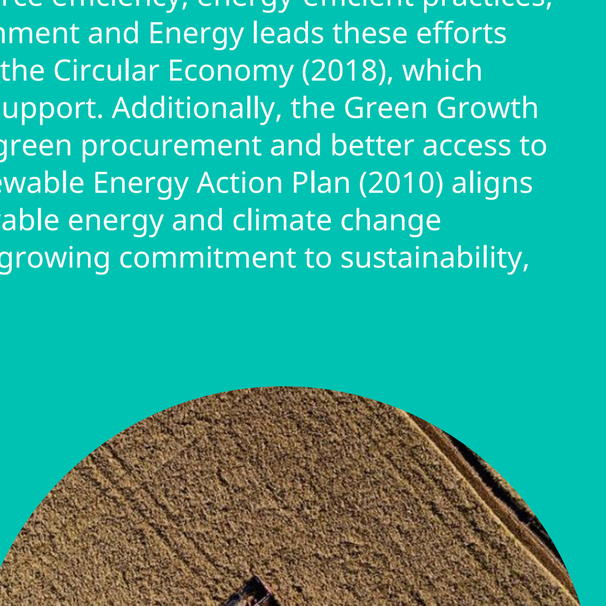
BioGov.net
Governance & Upskilling for a Stronger Bioeconomy

Greece
Factsheet

This document provides an overview of Greece'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

Greece currently lacks a dedicated national strategy for the bioeconomy, but the government is making strides in related areas, focusing on resource efficiency, energy-efficient practices, and low-carbon investments. The Ministry of Environment and Energy leads these efforts through key initiatives like the National Strategy for the Circular Economy (2018), which prioritises waste management and green business support. Additionally, the Green Growth Strategic Action programme (2010-2015) promotes green procurement and better access to capital for biotechnology centers. The National Renewable Energy Action Plan (2010) aligns with EU targets, and Law 4414/2016 supports renewable energy and climate change mitigation. Together, these policies reflect Greece's growing commitment to sustainability, circular economy principles, and renewable energy.



Thematic Orientation

Existing Sub-Sectors
The current bio-economy sector in Greece demonstrates a substantial turnover, estimated at approximately 27 billion euros, supporting employment for around 0.5 million individuals. Remarkably, nearly 80% of these activities are directly or indirectly linked to the agricultural sector, signifying its pivotal role.

The dominant sectors within the bio-economy landscape encompass:
- Agriculture and Forestry,
- Marine and Aquatic Resources,
- Waste Management and Circular Economy,
- Bio-based Industries (Food and Biotechnology),
- Renewable Energy,
- Tourism and Biodiversity.

Focusing on the subsectors the main ones are:
- Livestock farming,
- Bioenergy,
- Fisheries,
- Bioplastics and Biomaterials,
- Agro-food Industry,
- Wood and Pulp Industry,
- Ecotourism.

Key Trends Influencing Innovation
In Greece, bioeconomy innovation is driven by integrating advanced technologies like biotechnology and digitalisation, enhancing efficiency and product quality. Circular economy principles promote resource efficiency and sustainable production. Government policies support research and foster collaboration between academia and industry, creating a strong foundation for innovation. The focus on renewable energy drives advancements in bioenergy technologies, while growing consumer demand for eco-friendly products and investments in research and startups are shaping Greece's bioeconomy toward sustainability and technological progress.

Expected Sub-Sectors / Value Chains
Beyond the primary sectors like agriculture, renewable energy, and biotechnology, Greece has the potential for growth in various other sectors and value chains within the bioeconomy:

- **Agro-Tourism and Gastronomy:** Promoting agritourism and culinary tourism, highlighting traditional Greek cuisine, local ingredients, and farm-to-table experiences to attract tourists interested in sustainable and authentic food experiences.
- **Smart Farming and Precision Agriculture:** Implementing technology-driven solutions in agriculture, such as precision farming techniques, IoT devices, and data analytics, to optimise crop yield, reduce resource usage, and enhance farm efficiency.
- **Waste Valorisation and Circular Economy Initiatives:** Innovating waste management practices, focusing on converting agricultural by-products into value-added products like bioplastics, biofuels, or fertilisers, contributing to a circular economy.
- **Green Technologies and Clean Energy:** Involving renewable energy technologies and green innovations in energy storage, grid management, and clean energy production, utilising resources like solar, wind, and biomass.
- **Sustainable Fashion and Art:** Utilising natural fibers and sustainable materials from Greek agriculture, such as cotton, wool, and silk, to create eco-friendly clothing and textiles and creative design.

Opportunities for advancement *(Growth, Career, Social etc.)*
The bioeconomy offers diverse opportunities for growth, career development, and social impact. Careers in biotechnology, renewable energy, and sustainable agriculture provide pathways to leadership and innovation. Key areas include converting animal waste into electricity and heat through biogas, using by-products for crop fertilisation, and reusing food waste in new products. Entrepreneurship in this sector encourages personal growth and impactful solutions. Collaboration across disciplines enables diverse skills to tackle global challenges like climate change. Engaging in policy, education, and continuous learning fosters a fulfilling career focused on sustainability and societal contributions.

Governance, Education Levels & Skills

Governance structure in adult education on Bioeconomy, or on the wider topic of sustainability *(Higher Education, Vocational Training etc.)*
In Greece, the governance structure for adult education in sustainability, including bioeconomy-related topics, involves various entities:

- **Ministries and Government Bodies:**
The Ministry of Education and Religious Affairs is responsible for overseeing educational policies, curriculum development, and initiatives related to sustainability education across educational levels, including adult education.
The Ministry of Rural Development and Food deals with agricultural policies, which intersect with the bioeconomy.
- **Higher Education Institutions (HEIs) and Research Centers:**
Universities and research institutions in Greece offer programmes in environmental studies, renewable energy, agronomy, and other disciplines relevant to sustainability and the bioeconomy.
Research centers contribute to knowledge generation and might collaborate with educational institutions on curriculum development and projects.
- **Vocational Training and Lifelong Learning Centers:**
Vocational training centers and adult education facilities offer courses and programmes in green skills, sustainable practices, and potentially specific courses related to the bioeconomy.
While some strategies might directly address bioeconomy education, others might indirectly relate to aspects of sustainable agriculture, circular economy principles, or environmental sustainability without specifically mentioning bioeconomy education.
- **The new Common Agricultural Policy (CAP) for Greece:**
The new Common Agricultural Policy (CAP) for Greece aims to strengthen its agricultural sector by focusing on producing high-quality goods and supporting small and medium-sized farms. The plan emphasises enhancing competitiveness in sectors like fruits, vegetables, wine, apiculture, olive oil, and table olives. To tackle global market challenges, the strategy emphasises farmer collaboration through collective programmes and producer groups, aiming to bolster their position in the value chain. So, it indirectly impacts bioeconomy education by emphasising high-quality agricultural production.
- **National Climate Change Adaptation Strategy (NCCAS):**
The NCCAS relates to bioeconomy education through its approach to adapting to climate change impacts in agriculture, rural development, waste management, and sustainable consumption.
- **National RIS for Smart Specialisation on Energy, Environment, and Sustainable Development:**
This strategy contributes to defining energy-related goals and sustainable development initiatives, which intersect with aspects of bioeconomy education.
- **The National Strategy for the Circular Economy and the revised Action Plan for the Circular Economy:**
These plans often address the promotion of sustainable production and consumption, resource efficiency, and waste management.
- **National Energy and Climate Plan (NECP):**
The NECP primarily focuses on energy transition and climate objectives.
- **National Waste Management Plan, National Hazardous Waste Management Plan, and National Forest Strategy:**
These plans touch upon aspects of sustainability, waste management, and environmental conservation relevant to bioeconomy principles.
At the regional level, according to the European Commission's report, there is a lack of a specific plan or strategy for the development of the bioeconomy in most Regions. Only 4 of the 13 Regions have Action Plans for Bioeconomy.

Organisation of Adult and Lifelong Learning
Adult and lifelong learning in Greece is facilitated through a range of formal and non-formal institutions. Universities provide specialised courses, master's programmes, and continuing education in fields like environmental sciences, agriculture, and renewable energy. Vocational training centers offer certifications in green technologies and sustainable practices.

The Hellenic Open University and online platforms provide flexible distance learning, ideal for working adults. Additionally, private companies, industry associations, and NGOs deliver targeted training and workshops focused on sustainability, environmental management, and industry-specific skills.

Available Research on Bioeconomy Education
- No relevant research on a country level was found.

Main Training, Retraining or Lifelong Learning on Sustainability
In Greece, several universities offer advanced training in circular bioeconomy and sustainability, focusing on agriculture, forestry, and biotechnology. The Aristotle University of Thessaloniki (AUTh) offers an MSc in Bioeconomy, "Natural Resources: Monitoring, Technology, and Bioeconomy," aligned with the European Green Deal. The International Hellenic University provides an MSc in Bioeconomy: Biotechnology and Law, catering to professionals in both public and private sectors. The University of Piraeus and the National and Kapodistrian University of Athens offer an interdisciplinary MSc in Bioeconomy, Circular Economy, and Sustainable Development. The University of Thessaly's Master's programme in Bioeconomy and Entrepreneurship connects academic education with business applications, particularly in biotechnology sectors.

Postgraduate programmes in Bioinformatics and Biotechnology focus on medical, marine, healthcare, and agri-food industries, while no relevant Bachelor's degree is yet available. Organisations like the Hellenic Management Association and Greek Green Building Council provide certifications in sustainable business practices and green building.

The Institute for Bio-Economy and Agri-Technology (iBO) and the American Farm School's Perrotis College focus on agriculture and biosystems. The University of the Aegean's Centre for Sustainable Circular Bioeconomy and Energy combines biological resource recovery with ecosystem protection. ELGO-DEMETER offers workshops on sustainable agriculture, while institutions like the National Centre for Scientific Research "Demokritos" and FORTH focus on biotechnology and environmental sustainability.

The Cluster of Bioeconomy & Environment of Western Macedonia (CluBE) develops R&D and business activities aligned with bioeconomy policies, fostering regional growth.

Available Research on Bioeconomy skills needed
- No relevant research on a country level was found.

Linking Art & Bioeconomy Education

Bioeconomy education in which Art concepts are applied
Artistic Installations and Exhibitions: Events, exhibitions, and installations combine artistic expression with bioeconomy-related themes, showcasing innovative materials, sustainable design, or the utilisation of bio-based resources in art projects.

Municipality of Thessaloniki events, organised by TIF-Helexpo, under the auspices of the Ministry of Environment and Energy and the Hellenic Recycling Organisation.

Art addressing learning styles: NGOs, cultural centers, or educational institutions occasionally organise workshops or educational programmes where art is used as a medium to teach about sustainability, recycling, or the importance of biodiversity, connecting these concepts with the bioeconomy. The Ecumenical Refugee Workshop NAOMI is an urban non-profit organisation based in Thessaloniki. In the professionally configured workshop, it runs, refugees are taught by professionals in cutting, sewing, and changing clothes. It currently has 10 workstations with sewing machines and a place with a linking machine, as well as a large cutting table.

There are many ways to use art for Bioeconomy education on architecture, sculpture, and design topics. An example is from ASFA – School of Fine Arts, a self-governing Legal Entity under Public Law that operates under the supervision of the State. Also, local artisans or craftsmen incorporate sustainable practices, natural materials, or traditional techniques linked to the bioeconomy into their artistic creations.

Marginalised Groups

In Greece, efforts to integrate marginalised groups such as disabled individuals, immigrants and refugees, Roma communities, unemployed youth and adults (NEETs), and homeless individuals are a priority. Various organisations support this integration by offering services like language courses, cultural education, computer skills training, and professional counseling. Financial incentives are available to encourage employers to hire individuals with disabilities. programmes aimed at Roma communities focus on improving educational access and providing vocational training, though none specifically address the bioeconomy sector.

The main needs for integrating these groups into the bioeconomy include literacy support, education and training programmes, equitable access to resources, and advocacy. There is also a strong emphasis on community involvement, the development of inclusive policies, and fostering skills in areas such as art, creativity, leadership, and vocational training.

Currently, no specific activities or programmes at the national level in Greece target the integration of marginalised groups into the bioeconomy sector.

SWOT Analysis

STRENGTHS
- Significant potential in the Greek agricultural sector, abundant water resources, and extensive coastline.
- Over 4,000 km² of uncultivated land available for biomass production.
- Annual waste production in Greece totals 58 million tons, with a large portion from agriculture and livestock, yet only 3% is currently used in bioeconomy applications.
- Opportunities in lifelong learning, vocational training, and mass information.
- The tourism industry and cultural heritage offer avenues for sustainable tourism and eco-friendly products.
- Growing research and collaborations in biotechnology, renewable energy, and sustainable agriculture.

WEAKNESSES
- Low technical education among farmers, with 32% having no formal education.
- Challenges in adopting new technologies due to the aging rural population.
- Fragmented agricultural land, small property sizes, and inadequate transportation networks hinder reliable material supply.
- Declining employment in the primary sector.
- Lack of a comprehensive national strategy and governance for bioeconomy education.
- Bureaucratic hurdles and fragmented activities impede progress.
- Limited public awareness and insufficient tailored training programmes for the bioeconomy.
- Regulatory complexities and lack of appropriate financial mechanisms slow innovation and business development.

OPPORTUNITIES
- Government prioritisation of resource efficiency, energy-efficient practices, and low-carbon investments.
- Potential for growth in renewable energy through untapped resources.
- Embracing circular economy principles to reduce waste and promote sustainable resource use.
- Collaboration opportunities between political leadership, the scientific community, and social partners.
- Growing global demand for green technologies offers export opportunities.
- Access to EU funds and initiatives supporting sustainable development in the bioeconomy.

THREATS
- High raw material costs and inflation.
- Economic instability could affect funding for bioeconomy initiatives.
- Climate challenges, such as water scarcity and extreme weather, may disrupt agriculture.
- Inefficient policies and lack of control mechanisms undermine the bioeconomy's growth.
- Brain drain due to insufficient incentives for skilled individuals.
- Geopolitical tensions could disrupt markets and resource access, impacting the bioeconomy.

Consortium

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

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