

# Italy Factsheet

This document provides an overview of Italy's initiatives and current state in the bioeconomy sector, highlighting regional policies, educational programmes, key trends, existing and expected sub-sectors, and opportunities for personal advancement in bioeconomy related fields.

## About the region

Italy has had a National Bioeconomy Strategy since 2017, updated in 2019 to align with the National Smart Specialisation Strategy and the Italian National Strategy for Sustainable Development. This strategy encompasses key sectors such as bio-based textiles, pharmaceuticals, the paper industry, and the wood industry, which together contribute to over 10% of the national turnover and employment. The Smart Specialisation Strategy highlights strategic priority areas for most Italian regions. In the field of bioeconomy education, Italy benefits from a robust system involving multiple institutional players at both national and regional levels, supported by active social partners.

Since the National Strategy is promoted by the Presidency of Ministers and coordinated by different Ministries equally; The Italian Bioeconomy Strategy is promoted by the Presidency of the Council of Ministers. The following institutions are involved as part of the National Bioeconomy Coordination Board and contribute in the definition and implementation of the Strategy: Ministry for Economic Development (co-coordination); Ministry for Agricultural, Food and Forestry Policies; Ministry for Education, University and Research; Ministry for the Environment and Protection of Land and Sea; Conference of Italian Regions; Territorial Cohesion Agency; National Technology Clusters for Green Chemistry (SPRING) and the agri-food sector (CLAN). This involvement ensures effective collaboration among national, regional, and local public administrations and the National Technology Clusters in the bioeconomy, ensuring the coordination of public policies, taking into account the indications of the EU Union. By reducing duplication and fragmentation, the Coordination Board also facilitates and monitors the implementation of the National Bioeconomy Strategy across Italy, progressively proposing targeted measures and actions to enhance local bioeconomy development, in particular from the economic, environmental and social points of view.

## Thematic Orientation

### Existing Sub-Sectors

In 2017 the Italian government launched the Italian Bioeconomy Strategy (BIT) which was updated in 2019 (BIT II).

According to this strategy, as of the year 2017, the below sub-sectors are mentioned as the key sub-sectors in terms of their share in the total turnover, in addition to their share in employment. In this regard:

- Food, Beverages and Tobacco industries 40.9% of the turnover and 22.4% of the employment.
- Agriculture, forestry, fisheries and aquaculture, meanwhile consisted of 17.7% of the total turnover and 45.3% of total employment.
- Followed by the Bioeconomy sub-sectors of
  - Bio-based apparel (10% of turnover and 10% of employment),
  - Paper industry (6,9% of turnover, 3,6% of employment),
  - Bio-based textiles (5%, 3,8%),
  - Bio-based pharmaceuticals (4,6%, 1,9%)
  - Wood industry (4,1%, 5,2%), altogether accounting for a total of 90% of the total turnover in Bioeconomy in Italy.

In 2020 the Emilia-Romagna Region started a participatory process to define the new Smart Specialisation Strategy in view of the 2021-2027 EU funds programming. The new S3 Strategy has identified 8 Strategic Specialisation Areas, which are:

- Agrifood
- Building and Construction
- Mechatronics and Motoring
- Health and Wellness Industries
- Cultural and Creative Industries
- Innovation in Services
- Energy and Sustainable Development
- Tourism

In addition, there are 2 new areas with high growth potential:

- Aerospace Economy
- Critical Infrastructures

Meanwhile, the 15 Cross-sector Priority Areas adopted in addressing these specialisation areas exist.

### Key Trends Influencing Innovation

Key sub-sectors identified in the Italian bioeconomy include primary production, the food industry, bio-based industries, and marine bioeconomy, each with specific challenges, opportunities, and research priorities.

- **Primary Production** focuses on agriculture, forestry, and related sectors, emphasising biodiversity, climate adaptation, and innovative farming systems. There's a push for precision cropping, sustainable forest management, and the valorisation of agricultural residues for bio-based products and energy. Urban and peri-urban agriculture also play a role in regenerating cities.

- **The Food Industry** aims to develop and protect high-quality products, explore alternative protein sources, and utilize food byproducts for bio-based chemicals and materials. Urban food systems are emerging, bridging the gap between urban and rural food production.

- **Bio-Based Industry** seeks to exploit underused residues, convert abandoned lands into biorefineries, and develop regenerative processes for polluted areas. Innovations include converting CO2 into useful products and integrating biorefineries with existing waste management systems.

- **Marine Bioeconomy** focuses on sustainable aquaculture, connecting tourism with ecosystem preservation, and developing marine bioenergy technologies, all while preserving the unique cultural heritage of coastal areas.

### Expected Sub-Sectors / Value Chains

Joint Research Centre Report on the future scenarios of the Bioeconomy in the EU (for year 2050), has identified the below main drivers of the EU, that will shape the future sectors of the Bioeconomy. The main drivers that are expected to shape the sub-sectors/ value-chains of the future are as follows:

- **Ecosystems in the EU**
  - Agroecology
  - Bio-based carbon sequestration

- **Social systems in the EU**
  - Awareness and engagement for change
  - Food security
  - Food-related health concerns

- **Economic systems in the EU**
  - Bioeconomy-based employment
  - Bioeconomy-based international trade

- **Energy systems in the EU**
  - Biobased electricity/CHP
  - Biobased heat
  - Biofuels for transport

- **Material system in the EU**
  - Biobased chemicals, plastics etc.
  - Biobased construction materials.
  - Biobased fertilisers.

### Opportunities for advancement (Growth, Career, Social etc.)

According to the report titled "Promoting education, training and skills in bioeconomy" 7,7% of the working population in Italy are employed in the bioeconomy sectors.

The largest bioeconomy sector in terms of value added at factor cost and employment is agriculture, with 45% of people being employed in this sector. While this data indicates which sector presents the most employment opportunities, the report titled "Bioeconomy in Europe", prepared by key stakeholders of the Bioeconomy industry ecosystem provides some data concerning the number of start-ups in Bioeconomy in Italy (2021), in the differentiation of different sector. This data provides us an idea about the trends in the Bioeconomy industry, and sectors which present a potential and an opportunity to pursue innovative and entrepreneurial activities.

According to the table below, the highest number of start-up firms were found in the area of Research and Development and other professional and technical-scientific activities. The second sector with the highest number of start-ups was the Food and Beverages sector, followed by the sector of Agriculture.

## Governance, Education Levels & Skills

**Governance structure in adult education on bioeconomy, or on the wider topic of sustainability (Higher Education, Vocational Training etc.)**

The Italian context is characterised by the presence of multiple institutional players at national and regional levels, in addition to the relevant role of the social partners.

- **Existing Policies – Strategies**
  - A coordination structure among the involved actors

- **Governance Model**
  - The education ministry
  - The labour ministry
  - At the national level, the National Institute for public policy analysis monitors vocational education and training pathways
  - The regions and autonomous provinces are in charge of planning, programming, organisation and implementation of VET pathways
  - Social partners play an advisory role

- **Regulation – Legislation**
  - A system of adult education has been running in Italy since 1997, organised at Local Permanent Centres (Centri territoriali permanenti – CTPs) and through evening courses at upper secondary education institutions. In 2007, a specific Ministerial Decree launched the reform of the adult education system that started in 2012, and ended in the school year 2015/2016. The reform has also provided for the establishment of Provincial Centres for School Education for Adults (Centri provinciali per l'istruzione degli adulti – CPIAs) that, together with the upper secondary schools for the second level courses, have replaced the existing CTPs and evening courses respectively.

**Organisation of Adult and Lifelong Learning**  
The education and training system in Italy comprises of:

- preschool education
- integrated primary and lower secondary education
- upper secondary education
- post-secondary education
- higher education

At the upper secondary level, the following VET programmes are offered:

- five-year programmes (EQF level 4) at technical schools leading to technical education diplomas
- three-year programmes leading to a vocational qualification (EQF level 3);
- four-year programmes leading to a technician professional diploma (EQF level 4).

At the post-secondary level, VET is offered as higher technical education for graduates of five-year upper secondary programmes or four-year vocational education and training pathway programmes who passed the entrance exam.

**Available Research on Bioeconomy Education**

- BIObec project in 2021-2022 performed a EU & regional analysis of needs in light of the implementation and replication of a Mediterranean Bio-Based Education Centre, a specific analysis was performed involving 20 Italian actors in dedicated multi-stakeholder focus groups.
- UrBioFuture project performed research on a comprehensive map of completed and ongoing programmes of education in the bio-based sector.

### Main Training, Retraining or Lifelong Learning on Sustainability

programme/course	Facilitator
Sustainability and Circular Economy Management	Marche Polytechnic University
Circular Economy	Tuscia University
Sustainable Chemistry and Technologies for Circular Economy	University of Padua
Environmental Sustainability and Circular Economy	Polytechnic University of Milan
Bioeconomy in the Circular Economy – BIOCRICE	University of Bologna, University of Naples Federico II, University of Turin, University of Milan Bicocca
International Master in Sustainability and Circular Bio Economy	Rome Business School
Circular Economy Management	EIIS – European Institute of Innovation for Sustainability

**Postgraduate course**

Circular Economy	Polytechnic University of Bari
Environmental management and control: circular economy and efficient resource management	Sant'Anna School of Advanced Studies

**Highly Specialised Course**

Circular Economy for Business	Sant'Anna School of Advanced Studies
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**Seasonal School**

Circular Economy and Sustainable Management	Sant'Anna School of Advanced Studies
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## Linking Art & Bioeconomy Education

**Bioeconomy education in which Art concepts are applied**

- Art as a stimulus of the needed skills
  - An effective example at EU level to stimulate systemic thinking is the Joint Research Knowledge Centre for Bioeconomy foresight exercise "How can the EU Bioeconomy best contribute to specific Sustainable Development Goals and to the transition towards a climate-neutral economy by 2050?"

- Art addressing learning styles
  - "Link" is an association whose aim is to involve NEETs in training paths in the context of Italian municipalities. It aims at involving NEETs in creative/artistic experiences and non-formal educational activities, to help them find a motivational driver, and also stimulate their interest in different topics (specifically art, sustainability, and bioeconomy).
  - "My HandScraft" is a 30-month project aiming to develop and test an innovative education and training programme, addressed to low-skilled adults and migrants

### Available Research on Bioeconomy Skills Needed

- BIOSKILLS project "Promoting education, training and skills across the bioeconomy" provided recommendations for the development of education at higher education, VET and entrepreneurship levels;
- Transition2BIO project prepared a report on skill needs that have been identified during five co-creation workshops organised by the project, each of which targeted different Bioeconomy sectors.

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## Marginalised Groups

BioGov.net addresses Italy as a macro-region, focusing on region-specific priorities and policies connected to marginalised groups. The main target beneficiaries of educational activities supporting marginalised groups have been identified in relation to the regions represented by local stakeholders in the Italian CoP.

In Apulia, the focus is on women, youngsters, and NEETs (individuals not in education, employment, or training). Lazio prioritises young NEETs, adult NEETs, and women. In Friuli Venezia Giulia (FVG), the target groups are young NEETs, adult NEETs, and women. Emilia Romagna prioritises young NEETs, adult NEETs, women, and immigrants/foreign citizens.

The relevant sectors and opportunities for inclusion in the bioeconomy for these marginalised groups vary by region. In Apulia, the focus is on the agrifood industry, wine industry, craftsmanship, sustainable fashion, tourism, crafts industry, and sea economy. In Lazio, the agrifood industry, craftsmanship, and sea economy are the main sectors. Friuli Venezia Giulia emphasises the agrifood industry, forestry, and sea economy. Emilia Romagna focuses on the agrifood industry, building and construction, and health and wellness industries.

The integration of marginalised groups into the bioeconomy requires addressing several needs. These include providing networking opportunities to connect individuals to bioeconomy education and industries, offering motivation through inspirational success stories, and ensuring accessible, flexible, and free online training courses tailored to the needs of the target groups. Additionally, the development of soft skills, particularly entrepreneurial and transversal skills such as self-confidence, self-awareness, time management, prioritisation, and communication skills, is crucial. Individuals also need skills related to running or being part of a business, including the preparation of business plans, project proposals, and financial reports.

Existing educational and development activities aimed at integrating marginalised groups into bioeconomy activities are structured around regional priorities. These activities are often funded through dedicated calls under the European Social Fund, with educational centres responding to these priorities by providing training and development programmes tailored to the needs of the marginalised groups in each region.

### STRENGTHS

- Wide spectrum of sectors involved
- Competitiveness based on innovation
- Increasing transition to horizontal value chains
- Expected expansion to new sectors
- Increase of employment / available job positions
- Existing National plan for achieving the goals
- Existing Educational Strategies, defined policies and a well-structured governance
- Existing of lateral opportunities, Life-Long learning, Vocational training, mass information, etc
- Substantial overlapping between the Bioeconomy Education Institutions and Art related institutions

### WEAKNESSES

- Not fully valorised resources and products
- Bioeconomy is not fully aligned with the socioeconomic priorities of the country
- There is a National Strategy on Bioeconomy but there are no data on the level of implementation of this strategy
- Fragmentation of activities and priorities. Lack of an organisational umbrella
- Marginalised groups are identified on a regional basis with significant differences between them. This inhibits the possibility of establishing a National strategy for the education and integration of these groups

## SWOT Analysis

### OPPORTUNITIES

- Expansion in many ways, considering the geopolitical situation
- Building strategic alliances
- Further exploitation of the developed digital background
- Making Italy a recognised centre of Bioeconomy development in Europe
- Benefiting from the existing Educational background
- Organised structures for advancing opportunities on social and educational and career levels
- Italy can become a pioneer on European scale in matters of Bioeconomy and/or Art thanks to the existing affinity and interaction among the related institutions

### THREATS

- Potential decrease of resources by 2050 due to dynamic harvesting
- The increasing of the emigration waves will enhance the issue of managing and educating the marginalised groups
- A potential brain-drain due to the lack of motivation
- Lack of a concrete National plan aiming to identify and then to integrate the marginalised groups

### Consortium



For more detailed information, visit Italy regions page in our website.

BioGov.net  
info@biogov.net

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