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Emailed to: costofenergy@beis.gov.uk 3rd January 2018

NFLA / Stop Hinkley joint submission to BEIS call for evidence on the 'Cost of Energy' review

Dear BEIS Cost of Energy Review Team,

I attach with this letter the joint submission of the Nuclear Free Local Authorities (NFLA) and the group 'Stop Hinkley' to the BEIS call for evidence on Professor Dieter Helm's 'Cost of Energy' Review. The NFLA and Stop Hinkley are content for its submission to be made public as required, and will place an adapted version of this submission on its own website.

For your information, the NFLA is a local authority group made up of Councils from England, Scotland, Wales, Northern Ireland and the Republic of Ireland. It raises legitimate concerns and issues over all aspects of nuclear policy in order to assist local government in meeting its commitment to sustainable development, energy policy development, environmental protection and public safety. Further details on its remit can be found at its website http://www.nuclearpolicy.info or by contacting the NFLA Secretariat using the details at the top of this letter.

Stop Hinkley is a pressure group which is opposed to the development of new nuclear reactors at the Hinkley Point EDF Energy site in Somerset. Their interest in this joint submission remains around the development of new nuclear facilities and appropriate, cheaper alternatives. They fully support the NFLA's policies around the promotion of decentralised, renewable energy.

In its submission the NFLA and Stop Hinkley have sought to consider each of the questions that lay at the heart of Professor Helm's review and provide our own views and additional evidence to back this up. Its full response is attached below.

1. Electricity Generation

1.1 What are the longer-term challenges for electricity generation?

NFLA / Stop Hinkley note that the Committee on Climate Change (CCC) points out that ***the cost of renewables has fallen far more quickly than it assumed earlier***. In its 2011 Renewable Energy Review offshore wind costs were expected to fall to £52-124/MWh by 2040, but recently offshore wind projects have signed contracts at £57.50/MWh for delivery from 2022. At the same time, projected costs for new nuclear power have increased, while the deployment of carbon capture and storage (CCS) has not yet begun in the UK. Battery costs have also fallen more quickly than the Committee assumed. (1)

What is more offshore wind payments will only continue for 15 years whereas nuclear payments would continue for 35 years.

According to Hans Bunting, chief operating officer of renewables at Innogy SE, part of the company that owns npower, offshore windfarms will become even cheaper than today and

companies that want to build new reactors in the UK will not be able to compete with windfarms on cost, even when their intermittency was taken into account. (2)

Bloomberg New Energy Finance (BNEF) also predicts that offshore wind costs will drop a stunning 71% by 2040. (3)

Dave Toke, reader in Energy Policy at Aberdeen University, gives six possible reasons for the continuing fall in offshore wind costs:

- Advances in computer modelling leading to better blade designs;
- Digital control means more energy converted to electricity;
- A smaller number of turbines required for the same output;
- Fabrication and construction techniques for building the windfarms have been dramatically improved; Considerable reduction in 'supply chain' costs have been achieved;
- Some big multinational corporations are now seeing renewable energy as the central, rather than peripheral. (4)

Onshore windfarms could be built for the same cost as new gas power stations – around half the cost of Hinkley Point C. The technology has become so cheap that developers could deliver turbines for a guaranteed price of power so low that it would be effectively subsidy-free in terms of the impact on household energy bills. (5)

The average price at which contracts have recently been awarded in German auctions was €38/MWh. Once distribution and transmission costs are factored in, the figure is likely to be closer to €40/MWh – about £35/MWh. (6) According to Bloomberg New Energy Finance (BNEF) new onshore windfarms were the cheapest way for a power company to produce electricity in Britain by 2015 with costs dropping to £55/MWh. (7) The trade body, Scottish Renewables, has shown that costs could be cut by a further 20% if government, industry and regulators work together to make sure we can use the latest generation of turbines on suitable sites, reduce grid charges, and deploy energy storage technologies. (8) The Bloomberg New Energy Finance (BNEF) outlook says the price of onshore wind has dropped 30% in the past eight years, and is expected to fall another 47% by 2040. (9)

An analysis by ECIU shows that the current block on onshore wind could cost £1bn over 4-5 years relative to deploying other technologies. (10)

The solar energy industry has been notoriously difficult to predict correctly. The IEA have constantly underestimated solar's potential and growth. That said, there are many trends in solar that we can foresee continuing or accelerating over the next couple of decades. Costs will continue to decline as solar power installations multiply and solar technology becomes more efficient. Price could decline by an additional 59% by 2025 compared against 2016 prices, according to the International Renewable Energy Agency. Further declines will be difficult to achieve, but by 2040, the price could be two-thirds of its current cost. (11) By 2030 or 2040 solar will be the cheapest way to generate electricity, indeed any form of energy everywhere. At the rate of growth that we are seeing at the moment of 35-45% per year solar will grow from providing 2% of global electricity to at least 50% by 2030. (12)

In October it was reported that Saudi Arabia had received offers to supply solar electricity for the cheapest prices ever recorded, at 1.79 cents per kWh beating the previous record for a solar project in Abu Dhabi at 2.42 cents. (13) Since then Chile has received two bids for electricity from large-scale solar projects, in 20 year contracts, at prices under 2.5¢/kWh in a recent national auction. The lowest bid was 2.148¢/kWh. This represents continued price declines in the solar industry and financial trust in the product from global financial houses. (14)

As Mike Thompson, Head of Carbon Budgets at the CCC says "*It is increasingly apparent that renewables do or will offer the lowest cost of electricity over their lifetime of all generating options*."

In order to keep costs as low as possible over the coming decades the challenge for the Government is, therefore, to maximise the use of these renewables whilst also ensuring security of supply.

Energy minister Richard Harrington attacked nuclear power detractors as "*naïve and simplistic*" in his recent keynote speech at the Nuclear 2017 conference. He said that nuclear power would continue to play an "*important role*" in the mix of the UK's energy sources. "*There will be more pressure on nuclear from battery storage but we know that nuclear will be competitive*," he added. (15) It must be assumed that the Minister agrees with Tom Greatrex, chief executive of the Nuclear Industry Association, that: "*It doesn't matter how low the price of offshore wind is*" and EDF Energy who say the UK still needed a "*diverse, well-balanced*" mix of low-carbon energy. In other words because renewables are intermittent, nuclear energy will still be needed. (16)

However, renewables could soon be producing enough electricity to power the grid from April to October. The implication is that for most of its contracted operating life Hinkley Point C would increasingly be competing with other, lower cost low-carbon sources. For efficient system operation either Hinkley would have increasingly to 'load follow', adjusting its output up and down to follow changes in demand, or alternately, baseload nuclear would displace other and cheaper sources, for example forcing wind and solar off the grid, if it cannot operate flexibly, or if the £92.50/MWh (indexed) contract is allowed to determine its operation (the plant with biggest payment has most incentive to run). Ministers will have to explain to consumers why they are paying for expensive nuclear electricity when cheaper renewables are being turned off.

We strongly disagree with the nuclear industry view. As Dave Elliott Emeritus Professor, Faculty of Science, Technology, Engineering & Mathematics, Open University says "*we have the technology to match green power supply and demand at affordable cost without fossil fuels - by deploying the 'smart grid', using 'green gas' made from surplus power, and raising energy efficiency*." (17)

Thus the main challenges for the Government over the coming decade will be to establish a regulatory framework which balances green energy with supply, and to capture the benefits of the falling cost of renewables for consumers.

1.2 What matters should the Government take into account in considering the policy framework for electricity generation?

The CCC points out that many technologies (e.g. solar photovoltaics) that have recently deployed very quickly have benefited from a long history of earlier development first. (18)

Helm wants to phase out support for renewable technologies but he appears not to recognise that the dramatic cost reductions for some technologies are a direct result of earlier funding support. (19)

Helm wants a new "unified equivalent firm power (EFP) capacity auction to be put in place to replace Feed-in Tariffs (FiTs) and other low-carbon Contracts for Differences (CfDs). He wants a technology neutral approach, but Emeritus Professor Dave Elliott asks would 'one size fit all'? The Renewable Obligation (RO) and CfD were subdivided. Would a single EFP auction suit all the various technologies? Would they yield enough balancing capacity of the right type? (20)

In our view, pitting onshore wind, for instance, against solar PV, could mean we end up with a renewable portfolio dominated by one type of renewable technology, which could mean, for instance, a surplus of electricity when the sun shines but a deficit when the wind blows.

1.2.1 What about tidal and wave power?

The UK is the global leader in wave and tidal power. We have installed the first two commercial tidal stream arrays in the world off the coast of Shetland and in the Pentland Firth. The UK is also at the cutting edge of new technology: last month the new 'Scotrenewables' tidal turbine smashed the record for generating one gigawatt hour of power in testing at the European Marine Energy Centre off Orkney – where more devices have been tested than anywhere else in the world. Wave

Hub, off the coast of Cornwall, is one of the largest and most advanced testing sites in the world. In our view, such activity is building on the UK's existing maritime economy and expertise to create new industrial clusters in coastal communities across the UK.

This successful research and development effort now has to be translated into further deployment and commercialisation. Our global leadership in innovation has not yet translated into developing a UK market for wave and tidal technologies. Under the current set up of the Contracts for Difference (CfD) scheme, marine renewables have to compete against technologies which have already deployed at scale in the UK and been able to cut their costs, such as offshore wind. Replacing the CfD with the UEFP would compound this problem. As currently set up, the CfD will not help us build a market for these world-leading technologies. Yet the global market for marine energy could be worth £76bn by 2050. Other countries will capitalise on our hard work if we allow them to do so. Renewable UK's plans to work with the Offshore Renewable Energy (ORE) Catapult to prove marine energy can meet key government benchmarks. It is confident wave and tidal will clearly demonstrate how they bring industrial benefit to the UK by leading a global market and lowering carbon emissions; all whilst steadily reducing costs. (21)

The Government needs to come up with a system which backs new innovative technologies and nurtures them up to the point where they can be a commercial success.

1.2.2 Cost of Intermittency

Helm's UEFP would be intended to ensure "*the costs of intermittency rest with those who cause them*". He says this system would encourage intermittent generators – such as wind farms or solar farms – to team up with stabilising technologies such as battery storage to secure a power supply contract. Professor Dave Elliott says this could mean a race to the bottom in price terms, with no one looking to whole system balancing. The EFP auction idea would risk creating inefficiencies and added costs for consumers. It is more efficient to balance the grid at the system level rather than doing it at individual project level, in order to optimise the use of all existing generation and storage assets. Balancing each individual project would be likely to create unnecessary additional costs. (22)

1.3 What additional evidence should the Government consider to reduce the cost of electricity generation in the longer term?

Expenditure on the Hinkley Point C site will be rising as construction work proceeds but while the cost of abandoning the project may be high, it would be much lower than persisting with the project. At the moment it may only cost around £2bn to abandon the project, but could cost consumers around £50bn over 35 years if construction continues to completion. And the £2bn cancellation cost would be dwarfed by the 'opportunity costs' of the nuclear programme – what options are we not pursuing because we are assuming nuclear power will meet our objectives. Pursuing a consistent policy of energy efficiency measure and promoting renewables would be a much more cost-effective way of meeting our climate change goals. The Government should seriously consider the recent report by Professor Steve Thomas and examine the option of cancelling Hinkley Point C as a way of reducing the future cost of electricity to consumers. (23)

Abandoning Hinkley Point C now could save consumers almost £1.5bn per year for 35 years from 2027.

A study by E3G shows that the cheapest way to decarbonise the power system involves large volumes of variable renewable generation even when taking system integration costs into account. The E3G report says Government needs to deliver new low carbon generation capacity as cheaply as possible. The UK will need new capacity capable of producing around 150TWh per year of electricity by 2030 – around half of all current output. All plausible scenarios imply that this can only be achieved by deploying a significantly increased volume of renewable generation – likely to be around 50GW, predominantly from a combination of onshore and offshore wind and solar PV. (24)

Since Hinkley Point C was first approved there has been a consumption revolution. The Government was projecting an increase in electricity consumption of 15% by now, whereas in

practice we are consuming 15% less than a decade ago. In other words it made a 30 % error. This is despite a 13% increase in GDP over the last decade. Household consumption for lighting has dropped from 20.7TWh in 2007 to 14.2TWh this year. In 1990 when Compact Fluorescent Lightbulbs (CFLs) were scarce in UK homes 26.6TWh of electricity were consumed in UK domestic properties for lighting. The average household is spending £87.36 per year on lighting, but if consumption levels had remained at 1990 levels that figure would have been £164 per year. This trend is set to continue. By 2025 LEDs will probably have replaced most CFLs and incandescent light bulbs, and LEDs themselves are becoming more efficient. Consumption is expected to fall a total of 89% compared to the year 2000, and annual expenditure will fall to just £16. (25)

In our view, the Government should consider a crash programme to install LEDs in order to cut peak electricity demand by up to 8GW. Even a much more limited programme focussed on the domestic sector could reduce electricity demand by 2.7GW – almost enough to replace the capacity of Hinkley Point C. (26)

2. Electricity Transmission and Distribution

2.1 What are the longer-term challenges for electricity transmission and distribution?

2.1.1 Balancing Green Energy

The National Grid's (NG) Future Energy Scenarios (2016) show a steadily declining need for 'baseload' generation. By 2030 there will be growing periods when wind and solar meet all projected demand. In fact renewables could soon be producing enough electricity to power the grid from April to October. The capacity of 'firm' inputs (like gas, nuclear, biomass, interconnectors, storage etc) required to operate more than half the year is expected to be reduced to 20GW overall. (27) The dominant need in the majority of National Grid scenarios post 2030 will be for adequate responsive capacity displacing coal and gas, and more efficient approaches to balancing demand and supply.

Michael Grubb, Professor of International Energy and Climate Change Policy at University College London, told the House of Lords Selected Committee on Economic: "*If you are worried about how to provide power during winter periods when there is a cold dark windless night, you do not want to build a spanking new plant designed to run 100% of the time; you build something that is cheap to construct and expensive to run*." (28*)*

"Large-scale power generation … will be the dinosaur of the future energy system: Too big, too inflexible, not even relevant for backup power in the long run," says UBS Bank. (29)

Baseload is not helpful in balancing a variable energy supply – it simply leads to further overproduction of energy at times when renewables can meet demand on their own. In a grid which has a large contribution from variable renewables, what is required is flexible electricity supply which can be turned on and off quickly to fill the troughs when renewables aren't able to supply. Nuclear power is a very poor fit for a 21st century grid system and acts against increasing renewable energy capacity. (30)What the UK needs is flexible, not continuous baseload power generation to back up wind and solar, which can vary in less than one hour. Hinkley's power is not only almost irrelevant; its inflexible nature will soon make it redundant. (31)

Gas power stations that can quickly ramp up output, for instance, provide the best solution for this at the moment, and these could be made completely carbon neutral by using synthetic gas created with surplus electricity from renewables and UK-grown biomass. (32)

Michael Liebreich, CEO of Bloomberg New Energy Finance says "…*there are plenty of ways of managing intermittency in renewables without resorting to expensive backup power*."

In our view, these include improved forecasting; interconnecting the grid over a large area, so variability of renewable energy can be evened out; digitally controlled demand management with smart grids and power storage - pumped hydroelectric power, batteries, electric vehicles and heat

storage. The cost of each of these techniques is coming down just as rapidly as the cost of renewable energy." (33)

2.1.2 Electricity for heat?

The National Policy Statement on Energy (July 2011) says much of the UK's heating will need to be electrified if we are to reduce emissions of greenhouse gases by 80% by 2050. (34) But it would be incredibly wasteful to ditch the UK's recently upgraded gas distribution grid, developed over many years. (35) Switching from gas to electric heating would put a huge strain on the power transmission and distribution system and entail constructing a large number of new power stations in a short space of time that would only be used for a few months of the year. There would be huge variation in the daily and seasonal demand. Peak heat demand could require the equivalent of an additional 30 nuclear power stations and the UK's current distribution network would require a significant upgrade. (36)

A large proportion of households with gas central heating could be expected to rip out their boilers and radiators and install a completely new system probably using ground or air-source heat pumps or other forms of electric heating. This would be extremely expensive for each individual consumer and most people probably couldn't afford it without massive subsidies. Studies suggest that around 80% of households would require financial assistance to change their heating system. (37)

Surely it makes more sense to see how we can make the gas grid "green". Converting to renewable gas means we could continue to make good use of the gas grid.

The National Grid says green gas could produce 30-50% of domestic gas demand in future. Biomethane produced by anaerobic digestion (AD) is the main current source of green gas, and more of it could be injected into the gas grid rather than wastefully being used to generate electricity. Nearly a third more biogas was being produced in the UK in 2016 compared to 2015, according to the Anaerobic Digestion and Bioresources Association (ADBA). The UK had 617MW of biogas capacity - enough to power 800,000 homes. But growth in the industry has slowed due to government policy decisions and investment uncertainty. The bio-methane sector has only just started to develop and has significant scope to increase the production of green gas. National Grid highlights the potential for a 10-fold increase in the number of green gas connections with approximately 40TWh/year of green gas from AD injected to the grid by 2035 – around 5% of UK gas demand or around 10% of UK domestic gas demand. (38)

Another issue for the National Grid is that at times renewable energy has to be constrained, which is hugely wasteful. Here the Gas Grid can help too. By using surplus electricity to split water into hydrogen and oxygen by electrolysis then feeding it into the gas grid or by using it to fuel transport, or making renewable chemicals and fuels we can avoid wasting this free electricity. According to a study by the Hydrogen Council - a new coalition of companies, including 3 oil majors - hydrogen has the potential to develop US $2.5tn of business, creating more than 30 million jobs by 2050. The study entitled 'Hydrogen, Scaling up' outlines a comprehensive and quantified roadmap to scale deployment and its enabling impact on the energy transition. (39)

The technology for producing renewable hydrogen is known as power-to-gas (P2G), and it is quickly improving. P2G is primed for significant growth in coming years as demand for clean hydrogen grows, electrolyser capital costs fall, and cheap renewable energy bathes the grid. Many commentators believe it will be the key to grid stabilisation in systems with an increasing contribution from intermittent renewables. Research and development into using hydrogen as an energy source and storage medium which allows electricity to be stored for weeks and months beyond what lithium-ion batteries can manage is being backed by some big energy companies including Shell and Uniper (formerly part of Eon) as well as carmakers BMW and Audi. (40)

P2G has already surpassed its 2020 cost reduction target set by the European Union. Sheffield-based ITM Power has been quietly building a global market in hydrogen technology, making electrolysers that convert electricity to hydrogen. The Company says its P2G product is now half the price it was just a few years ago. The firm's work in Germany – where it has two ground-

breaking projects – shows that not only is the process possible, it's pretty much commercially viable. (41)

In Germany Uniper (formerly part of Eon) has been testing a P2G plant at Falkenhagen. The plant feeds small amounts of pure hydrogen (so-called "WindGas") directly into the natural gas network. (42) Because of the technical limits on how much hydrogen and can added to the natural gas network, it is now building a methanation plant which is scheduled to be completed in the spring of 2018. (43)

German company – Electrochaea – has developed a commercially viable process which converts low-cost and stranded electricity and carbon dioxide into pipeline-grade renewable gas for direct injection into the existing natural gas grid. The core of this power-to-gas system is a selectively evolved microorganism – a methanogenic archaea. The technical advantages of this biocatalyst mean the technology can operate at lower capital and operating costs and with greater flexibility than conventional thermochemical methanation processes. In November 2017 a company called Caloric won the tender for engineering and construction of a biomethanation pilot & demonstration plant in Solothurn, Switzerland using the Electrochaea system (44)

The UK should be looking to replicate such German examples and the Government should seek to work with local companies, utilities and local government to expand knowledge in this area.

2.1.3 Electricity for transport?

Following the announcement by the Government that it will ban petrol and diesel cars and vans from 2040 some sections of the UK media have published scare stories predicting huge growth in electricity demand to power electric vehicles (EVs). Some of the media highlighted a National Grid report's extreme scenario which looked at a peak demand increase of 18GW. The Daily Mail, for instance, talked about "five new Hinkley Points". (45) The Express claimed we would need ten new nuclear plants and 10,000 turbines for cars to go electric by 2040. (46) The Financial Times called it the "*equivalent to capacity of 6 nuclear plants by 2050*" (47) but pointed out that the big increases in peak demand would only happen if EV charging is unmanaged, but smart charging could minimise the problem.

The Guardian pointed out that shifting the charging of cars to times when demand is lower would reduce the extra peak demand to 3.5GW in 2030. (48) ***Since we are already consuming 15% less electricity than we were a decade ago this need not be a huge concern***. (49)

In our view, the Government should promote "vehicle to grid" technology which allows owners of electric cars to connect their batteries to the grid during low-demand, cheap tariff period; use the electricity stored in the vehicle's battery at home and at work when costs are higher, and even sell surplus electricity back to the grid and make a profit, at times of high demand. If all of the UK's cars were connected to the grid they could supply up to 200GW, more than double the current peak requirement. The ability to store electricity in thousands of batteries across the country will help maximise the use of renewables which are produced only when conditions are right, the companies said. It could also reduce the need for new power stations and upgrades to the grid. (50)

From 2018 British households able to afford a new Nissan Leaf electric car and willing to allow energy firm Ovo to fit a special charger in their home will be able to benefit from vehicle to grid technology. E.ON has already launched a tariff which allows owners of electric cars to use electricity at night when energy demand is at its lowest – at prices a third cheaper than in the daytime. (51)

This kind of technology will completely change our relationship with the grid. Rather than being utterly dependent on the grid for power, people may become a bit more interdependent, giving or taking.

Earlier this year the Green Alliance warned that as few as six electric vehicles connected to the grid in some areas could cause 'brownouts' or even power cuts due to the lack of smart chargers.

The think-tank made several recommendations, including a proposal for a new independent system designer, separate from National Grid, to manage the integration of small-scale energy into the wider electricity supply network. A National Grid spokesman said: "Growing use of solar power and electric cars will change the way the energy system is managed, but National Grid has been consistently dealing with evolution in the energy sector for decades, and these latest changes also present great opportunities." (52) Another worry is the impact of lots of solar- and electric car-equipped homes reducing their reliance on the power grids, and avoiding the cost of using the national grid which means neighbours without this technology might have to pick up the slack. Ofgem is reported to be looking at how paying for the energy network might change in the future.

In our view, the challenge for the Government is to come up with proposals for regulating the grid which promote rather than hinder the move to renewable generation.

One thing which the Government could be doing in the immediate future is to encourage local authorities to promote solar carports, particularly at Park and Ride sites, with EV charging. Cambridgeshire County Council received planning permission in July for what is probably the UK's largest solar carport. The installation, which will be developed at the site of St Ives' Park & Ride, is anticipated to be 948kW in size and combined with a battery storage system as part of a wider demonstrator project with collaboration from distribution network operator UK Power Networks (UKPN). Nottingham City Council installed a 76kW system at Harvey Hadden Leisure Centre in 2015, while SunGift claimed a UK first when it installed solar on a multi-story carport in Exeter the same month. The Cambridgeshire project may not be the UK's largest for long, however, with Bentley Motors having last year won planning permission for a 3MW solar carport at its manufacturing facility in Cheshire. (53)

What matters should the Government take in account in considering the framework for network regulation, and its associated institutional framework? What additional evidence should the Government consider to reduce the cost of electricity networks in the longer term?

"The energy market is changing rapidly, and the future energy market can be lower cost, lower carbon and centred around the consumer," according to James Court, head of policy and external affairs at the Renewable Energy Association. Helm's report "…*hints at the evolution of the industry, but perhaps doesn't fully recognise the fundamental shift that is happening from centralised and inflexible generation to a smarter, more connected and decentralised energy system, and the policy framework needed to make that happen*." (54)

A framework needs to be introduced which allows consumers, including households and businesses, to play a part in the energy market through on-site generation, storage and demand-side response, says the Solar Trade Association's head of policy Chris Hewett. (55)

Energy ministers Richard Harrington and Claire Perry both told delegates at the Conservative Party conference that new onshore wind projects could return to play a role depending on whether their costs are competitive and they win the support of local communities. (56) But there was no mention of a plan in the Clean Growth Strategy to bring new onshore wind projects to market. At the end of November 2017, Claire Perry confirmed to the House of Commons Business Energy and Industrial Strategy select committee the Government will look to provide support for onshore wind. Officials at the Department for Business, Energy and Industrial Strategy (BEIS) are "actively working" on a plan to allow large onshore wind farms to be built once again in Wales and Scotland. (57) This needs to be implemented as soon as possible. Nor should England be excluded if proposals have the support of local communities.

Dr Matthew Lockwood, Senior Research Fellow, Energy Policy Group at the University of Exeter, says some of Helm's preferred policies will tend to reinforce the power of the large energy corporations who can afford to throw large sums of money at political lobbying. For example, he likes auctions, and while well-designed auctions might help drive down costs, they also tend to work best for large players, and can lead to the kind of concentration we are now seeing in offshore wind, for example. In markets with barriers to entry and economies of scale, big players get established and become powerful lobbyists. In our view, the Government should ensure that

community energy projects and municipal energy companies can play a significant role in the energy transition. (58)

3. Electricity Supply

3.1 What are the longer-term challenges for electricity supply? What matters should the Government take into account in considering the longer term operation of the retail market? What additional evidence should the Government consider to reduce the cost of electricity supply in the longer term??

The Helm review recognises the huge benefits of improvements in energy efficiency, not least in reducing people's bills, but produces no policy ideas to accelerate their uptake. There have long been calls for energy companies to operate more as Energy Service Companies selling energy services such as warmth, comfort and light rather than as companies trying to sell as much electricity (and gas) as possible. In a report about reducing the cost of energy this might have been an obvious policy proposal to make.

Cost-effective investments in domestic energy efficiency between now and 2035 could save around 140 terawatt hours (TWh) of energy – roughly equivalent to the output of six power stations the size of Hinkley Point C, according to a report by the UK Energy Research Council. Such a programme could save an average of £270 per household per year at current energy prices. The investments would deliver net benefits worth £7.5bn to the UK, and could reach £47bn, if benefits such as health improvements and additional economic activity are counted. (59)

Domestic energy efficiency alone could save 40TWh/yr by 2030 and help eliminate fuel poverty into the bargain. (60) There are around 100 TWh of electricity savings detailed in a report for the Government by McKinsey for which there are currently no plans to capture. (61) Consultancy firm Utilitywise says Hinkley is an "unnecessary expense". Energy efficiency measures could save the equivalent amount of electricity along with £12bn. (62)

Helm says the ECO confuses fuel poverty and other welfare and distributional issues with market failures in the take-up of energy efficiency opportunities.

The Government's Fuel Poverty Strategy for England is that as many fuel poor homes as reasonably practicable should be brought up to an energy efficiency standard of Band C by 2030. (63)

A 2015 report by Policy Exchange points out that households living in the least energy efficient properties would have to spend as much as £1,700 extra a year to heat their home to a suitable temperature. It says the 2030 target is quite ambitious, implying substantial upgrades to the energy efficiency of the 2.3 million fuel poor homes in England. But it does not provide an estimate of the cost of achieving the target. However, analysis by the CCC suggests that hitting the target would cost £18bn, or £1.2bn per annum to 2030. Current annual spending on energy efficiency improvements in fuel poor homes in England amounted, in 2015, to less than half that. (64)

The Government's Clean Growth Strategy aims for 2.5 million fuel poor homes in England to be improved to energy efficiency rating C or better by 2030. More broadly, the aspiration is that as many homes as possible are improved to EPC Band C by 2035, where practical, cost-effective and affordable. The Strategy pledges £3.6 billion of investment through ECO to upgrade around a million homes by 2028 with a focus on households with low incomes. This leaves a further 1.5 million fuel poor homes to be funded from elsewhere and a further £14.4 billion to be found from elsewhere.

In our view, the Government should respond to the Helm Review view that "*The ECO confuses fuel poverty and other welfare and distributional issues with market failures in the take-up of energy efficiency opportunities*" by making sure that all homes are brought up to a decent energy efficiency standard as quickly as possible.

4. Conclusions

In our view, the best way for the Government to keep costs as low as possible over the coming decades, while delivering its carbon targets, ensuring security of supply, and seizing the economic opportunities of the low carbon transition, is to cancel Hinkley Point C, scrap the nuclear programme, launch a much more comprehensive energy efficiency programme and expand its renewable energy ambitions.

- Cancelling Hinkley Point C now might incur a cancellation cost of around £2bn but consumers could save around £50bn over its lifetime.

- Offshore wind is already approaching half the cost of nuclear power and Bloomberg New Energy Finance (BNEF) predicts costs will drop a further 71% by 2040.

- Removing the current block on onshore wind could save consumers around £1bn.

- Solar power is expected to be the cheapest source of energy (not just electricity) anywhere in the world by 2030 or 2040.

- Cost-effective investments in domestic energy efficiency between now and 2035 could save around 140 terawatt hours (TWh) of energy and save an average of £270 per household per year at current energy prices. The investments would deliver net benefits worth £7.5bn to the UK.

In order to keep costs as low as possible over the coming decades the challenge for the Government is, therefore, to maximise the use of these renewables whilst also ensuring security of supply. , Renewables could soon be producing enough electricity to power the grid from April to October. If the Government continues with the nuclear programme then Ministers will have to explain to consumers why they are having to pay for expensive nuclear electricity when cheap renewables are being turned off. The UK has the technology to match green power supply and demand at affordable cost without fossil fuels - by deploying the 'smart grid', using 'green gas' made from surplus power, and raising energy efficiency.

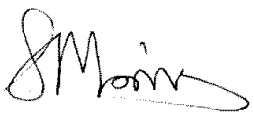
Baseload is not helpful in balancing a variable energy supply – it simply leads to further overproduction of energy at times when renewables can meet demand on their own.

Switching from gas to electric heating would put a huge strain on the power transmission and distribution system and entail constructing a large number of new power stations in a short space of time that would only be used for a few months of the year. It would also be incredibly wasteful if the only recently modernised gas grid was to be ditched.

The Government should be investigating power-to-gas (P2G) technology which can produce renewable hydrogen, using surplus renewable electricity, which could then be fed into the gas grid for storage or used for producing renewable heat.

If you have any queries with this submission please contact the NFLA Secretary using the details at the top of this letter.

Yours sincerely,



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NFLA Secretary – on behalf of the Nuclear Free Local Authorities and the Stop Hinkley group

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