

Organics Recycling & Biogas

Autumn 2021 Issue 48

- ▶ **THE ROAD TO NET ZERO**
The role of biomethane in the transport sector
- ▶ **FARMING RULES FOR WATER**
What do they mean for farmers?
- ▶ **HOT TOPIC**
Is there a future for subsidy-free AD?

The quarterly members' magazine from REA Organics and Green Gas



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Welcome

Kiara Zennaro, Head of Heat,
Green Gas lead

Jenny Grant, Head of
Organics and Natural Capital



Welcome to the autumn edition of our magazine. It's been lovely to finally get out and have lots of interesting conversations with members. We had our successful Green Gas Day, exhibited at LetsRecycle Live, and attended RWM.

There has been no let-up in the challenges over summer, however, with the HGV driver shortage affecting many members due to disrupted collections. We have been providing regular feedback to the Government on the impact that the crisis is having on the sector and continue to call for HGV driving to be recognised as a shortage occupation.

There has been a recent lull in Organics consultations, but discussions on Clean Air Strategy and the Fertiliser Regulation should resume in coming months. We continue to liaise with Defra and will confirm when these are published.

On the Green Gas side of things, we are waiting for Green Gas Support Scheme regulations to come into force on 30 November and are working on various hydrogen consultations. The recent energy price crisis has highlighted the huge potential for the green sector to capture and supply CO₂, but significant commercial and market-driven barriers need to be overcome first. We are in the process of submitting evidence to BEIS in support of the rollout of CO₂ capture at UK biomethane plants.

Furthermore, WRAP recently published their Organics Roadmap, with the aim to improve quality of feedstocks and outputs, reduce emissions, and increase value of products. We will be working with various stakeholders to help deliver some of the actions outlined in the plan.

We feel there is huge potential for the organics recycling and green gas sectors to contribute to our Net Zero ambitions, in facilitating the proper management of food and garden wastes and the generation of renewable energy and would love to hear from you if you'd like any information or assistance.

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Organics Recycling & Biogas is the magazine of REA Organics and REA Green Gas member forums

The Association for Renewable
Energy and Clean Technology

Brettenham House,
2-19 Lancaster Place,
London
WC2E 7EN

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ISSN 2041 - 2169

Printed by Stephens & George
Printed on Revive 100% recycled

Published by
Resource Media Limited
CREATE Centre
Smeaton Road
Bristol
BS1 6XN
resourcemedia.co.uk

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REA calls for action on driver shortage

The current HGV driver shortage is significantly impacting REA members in multiple ways. The suspension of food and garden waste collections is causing a lack of feedstocks for some AD plants and there have been delays in obtaining licences for new drivers across the board. Some companies have had to limit services and this has resulted in cases of financial penalties and inhibited business expansion.

We highlighted these issues to the Government, who have since announced how they aim to alleviate the situation. Plans include increasing the availability of test slots by allowing drivers to take a single test to drive both articulated and rigid lorries, as well as a relaxation of hours rules. The government has also announced a suspension of delivery deadlines; increased testing capacity; and introduced £7k apprenticeships to encourage people into the role.

We welcome the relaxation of immigration rules for HGV drivers. However, given the available visas are restricted to a few thousand, this will make little impact, as the estimated shortfall of drivers lies around 100,000.



There is also a concern that the waste and recycling sector would be unable to compete with higher wages on offer in other sectors, meaning that the issues around food and garden waste collections could continue and even spread to general waste.

Jenny Grant, Head of Organics and Natural Capital at the REA, comments: "The relaxation of immigration rules for HGV drivers to help ease the widespread recruitment shortages for drivers in the waste and recycling

sector would be a step in the right direction, and the REA first called for changes when concerns were raised earlier in the summer."

Grant continues: "It is vital that the whole economy, from waste collections to supply chains, are able to deliver services as normal. The Government must heed our calls for a two-year derogation to the points-based immigration rules for trained HGV drivers or we will only see these problems grow."

WRAP publishes Organics Roadmap

WRAP has recently published a roadmap for the organics sector. The document outlines clear objectives and actions for local authorities, organics processors, policy makers and regulators. It puts actions in place that will reduce feedstock contamination for organic processors, increase recycling rates, increase feedstock supply and protect the environment.

It intends to address the needs to:

- Maintain quality – across inputs, outputs and operations.
- Reduce emissions of ammonia from the generation, spreading and use of digestates.
- Fully value the products that the organic sector delivers.

The management and fulfillment of the actions outlined in the roadmap will be undertaken by WRAP, on behalf of

the Department for Farming and Rural Affairs. WRAP will assign owners to actions, monitor and report progress, and ensure that the roadmap remains a live and relevant document.

The report was drafted following on from a survey of stakeholders in the organics reprocessing sector in 2019. Its scope was extended to cover the market role of material from Mechanical Biological Treatment facilities as well as AD and composting sites.

The roadmap includes two specialist documents: *Comparison of the Environmental Impacts of Nitrogenous Materials* and *Review: Technologies to optimise the value of digestate*.

The Roadmap is available at www.wrap.org.uk (search for Organics Sector Roadmap).

Environment Bill passes third reading

A third reading of The Environment Bill has taken place at the House of Lords and is expected to be passed with Royal Assent by the end of the year.

With the bill's progression through parliament comes mandatory collections of food and garden waste from households, as well as mandatory food waste collections from businesses.

There is an allowance for Local Authorities to collect food and garden waste together providing they can demonstrate TEEP, but food waste must be collected weekly, which may make comingled collections problematic.

The start date for the bill to take effect is yet to be formally confirmed, though it seems likely that the legislation will be put into place by the end of the financial year 2023/24. Some Local Authorities with existing contracts may be given until 2030 to adapt to the incoming regulations.

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Green Heat Network Fund launched

Dr Kiara Zennaro

Head of Heat,
Green Gas lead



The Department for Business, Energy and Industrial Strategy (BEIS) has officially announced the Green Heat Network Fund (GHNF), a capital grant programme that aims to stimulate the growth of low-carbon heat networks across England from 2022 to 2025. The new scheme will incentivise low-carbon heat by offering targeted financial support to projects.

The Government also published its formal response to the GHNF consultation on the proposals for the scheme design.

Following industry feedback from the REA and other stakeholders, BEIS will no longer apply a blanket exclusion of the use of biogas or syngas as a fuel in the GHNF, except for peaking plant. Biogas or syngas may be considered as a fuel for GHNF supported projects in the following specific and limited circumstances:

- Where the heat network is off the gas grid, biogas or syngas may be used for primary, secondary or peaking plant, provided the gas is manufactured on site.
- Where the heat network is on the gas grid and the gas is manufactured on site, biogas and syngas may be used for secondary or peaking plant only, and will not be eligible for primary plant.

For any clarifications, please contact: kiara@r-e-a.net.

Green gas regulations passed

The Green Gas Support Scheme (GGSS) and Green Gas Levy (GGL) regulations were laid in Parliament on 9 September, marking a positive development for the REA Green Gas members. Pending its successful passage through Parliament, the GGSS is set to launch on 30 November, closing to new applications on 30 November 2025.

The GGSS is intended to encourage the deployment of new AD biomethane plants injecting into the gas grid, and to increase the proportion of green gas in the grid. It will be funded through the GGL, which will be placed on all

licenced gas suppliers in Great Britain. The first levy payment will take place in quarter one of 2022.

The government has committed to transitioning to a volumetric levy as soon as feasibly possible, adding that it will consult fully on any new proposals in this area. Ofgem has also recently consulted on the administration of both the GGSS and the GGL.

The REA's response to the GGSS consultation can be found at www.r-e-a.net, under the resources section (search for Green Gas Support Scheme).

Replacement of generating equipment under FIT

Ofgem has recently consulted on the replacement of generating equipment under the Feed-In Tariff (FIT) scheme. Through this consultation, the regulator sought views on how changes to equipment at FIT installations may affect accreditation. In our response, we highlighted that Ofgem's proposed approach appears to be workable and would represent a large improvement upon the current stance.

The REA has been raising concerns since 2015 in relation to the current approach taken on equipment replacement and therefore very much welcomed this consultation. We also stressed that changes must be implemented quickly to avoid any further delays, and called on Ofgem to clarify a timeline for the publication of its response and the implementation of the FIT scheme as soon as possible.



REA confirms support for Quality Protocols

Jenny Grant

The REA has written to the Environment Agency (EA) to confirm that we will support the revision of the Compost and AD Quality Protocols (QPs). The EA has, in turn, invited us to join the Task and Finish Group, to which we have formally

agreed. At the time of writing, we await the first meetings of these groups.

The first step will be to agree on the scope of the revision, a decision which can be drawn from the two workshops we held in June to gather feedback from the industry – thank you to all who attended. We also owe thanks to all the compost and AD operators whose

funding enabled this to go ahead – it is much appreciated. The EA has updated their position to confirm that the revision of these QPs is underway, and that the current QPs can continue to be used during the revision process.

If you have any questions about the process, please contact Jenny@r-e-a.net.

Appropriate measures for biological treatment of waste

Jenny Grant,
Head of Organics
and Natural
Capital, REA



The Environment Agency (EA) has published its response to the Appropriate Measures for Biowaste Treatment consultation, which was held last summer when the REA convened with members and issued a response. The EA's guidance aims to help operators understand the appropriate measures for permitted facilities that transfer or treat biowaste, combining three previous guidance documents and the Waste Treatment Best Available Techniques Reference document (BREF).

The summary of responses includes information provided by consultation respondents, the EA response and some of its proposed changes. The EA has stated that it has considered all relevant technical responses and will amend the text where appropriate. For some topics, however, it is still unclear how the EA plans to modify draft guidance. We will circulate the Appropriate Measures guidance to members as soon as it is published by the EA.

Once published, the guidance will apply to all biowaste operations, including transfer, composting, AD and water companies operating permitted facilities, such as liquor and sludge

treatment. Anaerobic digestion of energy crops is not subject to waste regulation and is therefore out of the guidance's scope.

New installations must comply with the guidance from the start of operations, with sites permitted after 17 August 2018 already required to do so. Waste installations permitted before August 2018 are required to meet Best Available Techniques and the associated emission limits by 17 August 2022. Operators unable to comply by this deadline have the option to apply for a derogation. For new facilities, the guidance will be implemented through the permit application process, and for older facilities, through staged permit reviews and the revised Standard Rule permits, which are yet to be published.

In the guidance, the EA acknowledges that differences between sites will result in diverse risk profiles, stating 'some measures may not be suitable or relevant for your operation. Appropriate measures will depend on the – activities being carried out; size and nature of the activities; location of the facility.'

The EA considers the operator as best placed to understand the risk profile of their activities, and should therefore take responsibility for applying the guidance to their site. This offers some flexibility but also requires that the guidance be read in context. Operators will inevitably need to exercise some judgement in deciding what constitutes appropriate measures for their facility.

Revision of UK Fertiliser Regs

The Department for Farming and Rural Affairs (Defra) is currently working with the devolved administrations to modernise and bring together the UK's fragmented fertiliser regulations.

The European Union's Fertilising Products Regulation (EUFPR) has been only partially implemented in the UK due to the timing of Brexit, although the EU FPR will become fully implemented in Northern Ireland.

Based on a conformity assessment framework, the EUFPR includes organic fertilisers such as composts and

digestates, as well as mineral fertilisers.

A consultation is due out before the end of 2021, with regulations set to come into effect in September 2022. The REA has been meeting with Defra to understand how the EUFPR will be implemented in the UK and to highlight differences between EUFPR and our current end of waste positions (i.e. Quality Protocols and PAS100/110).

We will keep members informed of progress and circulate the consultation when it is published. For more information, contact jenny@r-e-a.net.

EA publishes Regulatory Position Statement

Emily Nichols,
Technical Manager
REA Organic



On 13 September, the Environment Agency published its Regulatory Position Statement (RPS) 241. Applying in England, the RPS allows operators to accept wastes under codes that are not included in their waste authorisation or the Quality Protocols, instead of the '99' codes for wastes 'not otherwise specified'. These waste authorisations refer to bespoke and standard rules permits, waste exemptions and Low-Risk Waste Positions in the biowaste treatment and materials to land sectors.

Following feedback from the REA and others in the Biowaste Regulatory Forum, the EA has covered '99' codes within the Compost Quality Protocol and Anaerobic Digestate Quality Protocol.

In the documents, the EA sets out the codes and descriptions that an operator must use if they wish to treat specific waste. For each of the 43 codes, the documents state which permits and exemptions apply, and which replacement code and description must be used for that waste.

The EA said that they will 'address the coding via changes to standard rules and bespoke permits as part of permit review and also make changes to codes as part of the ongoing exemption review', as well as picking up coding 'through the QP reviews.' RPS 241 will apply until the relevant waste authorisations and Quality Protocols are amended, or the RPS is withdrawn, with the statement to be reviewed by 31 August 2022.

Here at the REA, we're interested in hearing your experience of using recorded wastes under this RPS, and how valuable you find it. To share your story with us, contact jenny@r-e-a.net.

New Farming Rules for Water regulations

In a typical year, the autumn application of organic materials would now be largely complete. However, recent months have seen the Farming Rules for Water regulations amended, restricting when spreading can occur. **James Holmes**, Senior Environmental Scientist at AHDB, explains what this means for farmers.

At the beginning of August, the Environment Agency (EA) released a regulatory position statement (RPS) on the Farming Rules for Water. These rules were introduced in 2018 to protect water quality through the standardisation of farming practices. The rules outlined require farmers to keep soil on land, match nutrients to crop and soil needs, and keep livestock manures and fertilisers out of the water.

The RPS issued an update to the latter requirement, introducing new regulations to moderate when organic material can be spread on farmland, in an effort to reduce nitrate pollution. These restrictions came as a surprise to many, despite hopes that the RPS would allow the majority of applications this autumn.

When the rules were first introduced, the EA adopted a light approach based largely on raising awareness. Over the past two years, clarification by the EA has led to a tightening of application restrictions, beginning with digestate and more recently for all types of organic materials. It is now clear that the EA wants farmers to avoid applying

organic materials during autumn and winter, unless the crop has a winter nitrogen requirement.

Why have the rules been tightened?

The UK government has become increasingly focused on the environment in recent years, introducing a new Environment Bill and with it a new Office of Environment Protection. Water pollution is of particular concern, with the EA's report in 2018 highlighting the challenges facing the agricultural industry.

In response to this, Defra's Farming Rules for Water aim to reduce nitrate leaching into waterways. Although nitrate pollution has declined over the past 20 years, the quality of both rivers and groundwater is a concern and the EA would like farmers to apply organic materials in spring to reduce leaching further.

Impact assessment

In January, AHDB commissioned research to assess the impact of Farming Rules for Water on farmers and growers. The rules pose significant

logistical challenges and could also require substantial investment.

The assessment, conducted by ADAS, focused on the management of manures and slurries, but also considered the impact of using biosolids, digestates and composts. Beyond water quality, the assessment also considered air and soil quality to ensure a holistic approach to the management of organic materials, and to avoid pollution swapping.

Although the assessment confirmed that moving autumn applications to the spring could reduce nitrate pollution by 60 per cent, it also highlighted the risks. In fact, spreading all materials in spring could result in increases in both diffuse phosphate pollution and ammonia emissions, as well as having a detrimental effect on soil health.

Application of materials in the spring means that nitrogen will be taken up by growing crops. However, adverse weather can cause significant challenges. Phosphate pollution could increase by 30 per cent if materials are applied in spring and run-off should occur unexpectedly. Wet soils pose a significant challenge and increase the risk of causing soil compaction.

The assessment also identified a risk to air quality in the application of all materials in spring. Application of organic materials to winter sown crops in spring means incorporation can't take place, which could increase ammonia emissions by 10 per cent.

Nutrient Management Guide (RB209)

General guidance in RB209 is to apply organic materials in spring. This guidance was written by MAFF over 20 years ago, prior to AHDB, aiming to make the most efficient use of nitrogen and minimise leaching.



However, RB209 does not preclude autumn application. In fact, the guide recognises that manures and slurries are often applied ahead of winter cereals.

While it is essential to apply organic materials in a responsible way, it is also important not to lose sight of the fact that they provide multiple far-reaching benefits. Not only do they supply nutrients and reduce the need for artificial fertilisers, but they also help to build soil organic matter with consequent improvements in soil

structure, drainage and water holding capacity.

Advice for farmers and growers

Currently, around 13,000 Mt of manures and slurries are spread during autumn, so it begs the question – what will farmers do with the surplus material?

The RPS allows for some material to be applied in the autumn, albeit with restrictions. If a material can be applied under the Farming Rules for Water or the RPS, then a farmer is free to do so.

If your organic material cannot be applied under the RPS and storage is not an option, then you should contact the EA and your local officer should be able to provide support and guidance.

This is a critical issue for farmers, and AHDB is working closely with all stakeholders to ensure the continued use of organic materials to improve soil health and make the best use of all available nutrients.

You can read the impact assessment in full at www.adhb.org.uk (search for Farming Rules for Water).

HOT TOPIC

Is there a future for subsidised AD?

Philipp Lukas,
CEO
Future Biogas



‘The future is unsubsidised’ – if we are to meet our climate goals, that statement must be true. We won’t be able to replace the trillion-dollar global energy industry with redistributed tax money. Of course, subsidy does have a role to play as a pump primer for new technology or where economies of scale need to be reached, but ultimately, the market must take over.

For Anaerobic Digestion (AD), this means that governments and policymakers should set parameters that drive organic waste collection and use. Future developments will need to be sized to optimise economies of scale and reduce cost. Most importantly, however, AD will need to find ways to value all of its benefits – treating organic wastes, biofertilizer production, soil improvement, agriculture decarbonisation, odour reduction and many more.

The most exciting opportunity, however, is for AD to be an energy-producing carbon sink. Whilst making green gas you can sequester

carbon in soil through careful feedstock provision. Energy crop plants could in future be hubs for local soil improvement, soil carbon sequestration and farm resilience.

The use of rotational cropping, digestate return, cover crops and regenerative farming methods in conjunction with AD will allow farms to enhance food crop yields, while also improving their soils and accelerating their ability to sequester carbon.

As a final step, the CO₂ that is stripped from the biogas before injection to the grid will be taken for permanent geological storage – the true negative carbon energy factory.

Chris Negus,
Head of Business
Development,
Privilege Finance



In a word, yes. In the future, AD plants could be built and operated profitably without subsidy support. However, for subsidy-free profitable plants to become a reality, biomethane plants would need to generate income from all products from the AD process, not just biomethane.

Carbon dioxide is produced by biomethane facilities when the biogas that is initially produced in the tanks is upgraded to form biomethane.

Carbon can be captured at this stage, preventing its release into the atmosphere. Captured carbon is identical to carbon gas from any other source, so can be purchased by the food and beverages industry for use in the production of carbonated drinks or packaging of meats. This can generate an additional income for the plant whilst displacing demand for manufactured carbon.

The AD process also produces a nutrient-rich digestate, which is currently undervalued. Digestate can be used as an alternative to manufactured fertilisers used in agriculture, as it contains key nutrients and organic matter that improve soil

quality. It is more cost effective for farmers than the current manmade fertilisers used, so with the right processes and regulations in place, it would generate a reliable revenue stream for biomethane plants.

Alternatively, digestate can be blended with compost to produce a nutrient-rich premium compost which would be highly valued by gardeners. Partnering with a composting facility to bring this product to market could be a gamechanger for any AD plant and really add value to the bottom line.

With the infrastructure in place to generate incomes from all AD products produced, there is definite potential for subsidy-free biomethane in the future.

The Road to Net Zero

Against the background of the growing case for the use of biomethane fuel in transport, **Philip Fjeld**, CEO of CNG Fuels, highlights the key benefits that the fuel source would deliver for the sector and the issues that producers and distributors are currently facing.



With road transport currently accounting for 26 per cent of the UK's emissions, decarbonising the sector is pivotal in reaching the Government's 2050 net-zero targets. Hydrogen has been highlighted as a 'key' fuel source, but with headline milestones for the transition falling around 2030 at the earliest, the sector requires a present solution to lower its emissions.

Although the Climate Change Committee (CCC) considers biomethane a fuel source for heat, Philip Fjeld states that biomethane producers are instead looking to supply the transport sector as it is an area that is primed and ready for progress: "There are lots of good projects that would like to expand and brand new plants that would like to inject into the grid. They have no other place to go than transport because the heat incentive and subsidy fluctuate."

In Philip's view, biomethane offers a more significant reduction in greenhouse gas (GHG) emissions for the transport sector than it does for heat. Crop feedstocks can be used, but the

"From January 2022, manure-based gas goes GHG negative."

market-based Renewable Transport Fuel Obligation (RTFO) gives double rewards to gas made from wastes and residues. As a result, the biomethane used in transport is drawn entirely from waste materials.

Each feedstock offers different GHG savings and, Fjeld asserts, particular waste-based feedstocks are expected to become GHG negative very soon, following an imminent update to the

RTFO scheme: "From January 2022, manure-based gas goes GHG negative. The industry won't be producing biomethane entirely from manure, but the biomethane that we supply is likely to go negative next year. There's this fixation on being net-zero by 2050 – sure, but someone operating one of our stations in the second half of next year will be net-zero already."

HGV trucks are seen as the lynchpin in decarbonising the transport sector. Moving a single truck to biomethane is equivalent to taking 50-80 passenger vehicles off the road and, with the industry of biomethane for transport growing 100-150 per cent annually, an emissions reduction equivalent to taking millions of passenger vehicles off the road could be seen by 2030.

Whilst a biomethane-fuelled HGV is initially more expensive, the fuel duty on diesel makes gas trucks cheaper

long-term: "On a pence per mile basis, the gas truck will cost less. You pay the driver the same, but the fuel will be cheaper – when you add that up over 5/6/7 years, with HGVs driving up to 100,000 miles per year, you begin to get an attractive business case as to why you'd want to run a gas truck."

This has sparked interest from large corporations, with the use of biomethane in HGVs presenting an opportunity to reach ambitious net-zero targets whilst saving money: "A number of them are focused on 2030 – that's doable for long haul transport, but only if they use biomethane. They're not going to wait for the hydrogen magic bullet that may or may not appear by 2040."

"Biomethane in trucks could make emissions reductions equivalent to taking millions of passenger vehicles off the road by 2030"

"If you wanted to run a hydrogen HGV, you couldn't. They don't exist. You can't buy one. People and politicians are made to believe that hydrogen is already here, but the reality is that you can't decarbonise transport using hydrogen today because, even if you could produce it, the vehicles aren't available."

Philip Fjeld explains that despite experiencing some resistance from the Climate Change Committee (CCC), biomethane for transport has found support in the Government, due to the market-based RTFO: "It's not the Treasury that pays, it's the motorists. Therefore, the Treasury says, 'Great, if biomethane can be produced for that purpose, that's amazing!' If biomethane goes to heat, the Treasury pays – they're not so pleased about that."

Currently, the uptake of biomethane is only 'scratching the surface' of its full potential. The industry is set to continue expanding, with contracts for the operation of new plants in 2023/24 currently being negotiated. However, Fjeld says, the supply of feedstocks must grow in lockstep: "It takes 18 months to two years to build a plant, and a lot of them have planning permissions already in place. For the industry, this primarily becomes a feedstock

question. As of today, we don't see a shortage of applicable feedstocks, but that won't last forever; from 2024 onwards, we need more production capacity."

Voices in the industry are calling for the fuel source to receive a guaranteed price for transport, but Fjeld asserts that there is no need: "We don't see many producers who feel they need that. That doesn't mean that it wouldn't be nice, but do we feel that's something we need to see in order to continue the growth trajectory we're on? No. The industry is growing well on its own, and we just need to be left alone, essentially."

What the industry does need, Fjeld says, is assistance with building the refuelling infrastructure: "From Q1 2022, we'll start constructing one station per month, but developing infrastructure in this country is a game for people with a lot of patience and very deep pockets. It's also a game that isn't helped by councils taking their time with planning applications."

"There are people who believe that there is going to be a nationwide network of hydrogen refuelling stations by 2035. No way. It cannot be done. The vehicles aren't even on the road today. Could we have a network of biomethane refuelling stations covering the country by 2035? Most likely, but it would still be lacking in some regions. We're working hard to make this happen, but there are many constraints which unfortunately determine a lot of our timelines."

Ahead of the hydrogen transition, CNG Fuels is set to trial adaptations to its existing refuelling stations to allow for the distribution of hydrogen. The company is pursuing several test cases to help 'set the scene' for the expected transition. However, Fjeld believes that there will always be a role for biomethane: "Biomethane is very focused on the truck market. People simplify trucks too much, when, in reality, they're used in a range of different applications."

"Although some trucks drive up and down the motorway for retailers, others have additional kit on them. Good luck powering that with batteries, or, 20/30 years from now, with hydrogen – there might not be the storage capacity. So, currently, I don't see an end date for biomethane in transport."

Paul Thompson,
Head of Renewable
Transport Fuels &
Landfill Gas
REA



Biomethane in transport makes up a small percentage of total renewable fuels supplied, but the amount is growing strongly. A key market is HGVs as very few alternatives are available. Electrifying this sector is challenging given the loads that have to be carried and the subsequent questions surrounding battery density and charging infrastructure/electricity grid reinforcement. That's not to say that these issues can't be overcome, but electrification of the HGV sector is some way away.

In the meantime, we need to do something other than just continuing business as usual with diesel fuels. The recent consultation on phase out dates for HGV diesel sets out the need for action. However, with proposals featuring a headline date of 2035/40, this falls short of the immediate action needed to reduce emissions.

The consultation's preferred option is to ban sales of new HGVs unless they are 'zero emissions at the tailpipe'; in other words, battery electric or hydrogen fuel cell. This isn't appropriate when the key concern is GHG emissions – the overall emissions are what matter. We are pushing strongly that the focus should be on banning sales of diesel HGVs. Trucks that are set up to use methane as a fuel or high blends of renewable liquids should be exempt from the ban.

This is not an anti-electrification point. The REA has strong membership in the area and it's clear we need to use all the tools at our disposal to reduce emissions in transport. Not forgetting reductions in demand, we need rapid uptake of electrification, additional renewable power generation to supply it and we need the fuels that we will continue to use over the next 20 years to be as low in GHG emissions as possible.

Komptech combination helps make the Ace of Herts

Cumberlow Composting Services director James Hodge describes the evolution and innovation that the partnership with Komptech/John Hanlon & Co Ltd has enabled at his family business

The UK composting industry has become much more sophisticated over the last 20 years, with improvements in techniques and equipment, as well as the increasing demands of legislation. This transformation is no better illustrated than by Cumberlow Composting.

The Hertfordshire-based organics reprocessor is situated on a farm that the same family has managed for three generations. Today, the business is run by brothers James and Henry Hodge who are developing the open windrow site established by their father David in 1995 – originally a pilot scheme to take 1000 tonnes a year of green waste from North and East Hertfordshire District Councils.

This grew as the local authorities expanded their collections, and by 2006 the operation at Cumberlow Green Farm was handling 25,000 tonnes of green waste, having developed its process to meet PAS100 specifications for the compost produced.

The following year, Hertfordshire County Council awarded a long-term contract to Cumberlow Compost Services to dispose of comingled kitchen and garden waste. In turn, prompting further investment in the operation and the introduction of an in-vessel composting (IVC) system to meet the Animal By-Products Regulations (ABPR).

As the operation has scaled up, inevitably so has the equipment required to process the material. Today, the site is permitted to take 40,000 tonnes a year, of which 30,000 comes from the Hertfordshire councils comingled collection, with the remaining 10,000 tonnes from local businesses handling green waste that goes directly to open windrow.

“When ABPR waste arrives on the dust carts, it goes over the weighbridge and then into a reception building,” James

Hodge, one of Cumberlow’s directors, explains. “From there, the comingled materials go through a two-barrier clamp system with retractable roofs and an underground aeration tunnel [the IVC]. After it’s been in there for four days above 60°C, it’s been sanitised and goes onto the maturation pad.”

Cumberlow then sends samples of the material for analysis to check for e.coli and salmonella. When the lab confirms that the pathogens have been killed, the comingled material is mixed with green waste outdoors and shredded for windrow composting.

A recent step forward for the business was acquiring a Komptech Crambo 5200D shredder last year. “We used a Williband high-speed shredder for the first 20 years, which was good. It did a good fine shot, but the problem with high-speed shredders is if you get a bit of metal or concrete, something it doesn’t like, it just breaks the machine,” says Hodge.

“My engineer likes Komptech, and then Hanlons [John Hanlon & Co Limited, which manages the UK dealership for Komptech] arranged a trial with the Crambo. Based on our tonnage throughput, they recommended the size. They brought it to the site and left it here for a few days.”

The team at Cumberlow Composting was persuaded: “They describe this as a slow speed, but it’s more medium speed. The slow speed doesn’t necessarily mean it’s any slower. It’s the way it shreds. On this machine, if something goes in it doesn’t like, it reverses and gradually takes it through and the machine doesn’t break. They’re longer-lasting, with less wear and tear on the parts. And as for things like tree stumps, big bits of wood, it just doesn’t struggle with them.” Like a highspeed would.

This capability of shredding a wide range of material to different sizes makes the Crambo 5200 operationally

significant for Cumberlow, as the feedstock varies throughout the year, ranging from hedges and branches in winter to more grass cuttings in spring and summer and leaves in autumn. Being able to change the basket size on the Crambo means the business can efficiently manage the product being produced and the throughput.

After shredding the combined wastes, the material is windrowed for seven weeks. The resulting compost goes through a 25mm screen and a 10mm screen. Fines from the latter sell under Cumberlow’s brand name ‘Ace of Herts’. The 25mm grade is made freely available to local farmers to collect from the storage pad on site.

Screens and separation

James Hodge recalls that the first piece of Komptech equipment that Cumberlow purchased in 2005 was a secondhand Mustang screen, which at the time had done 12,000 hours.

Although it’s now done 20,000, it’s still going strong today, comments Hodge. “We still keep it, even though it’s about 20 years old, as a back up machine, as it’s quite simple, parts are readily available and it’s so easy to repair.”

Recently, at a similar time to upgrading their shredder, the Herts-based composter went through procurement of a new drum screen, opting for a Komptech Nemus. “Again, John Hanlon brought us a demo model. We just thought it was amazing from day one. You can change a product with so many more alterations that you couldn’t do on the previous model or other competitors. On most screeners, the drums are 180 degrees – horizontal. With this, the chassis is hydraulically adjustable, so you can lift and tilt the screen. It has many more variations to get a better product.”

The ability to regulate the proportion of fines and oversize isn’t the only



Cumberlow have been trialling a new efficient process connecting the Crambo 5200 shredder with the Nemus screen, which feeds the Hurrikan windsifter

feature of the Nemus that James Hodge is pleased about: "It's on tracks, which is much more versatile. It's more mobile. It's a lot quieter, as is the Crambo. You can barely hear it even when they're working together. So that makes a difference for us."

His biggest concern was the cost. As was also the case with the Crambo, Hodge was unsure whether Cumberlow Composting could afford the Nemus. In both cases, John Hanlon structured a package 'that just worked' within their cash flow constraints.

It's a partnership that Hodge is quick to praise for other reasons. "The guys at Hanlon's know what they are talking about. Their backup is brilliant. They work really well with my engineer as well. We just got a part of the Crambo that we needed, which they flew over from Germany within 24 hours, despite Brexit and COVID."

Unlike many reprocessors taking organic waste from local authorities, contamination is not a major problem for Cumberlow. James Hodge attributes this to the local demographics, houses with bigger gardens and a good level of understanding by the public using the area's green and kitchen waste services.

A key factor in reducing contamination and managing the quality of the oversize has been the role of the Hurrikan windsifter. The separator was the brothers' first direct purchase from Komptech (in 2010) when the operation expanded to take in more waste from

East Herts. It has since been sold on and replaced with a Hurrikan S (dual fan) in 2015. According to Hodge, the Komptech separator requires no demo: "Word of mouth is the Hurrikan, or the Hurrikan S is the best in the industry. The windsifter is pretty good at taking out the plastics. If they're not handpicked out, they get taken out through the Hurrikan. It's got a stone trap and a metal trap, which work well. So the product that comes out is really clean."

Testing a single pass process

Cumberlow Composting has been running trials with a new method using its Komptech machinery, which processes material in a single pass after the ABPR waste has gone through the IVC and mixed with the green waste before windrowing it.

"We put this into the Crambo, then the Crambo feeds into the screener, and then the screener feeds into the Hurrikan S (as it always did anyway)," explains Hodge.

"So we get our fines coming out one side, the 25mm or 10mm, and then in the back, we get the oversize, which we then process. It's a good quality product, and we're not double handling. We don't have to load up the shredder, then move the waste, put it in a windrow, then move that waste again through a screener and separator."

It means there is hardly any contamination at the start of the outdoor composting stage: "As it comes out, the

windrows all look really clean, other than it hasn't finished its seven weeks it's good to go. So when someone comes out, that pad looks amazing. You don't see any plastic."

Although Cumberlow's tests have shown this technique works best in drier conditions, the expected cost-benefit means that the business plans to switch its process over to this for the next PAS100 assessment.

"Upfront, it'll be a bit slower doing it this way, but you're saving time in the long run. Plus, there's less fuel cost, less manpower. I think some sites won't like this; the foreman will see it only takes one person to do this job that previously needed two or three and say, 'We don't want it to work. Otherwise, we're going to be redundant.'"

As Cumberlow Composting continues to grow its operation, James Hodge notes that the reliable partnership with John Hanlon & Co/Komptech GB makes a big difference: "It's not just about the equipment, it's about the service, because if these machines are down for any period, it causes massive problems. And they do break down, even the best ones, but it's about getting it back up and running as soon as possible, and they are there in 24 hours, and if they can't get it repaired they'll get you a new one.

"In the 20 years that I've been in waste, this has been the best supplier relationship I've had. It helps that their equipment is the best as well."

Groundwork: Selling Soil Carbon

Once the stuff of rose-tinted eco-futurology, a soil carbon marketplace, which would see UK farmers being paid to sequester carbon, is moving closer to becoming reality. **Will Simpson** explores how a nascent Soil Carbon Code could unlock the potential of this new sector.

Back in March this year, Defra launched its pilot scheme for the Sustainable Farming Initiative (SFI) – one of its post-CAP agri-environmental schemes. Amongst the initiative’s ‘standards’ were proposals to pay farmers between £30-£59 per hectare to undertake soil improving practices. Nothing is certain at this point, of course, but Defra indicated that it would consider how the scheme could expand to receive payments via carbon trading or biodiversity net gain credits.

Even before that, Microsoft announced in February that they were buying up 1.3 million greenhouse gas emissions offsets, including 193,000 tonnes for carbon sequestration projects, as part of their drive to become carbon neutral by 2030 and other multinationals will likely follow suit.

You can glimpse the outlines of how a soil carbon marketplace might work with the large swathes of UK business currently lining up to go carbon neutral and an agricultural sector urgently in need of funds, with the end of the Basic Payment Scheme now in sight. Estimates of how much soil carbon will be worth vary from \$10 to \$100 per tonne.

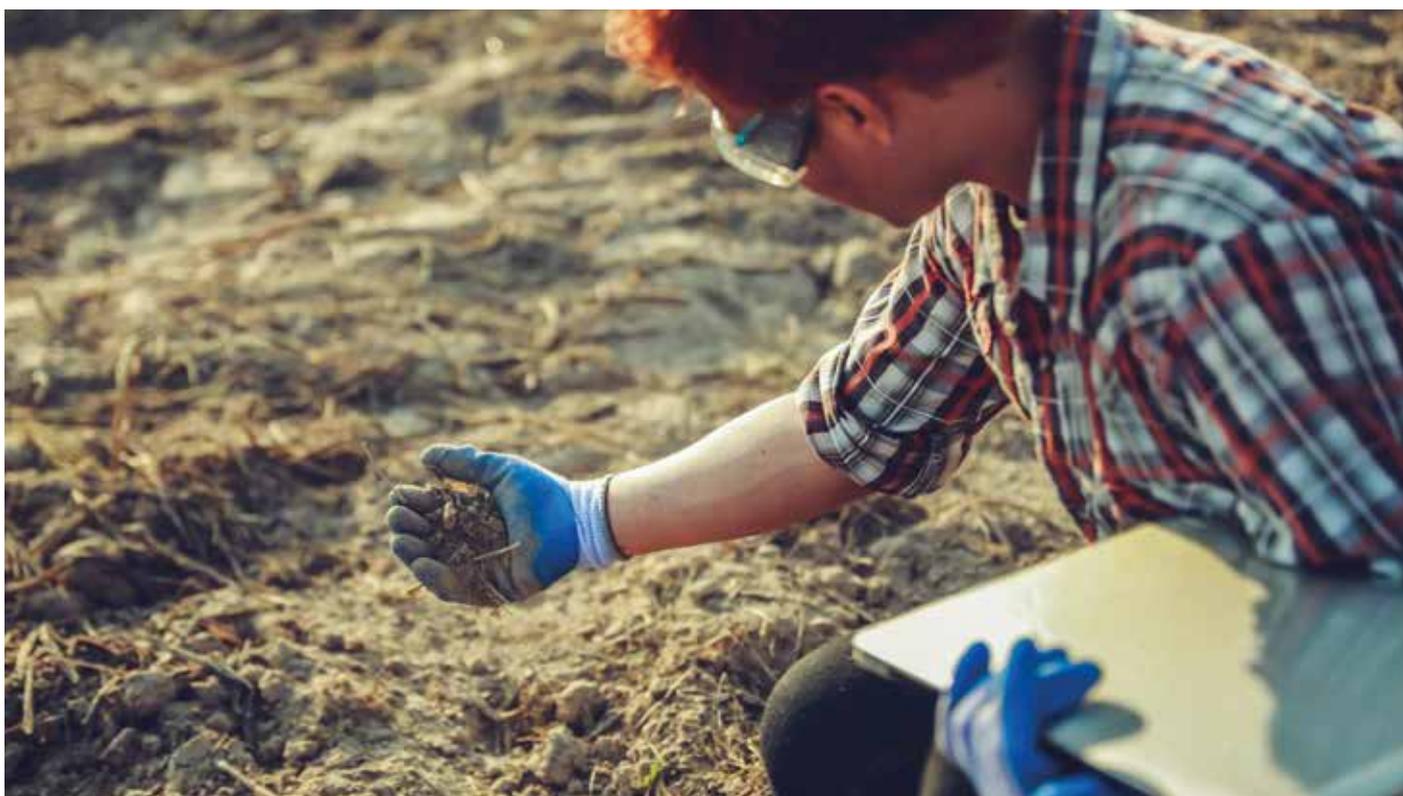
“A soil carbon code is critical for unlocking the marketplace”

Recent figures from the Sustainable Soils Alliance, a coalition of farming organisations, businesses, NGOs and academics working in this sector, suggest that the market could be worth

between £200 - £500 million per year for the UK farming industry.

In reality, a new soil carbon marketplace depends upon a structure being put in place, which is where the Soil Carbon Code comes into play. This is a set of protocols that will allow the agricultural sector to quantify and verify the amount of carbon captured – or emissions reduced – through sequestration and/or other regenerative practices. At present, the Code is in the process of being drafted. Matthew Orman, Director of the Sustainable Soils Alliance, says that the code will be “critical for unlocking the marketplace.” He predicts that there will be “various iterations of the code, which will probably narrow in and get more and more focused as the process evolves.”

“It’s slightly up in the air how specific



it will be regarding the kind of practices, outcomes and approaches. It's all about striking the balance between being sufficiently flexible, to allow for a degree of innovation, because this is obviously a very new, very novel marketplace... and being precise enough so that people have confidence in the final format."

But there are a number of potential snags to be overcome before any soil carbon marketplace can get off the ground. If farmers are being paid by the government for improving the soil what sort of incentive is there for private investors to get involved? A marketplace dominated by the government can't really be called a marketplace, can it?

Orman agrees. "There's this principle that lies at the heart of offsetting schemes called 'additionality'. Investors will only pay for initiatives and projects that wouldn't be happening without their investment. So that needs to be ironed out – when they drafted the SFI they made clear reference to the fact that they don't want to squeeze private money out."

There is also the question of how the scheme evolves from its initial premise. Surely the government won't continue to pay farmers once a standard for soils has been set? When does an introductory standard become a legal baseline?

Central to making the market work is how 'saved' carbon will be measured. On one hand, there is measuring via remote satellite drones, or LIDAR modelling, which is based on known experience of interventions and their impact on the soil. The preferable option, though, would be field or lab testing, which has financial implications. Matthew Orman points out there might be a way round this. "We're working with a company called Agracarbon who are looking to kind of revolutionise infield soil carbon testing to get it to a point where it is really affordable; where it's £1 as opposed to £25." If overcome, this would provide a huge boost to the marketplace, providing confidence for investors and stakeholders that carbon actually is being taken out of the atmosphere.

The other x factor in a soil carbon market would be the impact of the introduction of mandatory municipal food waste collections from 2023. Defra estimates that food waste arisings will increase by 1.35 million tonnes between 2019-2029. At present, most food waste

goes to wet anaerobic digestion – there are 642 AD plants in the UK versus 46 in-vessel composting facilities – but with this comes a number of limitations. Nitrogen-rich anaerobic digestate is spread on soil as a fertiliser. However,

"Investors will only pay for initiatives and projects that wouldn't be happening without their investment."

around 55 per cent of land in England is in Nitrate Vulnerable Zones where the Nitrates Directive legislation limits the nitrate pollution in rivers by placing restrictions on when it can be used alongside the Farming Rules for Water. You can only spread organic fertilisers when there is a 'crop benefit', mainly dry days in Spring (see page 8 for more on this subject). If the volume of food waste increases, so too will the volume of digestate stores, but without anywhere to go. It could be that a soil carbon marketplace would have to go hand in

hand with an increase in composting. The impact of compost on soil organic matter and soil carbon is well-observed. See Issue 47 for more information.

For a peek into the future at how it could work it helps to look at a project like Soil Capital. This is an international venture that pays farmers to sequester carbon at the current rate of £23/27 Euro per tonne. A certificate for each tonne of CO₂ is issued by the group based on the international standard ISO 14064. In return, the certificates are sold by Soil Capital's sales partner South Pole to "firms that want to support more responsible agriculture... Our preference is to sell certificates to food companies," they state. The idea being that as well as buying members' crops, food manufacturers are able to demonstrate that their supply chain emissions have reduced.

At present Soil Capital's membership of farmers across France, Belgium and the UK stands at 157 and growing. The outlines of a soil carbon market are already visible. In the coming years they will only become clearer.

Case study: Gentle Farming

A comparatively new project set up earlier this year by Cambridgeshire farmer Thomas Gent, Gentle Farming aims to reward land owners that carry out sustainable farming techniques. To facilitate the certification, Gent entered into a partnership with the Danish firm Agreena. "They provide the verification whilst Gentle Farming does the farmer recruitment and support," he explains. In less than a year the Agreena program has signed up over 110 farmers across six European countries, including 40 in the UK.

Measurement is carried out via an online carbon calculator with verification fulfilled in partnership with Hummingbird Technologies. "They are specialists in satellite imagery and remote sensing technologies. So, in simple terms, if a farmer says he grew this crop, Hummingbird will look on the satellites, check and verify."

Central to the program is that individual farmers control the fate



of their certificates: "When they are produced, they are issued directly to the farmer's carbon bank account and it's his choice what they do with them. He can trade them himself, or keep them, or we offer a broker service where we'll trade them for him."

Gent sees schemes such as Agreena Carbon as providing a massive opportunity for their members. "In the UK, farmers are losing BPS and government funding. We need to find more ways to farm sustainably and farmers need support to transition to more sustainable farming practices.

"The carbon payments are there to de-risk and provide support for that transition."

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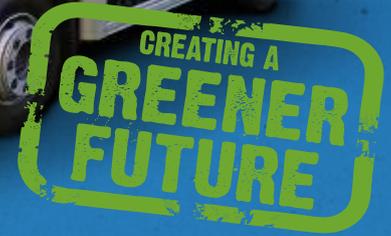
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CCS & BCS



Molly Rogers, Research and Communications Assistant, and **Georgia Phetmanh**, Schemes Manager at REAL, provide the latest on the Compost and Biofertiliser Schemes and the REAL Research Hub



COMPOST AND BIOFERTILISER CERTIFICATION SCHEMES

CCS & BCS 2020 Annual Report

REAL published the 2020 Annual Report for the Compost and Biofertiliser Certification Schemes (CCS and BCS) in early September. The document provides an overview of the data collected over the course of the year, as well as setting out the work done by REAL during 2020 to manage and develop the CCS and BCS, and the Research Hub.

By the end of 2020, there were 176 certified composting processes in the UK – 137 in England, six in Northern Ireland, 20 in Scotland, and 13 in Wales. These included 110 open-air, turned windrow processes, 11 in-vessel composting-only processes, and 12 aerated static pile processes with no subsequent process step. 143 were processing green waste only, approximately 2.5 million tonnes on an annual basis, and 33 were processing green waste mixed with ABP materials, an estimated 1.3 million tonnes per annum. Collectively, compost producers on the CCS were producing 1.6 million tonnes of quality compost annually.

On the BCS, there were 92 plants certified by the end of 2020 – 68 in England, five in Northern Ireland, 11 in Scotland, and eight in Wales. Feedstock data had been collected from 88 of these plants by the end of the year, with 71 plants falling into the scheme's 'waste' feedstock category, 11 falling into the 'farm' category, and six into the 'other' category. Approximately five million tonnes of feedstock materials were processed annually by all plants.

100th AD plant joins the BCS

In July 2021, Barkip AD Plant in Scotland became the 100th AD plant to join the BCS. This marked a big milestone for the scheme, which has been growing since its inception. It has now been 10 years since the first AD plant achieved certification back in 2011, with 100 plants achieving certification within a single decade. The scheme is contributing greatly to the national food waste recycling rate, additionally ensuring that all digestate spread to land is safe and of good quality.

Certificate details and contact information for plants on the scheme can be found on the 'Producers' page of the BCS website: www.biofertiliser.org.uk/producers, which was developed earlier in the year to include a search engine and additional information about the plants.

RESEARCH HUB

Research Library

The Research Hub's Research Library launched in January and is live and available for access. NNFCC, the project contractor, has been maintaining the Library since its launch to ensure the content remains focused, current, and valid. NNFCC reviews the Library content and updates the website's 'Documents' and 'Research Library' sections to routinely identify and link new research into the website.

Digestate data pack

The second project funded by the Hub is titled 'To develop a 'data pack' on the properties, characteristics, and content of digestate that will provide context for the development of new uses of outputs from Anaerobic Digesters'. The project commenced in May 2021 and will be carried out over a period of approximately six months, concluding in November 2021.

New projects

The latest work to be commissioned by the Hub has recently been confirmed. All research ideas submitted during the 2021 call for proposals were discussed and evaluated by the Hub's Research Panel. The two projects which received the highest scores, therefore set to be funded in 2021, are titled 'Plant Response Test Failures: Investigation of contaminants and phytotoxins in 'End of Waste' composting feedstocks and finished composts' and 'Evaluation of the potential for the improvement of the Residual Biogas Potential test and investigation of alternative test procedures for 'End of Waste' digestates'.



'Volume moves markets' in the world of green composting



Freeland Horticulture has cemented itself as a leader in topsoil production. Formed in 1993 by George Longmuir, the company has aimed to introduce a more scientific approach to green composting since its inception.

Through his experience as a soil scientist, Longmuir understood that adopting a more empirical approach to composting would be welcomed by the industry at large.

In the 1990s, much of the green compost produced – bearing in mind there were no more than 20 producers nationally, including both private companies and councils – was screened and applied to agricultural land. There were no methodical controls put in place and, effectively, laws were broken due to the spreading of waste.

Despite this, there was still a desire to select green compost and utilise it in other areas of the market – namely, retail horticulture: a large target customer with a high technical entry barrier, as is still the case today.

In order to gain the confidence of this market sector and using the formula 'volume moves markets', Longmuir orchestrated a collaboration between Freeland, Cleanaway, Veolia, and Suez. This collective partnership was called APEX. The task of the partnership was

to create a soil specification with main nutrients that also sets limits on potential heavy metals. Each producer had to meet these requirements and as a result, the large-scale horticultural companies started to purchase significant volumes of 10mm green compost.

The APEX specification was in place long before PAS100. However, PAS100 has subsequently become the industry standard, with the horticultural companies now viewing green composts as a valuable component in their growing media blends.

In spite of this, with increasing demands and the need to maintain both the technical parameters came the equally important levels of contaminants that composts might contain.

The green waste industry is today very much at a crossroads and contamination of the feedstock is now becoming the main issue for all processors, as council garden waste contracts have for some time permitted contamination levels of up to five per cent. It is now down to councils to introduce systems and procedures to reduce the level of contamination down to 0.5 per cent.

The benefit to the composters, with today's vastly reduced levels of

contamination, is significant and, as the markets for the compost now open right up, the level of cross contamination – whether in an agricultural field or retail bag – diminish. This is the ultimate goal.

Freeland's national topsoil production business uses approx. 250,000m³ of 10mm green compost. Freeland would be considered the largest supplier of topsoil in the UK with 10 production sites creating circa 600,000m³ per annum.

Freeland's soil business is specification driven and creates more than 10 different soil types for a range of applications. Everything is analysed so that total control is in place in both the physical and chemical properties of the soil. Longmuir doubles up as the unique combination of a managing director and soil scientist.

Freeland has been the main supplier of some of the country's largest landscape projects including the Olympic Park, DP World, Keir UK Motorways, Trafford Park Manchester, and Costain Heads of the Valley interchange Wales.

Freeland also has its research and development department looking into other areas of industry, which, if successful, should have a significant impact in all of our lives going forward.

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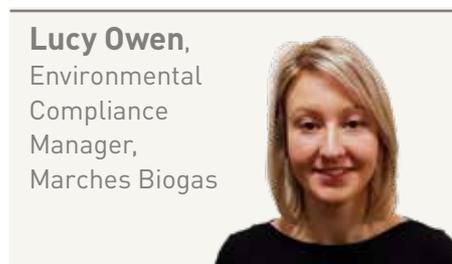


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REA Green Gas steering group

Lucy Owen, Environmental Compliance Manager at Marches Biogas, explores what the future holds for on-farm small-scale AD facilities



Lucy Owen,
Environmental
Compliance
Manager,
Marches Biogas

Throughout the community of on-farm anaerobic digestion facilities, with many operating at 800kW or less, there is growing uncertainty as to what the future holds for small-scale AD. Most sites of this scale are now an integral part of, rather than simply coexisting with, the overall farming business, predominantly utilising energy crops as well as on-farm wastes and manures.

With the impending prospect of regulatory changes posed by the Environment Agency consultation on Appropriate Measures for the Biological Treatment of Waste, worry is growing throughout the AD industry around the requirement for smaller AD facilities to remain compliant. While AD owners and operators play an important role at the forefront of “The Green Revolution”, they must still adhere to the required standards in order to protect the environment, as well as the safety of staff. The requirement to meet those standards must remain not only practicable, but also justifiable, from the outset.

Following the recent clarification of Rule 1 of the Farming Rules for Water and discussions surrounding this autumn’s

digestate application, concerns for the potentially limited land bank availability for the spring application are driving real concern for digestate storage capacity, along with the added pressure of reduced weather uncertainty. Some sites are already facing significant planning issues for the required installation of additional stores. If small-scale, on-farm AD is to continue to contribute to the UK’s renewable energy sector, strategies should focus on truly supporting farmers and AD facilities to maximise the value of organic materials, continue to operate safely, protect the environment, be eligible for future industry development and, perhaps most importantly, continue to play their important role in renewable energy production.

REA Biogas steering group members



William Mezzullo,
(Chair)
Senior Business
Development
Manager,
Centrica Energy
Trading



Neil Liddell-Young, Strategy
and Development
Director, Severn
Trent Green Power



Richard Gueterbock,
Director, Food
Chains



David Hurran,
(Vice Chair)
CEO UK, Air Liquide
Biogas Solutions
Europe



Lucy Hopwood,
Director and Lead
Consultant for
Bioenergy and
Anaerobic Digestion,
NNFCC



David Kinnersly,
Head of
Agribusiness, Fisher
German



Anna Becvar,
Earthcare Technical



Mark Richmond,
Technical Director,
WRM



Thomas Minter,
Malaby Biogas



John Baldwin,
Managing Director,
CNG Services



Philipp Lukas,
Managing Director,
Future Biogas Ltd

REA Organics Steering Group

The Environment Bill presents a great opportunity, writes **Justin Dampney**, COO of Eco Sustainable Solutions, giving the sector the potential to shape the future of sustainable resource management.



Justin Dampney,
COO,
Eco Sustainable
Solutions

With the Environment Bill passing through Parliament, navigating the multitude of consultations has been daunting for time-poor operators. We owe immense gratitude to the REA's work, particularly, but far from exclusively, that of Jenny, Emily and Kiara. A difficult and often thankless task, the REA has assimilated each of its members' positions into a carefully considered response, simultaneously keeping an eye on the greater good and

ensuring that key messages are heard by the Government.

Key policy outcomes and the capacity for flexibility amongst local authorities currently remain to be seen. Whilst this uncertainty has resulted in many businesses treading water strategically, we should be confident that the trend will be immensely positive for our sector as we are firmly part of the solution. We should be both proud of this fact and emboldened to seize the opportunities it affords us.

As an industry, we recycle a yearly nine million tonnes of valuable resources, the largest contribution to UK household recycling. Whilst we need to be better at reducing field-to-fork food waste, this number will increase through the imminent ubiquitous bio-waste collections.

This is just the beginning. Considering how much we have undervalued our resources, our opportunity to contribute to Carbon Budget 6 and net-zero is huge. Our compost has a marked positive impact, not only by adding nutrients to our ever-depleting soils but also by supporting agriculture's move away from fossil-derived fertilisers, and in carbon sequestration. This is in addition to our contribution to the challenge of decarbonising transport and heating, through the supply of carbon positive biogas from green and food wastes.

The Environment Bill will award us a great opportunity to shape the future of sustainable resource management. As an industry, we should be looking forward with a positive and enterprising spirit, as that's what society requires of us.

REA Organics steering group members



Dr Becky Wheeler,
Business
Development
Manager,
4R Group
(Chair)



Graeme Kennett,
Senior Consultant,
360 Environmental
Ltd.



Andy Sibley,
Managing Director,
Envvar



Charlie Trousdell,
Charlie Trousdell
Associates



Tony Breton,
Market Specialist
- UK & Ireland,
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**Stuart Hayward-
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Development Director,
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Recovery UK



Ralph Lodge,
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Robert Benford,
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James Astor,
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Ben Brown,
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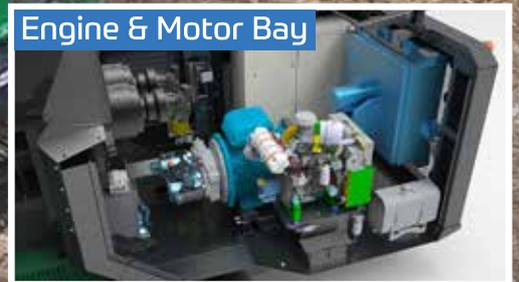


Robert Moody,
Managing Director,
Jack Moody Group

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Connection System



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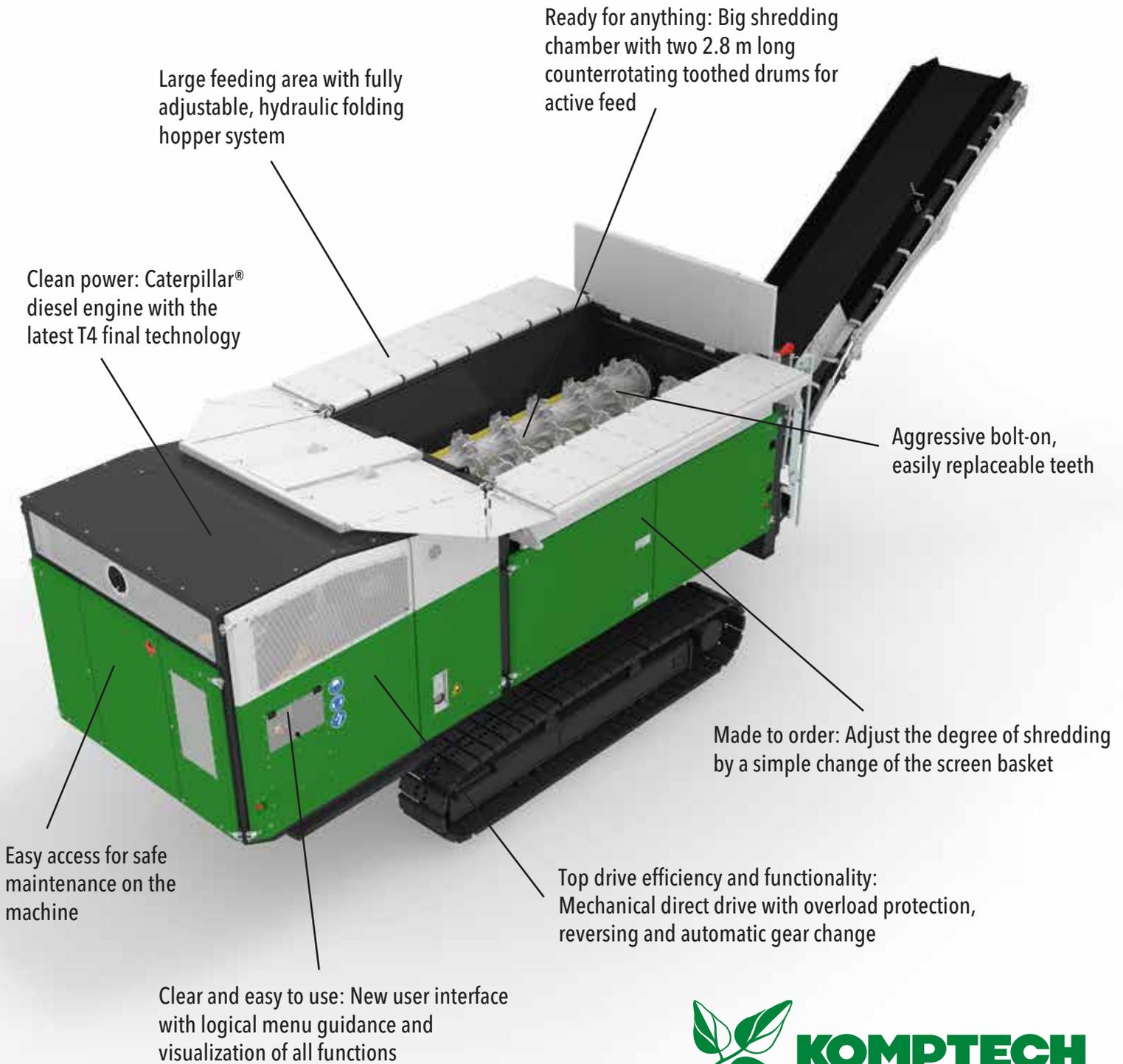
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