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Consultation on Electricity Market Reform

Dear Sir

I was asked, as Energy Science Adviser of the Low Carbon Innovation Centre (LCIC) at the University of East Anglia, to prepare a response to the Electricity Market Reform Consultation. The response was reviewed by other members of LCIC who made minor changes to the original draft. This agreed response is now submitted as attached. The response begins with a short statement relating to the background of LCIC and how it has become recognised worldwide for its excellence as a centre of learning, as a qualifying body. Thereafter there are responses to a few of the specific questions asked in the Consultation Document. However, while welcoming the Consultation, the LCIC has some serious reservations about some aspects and in particular the range and timing of aspects considered.

The Low Carbon Innovation Centre wishes to thank the Department of Energy and Climate Change to for the opportunity to participate in this consultation exercise.

Yours sincerely,



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Consultation on Electricity Market Reform

Response by N.K. Tovey, M.A. PhD, CEng, MICE, CEnv

on behalf of the Low Carbon Innovation Centre
(March 2011)

The Low Carbon Innovation Centre

The University of East Anglia (UEA) is at the forefront of research and knowledge transfer in the field of climate change and carbon emissions reduction and is the home of a number of highly successful initiatives including the Tyndall Centre, the Carbon Reduction Programme (CRed) and Carbon Connections. In 2008, it created and incorporated the Low Carbon Innovation Centre (LCIC) to focus its externally-facing initiatives, to provide products and services to the private and public sector, on a commercial basis.

LCIC is now the operational home of Carbon Connections. UEA has successfully operated this HEFCE (Higher Education Funding Council for England) and OSI (Office for Science and Innovation) funded initiative since 2006, investing in carbon reducing technologies, businesses and university-based innovations. A portfolio of 25 live projects including a mix of equity and royalty-based investments has already started to bring returns to the fund - these being available only for reinvestment. The regional universities are involved in or are the originators of technologies in over half of the 25 investees and the region's universities and companies responsible for in excess of 100 outline concepts and applications in a 2 year period. From October 2010 LCIC has also been operating a £20 million European Regional Development Fund aimed at funding providing venture capital for small to medium enterprises in the East of England. The Low Carbon Innovation Fund (LCIF) supports companies developing low carbon products, services and businesses seeking to improve processes in order to reduce their operational carbon emissions. At the time of writing LCIF has made one investment.

The LCIC is also home to CRed and provides carbon reduction expertise from the University to the public and private sector on a commercial basis. It is operated through a wholly-owned company of UEA which gifts its profits to the University. Its main services are consultancy, the provision of carbon reduction (IT) systems and innovation services including the operation of the Carbon Connections investment fund.

Current Market Arrangements: Questions 1 and 2

The Electricity Market Reform consultation focuses on the changes needed to enable confident investment in the low carbon energy supply and infrastructure necessary to deliver the UK's objectives for carbon emission reductions in the period to 2050.

However, though referred to in passing (e.g. paragraph 12), there are other policy and related issues which should be discussed at the outset and not separately, as decisions developed from these other aspects may well impinge on the most effective economic model to deliver the aspirations of a low carbon economy.

The different aspects which should also be considered include:

1. The capacity of the Construction Industry to deliver the objectives in terms of:
 - a. The development of the necessary supply chains where large investment in low carbon technology is envisaged,
 - b. The necessary training and skill enhancement of the workforce
 - c. The phasing and timing and deployment of the above aspects.
2. A recognition of the difficulty many low carbon energy projects have within the planning process (e.g. renewable energy projects, nuclear development, grid reinforcement (e.g. the Beaulieu-Denny saga), etc. These and other local issues may cause significant distortions in the locational aspects of low carbon electricity which, unless included in an overall strategy, might incur additional transmission and distribution losses.
3. The Consultation Document rightly raises the issue of Affordability and Demand Side Response, in several places, however, these aspects, if tackled innovatively, could have a significant impact on the economic aspects of the Electricity Market.

It is for these reasons, among others, that we remain to be convinced on the over emphasis on the detailed monetary aspects when many of the more fundamental aspects remain unaddressed.

LCIC are thus disappointed that there has been no opportunity to adequately comment on these fundamental aspects and will do so here under the following heading.

Localisation issues

It is becoming increasingly clear from regional data that there are significant variations in electricity consumption across the UK and that some Local Authority Areas are already net exporters of low carbon electricity whereas low carbon projects are often delayed elsewhere. Thus in Norfolk and Suffolk the total electricity consumption in 2009 was 7800GWh (DECC statistics), while generation in the same year was around 11000GWh. All this electricity was low carbon (Sizewell, B, above average Renewable generation), and the fossil fuel generation at Yarmouth was at one of Europe's most efficient CCGT stations. Overall this results in a carbon factor around 80g/kWh compared to a UK wide average around 500g and already close to the Government's aspiration of an 80% cut in CO₂ emissions. Thus Norfolk and Suffolk are exporting 3200 GWh electricity to the rest of the UK saving around 1.4 tonnes of CO₂ which would have a value to the East Anglian Economy of around £70M at the modelled carbon prices (page 45 of the consultation document).

A low carbon economy is consistent with the Government's vision of "The Big Society" where issues of energy supply can be decided locally, and the benefits could come from the encouragement of businesses to benefit from such low carbon energy. However, this will only come if decisions are continually taken to ensure that the low carbon agenda is foremost in *all* decisions not only in the financial markets. An effective way to ensure that such decisions are internalised into mechanisms favoured by economists would be to encourage those areas which export low carbon electricity by reducing electricity tariffs while at the

same time increasing them elsewhere. In this way those who may incur some minor inconvenience by having the low carbon energy supply on their doorstep will be compensated for this thus allowing low carbon decision making to be more focussed and objective.

Affordability

The consultation document is clearly concerned about the impact of the necessary costs as we move towards a low carbon future on those least able to afford such costs. A fundamental flaw in reasoning is that prices should be kept low to protect such people and yet such an approach does not provide the correct market signals for those who are better off.

Demand Side Response developments are important, but these could be addressed much more effectively than they are at present by requiring electricity suppliers to have the reverse approach to tariff structures. It is important to preserve competition and for competing suppliers to set their own levels. However, there is a basic flaw in all tariffs at present. Experiments were conducted sometime ago at Irkutsk Energo in Russia where instead of having the traditional approach of a high unit charge for the first N number of units followed by a much cheaper rate, a standard “social” tariff which was at a lower rate was used for units consumed below a given threshold in a given period. After this the tariff level was much higher. This approach has several benefits. For a consumer on average demand the differences between the traditional approach and this new one are negligible. However, those less well off with lower electricity consumption will benefit with reduced energy bills, whereas those with high consumption will pay more. What is important is that the incremental rate of electricity consumption above the threshold, unlike at present, provides more effective economic signals to encourage people who consume most to reduce their current consumption (and hence CO₂ emissions) or to invest in low carbon technologies to help reductions in future consumption. The proportion of homes now heated by electricity is relatively low, high consumption in electricity is mostly from appliance ownership and use and not heating. This will thus be a progressive form of charging for most households. For those houses still heated electrically separate initiatives should be in place to tackle issues of affordability and would allow a more sensible strategy towards charging for electricity.

Such an alternative approach to tariff setting would have the benefit of simultaneously addressing affordability issues and the pathway to a low carbon future. However, with the growth of smart meters and information displayed in the home and businesses, there are many more financial initiatives which will be significant drivers as we move towards a low carbon economy. Such initiatives could well impact significantly on the overall electricity market which is why issues such as this should be included at the outset in discussions.

Thus, taking the domestic sector as an example, all households would be allowed a fixed threshold power draw at any time of the day or night at a fixed unit rate to be decided separately each supplier. This might, for instance be 1 kW. Above that power level, the instantaneous power drawn would be charged at a variable rate that reflects the actual carbon factor at the time in question (say 30 minutes basis). If the carbon factor was low – e.g. high nuclear and wind output, then this variable rate might be identical with the basic rate, but at other times it could be much more. Consumers would have the choice of reducing their instantaneous power draw in times of high carbon electricity – signified by the smart meter by not having their washing machine, tumble dryer, electric kettle, hair dryer on simultaneously but deferring use of some or all until lower carbon periods. However, consumers must have the choice and they could have all on if they wished but would then pay very high rates for units consumed above the basic threshold level at such critical times. Such an approach would engage all the community in “the Big Society” and make the transition to a low carbon economy more likely.

As can be seen above, there are many potential financial models which will benefit the transition to the low carbon economy, but these should not be considered in isolation from wider issues. It is for this reason that

LCIC believe the basic consultation needs to cover a wider and more general approach than the highly technical approach to financial models in many parts of the consultation document.

Feed In Tariffs/ Renewable Obligation issues: Questions 3 to 11 and 35 to 38

We recognise that the proposed Feed in Tariff –Contract for Difference support mechanism would take away some of the risks to investors and developers currently associated with the likely returns under the Renewable Obligation Schemes and a FIT CfD would provide greater certainty on investment if the basic FIT price were relatively stable. If a FIT schemes is to be introduced, then, on balance, the FIT CfD mechanism is the one which should be adopted. However, care is needed in setting the FIT level as explained below.

In a period of rapidly changing wholesale prices the FIT CfD could lead to unnecessary costs to consumers if the wholesale prices were low. Conversely the scheme would not provide the necessary incentive to developers to invest in low carbon technology if they were not allowed to keep at least some of the benefits of upside turns in wholesale market prices.

Of course the FIT level could be reviewed regularly and set, but this would cause uncertainty to investors unless initial levels were grandfathered which would largely defeat the aim of avoiding unnecessary costs on consumers.

One way to minimise the impact of unnecessary charging on consumers would be to set the FIT level based on a rolling average (say 12 month) fixed differential between the wholesale price and set FIT level. In this was there would be no swings adversely affecting consumers and the uncertainty to investors would be minimal.

Questions 35 to 38

If Renewable Obligation developments are “vintaged” from 1st April 2017, then the fixed rate ROC approach should be avoided at all costs. This is a form of premium FIT without the benefits of FIT CfD. In this case there would be no point in “vintaging” existing sites they should merely be transferred to the FIT CfD scheme.

With regard to the setting of sufficient incentives for the “vintage” RO schemes, the fixed rate is also inappropriate as indicated above, but further issues are raised in paragraphs 43 and 44 on page 120 :

“43: This would involve fixing the price of a ROC and requiring Ofgem (or another delivery agent) to buy the ROCs, funded through a levy on energy suppliers.....”

44: Introducing a Fixed ROC system would mean that the scheme no longer operated through placing an obligation on energy suppliers”.

A Levy would be a disincentive for a Supplier to seek out renewable generation and may well form a barrier to renewable energy development as the Supplier would be tempted to pass on costs to the consumer.

While appreciating that the “headroom” approach will involve more work and potential further risk to investors this by itself should not be a deterrent to using such a scheme. In any case, if investors in existing schemes were averse to such risk then they should be allowed to opt from the RO Vintage scheme into any new FIT CfD scheme.

A problem with a fixed target approach is that the target levels in the future may either be such that they are excessive compared to reality and place additional costs on consumers or if set too low in the future provide additional risk for investors as their returns may not justify investment. A way to smooth out such variation without the considerable uncertainty of forward prediction is to adapt the headroom approach to be to set on targets based on a forward prediction of the historic trend of values which would have occurred as

an average of the annual historic fixed values and what the “headroom” principle would have given. Such a target projection would derive information from the previous say 4 – 5 years and allow setting of “targets”/“headroom” for 5 years in advance without the complications of specific projections each year. Each year the 5 year hence projection figure would be added based on experience in the previous 12 months. Only in exceptional circumstances should earlier values be adjusted after they have been set.

Emission Performance Standard. Questions 12 to 18

LCIC welcomes the approach to developing Emission Performance Standards (*EPS*), but are concerned that the target levels for emissions from a new coal fired power station for instance are set without the basis of physical reality that such levels would actually be technically achievable in practice. LCIC endorses the proposals not to set Emission Performance Standards on existing coal fired generation, as it also endorses the principles on the “grandfathering”. By the time CCS comes available at the scale required – post 2020-2025, many such plants will be 50+ years old and unlikely to justify the expense of retro-fitting and as the document identifies are likely to be closed rather than comply with new legislation. A premature closure here could impact seriously on electricity security.

What is of concern is the exceptions to EPS compliance outlined in paragraph 96. There appears to be no consideration of the likelihood of such exceptions taking place and the need to override the EPS requirements. Short term exceptions are one thing, but long term exceptions may well be contrary to a trajectory towards a low carbon future. Consideration of the generation fuel mix and the maximum proportion of such plant which might be excepted either temporarily or long term is urgently needed before the details of EPS are formulated. Thus if coal generation formed a relatively low proportion the risk would be low as other low carbon fuels can be used. However, if left solely to market forces without the correct financial incentives/deterrents, a disproportionately high level of coal generation may arise potentially leading to significant problems in emergencies.

Electricity Security (Questions 19 to 24)

The Government is correct to raise issues of security in this section. However, without further consideration of the Localisation and Affordability issues as outlined in the response to Questions 1 and 2 above, the most effective solutions to promote a low carbon future will not be found. Detailed options are given for reforming the details of the capacity aspect, but not the other areas. LCIC believes that fuller consideration of these other issues needs to be covered before consideration solely capacity aspects. There needs to be greater clarity in the opportunities these present and a clearer Road-Map to effective Demand Side Response through innovative use of Smart Meters etc is needed.

Other Questions 25 to 34

The discussion on various packages within these questions is premature and other wider issues need to be resolved first as discussed previously