Biomethane fuel far cleaner than electric vehicles

October 25, 2017. **Green gas campaign wants a piece of the renewables future** by Sara Stefanini, Politico. “Renewable gas is the new buzzword in Brussels energy circles.”

*Image: A UK first – collecting their food waste using a vehicle running from their food waste*

October 18, 2017. **UK’s ‘first’ vehicle to collect and run on commercial food waste – floats like a butterfly, stings like a bee.** “Resource management company GENeco has launched a vehicle called the Bio-Bee that **collects commercial food waste and runs on the same material** in Bristol, UK. With Bristol among 40 places in the UK that consistently exceeds air quality limits for nitrogen dioxide, the Bio-Bee demonstrates a real alternative to diesel RCVs and HGVs by running on clean biomethane, according to GENeco. In a statement, GENeco said: “It also offers a cost-effective and more sustainable way for food waste to be collected and recycled, and it follows in the footsteps of the Bio-Bus – or ‘poo bus’ – which ran on human waste and was trialled in Bristol in 2015 (…) “This clean fuel helps to improve Bristol’s air quality and creates a sustainable circular economy for the client’s operations. “Bees are renowned for the good work they do for the environment, and their daily routine involves collecting valuable natural resources and then bringing them back to a hive to make renewable and nutritious products. “The Bio-Bee operates the same way. It runs on biomethane that has been produced by the anaerobic digestion of food waste and sewage from houses in Bristol, Bath and the surrounding area.”

October 17, 2017. **Bristol firms buzzing over new Bio-Bee waste vehicle** by Priyanka Shrestha, Energy Live news [includes a video]. “A new bus that runs on the food waste it collects from
commercial businesses in Bristol has been launched. Bio-Bee collects and takes the food waste to GENeco’s anaerobic digestion plant in Avonmouth, where it is processed and turned into biogas or low carbon electricity for homes and communities. The biogas is either used to produce renewable electricity or converted to biomethane – which can be used as a fuel in the Bio-Bee and other vehicles or supplied to local homes. GENeco, Wessex Water’s renewable energy firm in Avonmouth, says only one full bin of food waste is needed to power the Bio-Bee for 25 miles.”

October 16, 2017. **Meet the Bio-Bee** by Charlotte Stamper, GENeco. “Our distinctive new truck is collecting food waste and creating a buzz on the streets of Bristol. The Bio-Bee is the UK’s first vehicle to both collect and run on commercial food waste and is operated from our base in Avonmouth (...) Jesse Scharf, Green Gas Certification Scheme manager at Renewable Energy Assurance, said: “GENeco is playing an important role in the growing UK biomethane industry by continuing to innovate and show that, with creative thinking, we can find solutions to the challenges we face around waste, energy, carbon and air quality.” Shelley Wadey, finance director at Boston Tea Party, has been working with us on the Bio-Bee project from the start. She said: “Although we have been recycling our food waste from our six Bristol cafes for three years through GENeco, this is another step forward to make things better by generating a sustainable circular economy. “Through this partnership we hope to inspire other food operators to follow our lead, demonstrating it is possible to be greener and reduce the amount of waste going to landfill.”

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**Food waste hierarchy**

October 12, 2017. **Tutta l’Italia a bordo di Fiat Panda a biometano** by Tommaso Coron, Auto passionati. “Nei giorni scorsi, in occasione del Festival dell’Acqua, in programma a Bari, le luci dei riflettori si sono spostate temporaneamente sulla Fiat Panda a biometano (Natural Power), fornita da FCA al Gruppo CAP come “esperimento” per essere alimentata dal biometano prodotto dai reflui fognari (...) Fiat sta scommettendo sull’economia circolare, ovvero sul riuso di ciò che si produce già, un campo che sta conoscondo una
nuova alba parallelamente allo sviluppo della mobilità elettrica e ibrida. Sfruttare le risorse razionalmente sarà la chiave della mobilità del futuro e del futuro stesso dell’umanità: pensando alle migliaia di tonnellate di rifiuti prodotti ogni anno in Italia e nel mondo, è proprio vero che la soluzione, molto spesso, è lì sotto i nostri occhi, anche quando non vogliamo vedere.”

October 10, 2017. **Biogas buses powered by fruit and food waste could run on MetroBus routes** by Esme Ashcroft, Bristol Post [includes a video]. “Buses powered by fruit and food waste could be used on the new MetroBus routes, bosses have revealed. Known as ‘bio-buses’ the environmentally friendly bio-methane vehicles could soon be ferrying passengers around the city to comply with the project’s emissions promise. And fuel experts have calculated one year’s worth of food waste could power a MetroBus for 30 miles (...) **Bristol has a history with the development of bio-methane bus technology, with FirstGroup trialling the UK’s first ‘poo bus’ - run on human waste - in 2015.”**

October 10, 2017. **L’observatoire France Biométhane présente son benchmark 2017 des filières européennes.** “Lancé en mars 2016 par le cabinet de conseil Sia Partners en partenariat avec France Biométhane, l'Observatoire du biométhane propose une nouvelle analyse de la filière française : analyse comparée des données pays en termes de capacité, nombre d'unités, mécanismes de soutien... et fiches de synthèse par pays (...) Le biométhane, un secteur en plein essor à l’échelle européenne (...) Des mutations notables dans les modes de production du biométhane (...) Une Europe du biométhane particulièrement hétérogène.”

**context:**  
July 20, 2017. **Applied Nanoparticles in The Biomethane Map.** The Biomethane Map identifies different innovative process and technology solutions along the biomethane supply chain

le marché du biométhane pourrait atteindre 2,6 milliards de dollars d’ici 2025, contre une estimation en 2016, de 1,5 milliard. Intitulé Biomethane market, Global Analysis, size, share, growth, trends and forecast 2017–2025, ce rapport indique que la recherche de technologies permettant de produire des énergies moins polluantes va tirer la filière biométhane vers le haut dans les années à venir. Toujours d’après cette étude, l’Europe et l’Amérique du Nord sont les principaux producteurs et consommateurs de biométhane, la France faisant partie des pays clés de la filière en termes de marché.”

September 27, 2017. **AMP Americas RNG Operation Scores Low Carbon Intensity Score.** “AMP Americas announced that its Renewable Natural Gas [biomethane] operation at Fair Oaks Farms in Indiana has received the first dairy waste-to-vehicle fuel pathway certified by California’s Air Resources Board (CARB). CARB awarded the company a Carbon Intensity (CI) score of -254.94 gCO2e/MJ, which is the lowest ever issued by CARB. AMP Americas’ first project at Fair Oaks Farms has been in action since 2011 and produces over 1.5 million gallons of 100 percent renewable transportation fuel from dairy waste every year. The project was also the first, and to-date only, U.S. EPA Renewable Fuel Standard-certified dairy waste-to-vehicle fuel project in the U.S. It is the first of its kind in California’s Low Carbon Fuel Standard program. Fuels that emit more carbon have higher scores. Diesel registers +98 and California electric is +35. Fair Oaks’ -255 CI makes trucks using its fuel far cleaner than electric vehicles.”

“**We’re looking at future cities**”

October 23, 2017. **12 global cities plan to build emissions-free neighborhoods, support clean transit** by Patrick Sisson, Curbed. “Each city will create a “major emissions-free zone” and only purchase zero-emission buses starting in 2025. Representatives from a dozen global cities pledged to take big steps towards cutting transportation-related pollution, promising to “envision a future where walking, cycling, and shared transport are how the majority of citizens move around our cities (...) The 12 cities that signed the Fossil-Fuel-Free Streets Declaration—London, Paris, Los Angeles, Copenhagen, Barcelona, Quito, Vancouver, Mexico City, Milan, Seattle, Auckland, and Cape Town—are members of C40, a coalition of “megacities committed to addressing climate change (...) The pledge grew out of the large C40 mission of taking action to prevent world temperatures rising above 1.5 degrees Celsius, a benchmark of the Paris Agreement.”

October 23, 2017. **El contenedor marrón de Madrid servirá para producir más energía** por Javier rico, Energías Renovables. “La instalación del nuevo contenedor marrón en la capital, destinado a la separación en origen de la materia orgánica en los hogares, busca facilitar tanto el compostaje de esta como su uso para generar energía. Sin embargo, el Ayuntamiento de Madrid no acaba de despejar los interrogantes que envuelven las plantas de biogás y biometanización del complejo de tratamiento de residuos de Valdemingómez. Estas últimas solo inyectan a la red una quinta parte de su producción (...) Es de esperar que con esta separación en origen de la materia orgánica se optimice mejor el uso y la capacidad de producción de las plantas de tratamiento de biogás y de biometanización instaladas en Valdemingómez. El año pasado volvió a incrementarse el biogás que se quema y desperdicia en antorchas (817.000 metros cúbicos) y se
mantienen las quejas por malos olores, que motivaron la elaboración de un informe por parte del Ayuntamiento. Las plantas de bioemetanización de La Paloma y Las Dehesas tienen una capacidad conjunta de generación de 33,4 millones de metros cúbicos al año (Nm3/año). Sin embargo, la memoria de actividades de 2016 de la Dirección General del Parque Tecnológico de Valdemingómez confirma que sólo 6,7 millones de Nm3 acabaron en la red gasista, equivalentes a 74.958 MWh térmicos. No obstante, el Ayuntamiento pone en valor la generación de electricidad. Según la misma memoria, la planta de valorización energética de Las Lomas y las de biogás del vertedero antiguo (La Galiana) y del vertedero de Las Dehesas produjeron durante 2016 245.314 MWh de energía eléctrica. Detallan que el 75 por ciento se exportó a la red y el resto se destinó al autoconsumo de las instalaciones.”

October 20, 2017. **On-farm energy could help fuel 'millions of homes' by 2050.** Farming UK. “Green gas generated by energy crops and agricultural residues could help fuel millions of homes by 2050, according to a new report. It found that energy crops, such as miscanthus, and agricultural residues, including manure and straw, together with household rubbish and food waste, could generate between 68 and 183 TerraWatt hours of biomethane. **That’s enough to meet the annual gas demand for seven to 15 million homes** – potentially equivalent to domestic gas demand across the whole of south east England, London and East Anglia. The Bioenergy Market Review, compiled by sustainable energy consultants Anthesis and E4tech, suggests that biomethane will continue to make an important contribution to renewable gas generation (…) There are currently more than 80 biogas plants connected to Britain’s gas network.”

October 16, 2017. **Biogas plant for the world’s largest city.** “The delivery of two kompogas digesters for a biogas plant in Chongqing marks the successful entry of Zurich-based Hitachi Zosen Inova into the Chinese market. With the signing of the contract to deliver two PF1800 Kompogas steel digesters to German Bio Energy Technology (GBE) for the biogas plant project in the Chinese city of Chongqing, Swiss clean-tech company Hitachi Zosen Inova (HZI) has successfully entered the Chinese market. Located in Sichuan Province and covering an area of 82,400km2, with a population of just under 30 million Chongqing is said to be the largest city in the world.”

**SEaB Energy’s Flexibuster, localized waste processing solution and sustainable energy source**

October 12, 2017. **Waste-generated biogas is turning homes into power plants** by Rich Wordsworth, Wired. “By turning unwanted food into biogas, Sandra Sassow wants to put a power plant in every tower block and supermarket (…) “Right now that’s what we’re working on: neighbourhood-based systems,” says Sassow, who formerly worked on guidance systems for the Hubble telescope and is now CEO of SEaB energy. **“We’re looking at future cities, and this prediction that the majority of humans will live in megacities around the world. When you look at**
what those megacities are about, could you change the way waste is handled in them, and make it decentralised and have it back at the building level so that nothing’s moving off-site?” SEaB’s answer is ‘yes’, and its solution is a closed-loop system that essentially turns a neighbourhood or business into its own power plant, eliminating a large amount of what would otherwise be thrown or flushed away and instead using the decomposition process to produce biogas that is converted into electricity. The technology is getting smaller all the time: its Flexibuster, designed for deployment in urban environments, currently fits inside a shipping crate, as does its agricultural cousin, the MuckBuster. You won’t have one sitting by the shed anytime soon, but once you have a sufficiently dense population – such as a housing block – or a business that generates a large amount of waste, cycling degradable material back into the power supply starts to look more and more appealing, both commercially, and environmentally. Perhaps most importantly of all: wherever you find humans, you find ‘waste’. And humans never run out of waste. “If you look at wind and solar, they’re intermittent; they’re based around a resource that isn’t always there,” Sassow explains. “Using waste, you’re tying [power] to the amount of waste available on the site. So your fuel source is constant; your output of energy can be consistent, constant and predictable.”

October 9, 2017. NYC proposes to expand food waste separation requirements by Erin Voegele, Biomass magazine. “The New York City Department of Sanitation (DSNY) recent published a proposed rule that aims to expand organic waste source separation requirements for large commercial food retailers and food service establishments (...) According to the proposal, food scraps and other organic waste make up more than one-third of all commercial waste in NYC. “Diverting this material from landfills to use for soil enhancing compost, or as an energy source in aerobic and anaerobic digesters, is a key component of the city’s goal of sending zero waste to landfills by the year 2030,” said the DSNY in the proposal.”

October 4, 2017. What is the Future of Small-Scale Anaerobic Digestion? by Marjolaine, Biogas World. “Although biomethanisation was considered unprofitable a few years ago, it is growing today with a new model of biogas production: small-scale digestion (or micro-scale digestion). All over Europe, farmer organizations and political bodies recognize the value of micro-scale
digestion. By the end of 2016, 130 micro-scale digestion facilities were in operation in Europe. Smaller, less expensive, easily self-sufficient, these production units attract farmers, but also investors in eco-neighborhoods, wishing to develop new sources of clean energy. While the low market value of biomethane hindered the development of micro-scale digestion, the revision of electricity feed-in tariffs, which were applied in January 2016, offers great potential for the development. Today’s trends: modular approaches (e.g. in containers), mobile units and “plug and play” (...) In France, one of the challenges in the years to come will be to develop small-scale digestion in cities. Several companies have created small-scale digesters and stations for the treatment of organic waste adapted to urban spaces. In Britain, HomeBiogas, located and manufactured in Israel, has developed an anaerobic digester specifically designed for domestic use, in which food waste is converted into biogas and fertilizer. Six liters of food waste per day is needed to feed it. The biogas produced can thus be used for cooking, heating and even lighting. HomeBiogas systems have already been installed in several eco-districts in Great Britain and close to 1,000 family sized Biogas systems have been deployed to over 75 countries in the last 2 years. The new model, HomeBiogas 2.0, offers a larger micro-scale of Biogas production- it can digest up to 36 Liters of animal manure and/or up to 12 Liters of kitchen waste. However, a legal framework should be applied in order to develop micro-small digestion in cities. The legal framework must allow small-scale digestion in urban space, although the development of renewable energies is still defended by the French government.”

September 29, 2017. Urban China turns sewage into power by Aditi Sahay, The Resource Magazine, IWA. “Why Asian cities are adopting and scaling sludge-to-energy systems (...) A Tsinghua University study found that less than 20 percent of sludge even gets properly treated. Most is illegally dumped, put in landfills, burnt, or spread out as heavy metal- and pesticide-laden fertiliser, whereupon it leaches into water bodies. But the combination of mandates, technology transfers, and economic incentives is changing all this, as a handful of pioneering urban treatment plants convert their toxic liability into a clean asset: biofuel. “Dumping the sludge was a much cheaper way of dealing with it than treating,” says Zhong Lijin, an expert at the Beijing office of the World Resources Institute (WRI), a global research organisation headquartered in Washington DC. But now “China is in a transitional stage of development, and needs to think of sustainable sludge treatment methods” (...) To affluent European and North American cities, sludge-to-energy may not feel that ‘new’. But what makes Xiangyang a game-changer is that it shows how, now, even booming cities in the developing world can adapt the technology, and scale up gains to meet climate mitigation targets. A recent World Resources Institute (WRI) study projects that if all the sludge and kitchen waste produced in Chinese cities is treated by a waste-to-energy approach, 6.6 billion m3 of methane could be produced, which is equal to 9 percent of China’s total methane emissions in 2012. Besides meeting the energy demand of the projects operation, the remaining methane could be used to substitute 4.2 million m3 of gasoline for vehicle use.”

“We can no longer ignore this crisis”

October 25, 2017. Biogas industry saving 20 million tonnes of CO2 emissions. “Biogas plants in Germany are saving 20 million tonnes of CO2 emissions a year, according to the president of the German Biogas Association. Recently released figures from the German Biogas Association show that 205 new biogas plants were connected to the grid in 2016, more than the 150 expected by the association. The figures also show that ten biogas plants were decommissioned. In total, the new plants have an output of 45 megawatts (MW), with 37 MW being used to generate electricity. "All in all, the growth in the new plants is still very low compared to previous years, but many operators are investing more in the flexibility of their plants. This investment and the export business allow
the plant builders to survive,” explained Horst Seide, president of the German Biogas Association. Increased investment in small liquid manure plants will likely continue the increase in plant numbers, according to the association. The biogas figures come in the wake of Germany’s Federal Environment Ministry showing that the government missed its 2020 self-imposed climate goals.”

October 24, 2017. **Hydroelectric power most damaging to ecology, study shows.** “Hydroelectric power is the most damaging to ecological systems, followed by solar power and wind power, the Hong Kong Economic Journal reports, citing a study. The study was conducted by the University of Hong Kong (HKU), Shenzhen’s Southern University of Science and Technology and James Cook University of Australia (...) Researchers said reservoirs [of hydroelectric power] constantly emit carbon dioxide, the main source of the greenhouse effect, as well as biogas and nitrogen monoxide, all of which are harmful to the environment (...) In addition, construction of dams for hydroelectricity lowers biodiversity in the areas where they are located because a large number of trees have to be cut down (...) The study showed that solar power plants can result in the elimination of certain plant species, as evidenced in southwestern United States. US authorities estimated the number of birds dying from hitting solar panels range from about 38,000 to 138,000 a year. While wind power is less ecologically damaging, the study said about 570,000 birds die after crashing into the wind turbines each year. Breeding is also affected by noise from the turbines. Dr. Luke Gibson, an HKU honorary assistant professor who was in charge of the study, called on governments and power companies around the world to consider the impact on the ecology when making plans for renewable energy facilities.”

October 24, 2017. **Renewable energy advocates want to boost the use of biogas** by Ellen Abbott, WSKG. “As New York State moves toward its goal of getting 50 percent of the state’s energy from renewable sources by 2030, much of the focus is on wind and solar energy. But there’s another energy source out there that boosters want to shine a light on. Pulling methane gas from cow manure and other organic matter has been going on for years. But in order to get biogas to the next level as a source of renewable energy, it needs to become more economically viable. “There needs to be some incentives [in the] early days, so that the producers of renewable gas can either sell it directly to the utility, or produce electricity, or use it for fuel at prices that are economical. So it’s all about economics at the end of the day,” said Bob Catell, chair of the Energy Research Center at Stony Brook University (...) “This is just as important as solar, just as important as wind. We need to put it all under the banner of renewable energy,” said Melanie Littlejohn, vice president of customer & community management at National Grid.”

October 23, 2017. **Global Biogas Market to Exceed 38,000 KTOE By 2022** by Jack Matt, Finances Wire. “The global biogas market is expected to reach more than 38,000 KTOE by 2022 and is projected to register a compound annual growth rate (CAGR) of 6.5% during the forecast period. Growth in infrastructure for natural gas, rising demand for waste treatment, and a shift toward the renewable source of energy are expected to drive the market. However, the high initial investment cost and high installation costs are hampering the growth of the market.”

October 17, 2017. **Launch of Pre-COP 2017 – We Need Absolute Dedication to the 1.5 Target.** “This is an historic day for Fiji as we begin the process of accepting the baton from Morocco and beginning our term as President of COP23 (...) We can no longer ignore this crisis. Whether it is fires in California, Portugal and Spain. Flooding in Nigeria, India and Bangladesh. The dramatic Arctic melt. Ice breaking off the continent of Antarctica. The recent hurricanes that devastated the Caribbean and the southern United States. Or the hurricane that has just struck Ireland and Scotland – the tenth hurricane of the Atlantic season this year. It’s hard to find any part of the world that is
unaffected by these events. And we in the Pacific need no lessons on this threat after Fiji was struck last year by the strongest cyclone ever to make landfall in the southern hemisphere. And Vanuatu was devastated by a similar event the year before (…) Future generations will rightly judge us on what we did about all of this. We must rise to the challenge. We must commit ourselves to solving this problem. Fortunately there is not only hope that we can find and implement solutions to climate change but there is opportunity to create better lives for our citizens once we make the hard decisions that need to be made. We can bring clean power to people who need it. We can introduce better and more affordable energy systems. And we can feed our people with better stewardship of our land, water and forests. We can use our resources much more efficiently through a combination of political will, ingenuity and finance. But finance that is well spent – investment for a better future (…) So Excellencies, Ladies and Gentlemen: urgency, political will, cooperation, ambition and an absolute dedication to meet the 1.5 degree target is what we need and what we must take to Bonn.”

October 14, 2017. On this day, three months ago… The time has come! Inaugurating the nanomicrobiology era: Applied Nanoparticles announces availability of BioGAS+ (beta version), unique trace element additive for the optimisation of anaerobic digestion, “In a new step from laboratory to market, with the purpose of making nanotechnology real, Applied Nanoparticles SL announces the availability of their patented, registered and unique product, BioGAS+, that obtains the highest ever-reported improvement of biogas production, among many other differential advantages. The trace element additive BioGAS+ contributes directly to the metabolism of microbiota. Based on innocuous iron oxide nanocrystals that dissolves at the demand of archaea in order to boost their metabolic activity, increasing thus biomethane production and keeping a healthy consortium stabilizing your process. The increased biomethane production is concomitant with a reduction of the digestate volume and its chemical potential (reactivity), and the final digestate is enriched in iron ions, being a better fertilizer. Increased anaerobic digestion also translates into an increased sanitation and process acceleration. Additionally, iron ions precipitate S and P species and attenuates pH variations. Interestingly, BioGAS+ has been observed to promote the degradation of recalcitrant matter and rescue of “sick digesters”. The ability of nanoparticles to absorb tensioactives resulting on reducing foams has been also observed. This is a paradigm shift in the prevalent solutions for optimization of biogas production. BioGAS+ is developed under the principles of Responsible Research and Innovation (RRI). The technology is safe and environmentally friendly, contributing to sustainable energy production and waste management. It produces not only greener energy but also greener digestate (ready to be compost). Anaerobic Digestion will never be the same.”
October 9, 2017. **The First Organic Biogas on Its Way to the Natural Gas Grid in Denmark by Stæ of Green.** “Minister of Energy, Utilities and Climate Lars Christian Lilleholt inaugurated the production of the first organic biogas on the 25th of September. This means organic biogas produced from waste products from Axel Månsson’s organic market garden will soon be flowing into the natural gas grid (...) “This is a historic day. For the first time ever, there will be organic biogas in the Danish gas grid. Our ambition is to significantly reduce carbon emissions, and by 2030, at least half of Denmark's energy consumption will be based on renewable energy. The biogas plant contributes to bringing this about as biogas starts to take the place of natural gas,” Minister for Energy, Utilities and Climate Lars Christian Lilleholt says (...) “Over the past three years, production of green natural gas has increased by as much as it did in the previous 30 years. As a result, almost 10% of the gas in the natural gas grid is already biogas, and once the Brande plant reaches full production capacity, we will be taking another important step in the greening of the natural gas grid,” according to Ole Hvelplund, CEO of Nature Energy.”

September 7, 2017. **Make use of the methanogens** from Des Godson, Asia Biogas, Financial Times. “Sir, Professor Edwards (Letters, September 5) seeks scrutiny of the green credentials of various clean energy technologies. As a climate scientist, I have looked closely and found nothing comes close to biogas. **We estimate the production of biogas from agricultural waste and effluent generates 50 times the greenhouse gas emission reductions and four times the amount of energy, on a per-megawatt-installed capacity basis, compared with solar photovoltaic.** Our biogas plants create good-quality jobs in rural areas, with most of our investment going into the local economies where we work. Not only do biogas plants produce clean energy, they also clean up wastewater by reducing organic content by as much as 99 per cent, reducing water pollution and odour problems. And all this is done with simple plastic pipes, well-engineered covered lagoons, pumps, clean burning gas engines and some of the oldest lifeforms on earth: methanogens.”

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*NASA: Here's the scientific evidence that global warming, climate change is real*