

Response to DECC consultation on 'Call for evidence on barriers to securing long term contracts for independent renewable generation. (5.7.12-16.8.12)

By **John**, vice chairman of Hove Civic Society's Renewable Infrastructure Group (RIG),
22, Saxon Rd Hove BN3 4LE, 01273 417997,
23.7.12

Planning our electric future: a White Paper for secure, affordable and low-carbon electricity' DECC published this document in early July 2012, which says (*with our emphasis in bold italics*):

'Our strategy

7. At the heart of our strategy is a framework that will offer reliable contracts, administered through delivery arrangements that are trusted by investors, to achieve the diverse portfolio of generation we need to meet our goals as efficiently and cost-effectively as possible. Broadly this approach consists of four parts:

- long-term contracts for both low-carbon energy and capacity;
- institutional arrangements to support this contracting approach;
- continued grandfathering, supporting the principle of no retrospective change to low-carbon policy incentives, within a clear and rational planning cycle; and
- ensuring a liquid market that allows existing energy companies and new entrants to compete on fair terms.

Contracting for Low-Carbon Generation

8. At the heart of our strategy to deliver this transition is a new system of long-term contracts in the form of Feed-in Tariffs with Contracts for Difference (FIT CfD), providing clear, stable and predictable revenue streams for investors in low-carbon electricity generation. This is a cheaper, more robust mechanism than the alternative support options available and provides greater certainty that we will meet our carbon emissions targets. These new contracts could be delivered by a range of possible delivery organisations – including private sector bodies.

9. In addition, there are two other complementary measures to decarbonise electricity generation. These are:

- the introduction of a Carbon Price Floor (CPF) to reduce uncertainty, put a fair price on carbon and provide a stronger incentive to invest

in low-carbon generation now. This was announced in Budget 2011 and represents an early and long-term signal to investors that the

Government is serious about encouraging investment; and

- an Emissions Performance Standard (EPS) set as an annual limit equivalent to 450g CO₂/kWh at base load to provide a clear regulatory

signal on the amount of carbon new fossil-fuel power stations can emit. This will reinforce the requirement that no new coal-fired power stations are built without Carbon Capture and Storage (CCS).

10. The new contracting approach and wider reforms implement the coalition agreement commitments to introduce an EPS and a new system of Feed-in Tariffs (FIT) and are consistent with the agreed position

4 that new nuclear stations should receive no public support unless similar support is available to other low-carbon technologies.

11. Together, this package of measures will:

- provide a more efficient and stable framework for investors, ensuring that the cost of capital required for new low-carbon generation capacity is lower. This varies by technology but the overall effect of the cost of capital reductions from Electricity Market Reform will be a potential saving of £2.5 billion over the period to 2030

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- encourage investment in proven low-carbon generation technologies, but also allow new technologies such as CCS to get off the ground and allow them to become cost-effective and compete without support. This is vital to our ability to adjust to different scenarios for fossil-fuel prices;
- boost competition within the market as it will provide the framework for independent generators and new investors to invest in low-carbon generation. The ability of new entrants to come to the market will also be supported by action from Ofgem to improve liquidity;
- lead to competition within and between different low-carbon generation technologies for their appropriate role in the energy mix, as we move to technology-specific auctions for contracts towards the end of the decade, and technology-neutral auctions further in the future;
- introduce an appropriate policy framework in the electricity sector to contribute towards delivery of the fourth carbon budget; and
- achieve our aims at least cost to the cons¹². ***We also recognise that reducing demand for electricity will lower carbon emissions and is likely to be more cost-effective than building additional generating capacity. As such, we will assess whether there are sufficient support and incentives to make efficiency improvements in electricity usage and consider whether there is a need for appropriate additional measures.....***

'21. The Government recognises that reducing demand is likely to be more cost-effective than building additional capacity. This will also require better use of existing generation through the development of a more flexible electricity network. Government and Ofgem have made significant progress over the last few years on improving networks. However there are more significant challenges ahead. This White Paper sets out a high level strategy on networks and system flexibility, detailing work over the coming months, in particular that being undertaken through the Smart Grid Forum. The Government will also develop its electricity systems policy next year, looking at the future system and focusing on challenges around balancing and system flexibility. This will include clarifying the role of demand side response, storage and interconnection, and the development of a smarter grid.....`

HCS/RIG response:

DECC is missing the opportunity to contract with potential independent suppliers to utilise the waste heat from power stations by whole city CHP/DH, and thereby save 20% of UK's carbon emissions

We agree with the words above that we have emphasised, namely that reducing demand is more cost-effective than building additional capacity. Keeping the lights on and the radiators hot in UK buildings is like trying to fill a bath, when it is more cost-effective to put the plug in, than to turn the taps on more.

1 How much heat is wasted from power stations? Enough to keep every radiator hot in UK.

The big omission in DECC's policy is the failure to plug the waste of energy discharged from power stations to cooling towers and the sea. DECC statistics show that in 2010, this energy amounted to 569 bn kWh. This was 1.7 times as much as was generated in electricity (357 bn kWh). At the average demand of 18,000 kWh pa per home, this would have been enough heat to keep the radiators hot in 32 million homes, which is 11% more than the actual number of homes in the UK (28 million) so radiators in offices and factories could probably also be included.

By comparison, the electricity generated in 2010 was 357 bn kWh, which was 39% of the energy in the fuel burnt to produce it, which totalled 927 bn kWh. The fuel mix for this generation of electricity was 46% gas, 28% coal, 18% nuclear, 7% renewables, so it was 75% carbon-based electricity.

2 Why is this heat orphan, and not regarded as 'renewable'?

This 569 bn kWh of waste heat is 'orphan' heat, because it has no parental support. It is called 'low grade' because it is at low temperature (c35 degrees) and is therefore regarded as valueless. Yet it is responsible for about a third of total UK carbon emissions. If two thirds (380 bn kWh pa) of that waste could be utilised in urban areas by the technology of whole city CHP/DH, the UK could save 20% (120 mtpa) of our 1990 carbon emissions (590 mtpa) (at 380 gm/kWh).

This heat is therefore a 'renewable' resource, in respect of carbon emissions, because saving it by keeping the radiators hot would save the gas that would otherwise have to be burnt to do so. It can easily be converted to high grade heat at 90 degrees, by removing a few rows of blades from the low pressure turbines. At that higher temperature, it is a valuable resource which can be piped under the streets and sold to keep the radiators hot in urban buildings, displacing gas.

3 How much carbon dioxide would this really save?

There are different figures in use for the consequential carbon dioxide emissions saved by renewables. The lowest figure for gas-generated electricity is 190gm/kWh, from David McKay's book 'Sustainable energy without the hot air'. (p365) However, E.ON claim that wind power from Rampion will save 430gm/kWh generated, and told us that this figure has been agreed by OFGEM and DECC for the industry to use. If so, I would claim that 430 gm/kWh should also be used to evaluate the saving in carbon dioxide by CHP/DH. If so, saving 2/3 of the waste heat from power stations (569 bn kWh pa) namely 380 bn kWh pa of gas would save 185 mtpa carbon dioxide, or 31% of UK emissions.

4 Where is CHP/DH used?

This technology is in widespread use in northern continental Europe. For example, in Denmark, 2 out of every 3 buildings are already connected to a district heating (DH) network. Copenhagen's DH network supplies 2 GW of hot water from 10 CHP power stations. This is why their politicians are contemplating to legislate to make Denmark carbon free by 2050.

5 What are the barriers to using CHP/DH?

This consultation asks for barriers to independent suppliers getting long term contracts to sell this waste heat, which are:

- a) **Heat is not yet classified as 'renewable'** by DECC because it comes from burning fossil fuel. This is a half-truth, which denies that it is also a potential renewable resource because the technology exists (CHP/DH) to utilise it. This half truth is David McKay's 'misconception', which falsely justifies perpetrating this waste of energy and

carbon, which could and should be saved. We have previously written repeatedly to DECC about this, (such as on 24.5.12 in response to the Heat Strategy consultation) We hope that ministers will take this point, perhaps in the DECC statement (expected before the end of July) on the result of the heat strategy consultation. If and when they do, they will reclassify waste heat as 'renewable'. This will remove this obstacle, and make feasibility studies on it's utilisation (such as from Shoreham power station) eligible for grant funding, as we have been asking.

- b) **There is no market** for this waste heat, because there are no pipes in the ground to distribute it.
- c) **Pipes under the streets are also orphans**, because there is no institution which can install them. Nationalisation of the UK's utility services in the 1940's transferred responsibility for the utility services (electricity, gas, water, telephones), from the municipalities (Local Authorities) to new state-owned industries. This did not include hot water. In continental Europe, this nationalisation did not occur. Municipalities have always had the power and responsibility for all utility services, including hot water. This is why the provision of whole city CHP/DH is no problem in any town in continental Europe. The orphan status of hot pipes make them institutionally impossible to lay in the streets of the UK. We do not know whether the Localism Act gives sufficient power back to LAs to install them *. A change in legislation may be needed, and perhaps this could be included in the Energy Bill. Alternatively, a new institution could be created to do so, such as a new nationalised industry, perhaps called the: 'Central Heat Distribution Board' (mirroring the Central Electricity Generating Board created in 1947). This would fly in the face of conservative policy, which is against nationalisation.
- d) **There is no mandate on consumers to connect to DH.** In Denmark, if a hot pipe is laid in your street, you have to connect to it for 25 years by law. In Sweden, you don't, so hot water companies have to compete for business with gas companies. We show elsewhere (www.hovecivicsociety.org) that at present UK gas prices (4p/kWh) the return on capital for whole city CHP/DH would only be about 4%, which is probably not commercially viable for energy companies to raise the investment. If so, legislation may be needed to follow Denmark in mandating consumers to connect, but this flies in the face of conservative policy on free market.
- e) **Government subsidy** is probably needed if whole city CHP/DH technology is to go ahead. We discovered in the Rampion consultation that the offshore wind companies like E.ON do not have a published rate of return on their investment, but seem to be getting a covert subsidy * in the form of an assurance on hidden future price rises in consumers' bills. The embarrassing exchange between Ed Davey and Jon Snow in June(?) around the question of £100 pa rise in consumers' bills by 2030, seem to confirm this. We doubt if this trick would work with gas prices. We believe that DECC should be open and transparent with the public on all renewable technologies, and treat them all (solar PV, wind, and CHP/DH) equally.

6 Conclusion

We hope that DECC will remove all the above barriers to allow feasibility studies to be done to properly assess the viability of whole city CHP/DH schemes. In particular, we are seeking a grant of about £40,000 for a pre-feasibility study on utilising the waste heat from Shoreham power station, and ask for support from DECC. This project could deliver the Council's pledge to become the first One Planet city, and the greenest in UK.

7 Parliamentary Questions

* These identified issues lend themselves to additional Parliamentary questions (PQs) as follows:

- a) If Adur District Council and Brighton and Hove City Councils jointly decide to connect waste hot water from Shoreham power station to a district heating system by burying hot water pipes in their streets, would they have the legal powers to do this?
- b) To what extent are consumers subsidising the costs of building offshore wind farms (such as Rampion) in the rises in their future electricity bills?

email

Matt Coyne
DECC
4th floor area C
3 Whitehall Place
London SW1A 2AW

15 August 2012

Dear Matt

Call for evidence on barriers to securing long-term contracts for independent renewable generation investment (DECC ref 12D/260)

We welcome the publication of this call for evidence, and in particular welcome the Government's desire to hear the views of independent developers considering investment in other (non-renewable) technologies.

Horizon Nuclear Power ("Horizon") is a 50:50 joint venture between E.ON and RWE, formed in January 2009. On 29 March 2012 E.ON and RWE announced that they no longer intended to pursue nuclear new build in the UK, and that they were seeking new ownership for Horizon. Whilst at the time of this submission the sale process is still in progress, Horizon remains a going concern with plans in development to deliver around 6GW of new nuclear capacity at Wylfa and Oldbury.

At this stage of project development, Horizon does not have any Power Purchase Agreements (PPAs) and does not expect to be generating any electricity until the early 2020s. If our developments at Wylfa and Oldbury go ahead, Horizon will become a substantial, potentially independent, power producer in the UK and therefore the expected availability and structure of PPAs in the future, is an issue of interest.

Under the current Electricity Market Reform (EMR) proposals a nuclear generator has three price-related variables that can affect his revenue: the project strike price¹; the market reference price; and the price he sells his electricity for (achieved price). We believe that the future availability and structure of PPAs could impact on both the market reference price and a generator's achieved price.

¹ It is not appropriate to comment on the process for setting the project strike price in this response

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A key issue for an IPP is whether electricity sale prices achieved through a PPA feature in determining the reference price, and if so, how. The call for evidence suggests that large suppliers would be incentivised to offer PPAs that were linked to the CFD reference price. If this were the case then, potentially, a significant part of the market could be trading at prices that were set by a much smaller part of the market. It is clear that there could be wider market risks with such an outcome. Furthermore, it is unclear what drivers there would be for suppliers to continue to trade in the OTC and exchange markets that the CFD Draft Operational Framework² identifies as the reference price setting source, which could further dilute the proportion of actual-trades to derived-trades in the market.

It is also worth noting that if companies were to offer PPAs that were, or ended up being, at prices beneath the market reference price (MRP), then a generator entering such a PPA will, for the generation covered by that PPA, not achieve his strike price.

The call for evidence states that the CFD works "by stabilising revenues for generators at a fixed price level known as the 'strike price'"³. In reality, there are two mechanisms by which an IPP's revenue could be stabilised at the strike price: it can trade its generation in a liquid market that provides the ability to sell its electricity, on average, at the market reference price; or it can enter a PPA which is set, each year, at the market reference price for that year. Both of these are key options to an IPP as they will help to maximise the generators opportunity to achieve the reference price. The Government and Ofgem should take steps to ensure that these options are open to IPPs throughout the life of the CFDs.

At this stage we cannot comment on the options presented in the table entitled "high-level options to address issues in the PPA market". However, it is important to highlight that the language has a bias towards intermittent generation: the 'Competition Measures' option describes increased liquidity in the day ahead market, which is only relevant (under current proposals) to intermittent generation; and the 'Regulatory Measures' option refers to an obligation to offer PPAs to renewable developers. DECC must ensure that any options explored should consider independent developers of non-renewable technologies and not simply focus on renewable generation.

Please don't hesitate to get in touch using the details above if I can be of any further assistance.

Yours sincerely,

Head of Commercial Development, Horizon Nuclear Power

Copies to: DECC Office of Nuclear Development
DECC Commercial Team

² Electricity Market Reform: Policy Overview, Annex B, page 41 (paragraph D.i.18)

³ Paragraph 5.1

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