

DECC Consultation on Electricity Market Reform

Submission by Biofuelwatch,

Ian Lander, 23rd February, 2011

Introduction

The purpose of the changes outlined in this consultation would appear designed to provide the industry more certainty that subsidies can be relied on for the period of operation of power stations – typically at least 20 years – and so encourage more investment in renewable energy. This would be sensible if support only went towards renewable energy which was sustainable and delivered overall greenhouse gas benefits. We are deeply concerned that much of the support will go towards industrial bioenergy which is neither sustainable nor climate friendly, particularly at the scale at which it is being developed and subsidised.

UK Government policy is to encourage the use of bioenergy. The UK like many EU member states is aiming to get at least half its total renewable energy from biomass by 2020. The proposals outlined seek to enshrine bioenergy in the electricity market for at least the next two decades, a policy we oppose.

Energy Demand

The electricity market reform supports the UK policy to significantly increase the use of electricity, on the basis that it is possible to generate renewable and low-carbon electricity, which includes bioenergy, unabated gas combustion and coal combustion with CCS – all of which are deeply problematical. There is nothing in this consultation that directly tackles energy waste and inefficiency. This is wholly unacceptable.

Decarbonising the electricity infra-structure

This consultation exposes a serious and worrying discrepancy in the timeline for taking action: Whilst *'DECCs 2050 Pathways Analysis advises the power sector emissions need to be largely decarbonised during the 2030s. The Committee on Climate Change has recently proposed that the power sector should be close to zero-carbon by 2030'*. We agree, that *'decisions made in the next decade will have consequences for the next 40 years. Choices must therefore be based on a understanding of the long-term challenges that the UK faces in decarbonising in a sustainable way and maintaining energy security'*. Clearly in the face of peer-reviewed science on the carbon debt of biofuels and biomass, this is just meaningless rhetoric. 'Decarbonisation' must take account of all direct and indirect greenhouse gas impacts, not only fossil fuel emissions, otherwise it will not be able to mitigate climate change.

What renewable's mix will decarbonise our electricity supply?

The report says: 'Renewable electricity is key to our low-carbon energy future and is a vital component of the UK's diverse energy mix. Our mix of electricity generation capacity should be diverse, so that problems with one technology or fuel do not lead to the failure of the entire electricity system. The UK has some of the best natural renewable energy resources in Europe' In fact DECC recently announced: 'The UK is rated number 1 in the world for its attractiveness for the offshore wind industry'. We could supply all our energy needs from wind, wave and tidal. The consultation frequently refers to wind but only once to tidal (and not tidal lagoons in the Severn Estuary), but not wave or solar. Biofuelwatch encourage the promotion of true and sustainable renewables that does not include industrial bioenergy.

ROCs

DECC states that the RO provides a greater incentive to those technologies that are further from the market and which have the potential to be deployed on a large scale. How is bioenergy not near to market/commercialisation? Power stations are already in operation. Worldwide, dedicated biomass power stations have been in operation for many decades and in the UK, seven larger biomass power stations are already in operation. This is conventional combustion technology. In the case of a biofuel plant, developers need only purchase second hand marine diesel engines. ~The potential to deploy bioenergy on a large scale is limited by land. According to the UN Millenium Assesment Report, humanity is already using too much land for ecosystem service health and climate stability, with 60% of the world's ecosystems having been degraded or destroyed. There is also a competition between land to grow food and fuel. Furthermore we already import around 80% of wood and wood products that is used for a myriad of purposes, before adding fuel to the mix. The potential to deploy true renewables like wind, wave, tidal, geothermal and solar appears only to be limited by political inertia and meaningful commitment. It is further limited by the fact that the RO favours technologies which have relatively low capital costs, since subsidies are paid per MWh. This is a boon for conventional combustion technologies, regardless of the upward pressure they exert on wood and vegetable oil prices (given that the high level of ROCs for bioenergy allow companies to burn feedstock which would otherwise not be affordable to them). We remind you of this previous comment: 'The UK has some of the best natural renewable energy resources in Europe.'

Previously, 1 ROC was issued for each megawatt hour (MWh), regardless of technology. Presently, on-shore wind continues to receive 1 ROC/MWh, off-shore wind and energy crops (including palm oil, eucalyptus, etc) get 2 ROC/MWh. Biomass and non-energy crops (ie feedstock not specifically grown as fuel) receive 1.5 ROCs. The ROC system favours biofuel and biomass because of their relatively low capital costs. Compare the logistics of building an off-shore wind farm to building a power station for burning palm oil, which are little more than containers supplying diesel engines in big sheds.

EPS & CCS

Under the proposed reform, there will be an Emissions Performance Standard (EPS) to limit carbon emitted, including carbon capture and storage (CCS). An EPS will not apply to biofuels or biomass even though burning biomass from electricity produces around 1.5 times more smokestack CO₂ emissions than burning coal per Mwh, and even though studies, including those by the Manomet Center and Joanneum Research show that biomass burning incurs a carbon debt of many decades compared to coal We contend that this is unacceptable and not consistent. Please see:

www.catf.us/resources/whitepapers/files/201007

[Review of the Manomet Biomass Sustainability and Carbon Policy Study.pdf](#) and

www.birdlife.org/eu/pdfs/Bioenergy_Joanneum_Research.pdf

Baseline issues

The consultation identifies natural gas and biomass to balance intermittent supply associated with renewables as well as interconnection with foreign electricity grids, demand side response and electricity storage to provide base load. We would encourage the latter three which presently have extremely minor roles. The consultation document does not acknowledge the need for major demand reduction. The UK needs invest in R&D, to develop ways of storing intermittent renewable energy and thus eventually running our energy system without large-scale combustion technologies. We also note that baseload would not be a concern if the current 2020 renewable energy target was met from non-combustion renewables alone, only at a higher renewables level.

It is unfortunate that unlike CCS, and unproven, high-risk technology which, if it worked, would substantially increase the UK's energy demand (which will receive a £1bn subsidy); no funding is provided for energy storage R&D. We would draw your attention to this reference about storage from the consultation: *'In terms of future investment in storage, high capital costs combined with uncertainty over the future market, in particular the levels of volatility will see, are cited as the main barriers to further investment'*. Compare this to the government's commitment on subsidizing CCS: *'uncertainties mean the private sector is unwilling to shoulder the financial risk of demonstration projects until the technology is further developed. It is for this reason that the Government has committed to continuing public sector investment in CCS for 4 demonstration projects'*. We would contend that this inconsistency is unacceptable. Biomass is neither carbon neutral or renewable. One of the reasons it is promoted is because of the baseline issues associated with other true renewables, however, in reality, the RO regime is leading to it largely out-competing non-combustion renewable energy. If the government was committed to the other solutions to the baseline issue, then this would remove a reason for the promotion of bioenergy.

Biofuel, biomass & biogas are not renewable or low carbon

The consultation says: *'A key factor in setting the levels of support under a feed-in tariff will be the need to avoid incentivising particular technologies beyond the point at which they are sustainable in respect of their environmental impact or which locks us into a mix of technologies which is not sustainable in the longer term'*.

This has already happened with biofuel and biomass power stations, but the planning system in England and Wales which is supposed to have sustainability at its core, has tried to preclude sustainability from planning decisions. Responsibility for managing sustainability is assumed to be managed by Ofgem under the RO. EU 'sustainability' and greenhouse gas standards have been strongly criticised, including for:

- Not addressing indirect climate impacts: Although the European Commission may decide to deduct some 'greenhouse gas savings' because of indirect land use change, this would in no way reflect the science about indirect impacts. Several studies show that, if all impacts are considered, nearly all biofuels emit more greenhouse gases than the same amount of fossil fuels;
- Underestimating direct climate impacts through various forms of creative accounting: A report by North Energy, commissioned by the UK Government (DECC) and NNFFC, for example, shows that if direct climate impacts alone are considered, electricity from biofuels still has a worse climate impact than electricity from natural gas (http://www.nnfcc.co.uk/metadot/index.pl?id=10478;isa=DBRow;op=show;dbview_id=2539)
- Having no credible verification and auditing process;
- Ignoring human rights, land rights, hunger and malnutrition, pesticide poisoning and all other impacts on people;

Severely restricting 'biodiversity conservation' so as to allow subsidies for biofuels from plantations for which different biodiverse ecosystems and farmlands have been converted.

In order for developers to receive their maximum ROC entitlement (twice that for on-shore wind), they must burn energy crops. This is likely to result in greater greenhouse gas emissions than fossil fuels once indirect land use change and indirect N₂O emissions are fully taken into account. See: Study by Paul Crutzen, A. R. Mosier⁴, K. A. Smith⁵, and W. Winiwarter, September 2007 (<http://www.physorg.com/news109581631.html>); Study by Joern PW Scharlemann and William F Laurence, 4th January 2008 (www.sciencemag.org/cgi/content/short/319/5859/43); Joseph Fargione regarding a joint study with Jason Hill, David Tilman, Stephen Polasky, and Peter Hawthorne, 7th February 2008 (Interview with J Fargione:

<http://www.nature.org/initiatives/climatechange/features/art23819.html?src=new> - study:
<http://www.sciencemag.org/cgi/content/abstract/1152747v1>)

We contend that these reasons should preclude bioenergy from ROCs.

The consultation goes on: *'Fuelled renewables: as part of this transition, the Government will also be considering the implications for those technologies which are not currently grandfathered in England and Wales, such as co-firing of biomass, bioliquids, energy crops and CHP. We continue to apply sustainability standards to biomass and bioliquids under the new support framework. In Scotland, grandfathering for biomass and waste technologies is subject to a Scottish Government consultation taking place this autumn'*. The government is also considering whether bioliquids produced from wastes and advanced conversion technologies (which may refer to gasification, including pyrolysis, in the heat and power sectors) should be grandfathered, despite serious concerns about the low efficiency ratings of such technologies, air pollution and the impacts of the additional demand, most likely for wood, which would be created this way. Grandfathering guarantees the level of a ROC until the current scheme ends in 2017. After that the support will be 'vintaged' until 2037.

We contend that the assurance, 'applying sustainability standards' is worthless because it ignores the critique of EU sustainability standards and the above referenced peer-reviewed science .

It is interesting that the consultation notes that grandfathering for biofuels and biomass was ceased because *'generators with different levels of support would compete for the same fuel stock and distort the market; if prices fell generators would be over-compensated, at a cost to the consumer; and if fuel prices increased power station would not be economic'*. Despite this, following industry representation to bring back grandfathering, a consultation was launched and *'Working extensively with industry and the finance community to assess the evidence we concluded that a greater degree of revenue certainty was needed to bring biomass forward and in the Government Response to Biomass Grandfathering the current administration set out our decision to:*

- *Grandfather Anaerobic Digestion, Advanced Conversion Technologies,*
- *Dedicated Biomass using solid biomass or biogas and Energy from Waste;*
- *Not to grandfather Bioliquids, Energy Crop uplift or CHP, but to make a more detailed assessment of bioliquids using wastes and advanced conversion technologies; and*
- *To continue our policy not to grandfather co-firing'. This will be reviewed in 2017'.*

As well as the above comments forming an integral part of Biofuelwatch's formal response, we find the following questions of particular relevance:

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?

This is intrinsically linked with the notion that CCS will sequester carbon successfully, which is unproven, while the risks could be substantial. However this is a moot point since an EPS will not apply to a biofuel or biomass power stations. An EPS will have no impact on decarbonisation since it precludes biofuels and biomass presumably because of the dangerous myth of carbon neutrality. In doing so it takes no account of the carbon emitted from combustion or the full life-cycle emissions associated with agriculture, processing and land use change.

The government states that if the European commission decides to take indirect land use change into account for bioliquids, then they will consider whether or not to do so for biomass. There is thus no commitment to take any indirect impacts into account and, furthermore, it is now clear that any 'indirect

land use change' indicator which the European Commission might agree to for bioliquids will not in any way reflect scientific and other knowledge of those impacts.

The default values for greenhouse gas savings which have been proposed suggest very high greenhouse gas savings from wood burning, despite the fact that the smokestack CO₂ emissions from biomass burning are greater than those from coal and that several scientific studies show that the life-cycle greenhouse gas impact of large-scale biomass, particularly if whole-tree burning, land-conversion and logging of previously unlogged forests are included, **is strongly negative for a period of decades or even centuries**. The evidence is discussed in more detail below – it shows that the figures cited by the European Commission and the UK Government do not in any way reflect even the direct, let alone the indirect climate impacts of bioenergy. This will render any 'greenhouse gas standards' meaningless.

A growing number of peer-reviewed studies assess the climate impact of indirect land-use change from bioenergy (see for example tinyurl.com/yck2gmu). Although many of the studies focus on biofuels rather than large-scale wood-based bioenergy, which is a more recent development, the climate impacts of plantation expansion for woodchips and wood pellets are likely to be similar to those of plantation expansion for palm oil or soya. It is important to note that virtually all such studies use a very narrow definition of „indirect impacts, one which tends to exclusively focus on land conversion (i.e. the fact that greater demand will translate into greater land use and thus land conversion somewhere in the world). There are, however, other serious indirect impacts, which include:

- New infrastructure, such as logging roads, new ports and waterways, etc. which tend to increase deforestation well beyond the area actually converted to new plantations;
- Higher land prices which in turn can lead to more speculative investment in land and forests, which can cause even greater land conversion;
- Policies being adopted in different countries with the aim of increasing logging and monoculture plantations in response to expected future demand for bioenergy, but with consequences well beyond the „measurable“ additional demand;
- Indirect climate impacts which, although well established, are difficult to quantify: Those include indirect nitrous oxide effects from fertilisers (which Paul Crutzen et al have assessed as being far greater than previously thought, see tinyurl.com/2f46zg), carbon emissions from peatlands as a result of nitrogen from fertilisers being spread over a large area (tinyurl.com/32fotg5), and remaining forests being affected by drying and possibly die-back caused by logging elsewhere. Interactions between biodiversity losses, cumulative „environmental stress“ and climate change: Increased logging as well as forest and grassland conversion to tree plantations not only emits large quantities of greenhouse gases but also diminishes or destroys the ability of ecosystems to help regulate the carbon cycle, nitrogen cycle, rainfall cycle and thus the climate in future. Reduced species diversity on the one hand reduces the ability of ecosystems to store and sequester carbon (see tinyurl.com/385syhx for evidence from a tropical forest in Panama). On the other hand, biodiversity losses make ecosystems less resilient to and less able to recover from „disturbances“ such as storms, fires, droughts, insect infestations and diseases, all of which are now becoming more frequent and severe due to climate change. As a recent report published by the Convention on Biological Diversity states: “The available scientific evidence strongly supports the conclusion that the capacity of forests to resist change, or recover following disturbance, is dependent on biodiversity at multiple scales... Plantations and modified natural forests will face greater disturbances and risks for large-scale losses due to climate change than primary forests, because of their generally reduced biodiversity.” (tinyurl.com/ygcqx7z)

Biofuelwatch believes EPS should be applied to all combustion forms of electricity generation. However, it must be self-evident that given the complex nature of the indirect impacts of bioenergy

described above, the precautionary principle should be applied in the case of biofuels and biomass and they should not form part of the energy mix of a national electricity supply.

Question 17: How should biomass be treated for the purpose of meeting the EPS? What additional considerations should the government take into account?

The fundamental point here and with the consultation as a whole is that industrial bioenergy is neither sustainable nor carbon neutral. Rather than mitigate climate change it accelerates it. Biofuels and biomass play a major role in the proposals and this needs to be stopped now as this reform of the market sets the course for the next four decades. Regarding additional considerations after precluding bioenergy due to negative greenhouse gas emissions, would be to take account of sustainability in a meaningful way. This would include human rights, food & water issues and habitat & biodiversity loss.

In principle, Biofuelwatch believes EPS should be applied to all combustion forms of electricity generation. However, due to the evidence we have presented regarding direct and indirect impacts of bioenergy, that even if an EPS were to apply to biofuels and biomass this would not be acceptable. For example the introduction of 60% mandatory greenhouse gas emission reductions is meaningless when the realities of the global supply chain are taken into account. The introduction of a 60% figure, appears to concede that carbon neutrality does not apply to biomass and can not be achieved. And of course, they do not include other sustainability issues, such as human rights and biodiversity loss.

This is a bit tricky, because taking account either LCA or combustion emissions for bioenergy tends to be mutually exclusive. And the government is already going to introduce meaningless ghg standards for biomass, with 60% mandatory ghg reductions. I suggest you use some of our conclusions from the ROCs briefing and refer to the precautionary principle, too.

Question 37: Some technologies are not currently grandfathered under the RO. If the Government chooses not to grandfather some or all of these technologies, should we:

- Carry out scheduled banding reviews (either separately or as part of the tariff setting for the new scheme)? How frequently should these be carried out?
- Carry out an “early review” if evidence is provided of significant change in costs [or other criteria as in legislation]?
- Should we move them out of the “vintaged” RO and into the new scheme, removing the potential need for scheduled banding reviews under the RO?

Grandfathering is intended to make it easier for developers to go into energy generation secure in the knowledge that their subsidy levels are guaranteed effectively for the lifetime of their operation. It helps them get project financing from banks and other sources.

Grandfathering of support for bioenergy will therefore further stimulate growth in this sector. It will allow wood and vegetable oil power stations to carry on running when their fuel prices rise, and will take investment away from truly clean alternatives like wind, marine and solar.

There are already 35 biomass power stations currently in our planning system. These are power stations that use wood directly to generate electricity, which is far less efficient than Combined Heat & Power (CHP). The 35 stations will use 39 million tonnes of wood which is 4.5 times the total supply of wood available in the UK. We currently import 90% of our wood.

Biofuelwatch therefore opposes the use of grandfathering for bioenergy.