Bioenergy Review (2018) - Call for evidence : Entry # 1320

Wales & West Utilities (WWU) is a licensed Gas Distribution Network (GDN) providing gas transportation services for all major shippers in the UK. We cover 1/6th of the UK land mass and transport gas to over 2.5 million supply points. We recognise the need for the UK to decarbonise its energy supply and we are committed to working to help decarbonise heat light and power through innovation, research and development.

As Green Gas Development Manager my role within WWU is to support the development, connection and use of green gases within the UK. This includes working to develop and connect biomethane, bioSNG and hydrogen into the UK gas distribution systems.

6. What are the strengths, weaknesses and gaps of the current sustainability framework for bioenergy in the UK? How could the current sustainability framework for bioenergy in the UK be improved to address these issues?

The current sustainability framework within the UK has led to a piecemeal and disjointed approach to generation and use of renewable energy in the UK. This has led to significant inefficiencies in the way the valuable bioenergy feedstocks are being utilised. An example of this is the way incentivisation mechanisms promoted the generation of electricity from biogas leading to an estimated 40% of the biogas produced in the UK being wasted in the form of unused heat. Source: 'ADBA Anaerobic Digestion Market & Policy Report – November 2017' this reports provides the following figures: Biogas 2017 – 11.4 TWh of which 3.8TWh was upgraded to biomethane and 7.6TWh was used for electricity generation . Of this 7.6TWh for electricity 4.6TWh was (largely) wasted in the form of vented co-generated heat versus 3TWh electricity. The alternative – the upgrading and distribution of this biogas in the form of biomethane for use in heat or transport would see significant increases in the efficiency and also aid in the decarbonisation of sectors, which unlike electricity, have limited economically viable decarbonisation options.

Incentivisation for renewable energy, especially for bioenergy where feedstocks are limited, should consider the whole system use of the feedstocks – incorporating production, distribution and use.

10. Please highlight any further measures you feel are required to ensure bioenergy feedstocks used in the UK are sustainable and deliver significant life-cycle GHG emissions savings. Why are these measures needed?

Any assessment of the use of bioenergy feedstocks should take into consideration the end to end use of the feedstock, efficiencies and intended use – this should include, but not be restricted to, feedstock conversion efficiency, transportation and distribution , as well as storage and storability. When considering sustainability the assessment should incorporate the end use of the feedstock and priority should be given to the conversion of the feedstock into fuels that help to decarbonise sectors that have limited other options.

For example the conversion of bioenergy feedstocks to biomethane for heat or transport is efficient, easy to distribute and store (both intraday and inter-seasonally and also address to energy sectors

that are otherwise difficult to decarbonise. Use of the same bioenergy feedstock to create electricity (either from biogas or direct biomass combustion) on the other hand is inefficient in both production and distribution, difficult and expensive to store in any meaningful volume and is being used in a sector that has a variety of other mature technologies available to aid in decarbonisation.

An additional consideration that should be taken into account when considering the sustainability of feedstocks are the additional benefits of diverting these feedstocks into renewable energy production - this should include consideration of avoided emissions (for example avoiding methane emissions from landfilled organic materials).

12. What are the most credible and up-to-date estimates for global bioenergy resource potential through to 2050, broken down by feedstock type? What key assumptions underpin these estimates?

Cadent have conducted a review of the bioenergy potential for the UK – this can be found here: https://cadentgas.com/About-us/The-future-role-of-gas/Renewable-gas-potential

14. What are the most credible and up-to-date estimates for the amount of bioenergy resource that could be produced from UK waste sources through to 2050? Where possible please state any assumptions relating the reduction, reuse and recycling of different future waste streams.

See response to 12

18. What are the main opportunities to scale-up the supply of sustainably-produced domestic bioenergy supply in the UK?

There is significant potential for increased use of Anaerobic Digestion for wastes in the UK. Research and development is increasing the conversion efficiencies of these plants and more widespread use of advanced anaerobic digestion techniques on sewage plants for example are increasing the biomethane yields that can be realised from such feedstocks.

In addition to improvements in Anaerobic Digestion, thermal gasification is making significant steps towards being commercially realised through the construction of the Commercial Demonstration BioSNG plant in Swindon by gogreengas (http://gogreengas.com/ ). This technology opens up the potential to utilise far more waste (both black bag waste and woody biomass) to create energy via a method that is significantly more efficient than simple combustion found in traditional energy from waste plants.

19. What risks are associated with scaling-up domestic supply and how can these risks be managed?

There are no real risks to scaling up the use of biomenthane from anaerobic digestion or gasification. The use such techniques provide a sustainable use of waste feedstocks to produce an energy vector that can be easily stored and ultimately used to aid in the decarbonisation of heat, light, power or transport.

20. What 'low-regrets' measures should be taken now (e.g. planting strategies) to increase sustainably-produced domestic bioenergy supply?

There should be additional incentivisation or legistion for wastes suitable for AD or gasification to be diverted for energy production thereby preventing them from going to landfill.

22. What policy measures should be considered by Government to help scale-up domestic supply?

See question 20

c. What risks are associated with the pursuit of other non-energy uses of bio-feedstocks and how can these be managed?

There is a finite amount of bio-resource feedstock available, diverting this from energy needs such as heating or transport to other uses would require the development of alternative, likely more expensive solutions to solve energy decarbonisation issues. A full risk / benefits analysis should be conducted to identify best use for the limited bio-resources available.

35. Please submit any further evidence that you would like us to consider.

Bioenergy, in the form of biomethane or bioSNG, offers a low carbon, efficient, low cost and sustainable source of energy that can be used to help the decarbonisation of heat and transport; the two sectors that have, thus far, proven to be the most difficult to decarbonise.

Bioenergy by itself is limited by the feedstock available and it is therefore necessary that the application of bioenergy should not be considered in isolation but as part of the wider, integrated energy system.

At Wales & West Utilities we have been working to promote ways in which biomethane or green gas could be utilised a manner that maximises the potential decarbonisation of heat in conjunction with the use of hybrid heat pumps. Hybrid heat pumps are a combination of heat pump and condensing gas boiler that would operate on renewable electricity when available and efficient to do so but would then switch to utilising gas, decarbonised through the injection of green gas into the network, when the efficiency of the heat pump drops or the intermittent renewable electricity is not available. This is a concept we are currently trialling in Bridgend in the Freedom project. This project is being conducted with Network Innovation Allowance funding in collaboration with Western Power Distribution and PassivSystems.

With energy systems becomingly increasingly integrated it is important to understand how each of the proposed energy vectors, including bioenergy, interact and the role they may have in future energy system. In order to do this Wales & West Utilities have worked to develop the 2050 Energy Pathfinder. The 2050 Energy Pathfinder enables any energy scenario, current or future, to be modelled for a town, city, county or country and the results show the costs, carbon impact and any shortfall / surplus in heat and power supply. The simulator can be used to find the feasibility of alternate solutions across all energy types in a more integrated way.

Further information on Freedom project and the 2050 Energy Pathfinder can be found here: http://www.wwutilities.co.uk/about-us/our-company/future-of-energy/ the following short papers (also attached) can be found here: http://www.wwutilities.co.uk/about-us/our-company/publications/the-future-of-energy-research/

“On the road to a green energy UK: Integrated gas & electricity networks support the journey”

“On the road to a green energy UK: Freedom – hybrid heating”

“The Renewable Cornwall Project; The Heat, Light & Power Simulator”