



Heat is on for regulatory change

The UK gas industry trade association – SBGI (formerly the Society of British Gas Industries) – together with the Natural Gas Vehicle Association (NGVA) and the Renewable Energy Association (REA) are lobbying for renewable natural gas – or ‘biomethane’ – to be given equivalent treatment to renewable electricity. John Baldwin, Managing Director of CNG Services, supports this campaign and explains what it’s all about.

At present, the House of Commons can be powered by wind turbines on a Welsh hillside, even though the electrons don’t flow from the windfarm directly to Westminster. It is accepted that if a supplier puts renewable electricity into the electricity grid at one location, it can take out an equivalent amount elsewhere. This avoids having to move the source of demand to the source of supply and makes sense for all concerned.

Unfortunately, the same does not apply to renewable natural gas. It is not clear why there is not equivalence between gas and electricity in this regard and, when energy was cheap, it didn’t really matter anyway. However, with higher energy prices and concern about carbon dioxide (CO₂) emissions, there are strong environmental arguments to end the discrimination.

The argument runs like this. The UK currently produces around 24 TWh* of biogas, which contains around 65% methane and 35% CO₂. Landfill sites are the major

source, along with sewage works. Most of this biogas is burnt in gas engines to make electricity. At the vast majority of these sites there is no use for any waste heat. The average efficiency of generation is estimated at around 35% for sewage gas but only 25% for landfill gas, the main biogas source (sewage biogas being able to use some of its waste heat). So, you can imagine that for every connection to the electricity grid, there is also a virtual waste heat pipe that sends the majority of the biogas energy directly into the atmosphere.

Growth potential

The greatest growth potential for biogas, however, is in new purpose-built anaerobic digestion (AD) facilities taking food, agricultural and other wastes. AD has had a great deal of political attention and is poised to receive double the benefits extended to other forms of renewable electricity. Between 2005 and 2006, a total of six new plants were built, increasing UK capacity by

over 100%. Two further new plants were started in 2007 and the many new biogas projects which are now in the pipeline indicate that German levels of expansion are now possible in the UK. With additional rewards on the horizon for renewable heat, AD again stands to benefit.

Joan Ruddock, Minister for Sustainable Consumption and Production, has said that while ‘central government doesn’t usually have a preference when it comes to selecting waste treatment technologies’, her Department considered anaerobic digestion as the best process for dealing with food waste. By changing the law to give gas equivalence with electricity, these virtual waste heat pipes will not form part of the design of the new ADs being built. Instead, the biogas produced can be cleaned up and converted into biomethane, able to be transported via the grid to where it can be used most efficiently.

Given that the energy cost of making grid specification biomethane from AD biogas is only around 5% to 7.5%, there is significant benefit from better utilisation of this gas.

What is the problem?

There are no regulatory barriers to injecting renewable methane into the gas grid. In fact, whilst it does not happen yet, the UK pipeline system welcomes it with open arms, not even charging a fee to accept it at the lower pressures that local gas pipelines operate at. The raw biogas has to be dried, cleaned, enriched and odourised, but this is straightforward with a range of technologies widely used in Europe. The problem is commercial. Without equivalent treatment, all green benefits are lost when the biomethane enters the mains. At present, power generated from biomethane taken from the gas network would not qualify for a premium payment under the Renewables Obligation or the Renewable Transport Fuel Obligation. However, there are positive signs that the government is interested in this idea, as BERR (Department for Business, Enterprise and Regulatory Reform) indicated in its response to the Renewables Obligation Consultation (issued 10 January 2008) that it is receptive to the idea and will call for

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The town of Lille in France runs its buses and refuse trucks on renewable methane
Source: Max Lerouge

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evidence later in January 2008 to see what the benefits will be from making the necessary reform.

European experience

Injection of biomethane into gas grids is now happening across Europe in a market growing at more than 25% annually. In Sweden, Switzerland, Austria, Germany and the Netherlands, the production of renewable methane from domestic waste offers a solution to the problems of waste recycling, reduction in global warming and reduction in natural gas imports.

If equivalent treatment were allowed in the UK, gas suppliers who already offer 'green' electricity tariffs could also offer 'green' gas tariffs. Supermarkets could recycle their green waste, turning it back into methane and running all their vehicles on carbon neutral compressed biomethane and tapping into the premiums available for renewable biofuels.

Giving renewable natural gas the same legal basis as renewable electricity will put the methane molecule on the same footing as the electron and will create the basis for truly sustainable local waste to biomethane plant. Each town in the UK could have its own anaerobic digester,



Waste collection truck

Source: Pierre Hirtzberger

converting its waste into renewable methane to heat its town hall and to run its buses and refuse trucks. Lille does it in France – it can, and should, happen in the UK too.

Equivalence would also open the door to the creation of second generation biofuels, made not from food crops but from the cellulosic green waste left behind. Salzburg AG, an Austrian energy

company, has just opened its first cellulosic biomethane gas station in Eugendorf. It features a new pipeline that will feed its biogas to the city's natural gas grid. This biomethane is obtained from fermenting meadow-grass (known in the US as Kentucky bluegrass), which is common in Austria's grasslands.

*TWh – tera (trillion) watt hours

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12 time zones with harmonised reporting and security procedures requires time and funding beyond current budget allocations.

Estlink is a non-synchronous link of back-to-back transformers. In theory, this could work between Lithuania and Poland. However, the Lithuanian grid is linked to the Russian enclave of Kaliningrad on one side and Belarus on the other, complicating the technology and increasing costs. Furthermore, even a non-synchronous link would affect Poland's power links with Germany to the west where, in Germany, the grid performance is governed by obligations regarding wind power.

The Polish-Lithuanian link would be expensive and redundant as there is a shortage of generation capacity on the Polish side, while in Lithuania, Ignalina is due to shut down. The Lithuanian government has been trying to interest its neighbours in the construction of a new plant for the last several years. Last October the then Polish Economy Minister Piotr Wozniak said that Poland would require an offtake of at least 1,200 MW from the proposed plant for it to be economically viable given the cost of also building a power link. However, the cooling capacity of Lake Druksiai alongside the Ignalina site is probably a maximum of 2,200 MW. This would not leave enough offtake for Lithuania and the other Baltic States.

Lithuania had insisted on inviting Poland into the new Ignalina project against the wishes of Latvia and Estonia and so was embarrassed at Polish demands. Furthermore, under EU rules the grids on either side of the link need to be run by independent system operators not engaged in trading activities, says Wladyslaw Mielczarski, Professor of Electrical Engineering and EU Co-ordinator for Interconnections between Germany, Poland and Lithuania. Poland has just created one such operator, while Lithuania does not comply with EU rules, he says. Vilnius is in the process of creating an 'energy champion' which will group together all power business activities in one corporate entity. An environmental commission is expected to report on the project in late 2008.

Meanwhile, Latvia has been improving its relations with Russia and cooling on the Ignalina project. Estonia increasingly sees its energy future linked with Scandinavia. Stung by the Polish demands, Lithuanian President Valdas Adamkus visited Sweden in the hope of generating interest in another international power link. Swedish power companies have expressed interest in participating in a new nuclear plant at Ignalina, says Niclas Damsgaard, but looming generation capacity shortages in Sweden mean that a power link with Lithuania could be a dead end.

Pressing on

However, the Lithuanian government is pressing on regardless. In mid-2007, the Seimas (parliament) passed a law stipulating that the state must have a minimum participation of 34% in the new plant. This is due to be changed in early 2008 with Seimas approval of the new 'energy champion', to be called Lithuanian Energy Organisation (LEO LT). This company will be the vehicle for financing the new power plant.

Dubbed the 'three headed dragon' it merges Lietuvos Energija (LT) with western transmission grid VST and the state's share in eastern grid RST, in which E.On-Ruhrgas is a major shareholder. VST is controlled by NDX Energija, a Lithuanian enterprise controlled by Vilnius Prekyba, a property and supermarket conglomerate. NDX was opposed to the creation of the national champion because of Lietuvos Energija's contractual and energy links with Russia, but the government forced the issue. Now members of the governing Social Democrat coalition are calling for a referendum on LEO LT, claiming that legislators have been bribed a total of 30mn litas (£6mn) to vote in favour of the new company. Lithuania faces parliamentary elections in September 2008 and presidential elections in 2009, making the power plant's future even more precarious.