

The Bioeconomy Creates New Jobs and Opens up New Areas of Business

The bioeconomy cluster in central Germany is focusing on the sustainable use of biomass

“Thinking in bioeconomic terms means understanding the cycles of the natural world and using them in an environmentally friendly, resource-efficient way,” says Matthias Zscheile. More than ten years ago, he was one of the founding members of BioEconomy Cluster e.V. in central Germany and is now head of the cluster management team. The cluster sees its core task as being the development and application of technologies for the sustainable use of biobased raw materials and, in particular, wood.

Jetty number 5 on the Saalepromenade, which runs along the bank of the river in the city of Halle in Saxony-Anhalt, has been occupied since mid-June. The new attraction is Germany's first citizen research ship, the *Make Science Halle*, which is moored here under the bioeconomy flag. Simon Grambau welcomes visitors with a drink made from algae. He is a member of the Science2public organization, which operates the research ship and is funded by the German Federal Ministry of Education and Research, the state of Saxony-Anhalt and the Fraunhofer-Gesellschaft during the German Science Year 2020/21. Grambau and other students from the four partner universities on the river Saale are running research stations and events to promote active participation in research with the overarching theme of the “blue bioeconomy.” In addition, the citizen research is finding its way into students' papers at Merseburg and Anhalt Universities of Applied Sciences, Burg Giebichenstein University of Art and Design and Martin Luther University Halle-Wittenberg.

New storage technologies for wood

As Matthias Zscheile explains, the ship confirms his view that the future bioeconomy needs completely new types of jobs. Zscheile is a professor at the faculty for wood technology and construction at Rosenheim Technical University of Applied Sciences. He was born in Saxony-Anhalt and grew up at his family's sawmill in Stolberg in the Südharz region. When he drives through this area now, he sees large quantities of felled timber waiting by the side of the road to be taken away. “We need new technologies that allow us to store wood for long periods without it deteriorating,” he explains and goes on to say that using the very latest processes wood can be transformed into completely new and innovative products. Zscheile believes that the forward-looking bioeconomy sector has the potential to be highly innovative. Around 60 partners are currently networked in the central German bioeconomy cluster, such as the Mercer Stendal cellulose plant, the sugar company Südzucker AG, DOMO Chemicals in Leuna and the film manufacturer Wolfen GmbH. Some of the young companies that belong to the organization include timura Holzmanufaktur, a timber merchant in Rottleberode, and the greentech company C3 Technologies in Halle an der Saale. The partners from the academic world and the field of research are Martin Luther University Halle-Wittenberg, the Fraunhofer-Gesellschaft, the German Biomass Research Center (DBFZ) in Leipzig, the Helmholtz-Center for Environmental Research (UFZ), the Technical University of Dresden and Rosenheim Technical University of Applied Sciences. All of the partners aim to make central Germany into a European model region for the bioeconomy.

Pilot projects and demonstration plants

According to Matthias Zscheile, the bioeconomy is a future area of the national economy consisting of all the sectors that process biological resources and make sustainable use of them. Saxony-Anhalt has a wide range of industries that fall into this category. These include the production of chemicals, plastics, paper and cellulose, agriculture, forestry and energy, plus machinery manufacturing, plant construction and logistics. All of these could come together to create a bioeconomic value-added chain covering all the industries. Zscheile is also aware that it is not easy for small and medium-sized businesses to combine bioeconomic thinking and action. “This is why we are setting up pilot projects and demonstration plants that clearly show that the sustainable bioeconomy can open up new profitable areas of business,” says Zscheile and specifically mentions support for start-ups that are developing a basic bioeconomic concept and aiming to industrialize it.

The technological competencies of the bioeconomy cluster include processing basic chemicals. At a demonstration plant in Leuna, partners from research and industry have the opportunity to develop biotechnological and chemical processes that will turn renewable raw materials into market-ready products.

The cluster is also focusing on the processing and use of wood as a raw material. A bioeconomy hub is being set up in Leuna to develop and demonstrate a range of biorefining processes that enable basic chemicals to be extracted from wood, for example. The HyAlt4Chem project is developing an industrial hydrolysis process for waste wood that will convert the polysaccharides into fermentation sugar. This basic material can be used to produce high-quality chemicals for the manufacture of bioplastics.

Matthias Zscheile predicts that the bioeconomy will be a promising route toward structural change in particular for the Mansfeld-Südharz region, which has been hard hit by the phase-out of coal. The future potential of wood as a raw material could help to preserve existing jobs in the area and create new ones. A “Future Wood” innovation hub will be established in Südharz with the aim of providing wide-ranging support for small and medium-sized wood processing firms in Saxony-Anhalt.

EU regions develop a bioeconomy strategy

Torsten Schmidt-Baum from the German Biomass Research Center (DBFZ) in Leipzig confirms what Matthias Zscheile has said. As part of the European POWER4BIO project, the DBFZ is working with partner regions to develop concepts for their structural transition to bioeconomy regions. “We are developing methods and guidelines for the technical training of the players in the region. In addition, we are supporting the development of a regional bioeconomy strategy and knowledge transfer across regional boundaries,” says Schmidt-Baum. He also mentions a catalog of sustainable business models. For example, milk fiber can be produced from unused milk in order to manufacture sanitary paper, bags and clothing. Whey can be used to make a bioplastic for disposable plastic bags.

The regions that currently form part of the European network include central Germany and Bavaria, plus Andalusia, Mazovia, Flanders, South Bohemia and various areas of Italy. Schmidt-Baum confirms that Saxony-Anhalt has the ideal conditions for opening up new markets for biomass. With his expert eye, he has identified the potential for examples of best practices on the research ship. A green substance bubbles in the algae reactors. Microalgae offer multiple opportunities: they can be used as the basis for fuels and other materials and for foods with a high vitamin content. Simon Grambau describes the cooperation with the Competence Center Algal Biotechnology at the Anhalt University of Applied Sciences, and Torsten Schmidt-Baum sees a rich source of new business models opening up.

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Bioeconomy hub Saxony-Anhalt

On July 3 the Bundestag and Bundesrat, the lower and upper houses of the German parliament, passed the acts on the phase-out of coal and on the structural reinforcement of the regions affected by the phase-out of coal. One of the most important projects in Saxony-Anhalt is the creation of a bioeconomy hub as a center for sustainable chemical production in central Germany.

BioEconomy e. V. and the state chancellery of Saxony-Anhalt had already launched a project to establish the bioeconomy model region and the bioeconomy hub as the central node of the bioeconomy in Leuna. The passing of the structural reinforcement act has laid the foundations for developing the economy of central Germany, according to the members of the cluster.

The planned bioeconomy hub will provide industrial facilities and staff for the project-based implementation of biotechnical processes on an industrial site. Start-ups and young companies from the bioeconomy will be helped to open up new markets and develop technologies ready for industrial production.

Sustainable economic growth requires the responsible use of resources. This is a reality in Saxony-Anhalt: more than half of gross electricity production comes from renewable sources of energy.

> Learn more about bioeconomy in Saxony-Anhalt and the strength of Saxony-Anhalt as a location for bioeconomy.

22.07.2020

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