

**We'll need more than hot air to get us out of this crisis – but the green gas, biomethane, could power part of the solution**

***By Beverley Nielsen, Director of the Institute for Design & Economic Acceleration, IDEA, at Birmingham City University and Senior Fellow at the Centre for Brexit Studies. She is also Mayoral Candidate for the Liberal Democrats in the West Midlands and holds the Economic Development portfolio on Malvern Hills District Council.***

Over the past year I have been working on an Innovate UK (IUK) grant-funded 'first of a kind' programme as Chairman of Ultra Light Rail Partners to offer smart, green and clean, ultra-light rail-based transport solution as an alternative to traditional heavy rail and metro options.

Thanks to a very welcome, fully funded grant of £350k from Innovate UK, supported by the Department for Transport on behalf of HM Government, the **Bristol Biomethane** railcar will be launched on 22<sup>nd</sup> July 2020 from 11am-2pm at the Motorail facility in Long Marston, Warwickshire. A live stream will also be available for those unable to attend in person. This ultra-low air pollution and zero climate change emissions railcar uses a combination of the green gas, biomethane, and zero carbon kinetic energy storage from a flywheel to provide on-board power without the need for overhead wires.

I became Chair of Ultra Light Rail Partners (ULRP) as leaders of this project in 2018 after the company was formed by industry veteran, John Parry, Chairman of Parry People Movers Ltd. John was keen to build on the successful development of the propane-powered Class 139 railcars in operation over the past decade at Stourbridge. Known as the 'Stourbridge Shuttle' these railcars have been providing a 99.7 – 100% service reliability for the past ten years under the management of Pre Metro Operations.

It's the smallest train operating company in the country and much loved by the people in the Stourbridge area. John Parry with colleague, Jimmy Skinner, founding director of Sustraco, have been innovating in this field for many years trialling the first UK on-street self-powered tram without any overhead wires in Bristol between 1998-2000 (hyperlink [https://youtu.be/Js\\_mOqK0C2g](https://youtu.be/Js_mOqK0C2g)). The **Bristol Biomethane** draws on the original railcar bodywork deployed on the streets in Bristol, but it's been provided with a whole new powertrain enabling it to run on biomethane.

Like many people I am conscious that the lack of infrastructure connectivity and investment has cost the West Midlands billions of pounds in lost productivity over many years. People are unable to attend meetings on time and opportunities for output are lost with traffic congestion leading to hours lost on wasted journeys. Worse still too many communities are isolated with few transport options other than the car adding to congestion and poor air quality outcomes.

Birmingham, as the UK's second city, has seen its 'effective size' reduced to half, diminishing beneficial agglomeration effects through unreliable transport systems with poor coverage, in particular through the [lack of any significant coverage](#) by tram networks renowned for greater punctuality in spite of congestion. There's been shocking underfunding of our transport infrastructure. London receives half of all regional public transport spend, when the West Midlands population at 5.93m people stands at over two thirds that of London at 8.9m. Over the past 10 years London has benefitted from an additional £39bn transport investment compared to the West Midlands. [Transport spending per capita](#) in our region was 33% of that in London.

There is a social justice dimension to this too. Daily traffic congestion has a dreadful impact on the health of our population. Poor air quality caused by noxious gases such as carbon monoxide, nitrous

oxides, ammonia and sulphur dioxide causes over 14,000 premature deaths alone, while airborne particulates are responsible for 37,800 premature deaths across the UK. More worrying are the presently unproven effects on young children, the development of whose lung capacity is being stunted from exposure to these pollutants, causing irreversible damage which will permanently affect their long term health.

Whilst vehicle exhaust emissions have attracted a lot of attention, the smallest (under PM 2.5) particulates cause the most injury to human respiratory systems. During any journey by road over 1,000 times more of these health damaging particulates are emitted from rubber tyres wearing down whilst interacting with road surfaces, than from vehicle exhausts. Trams have no tyres and rolling their steel wheels along steel rails requires 85% less energy than is required to drive wheels with inflated rubber tyres, hence trams such as this one are credited with even more environmental benefits as their propulsion requires significantly less energy and emits no airborne particulates.

Recent monitoring and review work by Sustainability West Midlands (SWM) for the WMCA has identified that reducing the levels of just one pollutant (PM2.5) by 50%, would prevent 952 deaths and save £1.4m of NHS costs in the WMCA area per year.

Additionally, the average numbers of people who died as a result of exposure to particulate [air pollution in the West Midlands](#) during 2017 was 5.1%. This is the second highest out of all Combined Authority areas.

People living in more deprived areas are disproportionately sensitive to the cumulative health effects of poor air quality. Areas with a low Index of Multiple Deprivation (IMD), and especially with low health index scores, are at greatest risk from the detrimental effects caused by poor air quality. For example, where respiratory or cardiovascular disease is already present in a community, the cumulative impact of air pollution is worse than in an otherwise healthy one.

Equally, the most significant health benefits may be gained by targeting interventions in areas where existing poor air quality coincides with low IMD and health index scores. With UK studies showing people from deprived areas were 2.5 times more likely to die from Covid-19 as those from more privileged areas, a recent study by the Harvard School of Public Health showed that particulates were a source of airborne transmission of Covid-19. Delivering clean and green, lower cost transport opportunities could start to transform people's lives helping to improve health and open up job prospects.

Last week the media was full of Boris Johnson's 'New Deal' launched in Dudley and supposedly modelled on Franklin Delano Roosevelt's (FDR) stimulus package of the same name, but minuscule in comparison.

Johnson's package of £5bn amounted to just 0.2% of UK GDP, less than £100 per head, whilst FDR's plan totalled 40% of one year's GDP over a period of years with annual spend of between 5-7% of GDP. With a focus on 'streamlining planning' to level up Britain through building, it actually decelerated the timeline for building affordable housing with £9bn spend spread over 8 years rather than the 5 years previously envisaged.

Meanwhile Mayor Andy Street of the West Midlands Combined Authority (WMCA) launched a bid for £3.2bn as part of his blueprint to kickstart the West Midlands economic recovery. However the Midlands, with GVA of £140bn should, on the basis of FDR proportions, be looking at a £60-70bn one-off payment.

For a Mayor who has often claimed the region lacks ambition this plan seems remarkably short of it given the scale of the crisis confronting us. It contains a series of requests with a commitment to invest in transport, housing and people, helping to drive a rapid economic recovery aimed at creating or safeguarding more than 135,000 jobs and building 35,000 new homes. Through its focus on creating green manufacturing, infrastructure and healthcare jobs it is looking to create or safeguard around 88,000 jobs. With 1.8m people between the ages of 16-64 and 1.4m economically active already and with the threat of maybe 20% unemployment rates in our region this does not appear to go far enough.

A major part of the ask is for £250m towards a Gigafactory producing state-of-the-art batteries which will no doubt be vital for our all-important automotive sector rapidly converting to electric vehicles (EVs). However, as we continue to put all our eggs into the electric powertrain basket, we seem to ignore the warning in the recent #WM2041 discussion document which clearly states, *"It is not practical to transfer this (current) use (of car journeys) over to electric vehicles....The Regional Energy Strategy sets this out: the 42,547 GWh of energy currently delivered to vehicles in the region as petrol and diesel is nearly equal to the amount of energy delivered through the entire gas network in the region and almost twice that delivered by the electricity system."*

Alongside the focus on electrification we must put far greater effort into diversification of power options to include gas. The green gas biomethane, readily available from common waste products including sewage sludge, food, plant and organic waste, red-meat processing waste, poultry and cattle manure, has been establishing itself as the world's most environmentally-friendly fuel being used worldwide to power all forms of transport including over 24 million road vehicles. But it's not become widely adopted for transport in the UK except for a relatively small number of trucks, buses and delivery vans.

With more UK government support, such as through our 'first of a kind' award, biomethane could be used to power trams and ultra-light railcars to transform air quality in our urban areas. As a low-cost clean option it could help connect up isolated communities even within the context of our urban conurbations. It is not widely recognised that biomethane is interchangeable with existing natural gas and could be used for not only transport purposes but for electricity generation, water heating, space heating and cooking and could replace up to half the natural gas currently in use. It could therefore provide real economic job creation opportunities regionally and especially around our shire counties where agriculture still forms a considerable element of the economy. In addition, it could offer a generation of skilled jobs in planning, engineering, operating and maintenance of biogas and biomethane plants.

Its chemical formula, CH<sub>4</sub>, confirms it has the lowest carbon content and is hence the cleanest burning of any hydrocarbon fuel. The difference is that biomethane is not like all the fossil fuels which were formed millions of years ago and which cause climate change by increasing the carbon dioxide in the atmosphere when they are burnt. When organic materials decompose naturally they give off carbon dioxide and methane gas which is at least 34 times worse than carbon dioxide as a greenhouse gas. Collecting and anaerobically digesting these organic materials (the inedible leaves, stalks and peelings inevitably associated with food production plus the animal and human wastes) to capture this methane for use as a fuel is actually 'doing good' for the environment by reducing the natural greenhouse gas emissions. The process also produces renewable carbon dioxide and clean, pathogen-free fertilisers. Using these organic fertilisers to replace the artificial fertilisers which are presently destroying the quality of our soils further improves the environment, decreasing the greenhouse gas emissions while returning the renewable carbon dioxide which, using sunshine as its only power source, was taken naturally out of the atmosphere as the organic material was growing.

Encouraging the capture of this methane and creating renewable energy is not simply about being less bad for the planet, it is about promoting positive action to curtail greenhouse gas emissions and to reduce the climate change caused by transport which is now the single greatest contributor to this form of damage to our planet.

The Covid crisis has highlighted the need to focus on real job creation opportunities. ONS data suggests that West Midlands unemployment currently stands at 4.8%. Claimant Count figures for May indicate unemployment sitting at 9% – 11.1% for men and 7% for women. The Midlands Economic Forum suggests that WMCA unemployment is currently around 13% With 24% of employees furloughed across the Midlands, the Midlands Economic Forum anticipates that perhaps 16% of these are likely to return to work once furlough support is withdrawn with perhaps a further 8% of people sadly losing their jobs this coming Autumn. If so, unemployment in the West Midlands could touch 20%. With Quarter 1 GVA contraction amounting to -2.2% with Q2 figures expected to come in with a GVA contraction of between minus 15-20% the scale of the challenges facing us is clear.

Our small Innovate UK project shows that we have a very real opportunity to build a new intermediate clean transport mode capable of travelling on-rail and on-street. Throughout our project we have focussed on sourcing over 90% of our components in the UK and over three quarters from the West Midlands as home of transport engineering research and development. We have been able to do this because of the West Midlands strength in automotive as the home of one third of the UK transport production. At this time of great national challenge, we can create many new jobs by investing in innovative clean, green, low cost and ultra-low emissions options like the *Bristol Biomethane*.

***Pictured: The ultra-light clean green low emissions Railcar, the Bristol Biomethane, under development at Severn Lamb, Alcester, in preparation for its demonstration launch on 22<sup>nd</sup> July 11-2pm, at Motorail, Long Marston***



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