

Government Response to the House of Lords Science and Technology

Committee Report:

'Waste or Resource? Stimulating a bioeconomy'

Introduction

The Government thanks the Committee for its report on the opportunity to stimulate a bioeconomy from harnessing waste resources. The Government agrees that waste plays an important role as a potential feedstock in growing the bioeconomy, but also considers there are other feedstock that are as important, such as non-food crops, e.g. algae, agricultural residues and forestry residues.

We are pleased that the report recognises the important role played by the Government in incentivising higher value uses of waste, moving up the waste hierarchy and in developing and commercialising new technologies to enable the economic opportunities.

The Government, like the Committee, wants the UK to make the best use of waste resources from an economic, environmental and societal perspective.

The Government supports frequent waste collection and the recycling rewards schemes which reward and recognise those who reduce, reuse and recycle their waste.

The Government has a strong ambition to work towards a more sustainable and efficient approach to resource use and management of waste throughout society..

The Government agrees it has a role in supporting the development of the bioeconomy here in the UK, including by enabling a range uses for waste such as from industrial biotechnology, biofuels production, energy from waste and anaerobic digestion.

The Government agrees that there is likely to be unavoidable waste that can be transformed and used as a resource in a bioeconomy, alongside other feedstocks, creating economic returns and supporting jobs.

Government also agrees that there are environmental benefits from making use of waste as a resource. To that end, the Government will develop a long term plan for delivering and supporting a growing bioeconomy by early 2015.

We now turn to the specific recommendations in the report.

We recommend that a Minister in the Department for Business, Innovation and Skills (BIS) is given responsibility for the development of a waste-based, high value bioeconomy. The Minister should be a

champion for waste as a high value resource and should coordinate activities across Government. The Minister responsible should ensure the production of a long-term plan, with at least a 15 year horizon, to support the development of a high value waste-based bioeconomy. This plan should be produced by early 2015.

The Government will continue to work to ensure that there are clear, coherent and aligned activities on resource use and management. The Government does however accept that progress in stimulating the bioeconomy will be enhanced if there is a clear ministerial champion identified. The Department for Business Innovation and Skills will take this championing role led by the Minister of State for Business and Energy. A cross Government Steering Group will be established with industry and key stakeholders to coordinate the development and stimulation of a bioeconomy, for which waste will form a potentially important feedstock. Through this Steering Group, the Government will ensure the engagement and participation of other Government Departments who own and manage a range of levers relevant to this opportunity, such as the Department for Environment, Food and Rural Affairs who lead on resource and waste management.

In developing a long-term plan for a high value waste-based bioeconomy, we recommend that the Department for Business, Innovation and Skills examines the strategies used by other countries to extract maximum value from waste, both successes and failures, and identifies approaches which would afford the UK the greatest economic opportunity.

Government agrees that there is merit in building a better understanding of international best practice and will, led by the Department for Business, Innovation and Skills, review readily available studies, coordinate respective sources of data and, if required, commission some further analysis as part of the evidence gathering and the production of a long term plan.

We believe that it is important that there is a shift from funding energy projects towards projects focusing on the development of higher value products. While we do not recommend that a specific funding stream is opened to ensure that the challenges of using waste as a feedstock are thoroughly researched, we would hope that the Research Councils and the TSB are alive to the burgeoning opportunities which we set out in this report. The two areas—waste and the bioeconomy—need to be brought together effectively if the UK is to succeed in exploiting this opportunity.

We therefore recommend that the Research Councils and the Technology Strategy Board should collaborate to ensure that the funding environment nurtures research on extracting high value from waste and developing a bioeconomy in the UK.

The Government is pleased that the Committee noted the important development steps now underway to create a new Industrial Biotechnology Catalyst. The Committee has noted that the Catalyst is co-funded by BBSRC, TSB and the EPSRC and has welcomed the plans to allocate £45 million of funding to multidisciplinary research and development projects in industrial biotechnology. This new Catalyst is intended to accelerate the translation of Research Council-funded research into commercial products and processes. This is an important development in terms of maximising the potential of industrial biotechnology as a whole and we welcome this investment.

The Government recognises the need for a collaborative dialogue and this is being established between Research Councils and the Technology Strategy Board (TSB) for a coordinated approach to funding research in this area. Hence, these mechanisms are in place and are currently working. This is evidenced by programmes like the Industrial Biotechnology Catalyst. The Department for Business, Innovation and Skills undertakes to continue to facilitate these with delivery partners. This includes through the Industrial Biotechnology Leadership Forum, where Industry sit down with a range of delivery stakeholders including the TSB and the BBSRC to coordinate the development landscape.

BBSRC has also recognised in its strategy the potential opportunities that lie in the use of alternative feedstocks, including municipal waste, syngas, and industrial waste such as CO₂, and approaches that integrate thermochemical and biological waste conversion technologies. BBSRC proposes to focus on research underpinning biopharmaceutical production and manufacture, building on the investment and expertise from the Bioprocessing Research Industry Club (BRIC).

With its strong science base the UK is well placed to be a world-leader in industrial biotechnology and bioenergy research, with benefits not only in generating high quality 'green' products and services, but also boosting the economy through the manufacture of biorenewable products as attractive alternatives to petrochemical products. This research will also benefit from international collaboration. One illustration of this potential is research by the University of York, University of Portsmouth, and the US National Renewable Energy Laboratory leading to the discovery of a new enzyme, used by tiny marine wood-borers called 'gribble' to break down wood, that could help inform the development of industrial processes to turn waste materials, such as paper, scrap wood and straw, into liquid fuel.

Further insights into the conversion of waste into useful products such as chemicals and biofuels should also emerge from the UK's research and development of synthetic biology (SynBio). This has benefitted from recent investments by the Government through the Research Councils (mainly BBSRC, EPSRC, MRC and ESRC) to implement the recommendations of the UK's published SynBio Roadmap. The result has been £40 million funding for three SynBio research centres at the University of Bristol, University of Nottingham and the University of Cambridge/John Innes Centre announced in

January 2014 by Minister for Universities and Science David Willetts. In April the Minister further announced at SynBioBeta an additional £10 million for five DNA synthesis centres at Imperial College, the University of Edinburgh, University of Liverpool, MRC's Laboratory of Molecular Biology, the Norwich Research Park and Imperial College London. Imperial College is also home to both SynbiCITE the TSB funded SynBio Innovation and Knowledge Centre and the EPSRC funded Centre for Synthetic Biology and Innovation. Doctoral Training centres at UCL and the Universities of Oxford, Bristol and Warwick will help to develop the next generation of industrial and academic leaders in SynBio and industrial biotechnology. Hence, the underpinning infrastructure for SynBio research able to advance the development of technologies that can utilise waste in the bioeconomy is being established. Industry will be encouraged to access and utilise this national network of research infrastructure and to commercially translate the results of SynBio research.

It is also important to note that some fundamental research into the conversion of waste to useful products such as fuel already is being commercially pursued. In the UK some small start-ups such as Biosyntha are seeking to commercialise research findings to convert waste gases and municipal waste into useful biofuels and chemicals.

We recommend that the Department for Business, Innovation and Skills takes steps to ensure that information on both domestic and non-domestic waste streams is collated in a way which enables it to be used as a resource. Information on sources of waste, quantities, composition, location and changes over time needs to be made available in a way which allows industry to make informed investment decisions on how to extract maximum value from waste resources. Industry needs to engage with the Department for Business, Innovation and Skills as a matter of urgency to agree ways in which this can be achieved for non-domestic waste streams. A clear owner needs to be identified to collate, and make available, such holistic information on waste as a resource. This may be an evolution of the functions of the Waste and Resources Action Programme (WRAP). The Department for Business, Innovation and Skills should draw upon this improved information in producing the long-term plan for a high value waste based bioeconomy.

The Government remains committed to making the data it holds publicly available where possible in a manner that makes it useable for others, including information on waste. The Government's commitment in the 2011 Waste Review to look at reducing the response burden of WasteDataFlow is on-going. Until decisions have been taken on the review of the Waste Framework Directive we cannot be certain about how WasteDataFlow will need to adapt to reflect them. We need to ensure we retain the ability to monitor our progress against legal targets, and equally importantly, continue to realise the added value benefits of the data as an open, transparent national resource for local authorities, the wider waste community and the public. We agree that it would be good if others who hold relevant data could also make it available, recognising though that in many cases this will be difficult because of intellectual property rights and commercial sensitivities.

The Government will continue to work with WRAP in the first instance to understand what is possible, and consider options for how it can be taken forward and can contribute to production of a long-term plan for growing the bioeconomy.

Improved waste data capture will need to be consistent with the waste hierarchy, encompassing reuse and re-manufacture as well as the higher value recycling processes. Government is already working on developing a suite of metrics to help monitor progress on waste prevention to enable a consistent measurement as committed to in the Waste Prevention Programme for England published in December 2013. The Government will continue to work with industry to ensure that any further work on measurement of waste streams, including environmental or economic benefits, are aligned with – and build on – these existing activities.

We recommend that the Department for Business Innovation and Skills takes steps to ensure that consistent approaches to whole systems analysis are adopted to ensure that the environmental impacts of processes and products can be compared effectively.

The Government understands that there is a range of different uses for waste and that there may be competition between available waste resources for different processes including anaerobic digestion, energy production, biofuels production, and the manufacture of high value chemicals. In developing a plan to realise a bioeconomy. The Government will need to work with industry and independent institutions to build a clearer, shared holistic understanding of the whole system for waste and other feedstocks.

The Department for Business, Innovation and Skills, in developing a long-term plan for a high value waste-based bioeconomy, should ensure that waste is collected in such a way as to enable it to contribute fully to a high value waste-based bioeconomy. To this end, we recommend that the Department for Environment, Food and Rural Affairs and the Department for Communities and Local Government adopt a far more ambitious approach to waste collection in order to ensure that waste is collected and treated in a way that maximises the potential for it to be used as a resource. To enable this, we recommend that local authorities are offered further guidance to enable them to put in place waste collection facilities, and make planning decisions on waste infrastructure, which maximise the value which can be extracted from waste. We recommend that a long-term policy goal should be the creation of a more standardised system of waste collection across local authorities which views waste as a valuable resource.

The Government considers that the way that domestic waste is collected is a local matter for local councils and they will wish to listen to their residents. The Government has stated that collection arrangements should be easy to use, cost effective and help the environment by enabling waste to be recycled and

reused. The provision of clear and easy to understand information should be part of those arrangements.

The UK has made tremendous progress in recycling over the last 10 years and we remain committed to meeting our statutory requirement to recycle at least 50% of household waste by 2020, which contributes to delivering a high value bioeconomy. The Government is clear on the importance of providing a high quality, regular and convenient waste management service to households. We will continue to work with local authorities and industry to promote good practice and look at how recycling can be made more convenient for residents. However, the Government recognises the wide variation of collection processes across local authority boundaries today makes this standardisation problematic.

The Government is not in favour of issuing new guidance unless there is a clear and immediate issue that needs to be tackled. However, we note that there are existing support tools that local authorities can use to aid decision making. For example, WRAP provide data and research findings to help local authorities make decisions on collection systems. WRAP also provide information on AD feedstocks, and is running demonstration projects on food waste collections from business to help new service providers design effective collection services to the sector.

Delivery of the Government's ambition requires a network of facilities of a range of different types and sizes. The planning system is pivotal to the adequate and timely provision of properly located new waste facilities to meet local and national waste needs. National planning policy on waste provides a positive framework to drive waste management up the waste hierarchy, addressing waste as a resource and looking at disposal as the last option (although one which must be catered for), and ensuring that the design and layout of new non-waste development supports sustainable waste management (including provisions of appropriate waste storage). However, the Government believes that local authorities are best-placed to decide on the most appropriate strategy for managing waste in their area and ensure that sufficient waste management facilities are in place. The Government is currently updating national planning policy to ensure that it is properly aligned to Government and wider European obligations.

We agree that it must make sense, both environmentally and for UK businesses, for policy and regulation to be directed, if at all possible, at ensuring that UK waste is treated and converted in the UK. As we were drafting this report, the Government acknowledged concerns about the growing export market in RDF:

“We are aware of concerns about the recent increase in exports of refuse-derived fuel and its effect on gate fees in the UK. We intend to publish a call for evidence shortly that will seek evidence on the market

for refuse-derived fuel and the extent to which a market failure might exist. This will enable us to assess the effect of increased exports on the UK market for refuse-derived fuel, including its impact on gate fees.”

We look forward to this consultation and recommend that the Department for Business, Innovation and Skills, in developing a long-term plan for a high value waste-based bioeconomy, takes its findings into account.

The Government published a Call for Evidence on the Refuse Derived Fuel (RDF) market in England on 12 March. The Call asks for evidence on whether there is a case for Government action to ensure that the waste hierarchy is respected and, if so, the form this might take. The closing date for responses is the 9th May 2014 and the evidence received will then be analysed with a view to making a decision on the way forward and feed into the development of a long term plan for the bioeconomy.

[https://www.gov.uk/government/consultations/refuse-derived-fuel-market-in-england-call-for-evidence.](https://www.gov.uk/government/consultations/refuse-derived-fuel-market-in-england-call-for-evidence))

We recommend that the Department for Business, Innovation and Skills (BIS) ensures that sufficient funding is given to knowledge transfer and near market research and that there is adequate capacity in demonstration facilities across the UK. In particular, BIS should regularly review whether the capacity of the High Value Manufacturing Catapult continues to be sufficient to support projects, particularly at later Technology Readiness Levels. In addition, we note that the Green Investment Bank has made a promising start in helping to reduce the risk of high capital intensive projects. To this end, we recommend that successive Governments support its mission.

The Government recognises the importance of funding for knowledge transfer and near market research for the effective stimulation of commercial adoption and economic growth. Indeed the need for this funding is not unique to the topic considered by this inquiry.

Through the Catapult network the Government has increased the UK's capacity to accelerate the commercialisation of technology products at later Technology Readiness Levels than other Research Council and Technology Strategy Board support. Investment in the Catapult network has been increased through recent fiscal events, with £38m for the National Biologics Manufacturing Centre as part of the Centre for Process Innovation (CPI) in Autumn Statement 12 and further increase in CPI's capability through the investment in Graphene provided in Budget 14.

The Government acknowledges the need to regularly review the scope, capacity and effectiveness of the Catapult network, including the High Value Manufacturing Catapult. To that end, the Government has commissioned Hermann Hauser to carry out exactly this kind of review. This will report in the autumn aligned with the Government's Science and Innovation Strategy.

The Government welcomes the Committee's support for the Green Investment Bank and the recommendation made that successive Governments should support its mission.

We recommend that the Department for Business, Innovation and Skills, in producing a long-term plan for a high value waste-based bioeconomy, reassesses the current approach of providing incentives to support specific sectors. The approach to the taxation and incentive structure should focus on providing policy stability, ameliorating market distortions and not inhibiting the extraction of high value from waste.

The Government shares the view of the Committee that the role of incentives and the approach to taxation will influence and shape the way that the bioeconomy develops. In producing the long-term plan the Government will facilitate engagement with Industry to consider how best to provide policy stability, ameliorate market distortions and not inhibit the environmentally-sound extraction of high value from waste.