



Promoting education, training & skills in the bioeconomy

Vocational education and training

September 2022

Overview

Europe needs more people with the skills needed to drive the transition to a sustainable and circular bioeconomy, a core component of the Green Deal. A study was undertaken to support the development of educational and training content, methods, tools and structures to achieve a mainstreaming of the bioeconomy in education and training. It includes recommendations to train people to work in the bioeconomy.

The importance of vocational education and training to the future bioeconomy

This study projects that up to 2030, **around half of the bioeconomy workforce will have VET- or equivalent qualifications**. At a sectoral level, there will be an increased demand for people with VET qualifications entering occupations in the **bio-tech** and **bio-chemicals**, and **bioelectricity**. Emerging digital and industrial technologies, business models and socioeconomic developments will shape the types of skills needed in these sectors.

The findings of the study show that the skill needs VET will need to deliver are **varied and depend on sub-sectors**: from those required in agriculture, food manufacturing, biotechnology, to energy. Given ongoing technology and policy developments, continuous education and development will be particularly important, with those already working in the bioeconomy needing to be reskilled.

This will encourage VET systems to develop:

- courses or modules in **initial VET (IVET)** for young people considering their future careers;
- **continuing VET (CVET)** provision to update the skills of those already working in the bioeconomy, and provide training to those looking to transfer into it from other sectors.

Both IVET and CVET will be of critical importance in meeting the future skill need of the bioeconomy. Many of the skills required are ones typically provided through VET.

Five case studies addressing different strategic needs of the bioeconomy through VET level

TKNIKA coordinates a network of VET schools in the Basque region that promote bioeconomy skills.

The network brings together VET providers to work together across different thematic areas on multi-disciplinary and innovative projects. It focuses in particular on sustainable agro-food with particular reference to the natural and ocean environments; smart building and sustainable construction; and environmental health and sustainable bioscience. The applied VET bioeconomy network focuses on applied innovation and research, generating economic value, and using resources of biological origin efficiently and sustainably. TKNIKA acknowledges the need to train trainers to meet the skill needs of the bioeconomy and provides training courses for VET teachers.

The Biotechnology Programme at the Riga Technical University's RTU Olaine College of Technology, Latvia

provides an example of the delivery of bioeconomy-specific technical skills. The college is the only VET provider in Latvia offering a specialised biotechnology programme. It has attracted EU funding for modernising its laboratories. Providing hands-on experience in the laboratory is an important part of the college's programme. The College is looking to create a national bioeconomy centre of excellence for Latvia. At the moment it provides biotechnology specialists for the biochemical food industries. The College also has plans to reduce the duration of its study programme to increase the attractiveness of its biotechnology programme to would-be students.

Fondazione ITS Agroalimentare Puglia (based in Bari, Italy) provides technician training for sustainable management of food supply chains.

The course it provides addresses resource efficiency and environmental sustainability in production processes. It is designed to train people in the management of production processes from a technical and organisational point of view, paying attention to the protection and enhancement of environmental resources from a circular economy perspective. Graduates from the course go on to work as employees in public and/or private companies (e.g. agricultural and/or processing companies, producer organisations, distribution or marketing companies and certification bodies) or as self-employed external consultants. The course leads to the award of a post-secondary school diploma which takes two years to complete.

A vocational qualification in forestry is provided by the Riveria VET centre in North Karelia in Finland.

Sustainable exploitation of forests is central to the Finnish bioeconomy strategy and the forest bioeconomy is central to the promotion of smart specialisation in the North Karelia region's forestry industry. The programme run by Riveria delivers specific technical skills. Sustainability of the forestry sector is among the mandatory subjects students need to take. The course is a partially work-based one. Employers provide feedback to the college on the skills the students have learnt and their application in the workplace.

Le Forem in Belgium provides continuing VET to help unemployed people find work via re-skilling and upskilling.

It runs a 10-month course that is divided into three parts. The first three months is taken up with learning about different aspects of the circular economy (e.g. environmental, waste and energy management). There is then a four-month period where the focus is more on project management, followed in the last three months by on-the-job training in a workplace. As part of the programme students run a project inside a business.

Recommendations for policy makers

- Make long-term **skills commitments in bioeconomy- and related strategies** to strengthen skills-related initiatives.
- **Monitor impacts of different approaches** and disseminate data and best practices across Europe, including an one-stop shop for talent monitoring and sharing best practices.
- **Promote the merits of the bioeconomy**, including by delivering awareness-raising activities and embedding the bioeconomy within careers guidance for young people and adults.



Recommendations for VET providers

- Support **individualised learning** by developing new bioeconomy learning paths, modules, learning nuggets, and micro-credentials for certification, including on entrepreneurship. These should be shared to be used across a range of bioeconomy-related courses.
- Use **varied teaching methods** to develop skills, including problem- and practice-oriented teaching and learning.
- Boost **high-quality bioeconomy training**, including ‘train the trainer’ and ensuring the provision of up-to-date training materials and modules.
- Support **agile curriculum development** that allow and support VET providers in incorporating emerging bioeconomy skills needs into VET modules, courses and programmes in a timely manner.
- Develop a **strong VET work-based pathway**, such as apprenticeships, which enable individuals to acquire skills with economic value.
- Develop **Bioeconomy Centres of Vocational Excellence (COVEs)** to concentrate often scarce expertise by bringing together employers and trainers to share knowledge and know-how.
- Develop the path to a **high skill, high productivity bioeconomy** through brokerage and signposting services to support employers in the bioeconomy in investing in their employees’ skills.