

Adult education in Germany

The way forward

Technical specifications document

This document presents findings on opportunities for advancement in the bioeconomy sector in Germany, highlighting the needs for skills, existing education, gaps and needs in promoting education. It also includes 3 relevant case studies collected from the country.



Opportunities for Advancement

Sustainable Construction Industry & Wood Processing

Enhanced production of chemicals, smart textiles and new materials in the construction industry; focus on more regional and more sustainable value chains; exploitation of production potential in wood, land and water resources; utilization of multifunctional nature of the forestry that provides amount of biomass, biomaterials and bioproducts; utilization of wood biomass for the production of energy; use of smart technologies in forestry as well as in the related paper industry.

Smart Agriculture & Food Industry

Processing the plants which are rich of proteins (e.g. lentils) to improve the protein intake in nutrition; using new technologies of mechanical, chemical and energy processing of agricultural and forest biomass.

Green Technologies & Renewable Energy

Enhanced use of green innovations and new technologies in energy storage, grid management, and clean energy production, utilizing resources like solar, wind and biomass; foster of local sourcing to reduce supply chain risks.

Innovative Entrepreneurship and Research

Utilization of advanced education and research at the higher education and research institutions in the country; continuing support for setting up innovative labs (e.g. research centre Jülich); attracting the interest of private investors through dedicated Institutions and calls; further exploitation of the developed digital background.

Needs for Skills

On educational/academic level

Due to its economic potential and geographical role, Germany may be considered as the leading force of bioeconomy in Europe – however, this still needs to be better expanded into the country's education sector.

On private sector level

Skills most urgently needed are trainings in the fields of chemistry, agriculture, biology, process technology, economy and information technology; making the adult learning and LLL programs more accessible with multidisciplinary approach.

On governmental level

Harmonization of policies/governance mechanisms throughout all educational levels. Although the country has a National Bioeconomy Strategy (the first national bioeconomy strategy in Europe), in parallel it has developed at least three more Regional Strategies, each of them with local particularities and specificities.

Existing Education

Higher education:

Many courses related to bioeconomy knowledge fields can be found at universities and technical colleges in the country; there is the Bioeconomy Council to draft and implement an internationally competitive strategy for a knowledge-based bioeconomy; there are many existing national and regional funding programs and measures in various fields of bioeconomy.

- In the Rhenish territory in North-Rhine Westphalia, 19 universities and technical colleges can be identified with the courses related to bioeconomic knowledge fields. That amounts to 238 courses related to bioeconomy such as Agricultural and Forest Sciences, Natural Sciences, Engineering, Energy and Supply Technology or Bioprocess Engineering;
- Research centre Jülich and RWTH Aachen offer a course Sustainable Bioeconomy (Nachhaltige Bioökonomie);
- Bioeconomy Science Center (BioSC) including the University of Aachen focuses also on the training of young professionals.
- The University (Hochschule) Niederrhein offers a project Living Lab Bioeconomy;
- Trainings like BLOOM (Boosting Bioeconomy Knowledge in Schools) are accessible for all teachers offering a fresh perspective into bioeconomy field and its applications in teaching STEM subjects.

Vocational training:

Many vocational courses with elements of work-based learning in bioeconomy are available such as biological-technical assistant, chemical technician or state-approved information technical assistant.



Gaps & Needs in Promoting Education

On educational/academic level

No existing educational strategies in the domain; lack of an organizational umbrella among institutions related to bioeconomy education; lack of any dedicated educational initiatives for marginalized groups.

On training level

Inadequate training programs in the field of bioeconomy for minority groups including disabled people, immigrants/refugees and young adults.

On governmental level

New National Bioeconomy Strategy has been published in 2020, however, there is a lack of assessment on the implementation of the strategy (both, at national and regional level); bioeconomy is not fully aligned with the socioeconomic priorities of the country; fragmentation of activities and priorities.

On private sector level

Inadequate advocacy support for the careers in bioeconomy.

On societal level

Lack of identification of marginalized groups and their specific needs and priorities; potential brain-drain due to the lack of motivation.

3 Case Studies



Case Study 1

Bioeconomy education, training and retraining in Higher Education | Bioeconomy certificate course – Bioeconomy and Sustainability: A practical introduction to the Basics /Germany

Purpose: The certificate course in six modules gives the participants a practical introduction to the basics of the bioeconomy and the challenges and opportunities associated with its implementation. The companies can book the entire course or individual modules for their employees.

Case Study 2

Injecting the bioeconomy into design, art, architecture and suchlike professions | Sustainable design /Cologne, Germany

Purpose: As part of the Sustainable Design course, designers are trained to create in a meaningful and aesthetic way by placing design in an interdisciplinary context with the ecological, social, cultural and economic challenges of the globalised world. Graduates are equipped with a unique selling point through the focus on sustainable design.

Case Study 3

Bioeconomy education, training and retraining in Vocational Education and Training | Environmental Protection Technician /Germany

Purpose: Vocational training to become a state-certified environmental protection technician with a focus on environmental and process engineering and ecological knowledge. The subjects of job-related lessons include waste management, recycling, knowledge of hazardous substances, occupational safety, wastewater and exhaust gas cleaning, measurement technology and renewable energies.

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