

The Chartered Institution of Wastes Management (CIWM) is the professional body which represents around 6,500 waste and resource management professionals, predominantly in the UK but also overseas. The CIWM sets the professional standards for individuals working in the waste management industry and has various grades of membership determined by education, qualification and experience.

## **UK bioeconomy: call for evidence**

*1. What is your name?*

Tina Benfield

*2. What is your organisation or business*

CIWM – the leading professional body for resource and waste professionals.

*3. Which best describes you? (Tick boxes)*

*Respondent type*

- Business representative organisation/trade body
- Central government
- Local government
- Charity or social enterprise
- Trade union or staff association
- Legal representative
- Large business (over 250 staff)
- Medium business (50 to 250 staff)
- Small business (10 to 49 staff)
- Micro business (up to 9 staff)
- Start-up
- Academic
- Individual
- Other (please describe) professional membership Institution

*4. What is your email address?*

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5. Please describe the sector you operate in and provide any further information about your business and activities that you think might help us put your answers in context.

CIWM represents thousands of professionals working in the waste and resource sector and has a number of members working in the biological treatment area, including consultants, facility owners, regulators and academics. CIWM also has a special interest group (SIG) who cover all aspects of biological treatment – composting, anaerobic digestion, water treatment, landspreading, MBT and using biological techniques for remediation.

### **UK bioeconomy: call for evidence Bioeconomy definition**

What is the bioeconomy? The bioeconomy is the economic opportunity of using biology to help solve challenges we face in agriculture, energy, health and more, which has the potential to deliver economic, environmental and social benefits to the UK.

The bioeconomy includes all economic activity derived from bio-based products and processes. These have the potential to contribute to sustainable and resource efficient solutions to the challenges we face in food, chemicals, materials, energy production, health and environmental protection.

The bioeconomy comprises all economic activities that are either:

- i. Feedstocks which could be biomass based (including domestic, commercial, agricultural or industrial waste) or fossil fuel based (including industrial and metropolitan wastes) which are treated by a combination of physical, chemical and biotechnological processes;
- ii. 'bio-transformative activities' – Those which add value through the inclusion of a physically or chemically transformative process that involves either as outputs or as processors, biological resources (the tissues, cells, genes or enzymes of living or formerly living things);
- iii. 'bio-based upstream activities' – Those that add economic value as upstream suppliers of bio-transformative activities; or iv. 'bio-based downstream activities' – Those which add economic value as downstream users of the outputs of bio-transformative activities.



6. Does our definition of the bioeconomy (see overview above) include within its scope all of the relevant bio-based products and processes? If not, please explain. Through the various types of bio-based activities, the bioeconomy makes a significant contribution to output and employment in the British economy. The whole bioeconomy, comprising transformative, upstream and downstream elements, generated approximately £220 billion in gross value added and supported 5.2 million jobs in 2014.

This seems to be a comprehensive definition but there are a few points to consider.

In *ii* above it might be worth adding biologically along with physically and chemically transformative. Biologically relates to both the feedstock and transformative process.

CIWM believes a link with soil and particularly soil organic matter is very important and should therefore be included in the definition. The direct application of waste and waste-derived organic materials to soils for agricultural remediation or other purposes should be included in this definition.

Although composting and anaerobic digestion are not specifically mentioned CIWM has thought about the questions with these processes in mind and so feels they should be included in the definition.

7. Within your sector or organisation, what are the prospects for economic growth that are related to the bioeconomy?

Significant potential remains in the UK waste stream for beneficial treatment to recover value from biowastes.

The 2014 House of Lords *Waste or Resource, Stimulating a Bioeconomy* inquiry heard that 100 million tonnes of carbon based wastes are still available for treatment. Landfill closures continue across the UK and only a small proportion of post-consumer food waste, for example, is currently separated and collected for treatment in England (see question 36). If the UK is to continue on its trajectory to divert wastes away from landfill and further up the waste hierarchy, prospects for economic growth from that waste hinge on provision of affordable services and infrastructure to manage it.



Investment in infrastructure for biowaste (or other waste) treatment needs stable and ambitious policy at national, UK and/or EU level. Current uncertainty (see question 43) re future EU policy in the UK is holding investment up and one of the consequences is export of refuse derived fuel to EU Member States with excess energy from waste capacity (3.2 Mt in 2016).

The Environmental Services Association (ESA) estimates that a favourable investment/policy framework would lead to an additional £10bn investment by this industry in new treatment capacity. That capacity to process biowastes in the UK could recover energy (electricity, transport fuel, biogas or heat), soil conditioners/fertilisers and individual feedstock materials – although R&D and new technologies and skills may be needed, especially to recover industrial feedstock chemicals from biowaste processing. Significant economic development potential therefore exists in UK biowastes but it needs favourable policy, investment and technologies to realise it.

*8. Given your expectations, do you think there are potential issues holding back further economic growth in the sector? For example:*

- *feedstock availability*
- *demand or ability of downstream users to adapt to the new products*
- *demand or ability of end users to adapt to the new products*
- *workforce skills*
- *input/output price uncertainty*
- *confidence in future of the sector*

CIWM believes that feedstock availability is the most important weakness in developing this market. This is exacerbated by:

- Poor waste data especially for industrial and commercial wastes – but also for other potentially important sources such as woodland, forestry and highway verges, etc.
- The uncertain but important impact of food waste prevention
- Poor recovery of separated food waste in England (compared to the rest of the UK) from all sources
- Poor development of household biowaste collection with less than half of local authorities (none in some regions e.g. NE England) providing separate food waste collection and variable/poor public engagement where services are provided.

There is contamination of biowaste feedstocks through poor separation by households or businesses, including plastics and other non-target materials. Packaging simplification, better decontamination technologies and better information for producers will help this serious issue.



For demand or ability of downstream users to adapt to the new products – it is about the relative cost of conversion using bio-based materials/processes compared with fossil fuel derived products/pre-cursors.

For demand or ability of end users to adapt to the new products – customers need information and support to stimulate interest in waste-derived products. Product standards – rigorously enforced will be essential in underpinning consumer confidence.

For workforce skills there is a significant upskilling needed from separated material (low contamination) collection through to process management and control.

*9. Do you think that growth in a particular sector of the bioeconomy impacts growth in other sectors in a way that should affect our priorities?*

There is significant potential in biowaste treatment to generate valuable outputs:

- Energy, as biogas, electricity, transport fuels and heat.
- Soil conditioners and fertilisers
- Valuable industrial chemical feedstocks including organic chemicals and gasses.

All of these would affect alternative sources and the industries which produce them. Careful carbon accounting and internalisation of environmental costs into prices paid will be needed to balance markets and give consumers real choices, but realising biowaste potential in this way will inevitably affect other competing sectors.

Within the bioeconomy, different feedstocks will compete, e.g. growth of energy crops or break crops verses use of biowaste as a fuel feedstock or food waste as a feedstock for anaerobic digestion versus a source of complex organic chemicals. Again, careful balancing of costs and benefits is needed to optimise the sources used.

Food waste – at all stages in production, transport, manufacture, retail and consumption – represents an especially important potential resource – WRAP estimate up to a third of all food production in the UK is lost from the process at some stage. However, by far the biggest social, environmental and economic gains lie in waste prevention, rather than better management of that waste. Estimates of the biowaste potential must prioritise prevention first.



*10. What do you think the UK's bioeconomy goals should be in the long term i.e. 15 years or more? You could add to your reply by telling us what actions we should be taking to get there. This could include actions by government, biotechnology developers/providers, UK user sectors and consumers.*

For biowaste the greatest economic, social and environmental benefit lies in prevention of waste, especially for food waste. This strategy and Government must maintain and increase its support for programmes such as WRAP's Love Food Hate Waste.

Recognising the potential in biowaste as a feedstock for other processes, this strategy must support the fight against waste crime and non-compliance to avoid under-cutting compliant businesses and leakage from the system.

The biowaste bioeconomy potential is therefore total arisings minus preventable wastes but plus losses through crime and non-compliance.

The strategy must link with other Government strategies especially the Industrial Strategy, the National Infrastructure Assessment (NIA) and the Defra 25 year plan on environment and or agriculture, with the objective of maximising social, economic and environmental benefit from improved biowaste management and use in England and in the UK as a whole. That will include maximising use of edible food as food and then animal feed, recognising obvious health, environment and animal health protection issues, etc.

The strategy must support closer monitoring and measurement of biowastes to assess their market potential. For many biowastes this will include careful data collection and analysis under the waste duty of care, using such tools as edoc (electronic duty of care) or edoc compatible systems.

The strategy should drive development of biowaste and its treatment products as industrial feedstocks. This is an under developed market and is likely to be R&D led, including through the Industrial Strategy Challenge Fund, via Innovate UK and R&D bodies across the UK.

The strategy must support maximum use of biowaste-derived energy, in all its forms, including improved planning for co-location of biowaste sources, treatment technologies and markets for outputs, especially heat.



This must be a long-term strategy for improving the productivity of farmland by increasing the soil's organic content. Alongside this there needs to be a better understanding of our connections with the microbial world, and there should be substantial investment in microbiome research.

In parallel the loss of nitrogen to the diffuse environment needs to be reversed by better soil management. This will also help with the control of greenhouse gases.

Skills needs and occupational competences are key requirements to help facilitate uptake and upskilling, sector representative bodies/ employers need support to undertake this.

Overall, all sectors must be co-ordinated to deliver the same goals for self-sufficiency of UK plc, hence the importance of linking Government strategies as above.

*11. What do you think the UK's bioeconomy goals should be in the short term i.e. the next 5 years?*

The potential of biowastes in the economy cannot be realised outside a stable policy environment. Much of the required policy is under development in the EU (see question 46). Completion and adoption of this policy by the UK, assuming it is still an EU Member State, should be seen as an early priority. This could provide long term stability to policy and legislation in a very broad range of issues from food waste prevention through to separate collection, landfill bans, use of products in soils, etc.

Without this EU policy framework, England and the UK will need to develop parallel or better policy and legislation of its own. This will be a major task for Government. Either way this industry and how it contributes to the bioeconomy and broader economy needs clear policy and objectives before 2020 to steer development beyond 2020.

A second early priority must be generation and analysis of biowaste resource flow information to support assessment of improved biowaste use as a resource linked to the Industrial Strategy, National Infrastructure Assessment, the Defra 25 year plan and a resources strategy for England (if one is developed) together with national strategies in Scotland, Wales and Northern Ireland.



This strategy will need to link with other areas of Government policy and initiatives, including the carbon reduction plan and energy policy and the subsidies provided for different sources. The carbon emission reduction plan will also link to air quality initiatives for example, through the potential to generate much cleaner transport fuels from biowaste. This is a complex but vital task across Government departments.

The strategy must also focus on exploitation of unpreventable food waste collection in England from all sources. Development of a compelling business case for local authorities or financial support where necessary to increase separate collections will be needed. This must be supported by measures to increase participation and reduce sources of contamination in biowastes, e.g. packaging design, information campaigns and enforcement of any regulations used to achieve that. The strategy should examine costs and benefits of mandatory food waste collection from businesses in Scotland, for example.

*12. Can you tell us about any "quick wins" to increase the growth of the bioeconomy?*

Government must support existing programmes, including:

- Love Food Hate Waste
- WRAP pilot schemes under Waste Collection Harmonisation
- Right Waste Right Place
- Uptake of edoc, especially for commercial and industrial waste

*13. Do you think the UK is likely to miss any of these "quick wins"? If so, why is that?*

Brexit could be an important distraction over the next 2 to 5 years, especially given the relative importance of EU policy and law in Defra's policy areas.

The UK and England especially needs to get away from short term thinking to build a better future and move towards more integrated policies. The links between this strategy and other Government initiatives has been highlighted above (see question 11). Failure to link and co-ordinate between those initiatives will frustrate development.

The planning system in England does not consider resource flows and resources use at a 'larger than local' level. In particular there will be a need for regional consideration of resource including biowaste flows to optimise service and infrastructure provision and co-location of businesses for vertical integration of resources management.





*14. Can you tell us about any other issues in the broader environment that are holding back economic growth in the bioeconomy?*

CIWM is aware of impact on other recycling – biobased materials being used to supplement other materials and the impact this may have on recycling or other processing. For example, concentration on collection and composting of green wastes to support recycling performance.

Competition for land can be important for solid organic material from the resource & waste sector and waste water industry, especially as more material is produced and requires an outlet. Management of UK soils and maintenance of a 'land bank' for soil inputs from competing industries, such as digested sewage sludge spreading, will be needed.

### **Sustainability**

*As demand for bio-based resources increases, there can be concerns regarding feedstock sustainability, including the direct and indirect impacts of changes in land use, soil quality and carbon stocks. However, there are also opportunities to increase resource efficiency by using residues from agriculture, forestry, and industry.*

*15. How sustainable is your sector of the bioeconomy in respect of infrastructure issues? Eg roads, planning issues, telecommunications, energy and water supply.*

An adequate network of biowaste collection, treatment and use services and infrastructure can be developed within existing supporting infrastructure, e.g. roads, energy and water. Links from biowaste treatment to energy infrastructure can be expensive but possible. However, the planning system provides poorly for clustering of biowaste production, management and use including potentially valuable heat outputs from treatment.

*16. How does your sector contribute to or impact on sustainability in respect of environmental issues including concerns about high energy use, water, greenhouse gas emissions, air and land pollution and destruction of animal habitats?*

Biowaste, especially food waste, prevention has a significant climate change impact. If food waste were a country it would be the third or fourth biggest greenhouse gas emitter in the world. Hence the importance of food waste prevention. Biowaste treatment to reduce overall environmental impact from unavoidable food and other biowaste is also important.



Reduction of biowaste to landfill under the EU Landfill Directive has been a UK success with the 2020 reduction target being met at least four years in advance, despite our previously heavy reliance on landfill.

Further improvements to manage food waste further up the EU waste hierarchy will be policy driven, e.g. through the EU Circular Economy Package (see question 43).

The most diverse environment on the planet is soil and we are losing it at an increasingly rapid rate. The sustainable and repeated application of quality compost/digestate to soils can increase SOM (solid organic matter) and SOC (solid organic carbon) and protect and enhance soil quality and productivity in the UK.

*17. How should the strategy take into account UN sustainable development goals? These include: ending hunger and poverty, improving food security and nutrition, cleaner water and improved sanitation, affordable and clean energy, sustainable industrialization with responsible production and consumption, reducing climate change, and protecting ecosystems on land and in water?*

Government should report routinely – at least once per Government cycle – on how UK policy and performance, including under this bioeconomy strategy, supports delivery of SDGs.

CIWM believes SDG target 15.3 is important, in addition to those suggested.

- By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world

*18. How sustainable is your sector of the bioeconomy with respect to workforce skills?*

Currently the only mandatory skills requirements are for technically competent management of permitted waste facilities and these are at managerial level only (level 4). Additional skills and knowledge levels need to be demonstrated at the levels below this to ensure day to day operations are safe and do not result in harm to the environment. This could potentially be considered as an extension to the technical competence requirements for activities covered by environmental permits and this will be a consideration in Defra's mid 2017 waste crime and persistent poor performance consultation.



Non permitted operations would also greatly benefit from enhanced skill and knowledge of all operations staff as often environmental, health and health & safety risks posed are comparable to that of permitted facilities. This should be addressed in Defra's forthcoming consultation as above.

An expression of interest has been made for a new trailblazer apprenticeship standard for resource and waste sector at level 2 and level 4 and CIWM will continue to support development and use of that standard. It is unlikely that these will be specific enough for land spreading or soil management areas, however, there may be opportunities for employers within the resource and waste sector to develop something specific if needed.

Other sectors will have transferrable skills that would benefit the bioeconomy and people with these skills could find opportunities within the waste bioeconomy with some additional training and awareness of waste specific issues and regulations, e.g. waste water treatment, mechanical and electrical engineering, land reclamation. There may be qualifications or elements of these that could be beneficial to be applied to the resource and waste sector.

CIWM is aware of (over the last 3 to 5 years) a noticeable reduction in students studying to be soil scientists. A vital part of bioeconomy development will be through improved soil management, especially in agriculture but also in land reclamation and remediation.

CIWM would also like to see an element of resource efficiency and resource security – potentially including the importance of the bioeconomy - into a broad range of undergraduate curricula, not just STEM topics but including business studies, planning and design for example.

### **Investment**

*Investment in the UK bioeconomy has seen an increase since 2010, above the trend in the economy overall. However, the level of gross fixed capital formation in these sectors has yet to regain its 2008 peak in real terms. In this section we explore issues around obtaining finance for your organisation.*

*19. Has your organisation or businesses received finance from one (or more) of these sources in relation to its bioeconomy activities? Tick all that apply:*

CIWM is aware that some members who are trying to fund PhD projects and MSc programmes.



20. *Has your organisation or business had difficulty in obtaining finance from one (or more) of these sources in relation to its bioeconomy activities? Tick all that apply and please provide additional details about the issue. You may use the examples provided to show amounts, but this is entirely voluntary*

For CIWM this is not applicable.

21. *More generally, does your sector, or sub-sectors within it experience difficulties in attracting investment? If so, why?*

Yes CIWM is aware of the difficulty the waste and resource sector has in attracting sufficient investment and funding for biowaste treatment. The reasons include:

- Use of an established technology – anaerobic digestion – being used for new (waste derived) feedstocks
- The record of pollution and health & safety incidents for these operations
- Access to reliable sources of appropriate quality feedstock (see question 27).

Waste crime is a serious drag on the sector. Responsible waste and resource management is under-cut and threatened by illegal waste management.

Regulations need to be simple and rigorously enforced. It must be easy to do the right thing, hard to do the wrong thing. If for example, food waste separation and collection is made mandatory, it will need to be more rigorously monitored and enforced than the general waste duty of care.

22. *What sort of challenges does your sector face in terms of financial sustainability?*

CIWM believes the challenges are around feedstock security (and purity – reduction of contaminants) and compliance with permits, health and safety aspects of operation and variability of operational skills.

There is also the challenge about long-term policy thinking and not short term fixes. (See question 43). This will allow better decision making for long-term improvements in self-sufficiency and improved security for those investing.

The impact of local government austerity measures means that many councils in England have not introduced separate food waste collection (see question 36). This lack of available feedstock is a rate-determining step in anaerobic digestion infrastructure development, for example.



### **Research and innovation**

*The United Kingdom is particularly strong in the research and development aspect of the bioeconomy, ranking second on the 2015 Global Innovation Index. We would like to build on this and create an environment where our world-class research is fully exploited by industry and society, and different sectors of the bioeconomy collaborate and tackle untapped opportunities, leading to the bioeconomy becoming 'greater than the sum of its parts'.*

*23. What are the key areas for investment in research and development in your area of the bioeconomy?*

CIWM is aware that demonstration projects would be beneficial to the resource and waste sector. Work studying biowaste supply flows and research into removing contaminants & upgrading biowastes as process precursors would assist.

Other areas that CIWM are aware of are:

- Microbiomes - bioaugmentation
- Artificial life
- Nitrogen fixation and recovery of ammonia
- New enzyme capabilities that have never existed before
- Clever membrane separations.

*24. Where do you see gaps in investment in research and development in your area of the bioeconomy?*

CIWM is aware of the good work of the research centres of excellence and the gathering of various industry groups, they allow some real networking opportunities, but there is still a real gap to bridging these communication and funding barriers.

Some areas that might be seen as gaps:

- Simplest self-sustaining ecosystems
- Maps of microbial biomes on all living surfaces
- Ammonia conversion to nitrate/urea in an artificial life form
- Developing artificial methods for fixing light energy
- Manufacture of carbon and silicon skeletons at nanoscale reliably
- Novel enzymes to enable new plastics to be degradable in controlled conditions
- Fully sustainable housing at minimum energy input from other than solar – in the plant fixed sense
- Integrated cities with underground handling infrastructure.



*25. What are the most notable types of new products or technologies that can be expected in your sector in the next few years that are related to the bioeconomy?*

CIWM is aware of work looking at carbon capture on to a medium that can be spread to land, increasing value – as well as increasing soil organic matter.

Others include:

- Manufacture of commodity chemicals
- Bio-packaging and collection systems
- More local and urban food production
- Biomanufacturing to order – designer molecules – particularly novel enzyme capability in daily products
- Bioaugmentation of living surfaces
- More non-animal proteins without the issues of existing single cell proteins

*26. What are the barriers and opportunities for bioeconomy related research?*

*Examples might include:*

- *Collaboration*
- *Technical/scientific challenges*
- *Gaps in research knowledge*
- *Lack of early stage research funding*
- *Lack of translational research funding*
- *Skills*

CIWM believes them to be:

- Technical/scientific challenges
- Lack of early stage research funding
- Lack of translational research funding.
- Bridging gap between waste and chemicals sectors.
- Public perception of risk
- Policy systems that are too bureaucratic and short term
- Regulation

*27. Are you aware of difficulties in commercialisation or translating R&D outputs into the marketplace in your area of the bioeconomy?*

CIWM members have highlighted that the difficulties are mainly allowing smaller sized companies that are successful to receive or be eligible for increased amounts of funding.



Often in biowaste treatment 'innovation' means application of established technologies to novel materials or situations. In that way projects may not be attractive to established R&D/innovation funding.

**Sectoral cooperation**

*Collaboration and integration of individual sectors brings with it substantial opportunities to create additional value. Opportunities can include use of by-products or waste and implementing best practice from other sectors.*

*28. What strong links does your sector have with the other sectors of the bioeconomy?*

CIWM believes the links are little and what links there are, could well be insufficient. There needs to be better integration with chemicals/petroleum and the agricultural sectors.

There seems to be a gulf between low tech and hi tech applications. Some of the answers may be outside the biological sectors. This is very important, because all it might need is the application of something old to a new problem – see Q 27.

*29. To what extent is your sector reliant on links to other sectors?*

CIWM members felt that the resource and waste sector relies heavily on links to other sectors and vice versa, but they are implicit at the moment rather than explicit. E.g. agriculture and inputs to soils. Energy is another link that crosses all sectors.

*30. Are there potential ways in which your sector would benefit from more cooperation with other bioeconomy sectors?*

Waste should be viewed as a strategically important issue in development of the UK Industrial Strategy, both as a resource efficiency issue (including waste prevention) and as future feedstock security in an increasingly resource constrained world.



Biowaste markets from industrial, commercial and municipal sources need to be co-ordinated with treatment technologies and capacities – and they in turn with markets for outputs. Use of biowaste treatment products as industrial feedstocks, e.g. polymer precursors or as a variety of forms of energy, including transport fuels, biogas, electricity or medium/low grade heat are poorly developed.

CIWM feels it is important to learn from other sector's previous/current R&D, technologies, knowledge of processing and quality requirements and access to their skills experience.

*31. Is there anything we could learn on sectoral cooperation from other sectors of the economy?*

CIWM suggests looking at how the chemical sector manages regulations. They lead and are not lacking data when their arguments come under scrutiny because they take a more united approach.

*32. Are there any barriers to collaboration with other bioeconomy sectors? If so, what are they?*

One of the key barriers is intellectual property, which is being locked away and not used.

*33. How can government ensure that bio-resource is used in the best way across the different sectors, taking into account the objectives and impacts of use in these sectors?*

CIWM sees the way forward as engagement – individually and or combined with other sectors. This gives the opportunity to share through demonstration projects and economic appraisals (see question 36).

Biowaste needs to be monitored in its pattern of arisings and markets for its treatment and product use at a 'larger than local' level. In particular the planning system needs to consider provision of an adequate network of infrastructure and clustering of biowaste production, treatment and use of outputs as an economic development opportunity.





### **Supply chain cooperation**

*In addition to different sectors collaborating more efficiently, improving how the supply chain work together could also bring substantial benefits both to the individual organisation and the bioeconomy more broadly. Added complexity might come through geographical barriers.*

*34. What strong links does your business have with others in the supply chain, including links to overseas companies?*

The resource and waste sector has a fundamental role in the collection and pre-processing of biowastes. The core competence of our sector is the effective collection and pre-processing to reduce contamination and potentially transform biowastes into precursors.

There should be some way of allowing all members of a supply chain to receive benefit. The grower/distributor/retailer; all need to gain – but this should not be at the expensive of others in the chain who then change their behaviour to a non-sustainable position. This would encourage a stronger more co-operative way of working. This is more conducive to innovation.

*35. Are there potential ways in which your business would benefit from more cooperation with others in the supply chain?*

Yes. Biowastes pre-treatment and final product quality is critical to others in the supply chain. Knowledge of supply and demand of properly separated or processed feedstock availability for biowaste treatment is important in the resource and waste sector to allow sufficient and appropriate material to be available. Feedstock quality or contamination have a knock-on effect to processing, cost and ultimately the confidence of the customer in using the product.

*36. Are there any barriers to collaboration with other businesses in your supply chain? If so, what are they?*

Separation and separate collection of biowaste is not mandatory in England (see question 38). Local authorities will need to be persuaded that separation and separate collection of food waste in particular and biowaste in general, is affordable or actually reduces overall waste management costs for the public sector. WRAP have a programme of around 10 pilot projects to explore the business case and this strategy development should follow those case studies closely; they will set the tone for other authorities to follow.



## **Government and policies**

*In this section we'd like to hear about issues where the government could remove obstructions to growth for the bioeconomy. But we would also like to hear about things that are already done, but could be done better or be more widely used. These could be things that stimulate innovation or new ways of doing things.*

*37. Please tell us about and programmes, policies, regulations, laws or taxes which are helping the growth of the bioeconomy?*

There are a number of policies, regulations and financial instruments that have helped the growth of the bioeconomy for the resource and waste sector.

- Landfill diversion of biodegradable waste
- Separate collection of food as proposed in WRAP Framework for Greater Consistency in Household Recycling and A Food Waste Recycling Action Plan for England
- FITs and ROCs
- Use of by-products rather than waste descriptors
- Landfill tax driving waste material to other technologies further up the hierarchy
- PAS 100 and 110 – building confidence in use of biowaste derived materials
- End of waste.

*38. Please tell us about any new programmes, policies, regulations, laws or taxes that you would like to see introduced in order to help the growth of the bioeconomy. Please describe why growth in this sector would be positive and what impacts it might have on other sectors?*

The EU Circular Economy package (see question 43) includes important policy, such as landfill restrictions, which could drive biowaste use, rather than disposal or energy recovery.

Mandatory separation and separate collection of industrial, commercial and municipal biowaste has been varyingly introduced in Northern Ireland, Scotland and Wales but not in England. CIWM advocates a review of the efficiency and effectiveness of these programmes and for a similar approach to be adopted in England. Voluntary adoption of biowaste separation has led to wide variation in services and infrastructure across England and represents a feedstock barrier to greater development of anaerobic digestion capacity, for example.



There needs to be a review of the regulations controlling the application of material to land and is something that CIWM has been calling for, for some time. This will ensure a sustainable market is available for quality material, (see question 43, re fertilizer regulation and soil strategy).

*39. Please tell us about any programmes, policies, regulations, laws or taxes which are holding back growth of the bioeconomy?*

CIWM is aware of the current level of incentives causing unease in the resource and waste sector, this is for FITs, RHI and ROCs – all of which are distorting the market or not giving enough confidence for the investors.

Suspension of the Environment Agency 'End of Waste Panel' is also of concern. The definition of biomaterial as waste or non-waste is crucial as regulation of those materials as waste can make their use either unattractive or uneconomic. Government should support the continued operation of the Panel to support use of biowastes in land spreading.

There are intricacies in regulations that make it easy for the criminal element to operate or penalises good opportunities, making them less viable.

REACH is one of those useful but complicated regulations and it affects a number of sectors, not just resource and waste. Government needs to look at how REACH can be made to work easier.

*40. How could the government further assist collaboration or research cooperation between the public and private sectors?*

There needs to be an awareness of what collaboration or research cooperation is already available or how relevant it could be to this agenda in the waste and resources sector.

It might also be useful to undertake research to upgrade biowastes as process precursors and make full use of the benefit of demonstration projects.

*41. How could the government further assist the growth of the bioeconomy in a way that accounts for any impacts on other objectives?*

CIWM believes there is a real need to increase soil organic matter as this has the ability to impact on other objectives (see Q 17).



### **European issues**

*Whilst the UK's relationship with the EU is in the process of changing, we would still like to learn from our European neighbours, make best use of opportunities that exist and will continue to exist and grasp the new opportunities that will exist outside the EU.*

*42. Can you tell us about any European Union initiatives or programmes that affect your sector of the bioeconomy? Examples might include the Circular Economy package, the Horizon2020 Programme for Research and Innovation or other areas of EU funding.*

CIWM is aware of the potential for the Circular Economy package, funding through Horizon 2020 and LIFE+ projects in the Waste and Resource sector. Edoc and EQual are two LIFE+ projects that CIWM have been closely involved in. EQual was an electronic tool to allow checking for end of waste status, without going to the regulator, it did not confirm this status but it helped producers see if they could request and likely receive such a determination.

*43. Are there European Union laws or regulations which affect your sector in a positive way? If so, what are these laws or regulations, what is their impact, and would you like them to be kept for the UK after we leave the EU?*

EU policy and law has been the principal driver for development of the sector as a whole and biowaste in particular. For example the Landfill Directive has been a strong and consistent influence in driving biodegradable municipal waste (BMW) away from landfill and into a variety of treatment processes, including composting and anaerobic digestion. This has been backed by concepts such as the waste management hierarchy under the Waste Framework Directive. It is vital that the drivers and protections of this EU policy and law are kept for the UK once it is outside the EU.

An important review of waste and resources policy is underway in the EU – through development of the Circular Economy package. This will drive EU policy in this area for at least another 15 years and appears likely to strengthen policy objectives and controls in a range of issues – including landfill restrictions, increased municipal waste recycling targets, a mandatory biowaste collection target, and potentially food waste prevention plans for EU Member States.



The status of this package and its UK implementation by the end of the UK Article 50 exit process and the management of this law under the Great Repeal Bill is crucial. If the EU package is not adopted and maintained in the UK, the UK will need to implement its own policy in these areas. Failure to do so would leave the industry with no clear policy beyond current (usually 2020) targets and policy or - worse – lead to dilution of UK policy for biowaste to the detriment of the bio-economy and the advantages it will bring. For example, the UK or England could see their first increase in BMW landfill since the mid-1990s, with associated greenhouse gas emissions.

The EU Fertilizer Regulation will drive waste and waste derived material to the soil and in doing so sets quality criteria and acceptance of use on soils. CIWM welcomes this more measured approach as part of the optimising biowaste use in soils and again this is EU policy and regulation that should be protected in the UK.

CIWM was disappointed by the UK decision to veto the EU soil strategy. Soil management and enhancement will be an important part of an overall climate change reduction and adaptation strategy, taking into account all soil pressures, uses and protection. CIWM believes a soil strategy will still be a useful addition to policy, either as an EU or UK initiative.

*44. Are there European Union laws or regulations which affect the bioeconomy in a negative way unnecessarily? If so, what are these laws or regulations, what is their impact, and how could they be improved?*

A number of CIWM members have cited the Nitrates Directive as this limits organic N (but assumes that all organic N is readily available) in its application to land. There are good reasons for limiting the level of N to soil but all aspects need to be considered to gain the maximum benefit.

Agricultural policy should also encourage farmers to accept organic inputs. This needs to be addressed to ensure maximum benefit is gained from materials applied to land and generated under the bioeconomy.

*45. Where do you see the greatest UK bioeconomy opportunities that will arise outside of the European Union?*

Food waste prevention and management is a global issue and WRAPs Love Food Hate Waste has already been adopted in other countries. There is a market for UK expertise in this area, which should be capitalised on.



### **International issues**

*We aim to make the UK the most welcoming country for those researching or investing in the bioeconomy in a sustainable way; the 'go-to' nation for developing, implementing, and exporting sustainable solutions. In doing this we would like to learn from other countries around the world (as well as transnational bodies such as the European Union and the Organisation for Economic Cooperation and Development) where they have put in place specific strategies or other initiatives that support the bio-based industries.*

*46. Are you aware of any government policies or regulations in other countries that are more or less supportive to growth in the bioeconomy? If so, please outline:*

- *The countries;*
- *The policies; and*
- *Their impact or why they are particularly useful or beneficial.*

CIWM has insufficient information to comment on this.

*47. Are there any barriers to collaboration with organisations in other countries? If so, what are they?*

CIWM has insufficient information to comment on this.

*48. How does UK policy and funding environment compare with other countries?*

CIWM has insufficient information to comment on this.

*49. What is the degree of reliance on overseas supply chains (for example raw materials) in UK companies?*

With the exception of the recent rapid growth of RDF export from England, in particular, to other Northern EU member States biowaste is predominately contained in the UK. This is due to it being a high weight, low value product and EU neighbours also having well established markets. Import/export of biowaste derived precursors currently and in the future may be problematic as they are still likely to be classed as waste. Development of new standards/specifications will be required.

The impact of Brexit on UK biowaste-derived product import and export is unclear.



50. Please describe any trade problems you are aware of that are causing obstructions for imports or exports?

CIWM has insufficient information to comment on this.

*51. Are there global pressures such as changes in demand or supply that affect your sector?*

The price of artificial fertilizers is often driven by oil price and/or other energy sources which impacts greatly on the market for demand of bio-materials produced by the waste and resource sector.

The carbon benefit from use of composts and digestates is not currently valued. If carbon costs and benefits were internalised in fertiliser and soil conditioning products this would create a significant market pull on the outputs from biowaste management. WRAP have carried out some work in this area in the past.

### **Standards**

*National and supranational standards have been proven to catalyse innovation and fuel GDP growth (<http://www.bsigroup.com/en-GB/standards/benefits-of-usingstandards/research-reports/>). A number of standards have been developed, or are currently in development, that address specific aspects of the bioeconomy, e.g. biobased energy, bio-based products, bio plastics, circularity and resource management standards.*

*52. How do you think standards could be used to help promote growth in the bio-economy?*

Standards have worked well in the waste and resource sector, they have been developed for end of waste status for compost as well as anaerobic digestate. They give market confidence.

As noted in Q 49 standards are now needed for biowaste precursors for import/export purposes and for precursors into more conventional chemical processes.



53. *What types of standards are best suited to support the bioeconomy? For instance, these could be: Standards that define the concept and explain its relevance to individual organisations, sectors or product groups; standards establishing technical criteria for bio-based products; sustainability schemes and criteria for bio-based products.*

CIWM believes any standards are likely to need to be a mixture of concept and explanation as well technical criteria. See Q49 and 52.

### **Other questions**

54. *Are there any relevant work studies, case studies or reports that you would like us to be aware of? Please provide a link if you can.*

The following two links provide examples of anaerobic digestion outputs used as feedstock.

Paques – manufacture of PHB in AD plants <http://en.paques.nl/>

Natureworks – lactic acid from AD to produce PLA  
<http://www.natureworkslc.com/>

55. *Are there any other points on the subject of the bioeconomy that you would like to make?*

CIWM has no other comments to make.

