in an important component of our future generation mix and one with significant future growth and export opportunities.

h. We support the introduction of a targeted capacity mechanism

We agree with the proposal to introduce a targeted capacity mechanism. In particular, we believe that such a mechanism will provide Government with greater control as to the amount and nature of the back-up capacity mix that is required, which would help ensure that the UK's back up plants are of the most appropriate nature to complement an electricity system increasingly based on renewable energy sources. **We also believe that the targeted mechanism should not just act as a back-up capacity tool, but also as a short-term system balancing tool. To this end, the targeted mechanism should be designed in a way that it also includes short term demand-side response, electricity storage and interconnection, as this would increase the system operator's ability to balance the system at times of**

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4 See our response to question 5 for more detail. This comes in addition to the waste and decommissioning costs which are currently heavily subsidised by UK taxpayers.

high demand and lower renewables output. In addition, including such a wider range of measures would help deliver greater emission reductions and potentially reduce the costs of the targeted capacity mechanism.

Current Market Arrangements

Question 1. Do you agree with the Government's assessment of the ability of the current market to support the investment in low-carbon generation needed to meet environmental targets?

We agree with DECC that current market arrangements will not deliver a near-decarbonised power sector by 2030. One of the key reasons for this is that current market arrangements are not designed to incentivise substantial investments in the low-carbon power sector and also lack a clear sense of direction, thus causing significant uncertainty for investors in the power sector. The challenges are compounded by weaknesses in the EU Emissions Trading Scheme, in terms of weak caps, high access to use of imported offset credits and lack of clear price visibility or regulatory certainty beyond 2020.

Question 2. Do you agree with the Government's assessment of the future risks to the UK's security of electricity supplies?

The National Policy Statement for Energy indicates that among today's 85GW of installed capacity, some 22 GW is to be decommissioned over the next 20 years, due to the combined effect of the Large Combustion Plant Directive and the scheduled decommissioning of the UK's existing nuclear fleet. Some additional closures may also take place due to the Industrial Emissions Directive around 2023. Clearly, security of supply is therefore an important issue that needs to be taken into account as the UK develops its decarbonisation strategy. In this respect, WWF supports the introduction of a targeted capacity mechanism to support the wide deployment of renewable energy that is needed to decarbonise the UK's power sector.

However, whilst planning ahead is essential, we believe that the Government does have the time to decide on the right mix and size of back-up plants that are required to support the resilience of the UK's electricity system and that decisions on security of supply should therefore not be rushed. In particular, we believe that the following considerations should be taken into account:

- As pointed out by DECC in the consultation document, the UK's electricity supplies are currently amongst the most reliable in Europe and around 20GW of new projects are currently either in construction or development[5];
- the report prepared by Poyry Energy Consultants for WWF and Greenpeace ("Implications of the UK meeting its 2020 Renewable Energy target" – July 2008)[6] made clear that if the UK government met its energy efficiency and renewable energy targets for 2020, new baseload electricity generation capacity will not be needed until the period beyond 2020, by which time other low carbon technologies (such as wave, tidal and floating offshore wind) will be close to commercialisation. It is important to note that this report only considered gas plants that were

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5 See page 16 of EMR consultation document.

6 See WWF / Greenpeace "Closing the Energy Gap" Report (http://www.wwf.org.uk/filelibrary/pdf/energy_gap_summary.pdf) and "Implications of the UK meeting its 2020 Renewable Energy Target", Pöyry energy consultants, July 2008, http://www.ilexenergy.com/pages/Documents/Reports/Renewables/July08_2020RenewablesTarget.pdf

actually being built (not those that had been consented but construction not started) and was based on energy demand projections that have since reduced due to the impact of the economic crisis.

- As pointed out in the recent Roadmap 2050 study from the European Climate Foundation, the level of back-up plants that will be required in an energy system based on a substantial proportion of renewables, does not need to be substantial as long as sufficient investment is made in improving interconnection capabilities between the different European grids, which the report found to be the most cost-effective way of addressing the intermittency of some forms of renewable energy. In particular, the report found that in a well interconnected European energy system based on 80% renewables, the load factor of back up plants would be in the region of 5%, increasing to 8% in 100% renewables scenario[7].

Options for Decarbonisation – FITs

Question 4. Do you agree with the Government's preferred policy of introducing a contract for difference based feed-in tariff (FIT with CfD)?

WWF's preference would be for a Fixed FIT to be introduced rather than a FIT with CfD or a Premium FIT. We have set out our key reasons below.

Advantages of a Fixed FIT

Firstly, both Fixed FITs and FiTs with CfD have an important advantage over the Premium FiT in that they protect revenues for low-carbon generators in the case of low gas prices but also protect consumers against electricity price rises beyond the fixed tariff or strike price in the event of high gas prices[8] (an important consideration given the need to maintain long-term public legitimacy behind the decarbonisation of the power sector). We see this balance between the protection of minimum revenues to the low-carbon power sector and the importance of mitigating increases in consumer bills as extremely important if the UK is to decarbonise its power sector in a timely and affordable manner. We also note the risks of under- or over-rewarding investment which could arise under a Premium FiT if a future Government increased or decreased the carbon floor price mechanism, which makes a Premium FiT an unattractive option[9].

We acknowledge that the introduction of a Fixed FiT would result in a greater disruption to current market arrangements, in particular given the need to introduce a low-carbon purchasing agency. However, once implemented, we believe that the Fixed FIT offers various advantages over the FiT with CfD and would be the best option to adopt to support the renewables industry:

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7 Roadmap 2050: A Practical Guide to a Prosperous, Low-Carbon Europe, European Climate Foundation, April 2010, http://www.roadmap2050.eu/downloads. See in particular executive summary to Volume 1.

8 See in particular pages 71 and 72 of the Redpoint report.

9 See in particular para 52 of EMR Consultation Document.

- Firstly, as made clear in the Redpoint report, one of the risks of implementing FITs with CfD *"is in identifying an index with sufficient underlying liquidity that it can be reliably used to settle financial contracts with low risk of manipulation"10*. Given the lack of liquidity in the current market arrangements and current doubts as to the extent to which liquidity will be improved in the near future, we consider this to be an important disadvantage of FITs with CfD.

- Secondly, as opposed to Fixed FITs and the current Renewables Obligation, the FITs with CfD introduce an offtake risk for low-carbon generators. Whilst we note from the EMR consultation that DECC sees this as an advantage as it maintains the effectiveness of short term electricity price signals on availability decisions, electricity price signals are in fact very unlikely to have much impact on maintenance / outage decisions for marine renewables, where most of the low-carbon generation growth is needed. For marine renewables and offshore wind in particular, generation and maintenance decisions will first of all be weather dependent, not market signal dependent. We believe that FITs with CfD would make it harder for new entrants to access the UK's electricity market, given that smaller new entrants will want as much certainty as possible at the investment decision stage that they will be able to sell their electricity. Indeed, one of the helpful features of the current RO is that by removing the offtake risk, the RO has facilitated the appearance of smaller new entrants on the UK's renewable energy market, an advantage which would be preserved under a Fixed FiT.

- Finally, once implemented, a Fixed FiT would be much simpler to administer on a day to day basis than FITs with CfDs, given that an agreed tariff will be agreed for a determined period of time under the long term contracts without any ongoing financial adjustments having to be made under separate financial settlement contracts.

Balancing efficiency signals can be preserved under a Fixed FiT

We recognise that a disadvantage of a standard fixed FIT from a system balancing perspective is that it does not provide the same short term price efficiency signals that a FIT with CfD would provide (although note our point above regarding the limited effectiveness of price signals on renewable generation). However, we believe that this issue could be addressed in the way incentives are provided under the Fixed FiT contracts. For instance, long-term fixed FIT contracts could provide a higher fixed tariff for periods of peak demand both on a daily basis (higher fixed tariffs could be provided for peak demand periods between 7 and 9am and 5 to 8pm) and on a seasonal basis (higher tariffs could be awarded in periods of higher demand in the winter than in periods of lower demand in the summer). This would then encourage generators to carry out outage and maintenance procedures at periods of lower demand, thus helping the system operator with its system balancing functions on both a daily and longer-term basis.

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10 See page 85.

Tariffs should be technology specific

Regardless of the type of feed-in tariff that will eventually be introduced, it is key that the level of support given under each long-term contract be specific to a particular technology. In particular, the level of support granted under a long-term contract should be reflective of the maturity of a technology and of its current ability to benefit from economies of scale. For instance, marine renewables (some forms of which are still at the emerging development stage) should be getting more support than onshore wind (which still requires further support to benefit from greater economies of scale), which in turn should be getting more support than other more mature technologies.

There is a need for an ambitious 2030 target for renewables

In the case of renewables, **we are strongly of the view that long-term contracts for low-carbon generation should be granted within the context of an ambitious 2030 target for renewables deployment.** Such a target will play an important role in providing a clear signal for the development of a strong renewables supply chain in the UK. In addition to the important contribution which renewables could make to help the UK meet its emission reduction commitments, the economic benefits of building a strong renewables supply chain in the UK should not be underestimated. For instance, the Offshore Valuation Report11, recently published by government and key industry players, found that by using 29% of the UK's practical offshore resource, the marine renewables industry could make the UK a net exporter of electricity, whilst creating around 145,000 jobs and £62bn of annual revenues for the UK economy by 2050 – this figure does not even take into account additional employment growth which could result from export opportunities. Renewable UK also recently found that in the period from 2007/2008 to 2009/2010, full time employment in the wind industry went up by 91% whilst employment figures in the rest of the economy went down by 3.4% over the same period12.13

Long-term energy demand reductions should be captured by the FIT contracts

As explained in answer to question 26 and in the executive summary, we are strongly of the view that the ability to deliver long-term energy demand reductions should be included within the scope of the FiT contracts.

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11 http://www.offshorevaluation.org/downloads/offshore_vaulation_full.pdf

12 http://www.bwea.com/media/news/articles/pr20110201.html

13 See also the Welsh Assembly Government's Energy Policy Statement "A Low Carbon Revolution". http://wales.gov.uk/topics/environmentcountryside/energy/renewable/policy/lowcarbonrevolution/?lang=en. This sets out an aspiration of generating more electricity from renewable sources, by 2025, than the total currently consumed.

Question 5. What do you see as the advantages and disadvantages of transferring different risks from the generator or the supplier to the Government? In particular, what are the implications of removing the (long-term) electricity price risk from generators under the CfD model?

We agree with DECC that when dealing with emerging and new low-carbon technologies such as renewables (and abatement technologies such as CCS), transferring risks (in particular electricity price risk) away from energy companies makes sense in order to accelerate the deployment of these technologies on a commercial scale and to allow them to gradually benefit from economies of scale. However, as these technologies improve and become more cost efficient, it will be important for these risks to be gradually transferred back to energy companies in order to protect consumers from providing unnecessary subsidies to self-sustaining industries.

However, we do not agree that a transfer of risks from electricity generators to Government should apply to new nuclear power stations for the following key reasons:

- ***The nuclear sector is already a mature industry:*** The nuclear industry has benefited from 50 years of civil nuclear expertise. If the nuclear industry cannot be competitive in a liberalised electricity market without removing the long-term electricity price risk from nuclear generators (in addition to introducing a carbon floor price), then this is clearly because nuclear energy is not an economically efficient option. It is important to note here that the government is proposing to take a considerable amount of risk away from nuclear generators outside of just the FIT mechanism. In particular, the current consultation on third party liability caps, which proposes to increase the minimum liability cap per nuclear site to €1.2 billion still falls far short of what the cost of a potential nuclear accident could amount to – for instance, the 1982 Sandia Sitting study**14** that was commissioned by the US Nuclear Regulatory Commission estimated that the cost of a single nuclear accident could amount to $300bn in 1982 value / $690bn in today's value, which is considerably above the newly proposed indemnity cap.

- ***The costs of building new nuclear power stations is continuing to rise:*** We have some serious concerns about the cost uncertainties linked to the building of new nuclear power stations and in particular the suggestion by certain observers that building new nuclear power stations is substantially cheaper than building renewable energy infrastructure. We have attached as a separate attachment to this submission a short summary of WWF's key findings on available evidence regarding the continued cost increases and uncertainties of building new nuclear power stations. This summary highlights in particular that the cost estimates of new nuclear power stations are continuing to rise, as currently demonstrated by the latest EPR reactors being built in France (currently €1bn over budget and 2 years delayed**15**) and Finland (currently

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14 http://www.nirs.org/reactorwatch/accidents/crac2.pdf

15 http://www.businessweek.com/news/2010-07-29/edf-said-to-raise-flamanville-costs-delay-reactor.html

55% over-budget and 3 years delayed)**16**, despite the fact that the nuclear industry is a mature industry.

- ***Relying on new nuclear power stations will introduce serious environmental risks:*** We are concerned that the construction of a new fleet of nuclear power stations in the UK will end up introducing a range of other environmental problems caused in particular by the lack of a long term storage solution for high level radioactive wastes (high level radioactive waste remains dangerous for over 100,000 years – up to 200,000 years in the case of spent fuel and 250,000 years in the case of plutonium) and the potentially catastrophic consequences of a nuclear accident. With respect to high level radioactive waste management, it is worth pointing out that the latest attempt to find a permanent storage solution in the Yucca Mountain in the United States had to be brought to an end by the Obama administration despite $1bn spent on a 6,000 page site characterisation plan. This casts some serious doubts as to whether a long-term geological storage solution will ever be developed. **Creating more radioactive waste with no real solution available for its safe and secure long-term disposal is passing on a serious legacy for future generations to deal with.**

- ***New nuclear power stations will be of little economic benefit to the UK:*** The construction of a new fleet of nuclear power stations would, as opposed to marine renewables, provide very little economic benefit for the UK economy. This point was well exemplified by the Committee on Climate Change in its recent report entitled "Building a low-carbon economy – the UK's innovation challenge"**17**. In this report, the CCC made a clear distinction between (i) technologies which the UK should "develop and deploy" – a strategy that should be pursued where the UK has a particular advantage to accelerate the development of new technologies (such as where the UK has the full range of manufacturing and business R&D facilities) - and (ii) technologies which the UK should simply "deploy" - a strategy that should be pursued where the UK is less well placed to influence the development of a particular technology**18**. **It is very telling that among the technologies that the UK should "develop and deploy", the CCC's analysis did not refer to nuclear power, recommending instead that the UK should "develop and deploy" offshore wind, other marine renewables and CCS technologies.** The CCC concluded that nuclear power was a technology that could only be "deployed" in the UK as opposed to "developed and deployed". One of the reasons given for this recommendation was that the UK would "need to rely on overseas based suppliers offering standardised designs" to develop new nuclear power stations. This would be extremely unlikely to benefit the UK's economy and employment growth and would instead cement the leadership position of other countries in nuclear power, rather than building the UK's industrial leadership in renewables.

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16 Schneider, M., Thomas, S., Froggatt, A., Koplow, D., 2009. The World Nuclear Industry Status Report 2009, Commissioned by the German Federal Ministry of Environment, Nature Conservation and Reactor Safety.

17 Building a low-carbon economy: the UK's innovation challenge, Committee on Climate Change, July 2010, http://hmccc.s3.amazonaws.com/CCC_Low-Carbon_web_August%202010.pdf

18 See in particular Part 2 (pages 13-17).

Options for Decarbonisation – Emissions Performance Standards

Question 12. Do you agree with the Government's assessment of the impact of an emission performance standard on the decarbonisation of the electricity sector and on security of supply risk?

WWF disagrees with a number of the government's assumptions on the impact of an emission performance standard. We do not believe that either of the government's proposed EPS models are sufficiently ambitious to avoid lock-in to high carbon fossil fuel generation.

Requiring only 25% of capacity of new coal to be fitted with CCS does not represent value for money

The rationale put forward in the consultation document for only requiring limited CCS on new coal is that requiring CCS on more than 25% of net capacity of new coal generation would represent poor value for money. Although fitting a larger proportion of the plant with CCS would cost more, it would contribute towards the UK's decarbonisation objectives and would undoubtedly be cheaper than doing a full CCS retrofit at a later date, a cost which is likely to have to be borne by consumers**19**. **If, as the consultation document states, the objective of the EPS is to ensure that coal contributes to security of supply 'in a manner consistent with the UK's decarbonisation objectives', then the government must set an EPS which is significantly lower than 600gCO2/kWh** to achieve this goal, given that the current average carbon intensity of the UK electricity sector is currently around 450gCO2/kWh.

An ambitious but realistic EPS would not threaten security of supply & would incentivise the low carbon supply chain

A well designed EPS would provide long term certainty for investors and should not pose a threat to security of supply. **WWF believes that it is key that a strong emissions performance standard be introduced alongside the carbon floor price to deliver a low-carbon power sector by 2030**. By "strong EPS", we mean an EPS along the lines previously suggested by WWF and Greenpeace (a plant-based EPS set at 300gCO2/KWh from now on for all new coal and gas plants, reducing to 100gCO2/KWh from 2025 onwards for all existing plants on the system**20**), not the "strong EPS" modelled in the Redpoint report (275gCO2/KWh for all existing from 2018), which we consider to be unrealistic. **We are concerned that the Redpoint report essentially sets up a "straw man" version of an EPS which is then dismissed because it is so ambitious that it could have adverse consequences.** A more phased version, along the lines proposed by WWF and Greenpeace, would have significant benefits.

In particular:

- A strong EPS would introduce clear physical certainty (i) as to the types of plants that can and cannot get built at a particular point in time but also (ii) as to the types of plant that can or cannot operate after a particular date, thus providing considerable certainty as to the level of

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19 The Energy Act 2010 currently contains a provision stating that part of the CCS levy (which could be worth up to £10bn over 15 years) could be used for the future retrofit of new CCS demonstration plants.

20 See the NGO joint statement on emissions performance standards, attached to this response.

decarbonisation that can be achieved by 2030. In terms of investment in new power stations, this has the advantage of providing a clear sales volume opportunity for new investments in the renewable energy sector (which is important given the opportunity for the UK to become an industrial leader in marine renewable in particular)**21** . In the case of CCS technology, a strong EPS also has the advantage of requiring the retrofitting of CCS technology on existing unabated coal and gas plants by a particular date, thus sending a very clear and early signal to stimulate the CCS supply chain.

- A tight EPS with a carbon intensity level that gradually goes down is much better at rewarding early movers who build plants that go below the statutory carbon intensity level. This is because the EPS provides more certainty of long term demand for low carbon generation and so will make investors more inclined to support the up front cost of plants that are ahead of the decarbonisation deadline rather than just reacting incrementally as the rising carbon price takes hold and interacts with other cost factors such as coal and gas prices. This 'early mover' advantage is important given that the timing of investments in clean energy is key if we are to substantially decarbonise the power sector in the next 20 years.

A carefully designed and implemented EPS would not have to result in a 'dash for gas'

A dash for gas caused by the introduction of an EPS would only occur if the policy was poorly implemented and if grandfathering of existing plant were allowed, which WWF does not support.

Question 13. Which option do you consider most appropriate for the level of the EPS? What considerations should the Government take into account in designing derogations for projects forming part of the UK or EU demonstration programme?

WWF supports a strong EPS, along the lines described in answer to question 12, and does not believe that either of the government's proposed options are set at an appropriate level given that the power sector needs to be nearly decarbonised by 2030. In practice, there is little difference between setting the EPS at 450gCO2/kWh and 600gCO2/kWh given the exemptions for plant receiving EU or CCS demonstration funding (as there is currently limited prospect of CCS projects going forward without one of these sources of financial support). As outlined above, we disagree with the government's assumptions on value for money and believe that new fossil fuel plants should be required to fit a higher volume of CCS. We do not consider that project forming part of the UK or EU demonstration programme should benefit from derogations.

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21 For instance, the Offshore Valuation Report (http://www.offshorevaluation.org/downloads/offshore_vaulation_full.pdf) that was put together by DECC and a range of other industry players, showed that by just using 29% of the UK's practical offshore resources, the UK's offshore renewable energy industry alone could allow the UK to become a net electricity exporter by 2050 and generate annual revenues of £62 billion and create approximately 145,000 new jobs in the UK by that date.

Question 14. Do you agree that the EPS should be aimed at new plant, and 'grandfathered' at the point of consent?

WWF does not agree that new plant should be 'grandfathered' at the point of consent. Grandfathering would mean that it is unclear whether and when either coal CCS demonstration plants or unabated gas plants will be incentivised or required to retrofit CCS, shut down or operate at reduced running hours. This puts at risk the UK's ability to meet the 2030 decarbonisation targets recommended in the Committee on Climate Change's 4th budget report22. Relying solely on future carbon price support (one of many price variables affecting investment / operational decisions) to drive down emissions provides significantly less certainty for investors and for Government's plans to decarbonise the power sector.

A strong EPS along the lines proposed by WWF above would introduce clear physical certainty (i) as to the types of plants that can and cannot get built at a particular point in time but also (ii) as to the types of plant that can or cannot operate after a particular date, thus providing considerable certainty as to the level of decarbonisation that could be reached by a particular date as well as providing certainty for investors in both conventional generation (in terms of when CCS retrofits would need to occur) and low carbon generation (in terms of anticipated volume sales opportunity).

Question 15. Do you agree that the EPS should be extended to cover existing plant in the event that they undergo significant life extensions or upgrades? How could the government implement such an approach in practice?

In the event that the government decides to grandfather existing plant at the point of consent (with which we strongly disagree), WWF agrees that if any plant undergoes significant life extensions or upgrades the EPS should be extended to cover that plant. However as previously stated, WWF's proposal is that the government should introduce an EPS with no grandfathering and with a gradually declining level of carbon intensity which would ultimately starting biting on existing plants from the mid-2020s. Failure to have such an EPS will make it very hard for the UK to meet the 4th carbon budget's objective of a near-decarbonisation of the power sector by 2030.

Question 18. Do you agree with the principle of exceptions to the EPS in the event of long-term or short-term energy shortfalls?

Exemptions could be granted under a strong EPS model for plants that specifically operate at times of peak demand / low renewables output under the Government's proposed targeted capacity mechanism23. This could be achieved by means of derogations in terms of restricted annual running hours or restricted annual volumes of CO2. This would however need to be designed so that derogations (and the extent of these derogations) only apply to plants that are required for security of supply purposes and have a very limited impact on overall power sector emissions. We have attached

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22 http://www.theccc.org.uk/reports/fourth-carbon-budget

23 See our response below on the targeted capacity mechanism.

to this response a joint statement published by several organisations in October 2010, which sets our derogation proposals in more detail24.

Options for Market Efficiency and Security of Supply

Question 19. Do you agree with our assessment of the pros and cons of introducing a capacity mechanism?

We agree that introducing a capacity mechanism in addition to other measures introduced as part of the EMR would be helpful. As explained in our response to question 2, we believe that decisions on the amount and nature of the UK's future back-up plants should not be taken in a rushed manner and should fully take into account opportunities in energy efficiency, demand side response and increased interconnection infrastructure which could reduce the amount of back-up capacity required.

Question 20. Do you agree with the Government's preferred policy of introducing a capacity mechanism in addition to the improvements to the current market?

Yes, please see our response to question 19.

Question 22. Do you agree with the Government's preference for the design of a capacity mechanism: a central body holding the responsibility, volume based – not price based, and a targeted mechanism – rather than market-wide.

Yes, WWF agrees with the proposal to introduce a targeted capacity mechanism in the manner described by DECC in the consultation document. We believe in particular that the targeted capacity mechanism will provide Government with greater control as to the amount and nature of the back-up capacity mix that is required, which would help ensure that the UK's back up plants are of the most appropriate nature to complement an electricity system increasingly based on renewable energy sources. As pointed out in the Redpoint report25, an additional advantage of the targeted capacity mechanism over a market-wide mechanism, is that it will be better at stimulating investment in new efficient plants as opposed to extending the operation of existing and less efficient plants (although there might be instances under a targeted capacity mechanism where Government may want to maintain the availability of older existing plants that would operate at restricted times of high demand and lower renewables output).

Question 23. What do you think the impact of introducing a capacity mechanism would be on incentives to invest in demand-side response, storage, interconnection and energy efficiency? Will the preferred package of options allow these technologies to play more of a role?

The impact of a capacity mechanism on incentivising demand-side measures, interconnection and storage will very much depend on what government wishes to include under a targeted mechanism.

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24 Joint Statement on power sector decarbonisation and plant CO2 performance standards.

25 See in particular page 10.

We believe that the targeted mechanism should be designed in a way that it acts not only as a back-up capacity mechanism, but also as a short-term system balancing tool. To this end, we believe that the target capacity mechanism should also include demand-side response, storage and interconnection. By including all these other measures, the targeted capacity mechanism would provide the system operator with more options to balance the system in the short term.

By putting greater emphasis on short term demand side response from large energy intensive users, development of electricity storage solutions and on improved interconnection, which would spread the intermittency of some forms of renewable power over a wider geographical area, such a targeted capacity mechanism would also reduce the amount of back-up plants actually required under the capacity mechanism (as explained in relation to question 2). This in turn has the potential to further reduce emissions from the power sector as well as the overall costs of the targeted capacity mechanism, which could help mitigate the impact of the reforms on consumer bills.

Analysis of Packages

Question 26. Do you agree with the Government's preferred package of options (carbon price support, feed-in tariff (CfD or premium), emission performance standard, peak capacity tender)? Why?

Carbon price support / emissions performance standard

A carbon floor price could be used as a useful additional tool as part of the overall EMR package, in particular in providing the Government with a helpful source of revenue from the UK's most polluting power stations (consistent with the "polluter pays principle"), a significant proportion of which could and should be reinvested in the capitalisation of the Green Investment Bank to support energy efficiency and renewable energy projects. **However, the effectiveness of the carbon floor price in promoting a greater deployment of renewable energy and acting as a disincentive to investment in unabated fossil fuel plants is likely, without stronger complementary policies, to be limited.** This is mainly because a carbon floor price will be one of many variables (such as coal and gas prices) which investors will take into account prior to making key investment decisions. As a result, the carbon floor price cannot on its own offer the clear regulatory certainty necessary to ensure that the UK power sector will reach a specific level of decarbonisation by a particular date and is therefore not a substitute for a strong EPS. As such, **we suggest that a carbon floor price should be accompanied by a strong emissions performance standard, without grandfathering and with a gradual tightening of the carbon intensity level as the decarbonisation deadline approaches. A strong emissions performance standard (as suggested in our responses above on the EPS) would be able to drive investment decisions away from unabated fossil fuel plants and send a strong and long-term sales volume opportunity signal to the marine renewables and CCS supply chain.**

As suggested in our response to the carbon floor price consultation (attached), we believe that the following recommendations would help maximise the effectiveness of a carbon floor price:

- As made clear in the Redpoint report analysing the different policy options for the EMR, **the carbon floor price will only have some impact on investment behaviour if investors have long-term confidence that this policy tool will not be subsequently modified by future governments.** To ensure that investors consider the carbon floor price as a predictable and long-term policy and in order to maximise the effectiveness of this mechanism, **we believe that an ambitious trajectory for a floor price needs to be set during this current Parliament for the period up to 2030. In particular, we believe that the floor price mechanism should result in carbon prices that follow a linear path from 2013 to £40/tCO_2 in 2020 and a minimum of £70/tCO_2 in 2030 (broadly Scenario 3 in the consultation paper).**

- It is important to the effectiveness of the carbon floor price as a tool to stimulate investment in low-carbon technology and to its public acceptability that it is not perceived as another "stealth tax". The carbon price will feed through into higher electricity prices for domestic and business consumers. Revenues of up to £4.5bn could be generated by 2015/16 (from the sum of EUA auctions and the carbon floor price) rising to £8bn by 2020. To this end, we are strongly of the view that all, or a very substantial proportion of the revenues generated from this policy should then be re-invested into energy efficiency and renewables funding (including R&D support for emerging technologies). This would be consistent with the requirements of Article 3(d).4 (auctioning of allowances to the aviation sector) and Article 10.3 (auctioning of allowances in Phase III of the EU ETS) of the EU ETS Directive (as amended) which require that a substantial proportion of the revenues from the auctioning of EU Allowances must be reinvested in measures to address climate change, including energy efficiency and support projects for emerging technologies.

- **To avoid undermining the integrity of the carbon floor price, windfall profits for existing nuclear power generation have to be avoided in the design of the mechanism.** The current suite of incumbent low carbon electricity providers (i.e. renewables, CHP and nuclear) all appear to be affected differently by the carbon floor price. However, **WWF and Greenpeace have recently revealed that according to the assumptions used in the Redpoint study, the potential windfall profit for the existing nuclear operators could amount to up to £3.43bn for the period 2013-2026 (£3bn until 2022) under the £40/tCO2 carbon floor price scenario** – although the timescales are different, it is interesting to note that this is equivalent to a substantial proportion of the £4bn to £6bn capitalisation of the Green Investment Bank (by 2015) which has been called for by most analysts if the bank is to be successful at raising significant funds to support renewable energy and energy efficiency projects. Given the substantial amount of subsidies that the nuclear industry has already received in the UK (including a £10bn bailout of British Energy paid for by UK taxpayers in 2002 and substantial waste processing and decommissioning support) and the mature state of that technology, the design of the carbon floor price must not result in super profits for existing nuclear generators. To this end, **we support the introduction of a windfall tax designed to capture these windfall profits (which would be similar to the German Government's proposal to introduce a tax on nuclear fuel rods from 2011).** An amount equivalent to the proceeds of this tax could then be reinvested via

the Green Investment Bank in energy efficiency and renewable energy projects, as already suggested above for the revenues of the carbon floor price mechanism.

Feed-in Tariffs

As explained in our response to question 4, we believe that Fixed FITs, with technology specific tariffs, would be the best form of feed-in tariff to introduce as part of the EMR. Whilst it does require greater implementation work than the other 2 FiT options, it has the following advantages over other forms of FITs once implemented: (i) it protects revenues for low-carbon generators in the event of low gas prices and protects consumers from increases in electricity prices in the event of high gas prices (a benefit shared with the CfD option), (ii) it is less open to manipulation than the FiT with CfD, (iii) it removes the offtake risks from generators which is key if the UK wants to see the arrival of new entrants in the renewable energy market and (iv) it is easier to administer on a day to day basis given that there is no need for regular financial settlements to be made under the long-term contracts.

As explained in the executive summary and suggested in the Redpoint report, **we believe that it is absolutely key for long-term demand reduction measures to be included under the scope of long-term contracts and for demand measures to be treated on a par with low-carbon generation.** There is strong evidence available (such as the UKERC study referred to in the executive summary) suggesting that there is ample potential to reduce energy demand in various sectors of the UK economy, including homes and transport, and that energy demand reduction measures could substantially reduce the costs of delivering a low-carbon power system in the UK. Including long-term demand reduction targets under long-term contracts with big businesses such as supermarkets, will provide contractual certainty that a specific level of demand reduction target could be delivered by a particular date. This then helps Government and the market have a better understanding of the evolution of electricity demand and the future levels of baseload and back-up capacity required to meet that demand. We would like to draw DECC's attention in particular to experience from the PJM market in the United States, where demand reduction targets are included under long-term contracts, and which suggests that energy demand reduction targets can be delivered in 90% of cases.

Targeted capacity mechanism

As explained in our answer to question 22, we agree with the Government's suggestion to introduce a targeted capacity mechanism in addition to other measures brought forward under the EMR. We strongly believe that this mechanism should incentivise not only generation assets but also demand side measures, development of electricity storage capacity and improved interconnection infrastructure with other European grids.

Implementation Issues

Question 31. Do you have views on the role that auctions or tenders can play in setting the price for a feed-in tariff, compared to administratively determined support levels?

We believe that technologically neutral auctions would not be an effective way of supporting the deployment of new low-carbon generation capacity as it would in effect favour some technologies over others. **We believe that should any auctions take place, these should be technology specific.** In particular, we believe that to ensure the continued growth of the renewables industry in the UK and to ensure the UK seizes the opportunity of becoming an industrial leader in marine renewables, an ambitious renewable energy target should be set for 2030. This would provide a clear sense of direction for the UK's energy policy and would send a strong supply chain signal to the renewables industry beyond 2020. **The lack of a target for 2030 and increasing concerns that the EMR package appears to favour the deployment of new nuclear capacity to the detriment of renewables could seriously undermine the growth of the renewables industry in the UK**, which could jeopardise the UK's ability to meet its decarbonisation target (including its legally binding renewables target for 2020) and of benefiting from the economic and employment opportunities offered by the renewables industry.