

Senior policy analyst Dr Ben Allen, of the Institute for European Environmental Policy (IEEP), outlines the advantages of moving towards a circular bioeconomy in Europe

A step further

BY 2030, we will require two planets' worth of resources in order to keep pace with our current lifestyle. Estimates suggest that it now takes the Earth one year and six months to regenerate what we use in just one year. We are living beyond our means and either we act now or risk undermining the resources on which society depends.

The circular economy is a system which promotes the reuse, repair, refurbishing, remanufacture and recycling of existing materials and products. At its heart is the transformative idea that growth can be decoupled from resource extraction, and waste can be utilised for both economic benefit and environmental good.

It is this vision that is guiding the European Commission's thinking around improved resource-efficiency and increased jobs, growth and investment, but Dr Ben Allen, senior policy analyst at the Institute for European Environmental Policy (IEEP), wants to go a step further. He's calling for a transition towards a circular bioeconomy, a move that will see the traditional circular economy and bioeconomy models integrated together and one where the production and utilisation of renewable bioresources and their conversion into value added products is part of a circular system, which he here outlines to Portal.

What do you see as the advantages in integrating the bio and circular economies?

It's clear to me from the research that I've been involved in, and having looked at this through the bioenergy lens, that there is a risk that

bioeconomies are not developing in the most sustainable way for the long term. I think there is also some confusion between the two concepts and some people use the terms interchangeably. The reason for this is not so easy to explain without a pencil and a very large piece of paper. There is a perception that because the bioeconomy is based on biological resources, and those resources can be regrown, the bioeconomy is renewable, or circular by default. For example, paper is made from trees, trees regrow, and thus there's some circularity or renewability inherent in this process. Whilst there's undoubtedly an element of truth to that, it is still possible to use biological resources faster than they can be reproduced, and as such the bioeconomy can be functionally quite linear in practice, even if circular in principle.

The circular economy, on the other hand, covers all resources, not just biological ones, and is about taking the outputs or waste from one process or system and either feeding them back into the beginning of that same system or using them in another; essentially, it's about utilising resources and waste more efficiently by closing loops within systems. Discussions and initiatives around the circular economy centre on electronics, minerals, and metals, and not so much biological resources, such as trees, timber, or food waste. So whilst there is potentially some overlap between the two concepts, they are at the moment two quite different things.

The confusion between the two – that assumption that the bioeconomy is by default circular – will become an issue if demands to move away from fossil resources and towards biological resources grow and we don't work within sustainable limits, i.e. maintain the functionality of biological systems to renew the resources that we are using. It's already an issue in that the two concepts have become



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shorthand for so many things that it's easy to lose focus on your original objectives. It's important to keep asking yourself: what do we actually want to do and what is the best way we can achieve this?

The reason I get excited about the idea of integrating the two concepts is that for me they are two halves of the same picture. As a society we need to transition away from using fossil and other finite resources and towards an economy based on bioresources and biological systems. In order to do this sustainably we limit the pressure on natural resources by being as resource efficient as possible, re-using wastes and embedding circularity within the bioeconomy. That is where the circular economy comes in.

What do you think about the Commission's new Circular Economy Package?

Encouragingly, the new Circular Economy Package includes a section on food waste and one on biomass and bio-based products. They draw particular attention to the fact that the use of biological resources requires attention to sustainable sourcing and lifecycle impacts and that the Commission will examine the contribution that the bioeconomy strategy (COM(2012)60) can make to the circular economy. This is really encouraging, but I think we also need to turn that question around and ask, what can the circular economy do for the bioeconomy?

Today we have a real opportunity, especially with the circular economy so high on the political agenda, to try and make our approach to resource use more sustainable from the beginning. We have learnt from the past that it's an awful lot harder to try and make changes or turn these things around later on, especially when a number of strategies or incentives and investments are already in place. For example, we've seen already some of the unintended impacts of promoting elements of the bioeconomy without taking a more holistic view of resource use and embedding the ideas of circularity, such as the development of biofuels and bioenergy policy and the impact of indirect land use changes and carbon debt. Of course, we can't expect to foresee all the potential outcomes, but some of these problems could have been to some extent avoided if we had



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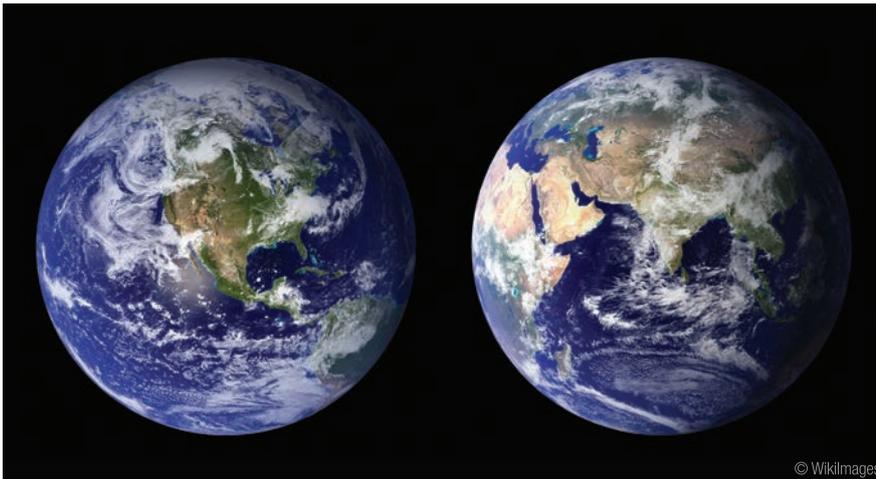
taken a more circular approach to developing that particular aspect of the bioeconomy.

Furthermore, other potential negative outcomes can be avoided if one takes a lifecycle approach to products. For example when it comes to plastic bags that are a major source of marine litter, there are arguments that biodegradable plastic can help. Looking at the lifecycle and the pathway of impacts will quickly show that biodegradability does not avoid many of the impacts of marine litter (e.g. on entanglement of species or ingestion). This then helps underline the need to find more effective solutions rather than going with the one that at first sight looks promising.

How useful are frameworks like the Common Agricultural Policy (CAP), Roadmap to a Resource-Efficient Europe, and EIP-AGRI in this discussion?

They can be really useful and there are already many tools in place that have the potential to help in the transition to a circular bioeconomy. The European Innovation Partnership (EIP) model –and for agriculture, in particular, the EIP-AGRI network –is a useful tool for facilitating innovation and collaboration, and has already started work in this area. The European Network for Rural Development is focusing on research, understanding, educating, and bringing together different practitioners, and there are also more specific measures, such as support through the CAP for encouraging co-operation between farmers and foresters, creating producer groups and so on.

Ultimately, we want to improve resource efficiency, reduce environmental pressures, increase growth and create jobs. Finding that balance, and



using the right tools in the right way, will be key to getting the circular bioeconomy off the ground and working. That may require more guidance and a different framework than we have, at least in the beginning.

Do you think there are enough incentives in place to try and promote this more circular, more resource efficient way of doing things within industry?

In general I don't think there is a sufficient incentive at the moment to encourage industries to move towards more circular activities. Some of this might come out of the Circular Economy Package discussions and how the proposed changes to waste and fertiliser legislation are implemented in practice. What we need to do is understand better the interplay between the current subsidies and incentives that are in operation, such as those for renewable energy deployment, and how these can help or hinder a move to a more circular approach.

There are all sorts of different approaches that can be used to promote the circular economy. IEEP was part of a consortium that carried out the research into identifying potential circular economy actions, priority sectors, material flows and value chains which fed into the reflections on the first Circular Economy Package. This identified a range of different tools that could be used to help industry in the transition, such as encouraging industry to take products back and reuse/remanufacture them. In fact there are already extended producer responsibility requirements for certain products, but they operate differently for different member states. I think expanding the scope of some of these activities could be hugely beneficial, but the variation between member states, products and sectors will be an important factor in getting the balance right.

Consumers also have a big role to play in this. Much of the linear economy is driven by consumer choice and our constant desire for new and novel things. The classic example is the mobile phone. Every one or two years a new one comes out and we're encouraged to upgrade, making the old one redundant. Those old phones either may or may not be recycled. Elements of circularity haven't yet been built into that process. Part of changing that will be about improving awareness and understanding so people can make more informed choices. As an example we already have fairly well-developed paper, glass and metal recycling communication. Most people will recognise the recycling logo, and some make informed choices about buying recycled products, such as paper. Expanding this thinking to other materials and products, and

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raising awareness about the impact of disposing of things that could be recycled or reused is going to be important. The linear model is also part driven by our own habits, whether in using single use plastic bag packaging, purchasing beverages in plastic bottles, or in our waste disposal practices – i.e. whether we selectively dispose of our waste that facilitates reuse and recycling.

Is enough attention being paid, then, to industry needs?

This comes back to some extent to broader questions around the resources and types of materials that different sectors need. Ultimately, businesses are going to look at the cost of manufacturing a particular product and the consistency of their input materials. Take agriculture as an example: at the moment it's often cheaper and easier to buy good quality chemical fertiliser tailored to your farm's needs than it is to produce your own. In some cases farmers might not have the ability to generate their own fertilisers, especially if they don't have livestock. It's the same with many of the manufacturing sectors: they can buy very clean, compatible input materials for their various processes, whereas recycling those same components would at the moment take more time and effort, it may cost more, and there are concerns over quality. Of course, this just reflects the state of the situation at the moment; over time the establishment of standards, supply chains and connecting organisations together can help to overcome some of these barriers.

There are already some examples of companies joining up in situations where their waste is another's input. A good example is medium-density fibreboard (MDF), a wood used in construction and produced from sawdust, generally a very cheap resource produced at sawmills. A whole industry has now been set up around what would once have been considered a waste product, driven in part by the relatively low cost and high availability of the resource.

Over time, costs for recycling and reusing other materials will come down as processes become more efficient or as industry is required to use recycled materials – or even because of new business models and consumers making different choices – and that will then start to



create the conditions whereby companies either work together or begin to promote more circular economy actions within their own organisations. But at the moment, the cost and effort required to improve circular activities are quite high and the different sectors or industries aren't necessarily working well enough together as they might.

Finally, how will IEEP contribute to and inform this discussion?

IEEP is an independent research organisation that focuses on all aspects of environmental policy, from forestry to bioenergy, waste to environmental governance, climate to biodiversity. Our role is to contribute to an environmentally sustainable Europe through the analysis and development of policy, and the dissemination of research.

We are working on a variety of projects and initiatives that can help to encourage elements of the circular economy and improve the sustainability of the bioeconomy. We have just finished supporting the EIP-AGRI on the contribution of agriculture and forestry to the circular economy. Earlier in the year we helped to support the UK Government in developing its approach to a waste-based bioeconomy. At the moment we are working with the European Commission on a project on the cascading use of wood, which is very much

The bioeconomy is assumed circular by default: paper is made from trees, trees regrow, etc. But, actually, the bioeconomy can still be quite linear in nature

linked to the circular economy, and we are leading the policy analysis on a study looking at the resource-efficient use of biomass, also for the Commission. We are also looking at the link between marine plastic litter and options for circular economy solutions to keep the value of plastic in the economy, and plastic out of our seas. We are also just starting some work on the role of market-based instruments for a circular economy as part of a wider project on green fiscal reform. Furthermore, we are part of a group of organisations – think tanks and progressive business – looking to encourage suitable circular economy measures and their implementation.

We're one of five organisations managing the Contact Point of the European Network for Rural Development, which works to increase the involvement of all stakeholders (in particular in agriculture, forestry and rural development) in the implementation of the EU rural development policy; to improve the quality of rural development programmes; and to play a role in informing the broader public on the benefits of rural development policy. More specifically, we're working as part of its thematic group on 'promoting the transition to a green economy', which aims to identify practical and proactive ways to support a transition to a more sustainable green economy in rural areas using rural development tools, as well as supporting the use of energy and resource-efficient investments to stimulate jobs and growth.

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