THINKFOREST

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Bioeconomy can tackle society's grand challenges

European Forest Institute, ThinkForest seminar, 7 June, 2016, Helsinki

We are living a time of accelerated changes and unprecedented global challenges: climate change, water, food and energy security, globalisation, migration and loss of biodiversity. All these challenges are interrelated, one way or another, to the defining issue of our time: how to decouple economic growth from environmental and social degradation.

But the 21st century is also an era of grand opportunities. The bioeconomy is one of them.
Decoupling growth from environmental degradation requires a major shift: a shift towards a low-carbon, renewable and resource-efficient society and a sustainable economy. This transformative change can be triggered by the bioeconomy, which uses science and technology to sustainably produce and transform renewable biological resources into food, feed, bio-based products and bioenergy, as well as services related to products and forests.

The bioeconomy can catalyse social, technological, and economic transformation towards inclusive, smart and sustainable growth. Three main reasons explain its potential. First, it creates new bioproducts that can outperform and replace fossil-based products and enhance the move to a low carbon economy. Rapid advances in bioscience, biotechnology and biorefineries mean that basically everything that can be made out of oil can also be made from renewable biological resources. Second, the bioeconomy supports new jobs in rural and urban areas, and third it enhances resource efficiency and security.

A good example can be found in the construction sector, which in Europe represents 42 percent of energy consumption, 50 percent of material use, 33 percent of waste and 35 percent of CO_2 emissions. New wood engineering products (for example cross-laminated timber modules) are now triggering a true revolution in wood construction. Architects call it the 'beginning of the timber age'. The mechanical properties of these new wood products mean multi-storey wood-frame buildings of up to 40 storeys can be created using industrial prefabrication methods. It is a new way of building which results in less use of materials, less waste generation, faster building times, can reduce costs, and implies moving from demolition to deconstruction once the building ends its life. Wood construction also has substantial potential to reduce carbon emissions and primary energy use during the life cycle of the building.

Many examples of bio-based products performing better in many respects compared to fossil-based products can be found in chemicals, food ingredients, bioplastics and composites, pharmaceuticals,

textiles or bioenergy. For example, wood pulp can be used for textiles instead of synthetic fabrics made from fossil raw materials, such as polyester, acrylic and nylon. In addition, the wood pulping process generates things like tall oil and lignin as side streams which can be used for biofuels and biochemicals.

The niche for the bioeconomy is clear. But there is an urgent need for it to become the norm if we want to address the unprecedented environmental challenges we are confronted with. However, the bioeconomy has a major obstacle to its development. This obstacle is the privileged position that the fossil-based economy enjoys. The major environmental costs that it generates are not captured by the markets in any way, and in many cases it benefits from different types of subsidies.

In such an operating framework, the development of the bioeconomy cannot be left only to the markets and technology. It requires political leadership, vision and strategic actions.

In our opinion, three strategic policy developments are required to develop Europe's bioeconomy:

A global carbon price. This would create a global incentive for fossil-based industries to move towards low-carbon alternatives. Carbon pricing mechanisms, either through fees, taxes, or cap and trade systems, will have incredible benefits for the development of the bioeconomy.

A long-term, predictable and coherent bioeconomy policy framework. This should be rooted in the principles of sustainability, resource efficiency and diversity to counteract current regulatory and market failures to ensure a level playing field for different uses of biomass. This framework should provide the necessary incentives and regulations to support the expansion of new markets and attract investments to move the bioeconomy from 'niche to norm'.

Closer communication with society. We need open, transparent and participatory approaches to explain the limits, benefits and characteristics of new processes and bioproducts, including new standards, labelling, etc. Potential concerns regarding sustainability, including trade-offs with biodiversity and implications for food and water security should be addressed and explained at an early stage to avoid misperceptions. The negative environmental and food price issues that were created with the development of the first generation of biofuels a decade ago gives a lesson in how not to start bioeconomy development now. It has to be sustainable, not only in rhetoric, but in action.

The bioeconomy has now gained momentum. The G7 summit held in June 2015 under German Presidency recognized the importance of the bioeconomy to increase industry's competitive capacity and foster environmental and climate protection. In November 2015, Berlin hosted the first Global Bioeconomy Summit which brought together business, politics and science to discuss for the first time the challenges and opportunities of a worldwide bioeconomy.

It is time to enter a new era. The bioeconomy offers us the opportunity to move towards smart, sustainable and inclusive growth. It can help to address some of the most complicated, unprecedented challenges of our time. This is a unique opportunity which needs to be taken.