

Waste Not, Want Not

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It was great as a local councillor to get out on a visit the other week. We were learning about the Severn Trent Green Power anaerobic digestion plant at Stourbridge. This is a remarkable facility, costing around £25m it produces biomethane energy from the 50,000 tonnes of organic wastes it digests each year. A bi-product is the digestate or natural fertiliser which results from the solid waste and a further bi-product is the carbon dioxide produced which some AD plants capture but which is so far not captured by this particular one.

It was interesting to read the Lex column in the Financial Times, (Lex. Biomethane what-whiff scenario, 13th Feb 2023) highlighting the potential of this green gas now big oil has started to acquire serious biomethane production assets. Goldman Sachs is looking to invest 1bn Euros in developing biomethane plants; Shell has just spent 1.9bn Euros on the purchase of Denmark's Nature Energy with BP investing \$4.1bn on Archaea in the US.

The Lex article states that biomethane has 'high operating costs' citing 65-100 Euros cost for a MWh. This compares to 40Euros/MWh breakeven for solar which it is claimed will fall to 10Euros/MWh by 2050. Although green hydrogen costs 500Euros/MWh they state.

The piece states biomethane is not easily scalable as production is limited by the amount of waste produced. The Anaerobic Digestion and Bioresources Association claims that 140m tonnes of organic waste is unused each year, the government that around 10m tonnes of food waste is unprocessed annually and in general [97% of the estimated 90m tonnes of cattle waste produced annually is not processed](#). A 1,000-pound dairy cow produces an average of 80 pounds of manure each day which is often stored in holding tanks before being applied to fields. Not only does the manure produce methane as it decomposes, it may contribute to excess nutrients in waterways. In the relative short term, over a decade, Methane is 86 times more harmful as a greenhouse gas. So, it seems there's plenty of organic waste – we are simply not collecting it and one assumes this is because it is not commercially viable to do so.

However, there are innovators out there challenging and changing the accepted paradigm. When it comes to collecting some of the cattle slurry going to waste each year, [BioFactory](#), a Bath-based design and engineering business, is using Anaerobic Digestion (AD) for micro-scale applications. Their simple to maintain products are built inside standard Shipping Containers so they can be used on farms for example. By reducing costs, their systems are targeting a wider userbase than existing market solutions, increasing the uptake of the technology's benefits. Their Micro AD Farm system pays for itself by off-setting imported energy costs, replacing the use of electricity, oil, or gas by using biogas as a fuel source. As well as reducing energy bills, their solution enables use of improved slurry wastes in promoting better nutrient uptake in your crops, whilst also reducing the costs associated with slurry spreading.



Source: [Micro AD Farm™ \(biofactory.energy\)](https://www.biofactory.energy)

Another innovator, tackling the similar challenges facing cattle farmers, [Bennaman](#), presented to our Birmingham Biomethane Cluster a few years ago and these farmers of any size are able to cover their manure slurry lagoons, capture fugitive methane emissions and build independent energy solutions whilst improving their profitability through reduced energy and fertiliser bills as well as selling on biomethane produced.



Source: Bennaman.com

A further company, [Ekogea](#) is producing products which de-water slurry enabling greater transportability of this waste stream, developing a micronisation pre-preparation technology with digester additives which significantly enhances digester yields whilst also improving resulting digestates and their ability to reduce acidity and phosphoric soil levels

Local authorities are mandated under the Environment Act 2021 to collect food waste by 2025. Those authorities collecting on a three weekly cycle – residual waste one week, tins and glass on another week and paper and card in the third week have been demonstrating savings which they are using to fund their weekly food waste collections. Stratford Upon Avon, for example, has delivered a £436k annual saving on this basis with Bracknell Forest Council delivering first year savings of £230k. Food waste is seen as a quality feedstock by AD operators and, according to some experts, can command around £40 per tonne in gate fees.

With methane responsible for around 30% of warming since the pre-industrial era, cutting human-caused emissions by 45% will help us to hit 1.5C targets. According to the UN it would avoid nearly 0.3°C of global warming by the 2040s. It would prevent 255,000 premature deaths, 775,000 asthma related hospital visits, 73 billion hours of lost labour from extreme heat, and 26 million tonnes of crop losses globally each year.

Inger Andersen, the UNEP Executive Director has stated:

“Cutting methane is the strongest lever we have to slow climate change over the next 25 years and complements necessary efforts to reduce carbon dioxide. The benefits to society, economies, and the environment are numerous and far outweigh the cost.”

Having started Ultra Light Rail Partners five years ago to provide an alternative solution to fossil fuel power for trains and trams, our company has won grants from [Innovate UK](#) and has applied for further funding to build not only green gas trains and trams, but a green gas refuelling station. Our ambition is to produce low-cost transport systems (BioUltraZero Emissions Lightweight Transport, BOLT), so smaller and even more rural communities could look to enhance their connectivity, just as has happened in Stourbridge with the [Stourbridge Shuttle](#) which has been running for 13 years operated by [Pre Metro Operations](#) with a 99.9% reliability track record as the only gas-powered train operating in the country.



[Suzanne Webb MP for Stourbridge](#) was singing the praises of the Stourbridge Shuttle in the House of Commons on 23rd January 2023 in a debate on the Restoring your Railway fund. She stated:

“It (Stourbridge Shuttle) connects the main-line train station to Stourbridge town and runs every 10 minutes. seven days a week... Its operating costs are 50% cheaper than those of conventional railways, and it is eco-friendly. running on liquid petroleum fuel that is kinder to the air which is a UK first.”

Ms Webb thanked Pre Metro Operations for bringing the Shuttle to her attention as well as highlighting the opportunity for a new ‘Dasher’ connecting Stourbridge to Brierley Hill, adding:

“Pre Metro Operations has done a brilliant job of putting together a business case, through work done out of dedication and love of the branch line, and with innovative thinking.”

Ms Webb noted the opportunity for the Dasher with 87% of her residents in favour of it and stating they would make use of it, by adding:

“It (The ‘Dasher’) would link Stourbridge to the wider Black Country, opening passenger travel between some of the region’s most deprived areas. It would be good for areas such as Amblecote and Brierley Hill, with stations planned at Vicarage Road and Brettell Lane and good for jobs by increasing the ease of travel, taking the burden off roads such as the A461, and

sparing residents from frequent traffic jams. If delivered this line and its stations would make a real contribution to reinvigorating the area.”

Bravo Suzanne Webb for these words! It is wonderful to see that some of our MPs recognise the opportunities which low-cost, affordable, sustainable transport opportunities can bring to their area.

Well done to Pre Metro Operations for making such a success of this opportunity to bring a LPG-flywheel powered lightweight train weighing no more than 10 tonnes (compared to 40 tonnes for a standard train carriage) to the people of Stourbridge and opening up new travel options to them. But why does it take so long for these opportunities to be rolled out further?

At Ultra Light Rail Partners we are delighted to be working with Pre Metro Operations as they open up new routes across the Midlands and elsewhere. We are interested in low-cost innovation that can meet the needs of people, not necessarily in shiny urban settings that seem to cost hundreds of millions of pounds, but smaller, lower-key projects costing perhaps £10m that revolutionise prospects for otherwise forgotten areas.

We want to connect the innovations taking place with the largely overlooked gas, biomethane, described by the Lex column as being held back by its ‘unglamorous origin in rubbish bins and landfills’ and harness this precious resource for the benefit of our residents, businesses and country. In this way, we are looking to use the only gas produced on the basis of a circular economy and continuous system as a wholly natural process resulting in no change to our climate.

Illustration envisaging the potential to fuel local ultra lightweight trains through locally sourced and produced biomethane without the need to connect to the gas grid.

