Consultation on Renewable Energy Financial Incentives 2009

Department of Energy and Climate Change

Water UK response

Date of submission: 15 October 2009

Summary

1. We strongly support the role of economic incentives in stimulating the growth of renewable energy generation in the UK. The water industry currently generates electricity and heat from anaerobic digestion, wind and hydropower. Together, this generation represents around 8.5% of the industry's total energy use. There is potential for this to increase in future.

2. The proposals as they stand will help to increase renewable energy generation in the water industry at the margins. However, much more could be done if the following changes were made:
   a. Advanced anaerobic digestion (AD) associated with the treatment of sewage sludge took account of the actual costs associated with this technology and FITs were allocated accordingly
   b. Explicit support was provided for energy recovery schemes

Introduction

3. Water UK is the industry association that represents regulated UK statutory water supply and wastewater companies at national and European level. We are a policy-based organisation and represent the industry's interests with Government, regulators and stakeholders in the UK and in Europe. Our core objective is sustainable water policy – actions and solutions that create lasting benefit by integrating economic, environmental and social objectives. [1]

4. The UK water industry generates around 750 GWh of renewable energy per year. This has been increasing in recent years, partly as a result of economic incentives provided by ROCs. The industry uses around 8,500 GWh of energy per year in pumping, treating and distributing water and wastewater. This has also been increasing, largely to meet statutory growth requirements and quality drivers aimed at achieving higher quality drinking water and wastewater treatment standards.

[1] A list of Water UK members is available at http://www.water.org.uk/home/our-members

5. We have limited our comments to those questions which are of most relevance and importance to the water industry.

6. We estimate that the FIT & RHI will increase energy costs for the water industry by several million pounds as a result of supplier costs being passed to consumers. We think that these additional and unplanned costs should be reflected in price determinations by the economic regulator.

Response to questions

Renewables Obligation

Q1. Do you agree that, at this point, no extension beyond 2037 is required?

We agree and welcome the recent extension from 2027 to 2037

Q3. Do you agree that additional capacity or plant that is refurbished or replaced should be entitled to the full 20 years of support, regardless of when the original capacity started to receive support?

Yes, but there needs to be a clear definition of refurbished to qualify for the 20 years full support

Q6. Do you agree a wholesale price stabilisation mechanism would bring benefits to renewable generators by providing a predictable and adequate level of compensation?

No, although the wholesale electricity price stabilisation would provide a more predictable income stream for the smaller generators it will not drive competition or efficiency for renewable generation. Any increase in benefit would also provide additional excess profits for the larger generators. The RO is aimed at larger generators and should be incentivising the lowest cost of carbon abatement in the generation sector; larger generators should have the capability to manage their own wholesale market risk. This proposal is a duplication of the FITs proposed for smaller generators.

Q11. Do you envisage any other implementation challenges which might result from the introduction of a stabilisation mechanism? If so, how do you propose we deal with them?

We do not agree that wholesale power price stabilisation is the correct incentive mechanism. The incentive for renewable generation should be either the ROCs or the FIT. As some generation sites do not export their power to the grid, it is embedded into the site distribution network where it is located and is consumed by the site, off setting the electricity purchase; this in itself is a risk management strategy to reduce the exposure of the company to the wholesale power market.

Q16. Do you agree that biomass and generation involving co-firing should be excluded from any new stabilisation mechanism? If not, why not?

We do not agree that wholesale power price stabilisation is the correct incentive mechanism. The incentive for renewable generation should be either the ROCs or the FIT. If this is introduced then a clearer definition of co-firing for fuels such as waste is required, so that there is a differentiation between a viable fossil fuel power station that is burning biomass and others.

Q18. If you believe that a price stabilisation mechanism should be introduced for the wholesale power price, do you think that it should be applied to the ROC price as well?

It is a combination of stability in the legislative process and headroom between supply and demand that gives investors confidence and incentivises forward investment. Providing the commitment that the headroom mechanism continues for the remainder of the life of the RO, which will maintain the ROC value, will give investors confidence. A minimum price for a ROC would also maintain investor confidence. However we do not agree that the wholesale price stabilisation mechanism is the corrective incentive.

Q19. Do you agree with the proposed conditions? Are there any more conditions we should consider?

We agree with the conditions. The RO is designed to achieve the UK Climate Change and Carbon Reduction Commitment. There is a risk that by opening the renewable generation market to generators in other countries, that they might receive double incentives. Additionally this would provide additional support to the lowest carbon abatement across the EU, and may disincentivise UK based investment.

Q20. Do you think we should set support levels for stations located outside the UK in line with those for UK-based generation?

The support should be in-line with support for UK based generation. However the UK should not be financing the electrical infrastructure costs and UK based companies should not pay indirectly through increased transmission charges as this increase cost of electricity will reduce the competitiveness of UK based industry.

Q21. Do you agree with our proposal to limit the eligibility for stations located outside the UK to those with a direct interconnection to the UK? If not, why?

We agree with the proposal. Also the measurement of the renewable electricity should be at the entry point to the UK grid, so that UK generation is not disincentivised.

Q22. Are there any other specific issues we should consider when implementing international trading in renewable electricity through the RO?

If international trading in renewable electricity is implemented, then a cap should be placed on individual suppliers, such as the co-firing cap, to maintain the balance of investment in UK based renewable generation.

Q24. Do you agree with our proposed level of support for offshore wind, including our proposal to step down support from 2 ROCs/MWh to 1.75 ROCs/MWh over 2 years?

We do not agree with the additional level of support proposed for offshore wind at the expense of proven and more certain technologies. The key justification seems to be that "the case for offshore wind is different due to specific supply chain and market factors not faced by other technologies". However, the consultation does not identify or discuss these factors. Every technology has special circumstances and the economics of each are directly related to the level of ROC support.

The RO should be promoting the lower cost carbon abatement technologies. By increasing the ROCs for wind the market mechanism to support lower cost technologies is being removed. All technologies have been exposed to the increases in the cost of borrowing and capital over recent months. The RO should be promoting the lowest cost of carbon abatement, e.g. co-digestion and sewage gas, to maximise their potential.

Q29. If you think the cap should be changed, when should this happen and at what level should the cap be set? Please provide evidence supporting your answer.

A financial model should be constructed which identifies the carbon abatement cost of increasing co-firing renewables in base load power stations. Currently the only base load renewables are biomass CHP, river hydro, landfill and sewage gas generation, which is a small percentage of the UK's renewable portfolio. There is a need to incentivise baseload renewables to reduce the reliance fossil fuel power stations to balance the peaks and troughs in renewable generation, which only increases the carbon footprint of grid electricity.

Feed-in tariffs

Q42. Do you agree with the selection of technologies for which we will be providing tariffs from April 2010?

No, we do not agree on two counts:

- The costs of advanced AD from sewage gas have been incorrectly calculated. The costs are equivalent to adding a CHP to an existing digestion site. The installation of advanced AD will produce increased biogas volumes and hence additional renewable electricity, but it requires additional capital investment. There is currently no incentive to build additional AD (standard or enhanced) for sewage sludge to achieve additional electricity generation. We provide more accurate costs below.
- If FITs are aimed at low carbon technology such as micro CHP, then energy recovery schemes should also be included. Within the Water Industry there are occasions where the design of pipe network requires water pressure to be increased to supply water to the highest point in the system, but this level of pressure is not required for all the system and pressure reduction valves are installed. The energy lost across the pressure reduction systems could be

recovered and used to generate electricity. There are similar opportunities on the wastewater sites. A FIT would support the viability of such schemes.

Advanced AD from sewage gas

The proposals include AD but exclude sewage gas. The basis for this seems to be that:

- *"A large deployment of these technologies has been financially viable under the RO"* (3.4.1). This is incorrect. AD in the water sector is primarily focused at larger sewage treatment sites close to urban areas, because this is where AD is currently economic. The UK water industry currently has AD at around 220 sites, producing around 100 MW per year. However, there are well over 1,000 sludge treatment centres and FITs would improve the economic case for AD at small-scale and rural works significantly. Well over half a million tonnes of sewage sludge in the UK is not currently treated by AD. This could be used to generate renewable energy if appropriate incentives are in place.

- Sewage gas is "*primarily deployed by large companies with experience in the energy sector – not the types of companies or people the FITs scheme is primarily aimed at*." However, we understand that it is the size of the plant that is relevant, not the size of the organisation. We do not believe that DECC can or should discriminate on FITs based on the organisation but would be interested to hear if this is the case. In addition, many UK water companies are quite small relative to others in the energy generation sector.

  Further, the water industry is central to the further development of AD, in terms of expertise, technology and innovation. It also supports a UK-based supply chain. Excluding AD from sewage gas from FITs will have a significant negative impact on further development in this area.

- DECC has assumed that AD from sewage gas is less costly than from other sources, based on cost information provided by consultants and used for the RO. However, work by independent consultants for Water UK shows that, whilst the costs of adding CHP to existing AD plant are in line with DECC's estimates, the costs of new and advanced AD or upgrading current installations are significantly higher and more in line with DECC's estimates for other advanced technologies. Such new plant using advanced treatment is where the key opportunities for the water industry lie going forward. In addition, the water industry has experience in applying advance AD techniques and has patented technology in this area.

  The actual costs of AD in the water industry are shown below:

Capital costs (£000/MW)	
Adding CHP to existing site High	2,632
Adding CHP to existing site Average	1,611
Adding CHP to existing site Low	973
Adding CHP to Existing site (advanced)	3,333
New Advanced AD with CHP High	13,317
New Advanced AD with CHP Average	9,989
New Advanced AD with CHP Low	6,498
Upgrade Existing Site to Advanced AD with CHP High	12,989
Upgrade Existing Site to Advanced AD with CHP Average	11,004
Upgrade Existing Site to Advanced AD with CHP Low	9,375

Operating Costs (£000/MW)	
Adding CHP to existing site High	355
Adding CHP to existing site Average	168
Adding CHP to existing site Low	158
Adding CHP to Exisiting site (advanced)	170
New Advanced AD with CHP High	1,055
New Advanced AD with CHP Average	647
New Advanced AD with CHP Low	458
Upgrade Existing Site to Advanced AD with CHP High	711
Upgrade Existing Site to Advanced AD with CHP Average	576
Upgrade Existing Site to Advanced AD with CHP Low	476

Levelised costs (£/MWh)	
Adding CHP to existing site High	111
Adding CHP to existing site Average	62
Adding CHP to existing site Low	48
Adding CHP to Exisiting site (advanced)	84
New Advanced AD with CHP High	375
New Advanced AD with CHP Average	258
New Advanced AD with CHP Low	171
Upgrade Existing Site to Advanced AD with CHP High	339
Upgrade Existing Site to Advanced AD with CHP Average	238
Upgrade Existing Site to Advanced AD with CHP Low	178

The majority of plant from which this cost information was collated was for sites under 5 MW, significantly lower in most cases. Very few existing or planned water industry sites generate above 5 MW. We would be happy to provide further detail and a breakdown of these costs (in confidence).

In summary, it appears that DECC's 'sewage gas' figures for capital, operational and levelised costs are similar to those above for adding CHP plant to an existing anaerobic digester plant. Capital, operational and levelised costs provided by the water industry for installing a new advanced treatment digester with CHP, or upgrading a current installations are much higher than those assumed by DECC. These figures are more similar to for advanced AD technologies.

We cannot be sure of the assumptions behind DECC's cost estimates, but believe that they assume digestion infrastructure is already present and therefore do not include digestion costs, including anaerobic digesters, enhancing digesters for advanced

treatment or adding advanced technologies and equipment such as gasholders, gas cleaning and transfer equipment.

It is also important to note that sewage gas does not occur 'naturally' in the sewage treatment process and does not, therefore, simply require collection. Its production requires the specific selection and investment in AD technology. Biogas from sewage sludge is produced by the AD process in exactly the same way as biogas from other biodegradable materials. The technological process is the same and should be treated equally.

AD in the water industry contributes to climate change mitigation in a number of ways

- Avoids uncontrolled methane emissions from decomposition of sludge
- The digestate produced and applied to land displaces nitrogen-based soil conditioners with associated emissions from production
- The process produces renewable energy (both electricity and heat)

We are therefore surprised by the low level of FIT incentive for AD compared with wind. Overall, AD is considerably more carbon-efficient than other technologies.

The use of sewage sludge to produce biogas is a proven technology that has the potential to expand significantly, particularly using advanced AD, if the economic support is forthcoming. Without appropriate FITs support, expansion of renewable energy generation in this area will not happen.

We therefore urge DECC to take account of this more accurate cost information when finalising levels of FITs. There is significant potential for advanced AD and associated additional renewable energy.

Energy recovery schemes

We would welcome further clarification on the treatment of these schemes and think they could benefit significantly from FIT support.

Section 3.92 of the document states:
'MicroCHP technologies are the only technologies that FITs can support that are non-renewable: that is, they can generate heat and electricity from fossil fuels, generally natural gas. The assumptions and methodology used to develop FITs for renewable technologies do not apply.'

The water industry consumes large quantities of electrical energy, much of it in raising the head of water. In the case of potable water distribution this may be to pump water to a service reservoir at high level. To illustrate this, in order to raise 1 Ml per day through 1 metre for a year consumes 1,400 kWh of electricity which in turn produces 775 kgCO_2e.

One of the purposes of a service reservoir is to provide supply security to customers, only some of whom live on the surrounding high ground. The remainder live at lower levels to which the pressure of their water supply has to then be reduced. A significant proportion of the energy expended in pumping the water is lost through this process.

In many cases this energy could be recovered using turbines and the electricity generated fed into the local network. Whilst this energy is not renewable it is very difficult to avoid and to modify existing distribution systems to obviate the need to pump so much water to high level would be prohibitively expensive.

There are similar situations at sewage treatment works where a dynamic head is created where water which has been pumped as it discharges into the next stage. This head could be utilized to generate renewable energy. This energy is currently lost as equivalent heat at the pressure reduction valve or discharge point and its potential for carbon reduction is worthy of recognition and support.

We believe there is significant potential for energy recovery through such schemes for small and large water companies. However, development would require support and we would urge DECC to include them within FITs. FITs for energy recovery would not provide an incentive to pump more water than is otherwise required since the cost for additional flow to be pumped would always be greater than the FIT.

Q51. Do you agree with the tariff levels, lifetimes and degression rates we have set out for the chosen technologies? If not, what evidence do you have for choosing alternatives?

See response to question 42

In addition, the RO buyout price is indexed to RPI. To maintain the value of the tariff over the duration of the scheme it should also have an index mechanism such as RPI.