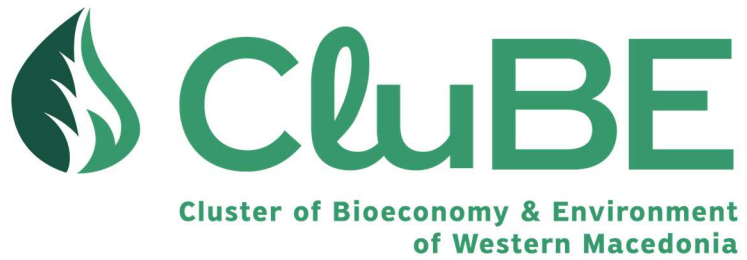


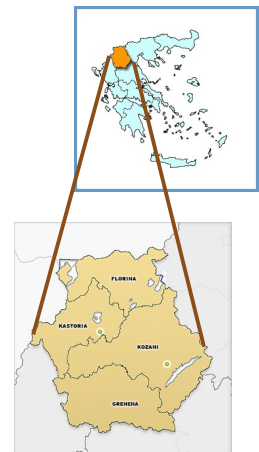
CluBE
Cluster of Bioeconomy &
Environment
of Western Macedonia



The **Cluster of Bioeconomy and Environment of Western Macedonia (CluBE)** is a non-profit company established among local actors and stakeholders of the Region of Western Macedonia in Greece. CluBE emerged since early '00s from the continuous collaboration of regional players during previous projects, analysing regional bioenergy and biomass potentials, the core cluster structures, and the regional innovation systems devoted to the energy sector.

The **mission** of CluBE is to **enhance collaboration** and **increase regional knowledge** by **promoting innovation** and **synergies** between regional stakeholders in the fields of bioeconomy and environment.

The Region of Western Macedonia has a population of 255.056, and covers a total surface of 9.451 km² (7,2% of the country's total). The nature of the region is mountainous, with Aliakmonas river crossing through the entire Region. Western Macedonia is situated in the northern part of Greece and borders with Albania and North Macedonia. It is the only region without sea coast. Western Macedonia is divided into the regional units of Kozani, Grevena, Kastoria and Florina. The productive character of the Region is determined primarily by the energy industry and secondarily by the fur industry. Other important economic activities in the area, which is gaining importance in the current transition phase, are the agrifood sector and the marble mining.

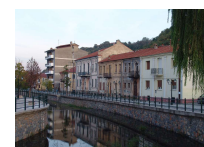


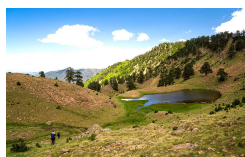
CluBE is developing **R&D and business** activities in the fields of **bioeconomy, bioenergy and environment**, in order to reinforce **green, smart and circular economy** in the region and the neighbouring areas, namely through:

- Energetic exploitation of biomass for household and industrial use, and especially for district heating systems for small, medium or large cities.
- Mobilisation of regional biomass supply chains.
- Development of the green hydrogen economy.
- Increase of the share of biofuels in the energy mix of transportation fuels.
- Co-firing biomass with lignite in existing power stations and/or future heating plants.
- Optimisation of heating systems.
- Improvement of energy efficiency for households, public and private buildings.
- Promote the concepts of smart cities and villages.
- Support of the entrepreneurship in the field of circular bioeconomy.



A SUSTAINABLE AND CIRCULAR BIOECONOMY FOR EUROPE





MEMBERS

After being legally established in February 2014 as a not-for-profit company, the cluster currently includes more than **70 quintuple helix members**:

- **Public sector:** Region of Western Macedonia, Regional Development Fund of Western Macedonia, Regional Union of Municipalities of Western Macedonia and Central Union of Municipalities of Greece.
- **R&D:** University of Western Macedonia, Centre for Research and Technology Hellas, Centre of Environment of Western Macedonia, Wood and Furniture Lab/University of Thessaly, KEPEA Velventos, NAS- Nikolaos Ad. Stylos, UNITYPATH
- **Environment:** Centre of Environment of Western Macedonia.
- **Entrepreneurship:**
 - i) **Municipal District Heating:** Municipal Enterprise for District Heating of Ptolemaida (DETIP S.A.), Kozani Municipal Enterprise for Water and Drainage (DEYAK S.A.), Municipal Enterprise for District Heating of Amyndeio (DETEPA S.A.);
 - ii) **Cooperatives:** Pentalofos Forest Management Cooperative, Forest Agricultural Cooperative DASE Palaiogratsano – Elati, Velvento Forest Management Cooperative, Agricultural Fruit Cooperative DIMITRA, Agricultural Cooperative Imeron olive oil products, Cooperative of Saffron;
 - iii) **Food companies/Product processing:** Bagatzounis Herbs, Deskati Dairy Products, Fonte di Vita Fruit Liqueurs, Lefkara Farm, Aslanidou Co. Industrial Cannabis, Anthimidis Aromatic Plants' Distillery and Animal products, 4G Greek Gaia's Global Gate Dried fruits, vegetables and herbs, Bisiritsas J. Brothers S.A. – Pig Farm, Fkiaras Dairy Products, Enteka Distillery, Pitenis A. Brothers S.A., Rizes Greek Delicatessen, Belidis Vineyard, ETHELEO, Dioscurides IKE, Beekeepers' Association of Kozani, Cheesemakers of Western Macedonia Koin.Se.P., Althea Lakeview Farm, Naoumidis, Kamkoutis Vineyard, LAVTOKEN
 - iv) **Biomass/Bioenergy producers:** Alfa Wood S.A., Giotas S.A., Ziogas G.P., Biekkio S.A., Chliapas S.A., Matesion Biogas Company, AZ Bioenergeia S.A., ELPIS Pellet Co;
 - v) **Boiler manufacturers:** Bio2CHP, Camino Design, Diana-Skordas;
 - vi) **Waste management:** Waste Management of Western Macedonia (DIADYMA S.A.);
 - vii) **Consulting companies:** Hellenic Forests Ltd, Olympos IKE, Metamind
 - viii) **New Technologies & Energy Companies:** MES ENERGY, B&T COMPOSITES, Western Macedonia Region Photovoltaic Investors' Association, Hellenic Hydrogen S.A., Toposol IKE, CUBE,
 - ix) **Lignite Mining:** Lignitorixio Axladas S.A.,
 - x) **Construction Materials Company:** MKM Domisi, Chatzopoulos S.A.
- **Social and Environmental entrepreneurship:** ZEIDORON Koin.Se.P., Astiki Anaptyxi Koin.Se.P., Drasi & Synergasia Koin.Se.P.
- **Supporting institutions:** Regional Development Agency of Western Macedonia (ANKO S.A.).

The members of CluBE as well as its staff have a **vast experience** in the field of **bioeconomy**, **biomass**, **bioenergy** and **green hydrogen**. They currently manage and have successfully completed in the past several European and Transnational Projects in the fields of **Research, Innovation, and Dissemination of Knowledge** and have assisted the regional business sector on promoting and fostering entrepreneurship in Western Macedonia.

CluBE's areas of expertise, regarding proposal preparation, writing and implementation, are **stakeholder engagement** (mainly local and regional but also National and European), **local and regional replication**, **coordination of local demo sites**, **communication**, and **dissemination** as well as **knowledge transfer** and **mobilisation of entrepreneurship**.



Affiliations in European and National networks and partnerships

- Greenovate! Europe – Full member 
- European Bioeconomy Stakeholders Panel – DG RTD European Commission – Member 
- Biobased Industries Consortium (BIC) – Associate Member 
- European Clean Hydrogen Alliance – Member 
- Innovawood – Full member 
- Hellabiom (Hellenic Biomass Association) – Full member 
- Hydrogen Europe – Member 
- Clean Hydrogen Partnership (Former Fuel Cells and Hydrogen Joint Undertaking (FCH JU)) –
Hydrogen Valleys Partnership – Member
- European Circular Economy Stakeholder Platform – Leadership Group Member 
- ENRD Mainstreaming the Bioeconomy Thematic Group – Member 
- S3 Bioenergy Partnership –  Member 

- Greek Bioeconomy Forum – Founding member

- Local Governments for Sustainability – Member



- Hellenic-German Chamber of Commerce and Industry



- American-Hellenic Chamber of Commerce



- European Biogas Association



- AMWAJ Alliance



- World Bioeconomy Forum



- European Federation of Agencies and Regions for Energy and



Environment

- EBCA – European Bioeconomy Clusters Alliance



In January 2019, the General Assembly of CluBE took the decision to transform CluBE from a bioenergy cluster to a bioeconomy cluster and to change its name to “Cluster of Bioeconomy and Environment of Western Macedonia (CluBE)”. This transition reflects the wider transition of the Region of Western Macedonia to a post coal era.

PROJECT PORTFOLIO

As of January 2026, CluBE implements 76 projects in total, amongst its other activities.

(26) Twenty-six Horizon Europe projects:

- **Sleeping Beauty**

Horizon Europe, topic: HORIZON-CL6-2024-BIODIV type of action: HORIZON-IA – HORIZON Innovation Actions

The SLEEPING BEAUTY project aims to rejuvenate neglected urban, peri-urban, and rural spaces across Europe through the integration of Nature-based Solutions (NBS) and the core values of the New European Bauhaus (NEB). By addressing diverse climatic contexts, this initiative promotes sustainable, inclusive, and resilient communities. The project leverages NBS to enhance biodiversity, foster natural beauty, and provide multifunctional public spaces, aligning with NEB’s principles of sustainability, beauty, and inclusiveness. SLEEPING BEAUTY seeks to transform underutilized and overlooked spaces into vibrant, biodiverse areas that reconnect people with nature. This holistic, co-creative approach combines innovative design and artistic interventions, encouraging collaboration among citizens, experts, and local stakeholders. These efforts will help reshape public spaces, strengthen community ties, and foster a shared sense for caretaking of environment. By emphasizing the creative re-use and revitalization of spaces, the project will demonstrate how integrating NEB and NBS can lead to improved well-being, enhanced biodiversity, and more resilient and beautiful communities. The



project's six pilot sites will serve as showcases for replicating and scaling NBS-NEB solutions across Europe, contributing to a systemic shift in how we design, interact with, and maintain public spaces in close connection with nature and cultural heritage. The initiative promotes long-term societal transformation, focusing on strengthening human-nature relationships, cultural identity, and collective action to address pressing societal challenges like climate change. SLEEPING BEAUTY's unique blend of artistic co-creation, sustainable spatial planning and innovation will push beyond traditional NBS approaches, setting a new gold standard for innovative, inclusive, and aesthetically compelling public spaces enabled by NEB-NBS and a new Natur-Baukultur.

Grant Agreement Number: 101181784

Project Duration: 48 months (01/06/2025 – 31/05/2029)

Total Budget: 4.997.720,63€

Project's webpage: <https://www.sleepingbeauty-project.eu/>

- **CEE2ACT**

Horizon Europe, topic: CL6-2021-GOVERNANCE-01-10, type of action: CSA (Coordination and Support Action).



CEE2ACT will empower countries in Central Eastern Europe and beyond to develop circular bioeconomy strategies and action plans through knowledge transfer and innovative governance models enabling sustainability and resilience to achieve better informed decision-making processes, societal engagement and innovation, building on the practice of experienced countries serving as role models in this context. Knowledge transfer and inspiration in creative formats that address the motivations, needs and knowledge gaps of each CEE2ACT target country will be realized through the CEE2ACT National Bioeconomy Hubs. A participatory, non-political, bottom-up approach will be applied throughout the project activities, tackling specific knowledge gaps and shortcomings of the top-down conventional approach, building closer interconnections between actors across public institutions, private sector, industry, energy, SMEs, feedstock providers, academia and research, NGOs, CSOs in the target countries. The findings will be synthesized, in an analytical framework, which will result in National-level Roadmaps for the Bioeconomy Strategies in Targeted CEE2ACT countries, boosting societal engagement in the countries' transition towards circular bioeconomy.

In this context, CluBE will take part in the effort by running case studies, establishing networks, providing training and capacity building, and performing stakeholder engagement in the region of Western Macedonia.

Grant Agreement Number: 101060280

Project Duration: 36 months (01/09/2022 – 31/08/2025)

Total Budget: 3.998.373,00€

Project's webpage: <https://www.cee2act.eu/>

- **BEAMING**

Horizon Europe, topic: HORIZON-WIDERA-2023-ACCESS-03-01, type of action: CSA (Coordination and Support Action).



BEAMING aims to raise excellence by enhancing innovation and knowledge valorisation within the bioeconomy domain through cooperation between higher education institutions, with a particular focus on Widening countries in Central-Eastern (CEE) and South-Eastern European (SEE) EU Member States and the Western Balkans. Improved global competitiveness and visibility of higher education institutions (HEI) will be achieved through establishing effective technology and know-how transfer between Widening countries and EU14 member states with more developed bioeconomies and R&I ecosystems, exploring and adopting structural reforms, educational priorities, and a culture of excellence. BEAMING aims to foster the uptake of the Quadruple Helix innovation ecosystem approach to provide a framework for higher education institutions to work collaboratively with industry, government, and civil society.

Thereby, we aim to enhance their innovation capacity and the applicability of research results. Local and regional implementation strategies and roadmaps will be developed regarding the relevant ERA Policy Agenda actions in the higher education sector, particularly in the domains of bioeconomy and circular economy.

Grant Agreement Number: 101006279

Project Duration: 48 months (01/01/2024 – 31/12/2027)

Total Budget: 4.500.250,00€

Project's webpage: <https://beamingproject.eu/>

- **C4B**

Horizon Europe, topic: HORIZON-CL6-2023-CircBio-01-9, **type of action:** RIA (Research and Innovation Action).



Primary production in agriculture and forestry represents an essential part of the European circular bioeconomy. However, the involvement of primary producers in circular bio-based economy is still limited, and the benefits are in most cases not fairly distributed along the value chain, to the disadvantage of primary producers. Fair and sustainable business models that create opportunities for rural entrepreneurship and develop new forms of successful rural business are therefore needed.

The purpose of **C4B** is to accelerate the development of rural communities and their economic viability by developing new fair and sustainable business models for different agricultural and forestry value chains. C4B business models will be designed to balance the share of power and profits across novel bio-based value chains and to enhance the cooperation among farmers, foresters and industry. This project will advance the understanding of bio-based value chains by carrying out a holistic analysis of different case studies in EU that considers technology, business environment, primary producers' behaviour, contractual agreements and ownership, and sustainability.

By providing financial support to third parties via Open Call, C4B will demonstrate the applicability, scalability and replicability of the new business models in different business settings and geographical areas, eventually stimulating the uptake of the new business models.

Grant Agreement Number: 101135323

Project Duration: 48 months (01/01/2024 – 31/12/2027)

Total Budget: 3.994.894,36€

Project's webpage: <https://www.c4b-project.eu/>

- **Interaction Seeds**

Horizon Europe, topic: HORIZON-CL4-2023-HUMAN-01-33, **type of action:** CSA (Coordination and Support Action).



InteractionSeeds partners have joined forces to facilitate and connect different worlds (industry, citizens, arts)

through the development of a repository of 50+ locally proven and easy to replicate interaction schemes. The repository (WP1), expected to turn into a platform at exploitation stage, will ultimately take the form of a two-sided platform connecting a network of stakeholders: -Providers of societal and cultural interaction schemes, that have proven their value and that have a potential for replicability beyond their geographic range. -Organisations having missions in fostering connections between industry, society and art willing to explore, adapt and test locally proven interaction schemes.

During the project, 20+ test cases of interaction schemes will be implemented, to support R&I knowledge valorisation. These test cases will notably involve R&I stakeholders previously engaged and trained. Protocol for the test cases implemented will be designed and adapted to the local context. Finally, a set of recommendations on why and how to facilitate the implementation of new test cases. These recommendations will be largely disseminated to 100+ R&I representative stakeholders (such as clusters, EDIH, incubators etc.) to support the project's replicability and large use of the repository.

Grant Agreement Number: 101135181

Project Duration: 24months (01/01/2024 – 31/12/2026)

Total Budget: 983.119,65€

Project's webpage: <https://www.interactionseeds.eu/>

- **Prolight**

Horizon Europe, topic: HORIZON-CL4-2021-RESILIENCE-02, type of action: HORIZON-IA



European districts play a pivotal role in the achievement of a future low carbon economy. The envisaged actions of the **ProLight** project are representative for innovative refurbishment with large potential of immediate replication of other residential buildings from the municipalities & the social housing involved. ProLight assembles & closely integrates all needed actors & measures. The envisaged solutions will lead to better quality of life for all targeted end-users. This includes to find suitable social responses for awareness creation, up-take of knowledge, establishment of behavioral changes towards the energy efficient use & the integration of renewables within an appropriate local political frame. Analysed districts include: 1) Building and renovating in an energy and resource efficient way in AT, FI & GR, 2) Energy communities in ES, IT & PT combined in so-called Innovation clusters.

A multi-actor approach uses a methodological concept that explicitly takes into account the energy transition as a societal lever for innovation in the involved demo districts. Applied research will be connected with theoretical analysis that involves identifying and compiling good practices, successful initiatives and exemplar real-world demo sites. These practices will be assessed and lead to a complete European competence framework, encapsulating the skills required to reach this change via recorded successful methods observed through ProLight. The project combines individual, gender & collective aspects of active and responsible citizenship in an integrated working concept, to conceptualize -aware citizens and communities. ProLight exploits the potential of this growing wave of civic engagement and citizen science, in order to facilitate the transition to green, sustainable societies & economies.

ProLight achieves this by understanding, defining, measuring & assessing of 6 demo districts in different regions of Europe & disseminate effectively project results.

Grant Agreement Number: 101079902

Project Duration: 48 months (01/10/2022 – 30/09/2026)

Total Budget: 2.884.068,75€

Project's webpage: <https://www.prolight-project.eu/>

- **PV4Plants**

Horizon Europe, topic: HORIZON-CL5-2022-D3-01-06, type of action: IA (Innovation Actions).

PV4Plants boosts the energy-agricultural synergy of agriPV technologies to enhance growth conditions and increase land-use efficiency, crop yield and renewable energy generation. This is achieved by optimising the light transmission of PV panels through cutting edge nanoparticles spraying on the PV glass surface. PV4Plants system is specifically designed to meet healthy harvesting and to be adaptable to different climatic conditions and crop varieties that will be demonstrated in 3 highly replicable demo sites in Turkey, Spain, and Denmark.

PV4Plants optimises the system parameters (panels tilt, irrigation level, number of fertilisers, etc) based on a multi-indicator real-time monitoring system that allows a continuous improvement of the microclimate underneath the agriPV panels to increase crop health and yield. Recyclability and reutilization of components and materials both for the manufacturing and End of Life of the PV4Plants system are central aspects of the project. The PV4Plants system will be certificated through the Environmental Product Declaration (EPD), compliance with ISO 14021 and the Sustainability Excellence Label by UNEF.



Finally, PV4Plants will boost its market penetration and uptake through innovative farmers' engagement strategies to enhance their acceptance and trust in innovative agriPV systems; new financing schemes and business models to improve investment performance and through a set of policy recommendations that will be developed together with public authorities to create new mechanism designed to accelerate the uptake of agriPV systems in Europe.

Grant Agreement Number: 101096409

Project Duration: 48 months (01/01/2023 – 31/12/2026)

Total Budget: 4.079.701 €

Project's webpage: www.pv4plants.eu

- **INNO-TREC**

Horizon Europe, topic: HORIZON -CL5-2024-D3-02-06 – Innovative, Community-Integrated PV Systems, **type of action:** IA (Innovation Actions).



INNO-TREC is implemented by 20 leading partners from the energy and research sectors, with the aim of revolutionizing the field of Renewable Energy Communities (RECs). The project is fully aligned with the European Union's vision for the energy transition, as it develops the next generation of tools, methodologies, and platforms that genuinely address the needs of these communities.

These innovations will be implemented through six pilot applications in six different countries: Portugal, Greece, Belgium, Ireland, the United Kingdom, and Italy.

INNO-TREC will examine the barriers, incentives, and factors influencing energy users by combining new technological solutions with insights from the social sciences and humanities. By the end of the project, it will have delivered cutting-edge, high-readiness results that can be practically applied.

Grant Agreement Number: 101230578

Project Duration: 42 months (01/01/2026 – 30/06/2029)

Total Budget: 5.360.894€

Project's webpage: N/A

- **PRECIOUS**

Horizon Europe, HORIZON-CL6-2024-FARM2FORK-01-8, type of action: HORIZON Research and Innovation Actions



The PRECIOUS project aims to create a robust and standardized database

of food loss and waste (FLW) prevention and reduction actions and to develop advanced models for assessing the effectiveness of reduction strategies. It seeks to integrate FLW solutions into EU climate policies and sustainability frameworks, while engaging stakeholders across the entire food supply chain to achieve large-scale and long-lasting impact. Description

PRECIOUS is a transnational partnership of 18 partners from 11 European countries, funded by the EU and adopting a multidimensional and systemic approach to the issue of food waste. The project combines interdisciplinary research, active stakeholder engagement, and large-scale data analysis to develop strategies with real impact.

Its approach goes beyond simply measuring the amount of food saved or the CO₂ emissions avoided. It also considers rebound effects, where reducing food waste can sometimes lead to unexpected environmental outcomes.

Through the development of innovative tools, standardised databases, and dynamic models, PRECIOUS aims to capture how food loss and waste affect climate, energy, and biodiversity, providing evidence-based insights to policymakers and society.

Grant Agreement Number: 101230578

Project Duration: 48 months (01/10/2025 – 30/09/2028)

Total Budget: 4.495.537,50€

Project's webpage: <https://www.precious-horizon.eu/>

- **RESONANCE**

Horizon Europe, topic: HORIZON-CL5-2022-D3-01-12, type of action: IA (Innovation Actions).



The **RESONANCE** project develops an innovative software framework that provides means for rapid development and plug-and-play deployment of standard-compliant Customer Energy Manager (CEM), Resource Manager (RM), and their aggregation solutions. The CEM, specified in the EN 50491-12 standard family, is the next-generation demand-side flexibility management (DSFM) solution in Europe. CEM is a software agent that automates DSFM by interacting with smart appliances (represented by RMs), aggregators, and the markets to maximize customer benefits.

According to the new EN 50491-12-2 standard, CEMs are envisioned to 1) provide a more deterministic demand response, and 2) be able to optimize consumer benefits with respect to multiple incentives and optimization targets. To achieve this, there is a need for accurate models of flexible assets (smart appliances) and model predictive control techniques to automate the decision-making within the customer premises. The **RESONANCE** Framework will facilitate the adoption of CEMs as the next generation DSFM system by significantly reducing the development efforts and costs. This is achieved with 1) a standard-compliant and modular system architecture, and 2) an innovative modeling pipeline that combines automated machine learning (AutoML) with physics-based modeling to provide accurate and robust models of flexible assets with minimum effort. The project brings together 19 partners (including a cluster with 40 organizations) with inter-disciplinary expertise and forms a basis for a cross-sector energy ecosystem that significantly contributes to the mobilization of DSFM at a large scale.

Large scale piloting in six member states with a variety of consumer sectors, flexible assets (e.g. electric vehicles, HVAC systems, and white goods), stakeholders, and market settings (including sector integration with district heating) is utilized for demonstrating and validating the scalability and replication potential of the solutions.

The Greek pilot will focus on a cross-sectoral energy ecosystem related to the issue of Demand Response and will be implemented in Ptolemaida, capital of the Municipality of Eordaia in the Region of Western Macedonia. The pilot will be coordinated by CluBE (Bioeconomy and Environment Cluster) and will involve the Municipality of Eordaia, the technology provider EDAT and the Athens University of Economics (AUEB). The pilot will be divided into 2 phases, depending on how the interventions will take place.

Grant Agreement Number: 101096200

Project Duration: 36 months (01/01/2023 – 31/12/2025)

Total Budget: 10.230.321,50 €

Project's webpage: <https://www.resonance-project.eu/>

- **Nexrur**

Horizon Europe, topic: HORIZON-CL6-2024-COMMUNITIES-02 - New sustainable business and production models for farmers and rural communities, type of action: Research and Innovation Actions (RIA).



NEXRUR (NEXT GENERATION SUSTAINABLE BUSINESS MODELS AND

MONITORING FOR RURAL RESILIENCE AND INNOVATION) addresses major economic, social and environmental challenges faced by rural areas and agriculture in relation to climate change, biodiversity loss and water supply. Through EU-China international cooperation, the project investigates innovation dynamics and strategies for change in rural areas, enabling farmers and their communities to develop, select and upscale new or improved sustainable business models and to monitor their economic, social and environmental impact on rural resilience.

NEXRUR generates new knowledge on community-led agricultural business models by combining conceptual and practical research, facilitating co-design and co-innovation in a network of 22 diverse community-led cases (15 in the EU and 7 in China) and 7 selected start-up cases (5 in the EU and 2 in China) based on sustainability performance criteria. In parallel, the project verifies the social and

environmental performance of community-led agricultural businesses in different contexts, agri-food value chains, pedoclimatic zones and socioeconomic and environmental conditions in the EU and China. To achieve its objectives, NEXRUR follows a three-phase methodology: (i) Knowledge generation through the collection of insights from stakeholders and research and the development of guiding concepts and strategies. (ii) Monitoring & evaluation through the development and testing of a KPI-based monitoring framework and associated digital tool for social, environmental and economic performance and (iii) Knowledge transfer via targeted dissemination, capacity-building, stakeholder engagement and replication/upscaling activities to maximize impact across Europe and China.

Grant Agreement Number: 101181273

Project Duration: 48 months (01/10/2025 – 30/09/2029)

Total Budget (maximum grant amount): 5.999.774,50€

Project's webpage: <https://nexrur.eu/>

- **i-STENTORE**

Horizon Europe, topic: HORIZON-CL5-2022-D3-01-11, type of action: IA (Innovation Actions).



i-STENTORE will examine the integration of diverse storage solutions and their combinations. Innovative storage systems will be showcased and their co-operation with the integrated assets will be co-optimized, placing the reliability, the power quality, the cost-efficient operation, and the maximization of the assets' lifetime as end-goals. i-STENTORE will introduce an umbrella framework aiming to showcase stand-alone and hybrid storage solutions highlighting the multi-purpose use of storage, not only as an energy buffer, but also as an active grid component capable of providing services and contributing to grid resilience, stability, and efficient operation. The proposed framework will examine the applicability of versatile storage solutions in various applications covering the mobility, agricultural, industry, household, heating, and other sectors, and in different timeframes, creating what-if scenarios for the selection of the optimal storage solutions to serve each individual application in the most effective way, promoting purpose-specific Hybrid Energy Storage Systems (HESS).

To achieve this and to ensure a seamless integration in a technology-agnostic and interoperable manner, i-STENTORE will design a Reference Architecture towards an open and flexible storage-enabling European energy system leveraging storage-induced flexibility and facilitating the increased integration of renewable energy sources (RES).

i-STENTORE will embrace the introduction of novel business models, towards building positive and attractive business cases for storage, identifying new revenue streams for storage operators, and promoting storage systems as a facilitator of the energy transition. This approach will develop and validate the enhanced connectivity of multiple systems at different levels of the energy value chain, incorporating both front-of-the-meter and behind-the-meter solutions, targeting the essential empowerment of new actors and the strategic shift of the role of storage.

Grant Agreement Number: 101096787

Project Duration: 36 months (01/01/2023 – 31/12/2025)

Total Budget: 8.098.455,43 €

Project's webpage: <https://istentore.eu/>

- **MarginUp!**

Horizon Europe, topic: HORIZON-CL6-2022-CIRCBIO-01-02, type of action: IA (Innovation Actions).



At the present, 60 – 70% of all soils in Europe are in unhealthy conditions, mainly because of poor land management practices, pollution of soils, intensive agriculture, and the constant effects of climate change. This situation is further aggravated given that 25% of land is at a high or very high risk of suffering desertification in most parts of Europe. **MarginUp!** proposes a

strategy to secure use and return profitability on marginal lands. Its main objective is to introduce climate resilient and biodiversity-friendly non-food crops for sustainable industrial feedstock in marginalised and low-productivity lands. The project will focus on producing biomass to be used as raw material for the production of bioproducts and biofuels, which in turn, will create a sustainable and circular value chain, increasing the farming system resilience in rural areas. To further enhance the biodiversity beneficial impact, MarginUp! is focusing on understanding which marginal lands are suitable for low ILUC biomass production. The knowledge gathered in this project will be put into practice in 5 different use cases located in 5 different regions across Europe:

- Mediterranean Lands (Spain)
- Mine Lands (Greece)
- Boreal Lands (Sweden)
- Wetlands (Germany)
- Central Europe (Hungary)

Moreover, international cooperation has been considered, and examination and identification of marginal lands will extend to non-European countries such as Argentina and South Africa.

To ensure the success of the project, MarginUp! will have a replication network to address the needs and requirements of relevant stakeholders, including, policymakers, land managers, farmers, the bio-based industry, environmental authorities, the academia, and the civil society. MarginUp! is directly contributing to European policies such as the European Green Deal, the Circular Economy action plan and the Bioeconomy and Biodiversity strategies.

Grant Agreement Number: 101082089

Project Duration: 48 months (01/12/2022 – 30/11/2026)

Total Budget: 7.829.617,50 €

Project's webpage: <https://margin-up.eu/>

• 24_7 ZEN

Horizon Europe, topic: -, **type of Action:** HORIZON-JU-RIA

The goal of **24_7 ZEN** is to design and build a high performing 33/100kW scale rSOC power balancing plant and demonstrate its compatibility with the electricity and gas grids. The multidisciplinary consortium behind this project has been spearheading innovations in the energy management and



are pioneers on the rSOC systems development. Together, they cover every step of the value chain from enhanced materials on the cell level (POLITO, FORTH, IREC), fully operational rSOC system (SP_CH, SP_IT, OST) fully integrated, plug and play ecosystem for grid interconnection (INER, BOS, CERTH), renewable energy generation (EUNICE), transmission system operator (DESFA) and international quality assurance (KIWA). The ecosystems' ability to optimize efficient routes of Power to Gas to Power, using H₂ or NG as fuel and inject H₂ into the grid, transition in <30 minutes and roundtrip efficiency of 45% will be demonstrated while ensuring compliance with standards and safety regulations. Finally, the consortium count on well-connected organizations in the European hydrogen, electricity, and grid services sector (HSLU, CluBE) that ensures the dissemination of the developed new business models and practices for renewable energy storage, including new concepts for the delivery of green hydrogen.

This consortium will develop and validate an ecosystem that can be efficiently scaled and replicated to multi-MW scale installations. Further knowledge on how to improve the performance of rSOC (degradation rates of 0.4%/kh for 1000h, current densities of 1.5A/cm² in both modes) and make them more cost competitive (by reducing CAPEX from 6000€/kW to 3500€/kW) will be generated. At the end of the project, new and viable scenarios to provide grid balancing and supply green hydrogen will be presented by means of a deep techno-economic analysis. By advancing Rsoc towards commercial exploitation, the renewable hydrogen deployment required for a climate neutral Europe will be one step closer.

Grant Agreement Number: 101101418

Project Duration: 36 months (01/01/2023 – 31/12/2026)

Total Budget: 5.499.822,50 €

Project's webpage: <https://24-7zenproject.eu/>

- **POST PURPLE**

Horizon Europe, HORIZON-CL6-2024-ZEROPOLLUTION-02, type of action:
HORIZON Research and Innovation Actions



POST-PURPLE (Prevention, Correction and Valorisation of Exhaust Flows from Urban Photobiorefineries) aims to develop and demonstrate innovative bio-based technologies that enable zero-pollution and zero-waste strategies in urban biorefineries, with a particular focus on wastewater treatment plants (WWTPs) and organic fraction of municipal solid waste (OFMSW) facilities. The project targets the integrated valorisation of gaseous, liquid and solid waste streams in order to reduce diffuse emissions to air and water while converting waste into high-value bio-based products.

The project develops technological solutions aiming at high CO₂ capture rates, significant reductions of VOCs and ammonia emissions, and advanced treatment of exhaust gas flows, vapours and odours. At the same time, the project promotes circular resource recovery by converting solid OFMSW rejects into biochar and syngas and by producing added-value products such as microbial protein, carotenoids, omega-3 fatty acids, coenzyme Q-10, green methanol, organic fertilisers and fortified irrigation water. Within POST-PURPLE, CluBE supports regional deployment and replication analysis through a dedicated case study in Western Macedonia, in line with the project's objectives for validating and demonstrating bio-based solutions in urban biorefinery contexts. In addition, CluBE contributes to stakeholder engagement, knowledge exchange and dissemination activities.

Grant Agreement Number: 101181162

Project Duration: 48 months (01.01.2026 – 31.12.2029)

Total Budget: 3.995.126€

Project's webpage: N/A

- **ROBOCOOP-EU**

Horizon Europe, type of Action: HORIZON-JU-CBE-2022



ROBOCOOP aims to deploy regional circular bio-based business models for the valorisation of waste streams from three agricultural sectors: grape, olive and stone fruit.

CluBE will lead the coordination of the "Living Labs" and the development of the Business Plans for each regional hub including the Greek one. ASOP DIMITRA and ENTEKA are also project partners

Grant Agreement Number: 101112407

Project Duration: 36 months (01/06/2023 – 31/05/2026)

Total Budget: 4.751.936,41 €

Project's webpage: <https://robocoop-project.eu/>

- **TIPS4PED (Turning cities Planning actionS for Positive Energy Districts into success)**

HORIZON-MISS-2023-CIT-01-02 – Positive clean energy district (PED) digital twins – from modelling to creating climate neutral Cities.



TIPS4PED aims to develop an Integrated Assessment Platform (IAP) to support cities in the decision-making process, enabling the design, development, and optimised management of PEDs (Positive Energy Districts) by means of DTs (Digital Twins). TIPS4PED project puts decision-makers and citizens at the core of the climate neutrality action and proposes a user-centric decision-making approach for the development of tools and solutions. The platform will incorporate a DT capable of modelling the potential PED, capturing both energy and mobility aspects and allowing the simulation of

different scenarios to help cities to optimally plan and manage their urban districts, reducing carbon emission as much as possible.

The TIPS4PED IAP will include several specialized modules for the financial, regulatory, and administrative support of the municipalities, to offer them guidance in these subjects. A bespoke data framework, in which the proposed tools will operate, and customised data gathering approaches, to support the development of the DT, will be developed. The project's anticipated outcomes will increase the environmental sustainability of cities, supporting municipalities not only from the technical but also from the social, financial, regulatory, and administrative perspectives. These outcomes will produce evidence-based results, optimised management measures, reduced operational costs, inform e-financial schemes and policies and boost citizen engagement in environmentally friendly city planning actions. The project's deliverables will be tested in 4 of the 100 Mission "NetZero City" (Turin, Cork, Budapest and Kozani), evaluating the techno-economic viability of PEDs, and enabling the optimisation of their design and operation supporting the proliferation of PEDs and the systematic decarbonisation of cities.

Grant Agreement Number: -

Project Duration: 48 months (01/01/2024 – 31/12/2027)

Total Budget: 7.397.803,75€

Project's webpage: <https://tips4ped.eu/>

- **HEDGE-IoT: Holistic Approach towards Empowerment of the DiGiTalization of the Energy Ecosystem through adoption of IoT solutions. HORIZON-CL5-2023-D3-01-15:**

Supporting the green and digital transformation of the energy ecosystem and enhancing its resilience through the development and piloting of AI-IoT Edge-cloud and platform solutions.

HEDGE-IoT aims to address a number of challenges that hinder the transition towards a digital energy ecosystem:

- Interoperability and standardisation.
- Data privacy and security
- Computational Orchestration
- User adoption and Stakeholder Engagement
- Ensuring resilience in a RES-dominant power system

HEDGE-IoT proposes a novel Digital Framework which aims to deploy IoT assets at different levels of the energy system (from behind-the-meter, up to the TSO level), to add intelligence to the edge and cloud layers through advanced AI/ML tools and to bridge the cloud/edge continuum introducing federated applications governed by advanced computational orchestration solutions. The HEDGE-IoT Framework will upgrade the RES-hosting capacity of the energy systems and will unleash a previously untapped flexibility potential. It will increase the resilience of the grid, create new market opportunities, and promote advances in IoT standardisation, by introducing and managing a plethora of diversified, interoperable energy services over scalable and highly distributed data platforms and infrastructure. The multi-dimensional framework of HEDGE-IoT comprises the following pillars: (a) the Technology Facilitator Pillar will exploit the computational sharing by offloading applications on the grid edge, towards providing a set AI/ML federated learning and swarm computing applications; (b) the Interoperability Pillar, which leverages on leading-edge interoperable architectures, such as the Data Space architectures; (c) the Standardisation Pillar will enable all involved platforms, systems, tools and actors to seamlessly communicate and exchange data in standardized formats using widely used standards, such as SAREF, etc.; (d) the Digital Energy Ecosystem Enabling Pillar will ensure the creation of an ecosystem facilitating the increased integration of RES and characterised by resilience. Liaisons with EU initiatives for IoT and digitalisation will be established (e.g., the AIOTI) and the engagement of stakeholders will be ensured by addressing IoT ethics and cultivating trust among end-users, thus promoting inclusivity. Scalability and replicability studies will be performed and connections with innovators and SMEs will be established through the Open Call mechanism of the project.



Grant Agreement Number: 101136216
Project Duration: 42 months (01/01/2024 – 31/06/2027)
Total Budget: 17.999.755,00€
Project's webpage: -



- **H₂MARINE**

Horizon Europe, topic: HORIZON-JTI-CLEANH2-2023-03-02, **type of Action:** HORIZON JU Research and Innovation Actions

The goal of **H₂MARINE** is to design, build, test and validate two PEM stacks generating 250–300KW for marine applications in a modular up-scalable design.

With 13 partners in 5 countries the H2MARINE consortium will validate PEM in relevant environment and industrial data, prove that Marine PEM stack lifetime reach 40.000h–80.000h and implement the goal of PEM stack capex:2024<1.500€/KW & capex:2030 1.000€/KW.

CluBE is leading Work Package 7 which will implement dissemination, communication, and exploitation activities. More specifically CluBE will create H2MARINE website, will collaborate with other partners on data sharing and assess PEM and techno-economic results.

Grant Agreement Number: 101137965

Project Duration: 42 months (01.01.2024 – 31.06.2027)

Total Budget: 7.499.171,50 €

Project's webpage: <https://h2marineproject.eu/>

H₂MARINE

- **ToBeReal**

Horizon Europe, HORIZON-CL6-2024-CIRCBIO-01, type of action: HORIZON Coordination and Support Actions



ToBeReal project is a 5-year European collaborative partnership bringing together multidisciplinary actors to promote bioeconomy projects along the different bio-based value chains. ToBeReal provides high quality expertise and strategic service assistance in four verticals (Fig 2): Technical (T), Business & Financial (B), Regulatory & Legal (R) and Social Innovation (S), in all geographical EU regions of Member States (including associated countries), paying special attention to those where bioeconomy is underdeveloped. ToBeReal project is an audacious endeavour that leverages an extensive experience and expertise of its consortium composed by 6 key bioeconomy clusters (SGZ, CLUBE, BFR, FAB, B4C and BEC), 3 recognized Technological Centers in the bioeconomy (AINIA, EV ILVO and VITO), and 4 SMEs service providers in the field of funding programmes, exploitation management and communication & dissemination (PNO ES, PNO PT), in process development and scale-up (BBEPP) and in policy, regulatory and market development (NNFCC). The main goal of ToBeReal is to catalyse public, private and public-private bioeconomy projects at different stages of maturity leading to a higher number of flagship projects across Europe

Grant Agreement Number: 101181799

Project Duration: 60 months (01.11.2024 – 31.11.2029)

Total Budget: 2.999.846,08 €

Project's webpage: <https://www.tobereal.eu/>

- **URSOiLL:**

Horizon Europe, HORIZON-MISS-2024-SOIL-01, type of action: HORIZON Research and Innovation Actions

Within the framework of the URSOILL project, five operational Living Labs (LLs) will be established, covering different climatic zones and soil types, as well as a wide range of tested solutions for soil improvement. At the same time, the replication of these solutions will be promoted in at least 30 cities beyond the scope of the project.



URSOiLL

More than 10,000 stakeholders will be trained and engaged to participate in the Living Labs or to replicate the developed solutions through the deployment of two tools. The project will also support the implementation of the EU Soil Monitoring Regulation through data and validated methodologies.

Grant Agreement Number: 101219012

Project Duration: 54 months (01.09.2025 – 1.03.2030)

Total Budget: 11.999.896,25 €

Project's webpage: <https://ursoill.eu/>

- **FLEXIZYME:**

Horizon Europe, topic: HORIZON-JU-CBE-2023, **type of Action:** HORIZON JU Research & Innovation Action



Fatty amines possess cationic and surface-active properties, finding applications in cosmetics, coatings, detergents, and more with a projected market growth to \$5.54 billion by 2027. They are usually synthesized via the so-called "nitrile route" from natural sources, fats and oils, or petrochemical raw material. Despite being a well-established route applied in industry for years, it presents multiple drawbacks such as high energetical demand, presence of toxic metal catalysts, harsh reaction conditions and low selectivity resulting into undesired mixtures of primary, secondary, and tertiary amines which complicate the downstream process. Biotechnological alternatives, deploying enzymes, offer a sustainable alternative, characterized by mild conditions and high selectivity but their industrial implementation is hampered by cost and complexity challenges. Currently, there's a lack of a holistic approach that considers upstream, midstream, and downstream factors when designing biotechnological processes. FLEXIZYME aims to pioneer an interdisciplinary, systematic biotechnological platform for fatty amine production from protein-rich and fat residues, encompassing all process stages. A pivotal project aspect is scaling up and validate the enzyme use in in cosmetics, detergents, and agriculture by integrating cutting-edge technologies. Key project elements include a chemo/enzymatic approach, machine learning tools applied to experimental and in silico data, enzyme engineering/improvement, reactor design and monitoring. Encouraging widespread adoption of biotechnological industrial applications would be achieved by including these findings in a biotechnological platform for fatty amine production. This flexible, versatile biotechnological platform marks an innovative departure from existing fatty amine production processes, addressing current limitations enhancing environmental performance. Sustainability is a central focus throughout the project, with an emphasis on maximizing by-product utilization and adhering to a zero-waste approach.

Grant Agreement Number: 101157528

Project Duration: 48 months (01.06.2024–31.05.2028)

Total Budget: 4.984.163,75 €

Project's webpage: <https://www.flexizyme.eu/>

- **BIO-INSPIRE**

Horizon Europe, topic: HORIZON-JU-CBE-2024, **type of action:** HORIZON JU Coordination and Support Actions



The purpose of the BIO-INSPIRE project is to strengthen bio-based innovation and participation in under-represented regions of Eastern and Southeastern Europe by mobilizing Regional Bioeconomy Clusters (RBCs) and fostering collaborative governance. The project addresses key barriers such as limited access to R&I infrastructure, weak networking opportunities, skills gaps, and lack of supportive policies.

Through a combination of awareness-raising, stakeholder engagement, knowledge transfer, and cascade funding, BIO-INSPIRE will equip regional actors with tools and frameworks to increase their innovation capacity and connect with European and international networks. A central legacy of the project will be

the Governance Model Road-Map, Communities of Practice, and Replication Handbooks, which will provide long-lasting guidance for collaboration, replication, and sustainable growth.

BIO-INSPIRE aims to unlock the potential of local bio-based ecosystems, strengthen their role in EU bioeconomy initiatives, and ensure more inclusive participation in the CBE-JU programme. Regional clusters are the unsung heroes of sustainable development, driving innovation and economic growth by leveraging local ecosystems and fostering strong connections among businesses, research institutions, and stakeholders. This is even more valid for Clusters in Bioeconomy, where new knowledge is born constantly. The project's collective understanding is that Regional Bio-Economy Clusters are ideally suited to mobilise R&I ecosystems, due to their crosssectoral nature of bioeconomy in different countries, their proximity to local enterprises, and their ability to reflect common bottlenecks and needs and link the local ecosystem with international knowledge and funding hubs.

BIO-INSPIRE, an alliance of 14 transdisciplinary entities from 12 EU countries, demonstrates that regional bio-economy clusters are a valid answer to developing bio-based innovations, driving sustainable growth and fostering resilient local economies across the widening regions of Eastern and Southeastern Europe. BIO-INSPIRE will engage Regional Bio-Economy Clusters in 7 widening countries (Greece, Hungary, Slovakia, Lithuania, Romania, Bulgaria and Poland,) and research and technology developers and clusters in 2 non-widening countries (Sweden, The Netherlands) to address systemic causes of underdevelopment across geographical boundaries. BIO-INSPIRE aims to contribute to the transformation of the widening regional bioeconomies by addressing existing bottlenecks and providing to the regions the necessary tools to advance their R&I capacity and their ability to broaden their collaboration networks. At the heart of this project is the provision of a Governance Model framework, addressing the critical lack of established structures, norms, and procedures for sustainable collaboration. This framework is designed to be a long-lasting legacy, empowering also other regions to achieve sustainability and growth, and ensuring their effective and enduring engagement in the bio-based economy.

Grant Agreement Number: 101214256

Project Duration: 36 months (01.05.2025 – 01.05.2028)

Total Budget: 2.999.180,00€

Project's webpage: N/A

- **iCOSHELLs**

Horizon Europe topic: HORIZON-MISS-2023-SOIL-01-08 - Co-creating

solutions for soil health in Living Labs, type of action: Research and Innovation Action (RIA)



European soils face pressing conditions for their health. An alarming 60-70% of EU soils are considered unhealthy, attributed to factors such as pollution, urbanization, and intensive agriculture, further exacerbated by climate change. This degradation results in economic, societal, and environmental repercussions, including decreased land productivity, migration, land abandonment, and biodiversity loss. Addressing this challenge necessitates holistic measures, especially since soil restoration can take centuries. The project initiative, aligning with various EU policies, emphasizes the importance of comprehensive soil restoration efforts. It plans to establish six Soil Health Living Labs (SHELLs) across diverse EU climatic zones, including Sweden, Spain, Spain-France, Italy, Greece, and Bulgaria. These labs are envisioned as innovation hubs, tailored to address the EU's specific soil health objectives. Through collaborative efforts within these SHELLs, the goal is to develop, test, and validate potential solutions, ensuring scalability beyond their immediate regions. iCOSHELLs places a strong emphasis on inclusive stakeholder engagement, from researchers to landowners. Its systematic approach includes building stakeholder capacities, bridging gaps between science and practical applications, deepening understanding of soil indicators, replicating effective soil recovery methods, and championing supportive soil health policies. Additionally, iCOSHELLs seeks to redefine the concept of Living Labs (LLs). Challenging the traditional model, which often revolves around isolated research

entities, iCOSHELLs envisions LLs rooted in co-creation, broad engagement, and real-world application. This transformative vision aims to evolve existing SHELLs into standardized, widely recognized labs, setting a foundational blueprint for future LLs. Moreover, as a comprehensive soil data repository, iCOSHELLs promotes collaboration, ensuring replicable.

Grant Agreement Number: 101157394

Project Duration: 48 months (01.06.2024 – 31.5.2028)

Total Budget: 11.999.872,50€

Project's webpage: <https://www.icoshells.eu/>

- **GUESS-why**

Horizon Europe topic: HORIZON-JTI-CLEANH2-2024, type of call: HORIZON JU Coordination and Support Actions



The shift toward a hydrogen-based economy requires a fundamental redesign of current engineering systems. As hydrogen production, storage, and usage expand, ensuring their sustainability and safety from the outset is critical. The GUESS-WHy project tackles this by promoting a Safe and Sustainable by Design (SSbD) framework, which is recognized at the EU level as a benchmark for minimizing lifecycle impacts during the design phase. GUESS-WHy will develop seven SSbD guidelines for different fuel cell and hydrogen (FCH) technologies across the hydrogen value chain—covering systems like PEM and Alkaline electrolyzers, SOFCs, H₂ gas turbines, and storage via metal hydrides. These guidelines aim to balance safety, environmental, social, and economic dimensions. By collecting insights from previous projects, stakeholders, and scientific literature, the project ensures relevance and broad applicability. GUESS-WHy's systematic approach follows clear steps: defining products, conducting initial impact assessments, generating improvement scenarios, and analyzing benchmarks. The results will be actively shared with industry and policymakers to encourage uptake. The consortium includes academic and research institutions alongside private companies experienced in FCH design. GUESS-WHy also works closely with a network of public and private actors to feed in practical needs and support dissemination.

Grant Agreement Number: N/A

Project Duration: 36 months (01.01.2025 – 31.5.2027)

Total Budget: 1.499.976,56€

Project's webpage: <https://guesswhy.eu/>

(1) One Interregional Innovation Investments (I3) Instrument under the ERDF project:

- **Hy2Market**

Interregional Innovation Investments (I3) Instrument under the ERDF, topic: I3-2021-INV1-GREEN, type of action: I3-PJG.



The main objective of Hy2Market (HYdrogen TO enter MARKETs reducing carbon Emissions footprint) is to realize a more mature hydrogen value chain across Europe. With an interregional approach, knowledge about building a robust and innovative Hydrogen value chain is realized through targeted investments on green hydrogen production - with special focus on management systems-, the transport of hydrogen in existing and new infrastructure and the offtake of green hydrogen by industrial partners and in mobility.

The basis of Hy2Market lies with European frontrunner regions like Northern Netherlands, Upper-Austria and Rhone-Alpes, who connected and joined forces with emerging hydrogen regions from the Iberian Peninsula like Asturias, Aragon, Castilla y Leon and Medió Tejo, Sicily in Italy, Western Macedonia in Greece and Constanta in Romania, where each region joins in a minimum of one focus point. The results of this project will be broadly spread within the regions and off course the EU-community as a whole.

Within the project, CluBE will evaluate aspects relevant to hydrogen compression need and solutions, the variable and partial use of hydrogen in power plants (coal, gas, cogeneration) and furnaces in general in several industrial sectors, the barriers, challenges and opportunities for different industrial sectors and the evaluation of required hydrogen quality for different applications. Further, CluBE will collaborate

with the other partners on data sharing regarding business cases and technical documents, from pilot plants and stakeholders involved.

Grant Agreement Number: 101083592

Project Duration: 36 months (01.11.2022 – 31.10.2025)

Total Budget: 14.276.937,23€

Project's webpage: <https://hy2market.eu/F>

(5) Five Horizon 2020 projects (finalised):

- **STARDUST**

H2020, topic: SCC-1-2016-2017, **type of action:** IA (Innovation action).

STARDUST Smart Cities Project serves as smart connector bringing together advanced European cities and citizens of Pamplona (ES), Tampere (FI) and Trento (IT) – with the associated follower cities of Derry (UK), Kozani (GR) and Litomerice (CZ). These six cities, collaborating with relevant industrial partners, including a variety of innovative local SME, and supported by academia and research centres will demonstrate three lighthouse cities, deploy intelligent integration measures, test and validate technical solutions and innovative business models, and deliver blueprints for replication throughout Europe and abroad.

Within the STARDUST project, CluBE will take an active role in linking and transferring know-how between the “lighthouse” cities, Pamplona (Spain), Tampere (Finland) and Trento (Italy) and the “follower” cities, Kozani (Greece), Cluj (Romania), Litomerice (Czech Republic) and Derry (UK). In this framework, CluBE will act as catalyst for the implementation of studies and projects that will make the Follower Cities smart and environmentally sustainable. Specifically, for the municipality of Kozani, CluBE will help the city of Kozani maintain its energy character and become a smart green energy municipality model during its transition to the post-coal era.

Grant Agreement Number: 774094

Project Duration: 10/2017-03/2024 (77 months)

Total Budget: 21.093.539,25 €

Project's webpage: <https://stardustproject.eu/>



- **NOMAD**

H2020, topic: CE-SFS-39-2019, **type of action:** IA (Innovative Action).

NOMAD aims to replace non-renewable mineral fertilizers with low-carbon, organic equivalents, creating new, disruptive business models for rural decentralized AD to support the circular bio economy. The



project includes partners from China, Greece, the UK, Italy, Romania, Malta and the Netherlands to develop an innovative, **mobile**, small-scale technology solution designed to **recover fibre and specific nutrients from digestate** to produce high performance **bio-fertilizer** products. This is an innovative approach and may create new economic growth where nowadays turning digestate into bio-fertilizer products is not feasible for most small plants due to lack of available, cost-effective equipment.

CluBE is coordinating all the regional work in the pilot case of Western Macedonia, Greece, including understanding stakeholder and regional variations for demonstration/trials and Greek field tests, demonstration and evaluation. CluBE is also supporting the techno-economic evaluation and impact assessment as well as leading the exploitation plan and support and coordinating in regional level all the efforts from the Greek partners for the wider regional and national impact.

Grant Agreement Number: 863000

Project Duration: 10/2019-06/2023 (45 months)

Total Budget: 4.877.607,01 €

Project's webpage: <https://www.projectnomad.eu/>

- **MODEL2BIO**

H2020, topic: BBI-2019-S02-R7, type of action: BBI-RIA.

Agri-food industry generates nearly 50% of the average composition of global waste in form of organic residual stream.

The main objective of **MODEL2BIO** is the integration of a deeper knowledge on composition, logistics and volume of various **organic streams** which is in the position of supporting the decision-making process to maximise profit from a specific feedstock and to select the most appropriate technologies for its optimal **valorisation**.

By using predictive models, this innovative concept will estimate i) the agri-food industry residual streams composition (considering the seasonality, territorial features and origin); ii) the best recommended ways for valorising it.

CluBE will lead the Work Package on the tool validation in 3 pilot cases covering 3 EU main geographic distribution and entities, through a multi-stakeholder verification process. CluBE will also be the coordinator for all the activities and residual stream characterisations in the Western Macedonia region.

Grant Agreement Number: 887191

Project Duration: 5/2020-4/2023 (36 months)

Total Budget: 5.919.085,00€

Project's webpage: <https://www.model2bio.eu/>



- **HOOP**

H2020, topic: CE-SFS-25-2018, type of action: IA.

The **HOOP Project** will help to unlock bio-based investments and deploy local bio economies in Europe through a systemic and cross-cutting approach. It will offer Project Development Assistance (PDA) to a group of 8 lighthouse cities and city clusters - to build the technical, economic, financial and legal expertise needed to develop concrete investments to valorise OFMSW (Organic Fraction of Municipal Solid Waste) or UWWs (Urban Wastewater Sludge) with the aim of obtaining safe and sustainable bio-based products. Each PDA will contain detailed implementation assistance and a defined Circular Business Model tailored to each participating lighthouse city, as well as financing mechanisms to be used for mobilising investment. Moreover, HOOP will launch stakeholder engagement and citizen science initiatives to allow for the co-design of an improved collection of OFMSW for its later optimum valorisation. It will promote behavioural change and acceptability of biowaste-based products, as well as food waste prevention.

CluBE will participate in the Project by a) the identification and analysis of novel Circular Business Models behind successful solutions in the value chain of bio-waste valorisation. CluBE will also undertake a stakeholder engagement, awareness raising and acceptance of biobased products for the city of Kozani. Finally, will contribute to establish a European network to facilitate the exchange of good practices among circular bio-based cities.

Grant Agreement Number: 101000836

Project Duration: 10/20-09/24 (48 months)

Total Budget: 7.994.989,13€

Project's webpage: <https://hoopproject.eu/>



- **BBTWINS**

H2020, topic: BBI-2019-S02-R7, type of action: BBI-RIA.

BBTWINS Project (Bio-Based Digital Twins) aims to develop a **digital platform** for the **optimisation of agri-food value chain processes** and the **supply of quality biomass for bioprocessing**.

The platform will be based on 'digital twins' technology - creating a real-time digital replica of physical processes in the agri-food industry. Two regions, one in Spain, La Rioja and one in Greece, Western Macedonia will be the demonstration regions. With 13 partners in 7 countries, the BBTWINS consortium will be focusing on **meat and fruit production**, integrating the value chain (from crop to final product) and



will define the optimal pathway for each feedstock to maximise efficiency and minimise losses – without impacting quality. CluBE is coordinating the regional demonstration while also leading the Work Package 6 which will validate the model in real life environments.

Grant Agreement Number: 101023334

Project Duration: 06/21-05/25 (48 months)

Total Budget: 4,053,705 €

Project's webpage: <https://bbtwins.eu/>

(1) One LIFE project:

- **GREENH2ORN**

LIFE-2023-SAP-CLIMA-CCM, Type of action: LIFE Project Grants



LIFE GREENH2ORN will implement the first operating Green

Hydrogen Refuelling Station (HRS) in Greece and specifically in the city of Kozani, embedding sustainable/zero emission mobility in a lighthouse city selected as one of the 100 climate-neutral and smart cities by 2030 Mission launched by EC. GREENH2ORN will demonstrate the potential for local production, distribution and use of green hydrogen in the mobility sector, namely for heavy, medium and light-duty vehicles. It focuses on the production of green hydrogen via electrolysis, and its use as a fuel for municipal fleets. (Moreover the project aims to promote new sources of hydrogen with a circular approach by 2 feasibility studies). Also, an IT platform will be developed to centralize data for the stakeholders and to support the replication of the project in other cities, as well as several training skills packages to help the declining industries employees move to greener jobs. Finally, a socioeconomic assessment regarding the development of the demonstrator will be carried out to conduct a new green circular approach in Western Macedonia and providing policy makers with clear recommendations to efficiently use green hydrogen as an energy resource and fuel. The expected impacts arising from the project are directly related to climate mitigation and adaptation, such as, reduction in the consumption of fossil-based fuels, reduction of the equivalent carbon emissions in Kozani, demonstration of the benefits of using a centralized Green Hydrogen system to reduce the GHG emissions related to urban transport, and Replication and transfer of the results to 3 more cities/prefectures in Greece. The project length is estimated in 60 months, and the consortium consists of 8 entities (CluBE as coordinator, Municipality of Kozani, DEPA, European Dynamics, UoWM, DIADYMA, ACEA and B&T) with Support of Regional and National Public Administrations.

Grant Agreement Number: 101158215

Project Duration: 60 months (01/09/2024 – 31/08/2029)

Total Budget: 5.340.168,84 €

Project's webpage: <https://greenh2orn.com/>

(6) Six ERASMUS+ projects:

- **GreenSkills4H2**

Erasmus+, Call: ERASMUS-EDU-2021-PI-ALL-INNO, Activity: ERASMUS-EDU-2021-PI-ALL-INNO-BLUEPRINT



The project **GreenSkills4H2** (The European Hydrogen Skills Alliance) is referred to Vocational Training Programmes to address urgent skills needs of people for a 4 - year period. The blueprint will also address the skills need of workers in Declining Sectors and Transition Regions to provide them with upskilling and reskilling opportunities that will enable them to access new employment opportunities within the Hydrogen sector. Technical skills might also be transferable from one field to another, and these possibilities would benefit both workers and industries. Through this GreenSkills4H2 blueprint and the wide sectoral partnership of European stakeholders it will establish, it will be possible to develop and rollout a Hydrogen Skills Strategy across the whole of Europe, maximising the project impact and delivering the skilled workforce needed by the rapidly growing Hydrogen Industry. The project includes the establishment of a long-term partnership between Industry and Education – the European Hydrogen Skills Alliance; the design of an innovative and

sustainable Hydrogen Skills Strategy; the development, testing and roll-out of VET training curricula for VET and higher VET; VET training programmes and qualifications in line with latest market needs and consistently linked with EU instruments and tools; continuous skills and career development that empowers technical professionalism in both green and digital competences; and the widespread dissemination and longterm rollout of the strategy and training programmes to maximise impact long after the four year project duration.

Within the project, CluBE will design reactive and urgent upskilling and reskilling programs for the Western Macedonia Region, which will be specific to hydrogen technologies for the whole hydrogen value chain.

Grant Agreement Number: 1011056448

Project Duration: 01.07.2022 – 30.06.2026 (48 months)

Total Budget: 3.793.793,00 €

Project's webpage: <https://greenskillsforhydrogen.eu/>

- **SEED**

Erasmus+, Call: ERASMUS-EDU-2021-PEX-COVE, **Type of Action:** ERASMUS-LS



SEED – Sustainable Energy Education realizes impact to global climate change prevention with excellent and innovative vocational education on solutions to become a fossil free energy continent. Challenges on transition develop rapidly, with a high demand for digital and green. Solutions are not yet clear, and technologies are constantly evolving. Well-equipped students, professionals and suitable labor capacity are needed for the tasks and challenges. Vocational education, as a driver for innovation and growth and agile in adapting to the labor market, has a heavy responsibility. In addition, the shortage in labor capacity forces us to develop new ways of working and educating. SEEDs partners (14) and associate partners (23) are VET providers EQF level 2-7, representatives from regional skills ecosystems and national agenda-setting stakeholders. With the objectives to prepare learners, students and professionals with skills and competences for the future, to empower regional innovation based on regional needs and to scale up and promote work-based education, they will establish an international learning community and COVES in five regions. The result is regional growing cooperation on vocational excellence in five regions, a shared implemented vision on regional learning, transnational learning and adapting to the labor market, development and exchange of good practices and tools, innovative approaches for learning with impact and an international community on vocational excellence dedicated to sustainable energy. CLUBE is leading the Work Packages related to the Communication and Exploitation of the project and acts as a regional mobilization hub for decision makers, research, education, and enterprises, and brings all stakeholders together to develop synergies and projects in the fields of Bioeconomy and Environment. CluBE is leading the Work Packages related to the Communication and Dissemination of the project as well as the community engagement.

Grant Agreement Number: 101056147

Project Duration: 48 months (01/06/2022 – 31/05/2026)

Total Budget: 3.950.097,60 €

Project's webpage: www.coveseed.eu

- **HABITABLE**

Erasmus+, Call: ERASMUS-EDU-2022-PEX-COVE, **Type of Action:** ERASMUS-LS

HABITABLE – Alliance of Centres of Excellence in Vocational Training for Sustainable Habitat project aims to respond to the challenges and needs of the Habitat sector in terms of skills shortage and mismatches derived from the digital and green transition, improving the responsiveness of the VET systems to these changes while promoting inclusion and equity in education. To this aim, the project will co-create a Platform of Centres of Vocational Excellence for Sustainable Habitat, building a 'skills



ecosystem' together with a wide range of other local and regional partners, also working with centres of professional excellence in other countries through networks of international collaboration.

The consortium is composed of 20 partners (17 beneficiaries, 2 affiliated entities and 1 associated partner) from 6 countries (Spain, Portugal, Austria, Greece, Moldova and Georgia) involving public authorities, VET providers (IVET and CVET) and sector representatives organisations. The project has defined a strategic approach for the involvement of the associated partner, from the initial phase of the project and continuing after the end, to support further sharing, promotion and exploitation of the project results. They will work together, with the active support of key associated partners and stakeholders, to address similar needs and provide common solutions to lead the green and digital transition of the Sustainable Habitat skills ecosystems in Europe.

HABITABLE project is designed to address the challenges faced by the project partners but shared by Sustainable Habitat sectors in Europe. By doing so, the project will contribute to

- Set up a new skills governance strategy for the Sustainable Habitat skills ecosystem, aligned with the SDGs, of reference for the sector in Europe.
- Facilitate further international cooperation for innovation, excellence and access to National and European funds.
- Transfer the lessons learned to other CoEs, Blueprint initiatives and regions about the innovative strategy to spread and mainstream the CoVEs approach to regional VET systems by transferring innovation from tractor CoVEs to the network of VET centres in the region, explored during the implementation of the project.

CluBE is participating in all WPs and in several tasks aiming to enhance collaboration and increase regional knowledge by promoting innovation and synergies between regional stakeholders in the fields of bioeconomy and environment and reinforcing green, smart and circular economy in the region and the neighbouring area.

Grant Agreement Number: 101104680

Project Duration: 48 months (01/06/2023 - 31/05/2027)

Total Budget: 3.998.709,00 €

Project's webpage: <https://habitable-cove.eu/>

- **H2VE**

Erasmus+, Call: ERASMUS-EDU-2024-PEX-COVE, Topic: ERASMUS-EDU-2024-PEX-COVE

H2VE (Hydrogen Valley Vocational Excellence Hub) is an Erasmus+ project supporting the development of skills ecosystems related to Hydrogen Valleys and addressing labor market needs in the Hydrogen Sector. The project establishes six (6) Centers of Vocational Excellence (CoVEs) across Europe (Italy, Greece, Germany, Poland, Latvia) and Africa (Ghana), fostering the development of an adaptable and skilled workforce. Each CoVE acts as a collaborative hub, fostering knowledge exchange by equipping learners, educators, and professionals with essential competencies and co-creating training strategies aligned with local priorities. The project brings together vocational education providers, industry partners, and regional stakeholders to develop adaptive training programs, reflecting local technological, economic, and social needs. Through international collaboration and shared learning, the project promotes vocational excellence and scalable solutions, contributing to the EU's green and digital transitions while reinforcing Europe's leadership in sustainable hydrogen technologies.

Grant Agreement Number: 101194163

Project Duration: 48 months (01/02/2025 - 31/01/2029)

Total Budget: 3.959.532,00 €

Project's webpage: <https://h2ve.eu/>



- **TEAMIT+**

Erasmus+, Call: ERASMUS-EDU-2022-PI-ALL-INNO, Type of Action: ERASMUS-LS



TEAMIT+ - Teampreneur multicultural impact innovation cooperatives aim to help change the pedagogical model of entrepreneurship and innovation education. Until now, these fields have been focused on the

"Individual Entrepreneur" and on innovation that is mainly evaluated on the market. The TEAMIT+ project wants to show in the long term that in order to meet the objectives of sustainable development, entrepreneurship and innovation must not only be thought of differently but also taught differently. Entrepreneurship must become an entrepreneurship that responds to sustainable development objectives; it must promote equality and, in particular, by defending cooperative values. Innovation must now be based not only on market potential but also on responses to environmental and climate issues. From this perspective, the creativity methods taught must consider the social and environmental benefits of innovation.

To achieve this, the project will make a territorial diagnosis of European regions to identify societal and economic challenges and understand the situation of different territories. This information will be used to create a novel "Learning by creating" learning model that will be later implemented in the training programme. TEAMIT+ includes two editions of the programme, which consist of three modules in which participants (young people from 16-30 years from VET and HE, jobseekers and immigrants) will learn about climate change awareness and environmental issues, impact innovation and teampreneurship. The consortium will also work on the replicability of the course. It will create a replicability guideline to facilitate the replication by other educational centres. In the 2 editions of the course, more than 1.300 young people will be benefited, as well as other stakeholders like companies (>80). Main results of the project: TEAMIT+ training programme, replication guideline, white book, EU policy recommendation, commitment booklets, trained volunteer, 20 business projects and entrepreneur's network. A strong consortium has been assembled for the project's successful implementation and future sustainability. It consists of four (4) HE providers, one (1) VET provider (Greece), four (4) labour market actors and 1 NGO, which belongs to 5 different countries (France, Finland, Greece, Mexico and Spain). All ten (10) partners have a strong focus on the transition to a circular and greener economy and are compromised towards the achievements of the SDGs. Furthermore, the participation of policymakers and local authorities such as the Euroregion and the Region of Western Macedonia (as associated partners) guarantee the impact at a local level and will serve as a model for other regions to follow and have an impact at a European level. 20 partners (17 beneficiaries, 2 affiliated entities and 1 associated partner) from 6 countries (Spain, Portugal, Austria, Greece, Moldova and Georgia) involving public authorities, VET providers (IVET and CVET) and sector representatives organisations. The project has defined a strategic approach for the involvement of the associated partner, from the initial phase of the project and continuing after the end, to support further sharing, promotion and exploitation of the project results. They will work together, with the active support of key associated partners and stakeholders, to address similar needs and provide common solutions to lead the green and digital transition of the Sustainable Habitat skills ecosystems in Europe. CluBE is leading the Communication, Dissemination, Exploitation and Sustainability in all WPs and in several tasks aiming to enhance collaboration and increase regional knowledge by promoting innovation and synergies between regional stakeholders in the fields of bioeconomy and environment and reinforcing green, smart and circular economy in the region and the neighbouring area. CluBE will be the Leader for WP6, which is dedicated to Communication and Dissemination Activities. Specifically, WP6 establishes communication and dissemination strategies and materials. The rest of the partners will play a "local role", adapting these strategies (translating the communication materials and activating their networks) to their region.

Grant Agreement Number: 101111560

Project Duration: 36 months (01/09/2023 - 31/08/2026)

Total Budget: 1.499.994,00€

Project's webpage: <https://teamit.plus/>

- **E-lit ADULTS+**

Erasmus+, Call: N/A, Type of Action: ERASMUS-LS

E-lit Adults project will provide flexible, high-quality learning opportunities to adults at risk of energy poverty at the local level. This will enable them to make informed decisions about their energy use and reduce energy bills, leading to a lower risk of energy poverty and reducing their carbon footprint. At the same time, the project will greatly enrich the adult education landscape, contributing to the overall upskilling of lifelong learning opportunities. Collaboration with stakeholders such as energy providers and local authorities will ensure teaching materials and training opportunities align with national and regional priorities on energy poverty, supporting authorities' efforts to address this issue. The networking platform will facilitate the exchange of knowledge and best practices related to energy literacy, promoting energy community establishment at the national level. The comprehensive dissemination strategy, engaging national-level partners, will raise awareness and promote further action on energy poverty and energy literacy, contributing to the fight against climate change.



Grant Agreement Number: N/A

Project Duration: 24 months (01/01/2024 - 31/12/2025)

Total Budget: 250.000€

Project's webpage: N/A

(1) One Special Development Program (E.A.P.):

- The Kouri Forest Experience - The Kouri Experience

CluBE, in collaboration with the Municipality of Kozani, has undertaken the study and implementation of an environmental education program in the Kouri Forest, a forest next to the city of Kozani. The vision of this educational program is to develop a multi-sensory environmental theme park in the Kouri Forest for the purpose of educating, raise awareness, and motivate citizens through the eyes and active involvement of the younger generation in addressing the climate crisis.

Each school carries out a separately planned activity in the Kouri forest lasting three hours. The activity covers cognitive topics, while at the same time creating environmental stimuli through discussion and observation. Students experience the dynamics of environmental education, which can support their personal relationship with nature, responsible environmental behavior, and active citizenship.

The educational activities are differentiated according to educational level and constitute an outdoor education model in which students develop personal, social, and technical skills. Participation is an inspiration for them to succeed and develop their self-confidence through experiential learning in a forest environment.



(6) Six Interreg IPA CBC projects (One of them is finalised):

- **BeCircular**

Interreg IPA CBC Greece - Republic of North Macedonia
2014-2020

Priority Axis: 1. Development and Support for Local Economy

Specific Objective: 1.1 Create employment opportunities for educated graduates by exploiting comparative advantages of the cross-border area, preferably with the use of innovative tools and practices.

The main objective of BeCircular is to provide employment opportunities for young educated unemployed people and set the base for trade growth within the cross-border area of Greece-Republic of North Macedonia. It also promotes the cross-border mobility of people and ideas through the optimized



exploitation and elaboration of the project's results. CluBE is leading the Work Packages related to the Communication and Dissemination of the project as well as the community engagement. In WP3 CluBE will collect data and assess needs related to the sector of circular economy and elaborate on action plans related to new feedstocks. In WP4 CluBE will upgrade the existing e-platforms for material workflows in R&R center and develop an e-learning platform and a smartphone application. In WP5 CluBE will be responsible for the creation of "Living Labs" ecosystems related to creative industries, bioeconomy and bio-waste exploitation and general entrepreneurship.

Project Duration: 03/2022 – 09/2023

Total Budget: 581.268,77 €

Project's webpage: www.becircularproject.eu

- **BENEFIT**

Interreg IPA CBC Greece – Republic of North Macedonia 2014-2020

Priority Axis: 2. Protection of Environment – Transportation Thematic Priority: 2c. Promoting sustainable transport and improving public infrastructure.

Specific Objective: 2.1 Upgrade public infrastructure to improve road travel time, safe border crossing and promote energy efficiency towards green transport.

The overall objective of BENEFIT is to strengthen the capacities of public authorities in the cross-border area of Greece – Republic of North Macedonia towards **Energy Efficiency (EE)** planning for **upgrading public buildings' energy performance**, as well as to increase energy awareness of the wider society on benefits from EE. CluBE is leading the Work Packages concerning the Communication and Dissemination of the Project, as well as the Policy uptake and community engagement. In WP2 CluBE is responsible for the preparation of the Communication plan, the project website, the project identity, promotional material such as brochures, banners and a video showing the three stages of the interventions (before, during and after) on the two public buildings in the cross-border area. Project awareness and dissemination events such as regional workshops, focus group meetings and thematic roundtables. Furthermore, CluBE is responsible for publications – broadcast for project dissemination and finally for 2 training seminars that will take place in the CB area. In WP6 CluBE will focus on the capitalization beyond project end towards up-taking and community engagement in the project's objectives. In addition, based on its experience and expertise, CluBE will drive the efforts on **clustering to mobilize local entrepreneurs**, while it allows for new business models to be promoted to the wider public.

Project Duration: 01/09/2018-31/06/2023

Total Budget: 1.170.475,00€

Project's webpage: <https://benefitproject.eu/>



- **GOOD CITIES**

Interreg Europe

Priority Axis: 2. Protection of Environment – Transportation

Thematic Priority: 2c. Promoting sustainable transport and improving public infrastructure. Specific Objective: 2.1

Upgrade public infrastructure to improve road travel time, safe border crossing and promote energy efficiency towards green transport.

Millions of underused consumer good, such as leisure equipment, tools or home appliances, are hidden in European households, contributing to financial waste, resource depletion, ecosystem destruction, climate change and a growing waste crisis while being rarely used (i.e. a drill is used on average 12 mins its lifetime). This is the invisible problem. While mobility and housing embrace the sharing economy, goods receive low political priority, despite their significant impact (up to 21% of EU citizens' consumption related GHG emissions).



The potential of small initiatives and peer-to-peer platforms is recognized by **GOOD CITIES**, but these struggle to scale due to inefficiencies, lack of visibility and embeddedness in the urban fabric and insufficient support from public authorities. European cities, with their existing infrastructure, resources, density and proximity offer an ideal environment, yet lack effective strategies and dedicated managers. This results in ambiguity, limited knowledge on actionable steps and a lack of collaborative partnerships. Through coordinating efforts with local stakeholders and leveraging policy instruments, partners aim to significantly reduce the volume of goods and negative consumption-related ecological impacts while improving wellbeing and social cohesion. **GOOD CITIES'** public authorities will define their role in the sharing economy, establish effective governance mechanisms, learn from and develop good practices and foster a culture of cooperation. The initiative will empower them to develop comprehensive policies and tools that create trust and space for sharing.

By increasing the visibility of sharing and proactive leadership **GOOD CITIES** will demonstrate alternatives for a sustainable and efficient approach to consuming goods, ultimately creating a prosperous and resource-conscious future for our cities within planetary boundaries boosting the implementation of EU and local environmental policies.

Project Duration: 48 months (01/04/2024-30/06/2028)

Total Budget: 1.571.330,00€

Project's webpage: <https://www.interregeurope.eu/good-cities>

- **CORE**

Interreg Europe

The management of the organic fraction in rural areas with low-density population is environmentally and economically impactful. Different solutions are required to collect, transport and treat sustainably

small amounts of organic waste dispersed in distant and sparsely populated villages. Prevention of biowaste and the normalization of quality composting could contribute to the drastic reduction of this fraction and of the effects derived from its management. The compost produced can be used as soil-improving material and fertilizer in local and regional parks and gardens or in the form of biogas, while further uses could be promoted. Even though regional and local policies observe all the transition to circular economy and guide the transitioning of the waste management sector towards it, composting is often not sufficiently developed, notwithstanding its potential to comply not only with circular economy but also with the mitigation of climate change. **CORE** aims at rural low-density territories and leading the process of spreading and mainstreaming the treatment of biowaste. The prevention of biowaste and the establishment of quality composting could be a big contribution. The compost produced can be useful for soil improvements in local, regional parks, and gardens and as well in agriculture. The project is expected to be an accelerator for rural territories to increase composting and the overall prevention of landfilling or burning of biowaste significantly.

Project Duration: 48 months (01/03/2023-31/05/2027)

Total Budget: 1.843.714,00€

Project's webpage: <https://www.interregeurope.eu/core-0>

Interreg
Europe



Co-funded by
the European Union

CORE

- **REWASTE**

The project promotes recycling and environmental awareness among citizens through a reward-based system: each time they dispose of recyclable waste, they earn credits that can be redeemed for discounts or gifts, with the support of local sponsors. Through this initiative, citizens are encouraged to actively participate in proper waste management, reducing pollution and energy consumption, while the implementation of the project in the Municipalities of Voio in Greece and Debar in North Macedonia strengthens sustainability and the local economy.

Project Duration: 24 months (27/08/2025-26/08/2027)

Total Budget: 919.966,8€

Project's webpage: <https://greece-northmacedonia.eu/project/rewaste/>

Interreg



Co-funded by
the European Union

IPA Greece - North Macedonia

ReWaste

(3) Three projects as a direct assignment from ENEL Green Power

A cooperation between Enel, CluBE & Wise Greece in the Region of Western Macedonia

- **Agriculture and Photovoltaics - Strengthening the local community-Vamvakies**
Project: The project scope is the exploitation of the PV space for the cultivation of local products.



Educational Programs:

Participants: people from the community of Polymylos and the Municipality of Kozani

Characteristics of participants: unemployed, vulnerable groups, women, existing producers who want to evolve further

Object of educational programs:

- Cultivation of land and production of bioproducts
- Packaging and successful product promotion
- Practical help and guidance to get a product from the "field on the shelf"
- Promotion of products through the sales network of "Wise Greece" as the first products produced with the power of PV

Project Duration: 09/2021-08/2023

- **"Kivotos"**

Bioeconomy and Environment Cluster of Western Macedonia (CluBE) on the occasion of collaboration with Enel Green Power, took the initiative to create one project of reusing the wooden pallets from the photovoltaic packaging panels of Enel Green Power, which will result from the construction of photovoltaic park at Perasma in Mavrodendri, so that they can be used creatively in collaboration with the School of Fine Arts for the manufacture of wooden gifts for the children, decorative or utilitarian objects and small-scale toys.

CluBE is going to participate in this action with the University of Western Macedonia, in particular with the Department of Visual & Applied Arts, of the School of Fine Arts of Florina, as well as with the Center for Recovery - Rehabilitation, and Daycare for people with disabilities, "Kivotos" based in Argilos Kozanis. The aim of this proposal is to strengthen the circular economy through collection and reuse of materials, as CluBE actively participates in projects and recycling and reuse processes of resources in the context of actions that concern Climate Neutrality for the city of Kozani but also New European Bauhaus, as well as supporting children with special needs to eliminate their social barriers and the promotion of artistic activities by student groups through a group artistic meeting.

Project Duration: 20/10/2022-20/10/2023

- **"Energy Poverty"**

This project is an initiative of the Bioeconomy and Environment Cluster of Western Macedonia (CluBE), on the occasion of its cooperation with Enel Green Power.

The main goal of the project is to assess the energy crisis and mitigation measures through the behavior of households in Mavrodendri. Data collection will be carried out by field survey. The project was triggered by the efforts of the energy community of Ypsilanti to save resources from energy production. The most important and pioneering action of the project, for Greek standards, is the establishment of a one-stop shop, the first one in Greece, which will offer information services, free of charge, regarding energy saving, financial tools to support it, the selection of the appropriate heating and cooling system and finally the correct and integrated operation of an energy community.

Project Duration: 20/10/2022-20/10/2023

(1) One project as a direct assignment from NRSF (National Strategic Reference Framework) (2021-2027)

- **SYNERGiNN (SYNERGiNN EDIH: SYNergy - enERgy - iNNovation)**



The main objective of Digital Innovation Hub of Western Macedonia is to offer its EDIH services as one-stop shop in the region of Western Macedonia. The consortium aims to establish SYNERGiNN EDIH that will guide the companies and the public organisations into utilising Artificial Intelligence (AI), Cybersecurity (CS), Internet of Things (IoT), and Big Data (BD) analytics, in order to promote and transform the “know-how” that the region of Western Macedonia possesses in the Energy and Environment sectors as well as replace the lignite deposits by a longer lasting knowledge deposit. The Energy sector is of major importance for SYNERGiNN since the region of Western Macedonia needs to capitalise the existing human resources experience in this sector. SYNERGIN EDIH will organize all of its activities in harmonisation with the goals of EU's Green Deal focusing on zero carbon and energy neutral of its day-to-day operations. Clube will lead the work package of Networking and Stakeholder engagement but will also be participant in all work packages.

Grant Agreement Number: -

Total Budget: 4.196.647,5 €

Project's webpage: -

Project Duration: 36 months

(1) One project as a direct assignment from Municipality

- **100 Climate Neutral Smart Cities**

CluBE coordinated the proposal of the Municipality of Kozani which was submitted to the relevant Call of Eol of the European Mission “100 Climate Neutral Smart Cities by 2030”.

The project will include a huge effort of the Municipality to be climate neutral by 2030, by significantly reducing its emissions from all sectors, including buildings, transport, energy production, industry, etc, while off-setting the remaining GHG emissions with relevant initiatives, such as afforestation, etc.



The first stage of the implementation of the “100 Climate Neutral Smart Cities” Project, is the “**Climate City Contract**” Project. It must fully define the guidelines that the Municipality of Kozani will follow in order to achieve what it has signed as part of its inclusion in the 100 Climate Neutral and Smart Cities by 2030.

This will be done through the full definition of the Municipality's commitments towards Europe and the local community, then there should be a holistic action plan in this direction, after that the interventions that will be launched should be fully costed and finally it is extremely important the dissemination of the whole project and the acceptance it will receive from the people. CluBE is the coordinator of the whole effort while also leading the Work Package of communication and dissemination in the local community.

(1) One project as EUI (European Urban Initiative)

- **EcoZANI**

The Eco2ani project aligns with the Harnessing Talent in Shrinking Cities challenge, embedding the theme within Kozani's socioeconomic development framework based on Richard Florida's 3T (Talent-Technology-Tolerance) model. It aims to create a zero-waste, zero-emission, zero-exclusion city, starting with the Kozani Carnival as Europe's first 32 Carnival. A local Talent Booster mechanism will focus on youth (15-30) to drive this transformation. The Municipal Inclusive Circu-Tech Hub (MICTH) will be the center for co-creation and participatory activities. MUA leads the co-creation process, involving citizens and managing investments. Kozani faces severe economic and demographic challenges, including a decline in coal mining jobs, population loss, and high unemployment. Eco2ani draws on best practices in job creation, demographic change, and climate neutrality, combining them innovatively around cultural events to address these challenges. The project supports several Cohesion Policy targets, notably SO 5.1 for a Europe closer to its citizens. It adopts an integrated urban development approach, contributing to a green, just, culturally vibrant, and productive city, and supports green and digital transitions through the development of a CircuTech Hub and smart mobility solutions.



Grant Agreement Number: -

Total Budget: 6,129,599.40€

Project's webpage: <https://ecozani.eu/>

Project Duration: 42 months

(1) One project as DUT (Driving Urban Transition Project-Cofounded by Horizon Europe Program)



UVAR4US examines how urban vehicle access regulations (UVAR) contribute to net-zero, liveable, multi-functional urban spaces as envisioned in the 15-min city concept (15mC). UVAR4US research how UVARs affect mobility as well as the use of space and what their impact is on reducing car dependency in doing so. UVARs are broken down into different 'building blocks' and can be re-combined to be effective for local, urban areas. An open knowledge base will be made that describes existing UVAR solutions in urban contexts, their impact on 15mC and car dependency. A participation framework will describe the participatory processes behind successful UVAR-15mC implementation. Evidence-based choice support methods are developed to identify relevant building blocks for neighbourhoods for a local context and preference. This leads to the UVAR4US toolkit that supports integrated policy making to shape UVAR-related scenarios for 15mC neighbourhoods with an understanding of its impact. UVAR4US is supported by four Living Lab cities that all have planned UVAR implementations. Their activities, input and feedback are used to co-create, finetune and validate the UVAR4US results. CluBE serves as the lead organisation of the Kozani City Living Lab, coordinates the Greek partners' consortium, and is a member of the DUT Knowledge Hub of Experts.

Grant Agreement Number: N/A

Total Budget: 1.231.601,98€

Project's webpage: <https://dutpartnership.eu/projects/uv4us>

Project Duration: 30 months

(1) One project as National Program-Green Fund

- Hy2Citizens, "The Hy2Citizens project is funded by the Green Fund under Priority Axis 4: 'Innovative actions with citizens' of the funding programme 'Natural Environment & Climate Neutrality 2024'."



The Hy2Citizens project proposes the implementation of a pilot program to inform and educate citizens on the production and use of green hydrogen in the transport sector. Through targeted awareness-raising actions, experiential learning, and a participatory approach, the project aims to strengthen social acceptance of hydrogen technologies, particularly in an area undergoing energy transition, such as the Municipality of Eordea. The proposal includes the supply and installation of educational equipment and its use in actions targeting students, students, professionals, and vulnerable groups, leveraging synergies with existing projects and enhancing the continuity and scalability of results at the local and regional level.

Grant Agreement Number: -

Total Budget: 50.000€

Project's webpage: <https://ecozani.eu/>

Project Duration: 18 months (01/09/2025-28/02/2027)

Furthermore, CluBE has already finalised successfully 11 projects:

- **MUSIC**

H2020, topic: LC-SC3-RES-28-2019-2019-2018, type of action (CSA).



MUSIC aims to facilitate further market uptake of three types of IBC (pyrolysis oil, torrefied biomass and microbial oil) by developing feedstock mobilisation strategies, improving logistics and development of IBC trade centres. **Intermediate Bioenergy Carriers (IBC)** are formed when biomass is processed to energetically denser, storable and transportable intermediary products analogous to coal, oil and gaseous fossil energy carriers. IBCs can be used directly for heat or power generation or further refined to final bioenergy or bio-based products.

CluBE's contribution will mainly consist of identifying the local supply chain, as well as mobilising and coordinating the local case study for Greece; CluBE will bring all actors involved in the production of the IBC together, in order to successfully implement the local bioenergy setting.

Grant Agreement Number: 857800

Project Duration: 09/2019-3/2023 (50 months)

Total Budget: 2.999.871,25 €

Project's webpage: <https://www.music-h2020.eu/>

- **SCALIBUR**

H2020, topic: CE-SFS-2018-2020, type of action IA (Innovative action).



SCALIBUR created a holistic consortium to reduce **urban biowaste** and replace it with a new production chain of biomaterials, forming a partnership of end users to recover and transform biowaste from three municipalities, namely Madrid (ES), Albano (IT) and Kozani (EL), into value added products.

In this framework, CluBE performed these tasks for the pilot city of Kozani by means of mapping the local stakeholders involved in household and HORECA biowastes and organising them into a local Biowaste club. Furthermore, CluBE analysed the local consumption behaviour and urban waste management. Finally, CluBE assisted the city of Kozani in improving the methods of the selective collection of urban biowastes, by transferring best practices, enhancing new methods for transport and logistics, characterization and monitoring of biowaste.

Grant Agreement Number: 817788

Project Duration: 11/2018-10/2022 (48 months)

Total Budget: 11.905.566,25 €

Project's webpage: <http://www.scalibur.eu/>

- **Waste4Soil**

Horizon Europe, type of Action: HORIZON-MISS-2022-SOIL-01



Waste4Soil project aims at developing applicable recycling technical pathways to transform FPR into soil improvers, through a circular, systemic and multi actor approach at regional level involving all food chain actors, thereby closing specific loops (nutrients, organic matter, water).

Performing research through its 7 context-based and science-driven Living-Labs will allow a "cross fertilisation" that accelerates the development of smart, sustainable, resilient and inclusive food systems, being part of the desirable fit for all, circular and zero-waste societies. CERTH and DIADYMA are also project partners.

Grant Agreement Number: 101112708

Project Duration: 48 months (01/06/2023 - 31/05/2027)

Total Budget: 6.999.461,25 €

Project's webpage: <https://waste4soil.eu/>

- **BIOTRANSFORM**

Horizon Europe, topic: HORIZON-CL6-2022-CIRCBIO-01-03, type of action: CSA (Coordination and Support Actions).



BIOTRANSFORM provides European policymakers with an adequate assessment and policy development framework, knowledge base and expert support ecosystem to accelerate the transition from linear fossil-based systems to circular bio-based systems. It is therefore operating at the interface between the circular economy and the bioeconomy transitions. In this way, BIOTRANSFORM equips policymakers with the tools to set informed priorities that serve environmental, economic, and social goals, being actionable, future-proof, and align with supply-and-demand trends in related industries and value chains. BIOTRANSFORM's "assessment package" will be tested by and provided for European policymakers, which will include 3 complementary tools:

- (i) resource flow analysis tool including circular innovations,
- (ii) a cutting-edge quick environmental, social, and economic assessment tool
- (iii) a logistics management tool.

To achieve this, BIOTRANSFORM develops and tests its framework to establish and roll out circular biobased systems by applying a multi-actor approach around 6 regional cases: Andalusia (Spain), Northern Burgenland (Austria), Western Macedonia (Greece), Finland, Charles Spa Region (Czech Republic) and North Rhine-Westphalia (Germany). These regional case studies represent several important industries and scenarios for Europe such as forestry, agri-food, lake ecosystems, lignite and minerals, and chemicals. Action roadmaps will consider specific regional available resources and infrastructures, conversion pathways, logistics, current policies, strategies, and access to finance.

In other words, BIOTRANSFORM builds on the concept of regenerative bioeconomy value cycles by tapping into what is there already and connecting the dots. In this concept, carbon is stored and nutrients are recovered. This concept shall be upscaled and replicated to many further European regions to achieve Europe's ambitious goals.

Grant Agreement Number: 101081833

Project Duration: 30 months (01/10/2022 – 31/03/2025)

Total Budget: 1.999.973,75€

Project's webpage: <https://www.biotransform-project.eu/>

- **REGIO1ST**

LIFE, topic: LIFE-2021-CET-LOCAL, type of action: LIFE-PJG.



The EU Energy Efficiency First (EE1st) principle has addressed to some extent in the National Energy and Climate Plans; however, when it comes to the regional and local governance levels, this principle is not yet explicit in the public debate. The overarching aim of **REGIO1ST** is to raise awareness about the EE1ST principle among the regional governments and their agencies and support them to make related decisions in their planning. It pursues to provide appropriate guidance to regional authorities to embed the E1st principle in their decisions and implementation of their development and energy planning departing from six participant regions and expanding to over 100 regions in the EU. Furthermore, it will establish a community of practice for E1st in cooperation with the Covenant of Mayors to ensure political commitment of the regional authorities and finally, it aims to Support the introduction of EE1st in National Energy Action Plans and foster the enforcement of the Multilevel Climate and Energy Dialogue provision. This policy process will be assisted with a customized decision support tool for regions, which will include a citizen deliberation set of practices for engaging and eliciting preferences of stakeholders and citizens. This co-design of policy trajectories will bring EE1st at the core of the dialogue and increase its social acceptance.

Grant Agreement Number: 101076088

Project Duration: 36 months (01/11/2022 – 31/10/2025)

Total Budget: 1.743.541,15 €

Project's webpage: N/A

- **ROSEWOOD 4.0**

H2020, topic: RUR-15-2018-2019-2020, type of action: CSA.

ROSEWOOD4.0 project built on the well-established ROSEWOOD network of Regional Hubs connecting multiple actors along the **forest value chain to reinforce the sustainability of wood mobilisation in Europe**. The new action

especially reinforced and enlarged the links with Eastern Europe by creating a new Eastern Hub including new countries (Poland, Slovakia, Ukraine). The project also put special emphasis on **digitalisation** (forestry industry 4.0) and digital tools (social media, platforms, e-learning) for training and coaching, enabling practitioners to share know-how with much wider impact.

CluBE was participating in the South-East Regional Hub, supporting the efficient knowledge transfer and exchange between key local, regional and National stakeholders while boosting the dissemination between the South-East Hub's regions, in order to align multi-level actors from the entire value chain around common goals such as the reinforcement of the forestry industry and the creation of new business opportunities.

Grant Agreement Number: 862681

Project Duration: 01/2020-12/2021 (24 months)

Total Budget: 2.047.901,25€

Project's webpage: <https://rosewood-network.eu/>



- **RUBIZMO**

H2020, topic: RUR-09-2018, type of action: RIA (Research and Innovation action).

RUBIZMO aimed to generate jobs and growth in highly diverse **rural areas** in the **food sector, bio-based value chains and eco-system services**. RUBIZMO prepared Europe-wide upscaling and replication of models in rural areas using 50

successful business cases and 20 new business models. It explored conditions for replication to develop four practical, user-oriented tools: i) A virtual library of business cases; ii) Guidelines on creating favourable conditions for the deployment of innovative business models; iii) A toolkit for clustering and network development in rural areas and iv) A transformation support tool. These tools promoted across Europe through capacity building and entrepreneurial support activities.

The expertise of CluBE in cluster development was brought forward for the assessment of the role of collaborative models in creating value in rural areas, a Work Package led by CluBE.

Grant Agreement Number: 773621

Project Duration: 05/2018-10/2021 (36 months)

Total Budget: 3.928.852,04 €

Project's webpage: <https://rubizmo.eu/>



- **EyesHeartsHands**

Horizon Europe, topic: HORIZON-MISS-2021-NEB-01-01, type of action: CSA (Coordination and Support Action).

Cities need support to implement their Sustainable Action Plans in line with the ambitious and stringent regulations towards a zero carbon Europe. The **EYES HEARTS HANDS Urban Revolution (EHHUR)** project will develop and test a co-designed methodological structure to support cities in their built environment transformation by using already existing good practices and complementing them with the New European Bauhaus and EU Missions principles. 7 Lighthouse demonstrators will be involved across EU and Associated countries (DK, EL, BE, PT, TK, HR, IT).

EyesHeartsHands will tackle socio-economic and cultural challenges through relevant case studies facing social segregation, vulnerable residents (experiencing energy poverty), coal transition, depopulated and degraded historic centres. EyesHeartsHands relies on engagement and co-design as



the “backbone” of its methodology, by deploying a set of tailored social innovation activities aimed not only to engage, but also to commit the participation of relevant urban players at multiple and multidisciplinary levels (technology co-design, co-financing, aesthetic co-creation). The EyesHeartsHands new integrated methodology will cover innovative i) engagement practices to transform citizens into active players of their future urban transformation and empower them in the decision-making process, ii) financing schemes involving local businesses and citizens, iii) digital and green technologies, iv) architectural design and materials to meet climate change and sustainability challenges while respecting heritage and cultural ecosystems, v) arts and creative co-design in third sector buildings and public areas. The diversified experiences of the LH demonstrators will provide a variety of good practices and guidelines for future replication. Future adopters will benefit from a DSS tool, supported by a capacity building programme, that offers the ideal mix of best technical solutions, optimal financing schemes and engagement tools and social innovation practice.

Grant Agreement Number: 101079948

Project Duration: 36 months (01/10/2022 – 30/09/2025)

Total Budget: 4.994.902,50€

Project's webpage: <https://eyesheartshands.eu/>

- **BIOMODEL4REGIONS**

Horizon Europe, topic: CL6-2021-GOVERNANCE-01-07, **type of action:** CSA (Coordination and Support Action).



BIOMODEL4REGIONS project aims to support the establishment of the innovative governance models at local/regional level to achieve better-informed decision-making processes, social engagement and innovation to support and strengthen EU and international science-policy interfaces to achieve the Sustainable Development Goals by:

- Supporting the development of regional/local strategies, aiming at exploiting the local potentials and innovations by integrating the opportunities created by the local bio-based economy thus contributing to the broader bioeconomy transition.
- Developing novel business models to enable consumers, industry/producers and public bodies to a societal switch towards environmentally responsible behaviour by means of biobased products and services.
- Developing best practice guidelines for local operators and innovation developers, supporting climate-neutrality and low environmental footprint improvements of bio-based products and services.

The methodology is based on the set-up of a governance structure among bioeconomy clusters that will leverage on previous successful projects, initiatives and best practices to capitalise on work performed through several years of research and studies in the field of bioeconomy. These results will be demonstrated within the project to support 6 pilot regions chosen in clusters' network. The pilot regions, taking into account different model regions (Northern, Southern, Eastern and Central-Western EU), their conditions and assets and different primary sectors (forestry, agri-food, aquatic biomass and organic fraction of municipal solid waste- OFMSW) will be demonstrated under a fully transferable case-study approach, that can be replicated throughout Europe to demonstrate the replicability of the approach after the end of the project.

Grant Agreement Number: 101060476

Project Duration: 36 months (01/06/2022 – 30/05/2025)

Total Budget: 2.502.102,50€

Project's webpage: <https://www.biomodel4regions.eu/>

- **SecureChain**

H2020, topic: LCE-14-2014, **type of action:** CSA.



SecureChain promoted a **Sustainable Supply Chain Management (SSCM)** that met highest environmental quality standards and targeted local biomass suppliers, energy producers and financial sector players to mobilise more **biomass**, maximise the share of sustainable **bioenergy** in the final energy consumption, and reduce the transaction costs for further market uptake of most efficient systems in six European model regions. The whole process involved an open call for SSCM pilot projects through **Innovation Vouchers**, encouraging market actors to mobilise and secure additional supplies of biomass from regional sources, through technical analyses, training and coaching, Life Cycle Assessment (LCA), financial mentoring and sustainability certification.

CluBE has led the Work Package on Dissemination and exploitation. Moreover, CluBE acted as the Regional Lead Partner, mobilising all actors involved and coordinating and implementing the procedure with the Innovation Vouchers to local SME's.

Total Budget: 1.809.586,25 €

Project's webpage: www.securechain.eu

- **aGROWchain**

**Interreg IPA CBC Greece – Republic of North Macedonia
2014-2020**



Priority Axis: 2. Protection of Environment – Transportation

Thematic Priority: 2c. Promoting sustainable transport and improving public infrastructure.

Specific Objective: 2.2 Sustainable management and recycling of bio-wastes

The scope of this project was to establish a **supply chain for green wastes**, combined with the relevant business model, which secured its sustainability. The supply chain customized according to the wastes that were available from both sides of the border (Greece – Republic of North Macedonia) and the business model adapted to the specific local conditions. The supply chain serve selected end users in each country; therefore, its operability was tested and possible problems and barriers that occurred, resolved.

CluBE was leading the Work Packages for Communication and Dissemination, as well as the Knowledge transfer and Capitalization to the Cross-Border area, including the development of Biomass/Bioenergy Clusters on both sides of the border.

Project Duration: 05/2018-05/2021

Total Budget: 669.084,90€

Project's webpage: <https://agrowchain.eu/>

Total Budget: 7.499.171.50€

(1) One project under the Green Fund National Program "Natural environment and innovative actions 2019", measure "Innovative Actions with Citizens":

- **In2UCO**, Integrated and innovative pilot-scale management of cooking oils with the participation of citizens and students.

In2UCO project scope was the integrated and innovative separate collection and management of used frying oils – household waste, the so-called Used Cooking Oils (UCOs), in order to be further utilized. The disposal of large quantities of used frying oils and fats creates significant problems in the municipal waste-water treatment plants and landfills, mainly due to their physicochemical characteristics. The proposed pilot-scale system was addressed to the citizens – households of Kozani as well as to the students of the city. In the framework of In2UCO project two special devices purchased and installed in public areas widely and easily accessible for citizens, where the full containers exchanged with the empty ones. These multi-purpose, high strength and fully recyclable containers distributed to 1.500 citizens. An authorized company was the end-user of the collected frying oils for the production of biodiesel. The main objective of the project was to engage citizens to shape a proper behavior on the used frying oils



treatment. In this direction several actions (workshops, events, educational presentations) carried out for the information of local associations and students.

CluBE was responsible for the coordination of the project and its correct and timely implementation within the specified time. The coordination of the project included the management of both the physical and the financial object of the project.

Project Duration: 05/2020-06/2022

Total Budget: 50.000,00€

(1) One project under the Operational Programme Competitiveness, Entrepreneurship and Innovation 2014-2020 (EPAnEK National Programme):



- **DISHEAT**, Development of procedures and technology validation for the creation of locally available **biomass value chains** in Western Macedonia in order to cover the fuel needs of the local **district heating** systems to replace the use of heat from lignite power plants that their shutting down is eminent.

In the Region of Western Macedonia large municipal enterprises operate offering district heating (DH) to local communities by making use of heat from lignite thermal power stations. Nowadays, the operation and expansion of these businesses is at a great risk as the post-lignite era has already started. The most significant example is that the Amyntaio power plant should cease operating in 2019 according to Directive 2010/75/EU. In order for DETEPA (District Heating Company of Amindeo) not to cease meeting the needs of the local community for DH, has implemented a study for the installation of a biomass combustion plant with a capacity of 30 MWth. The creation and optimization of the biomass supply chain was a matter of urgency so that the operation of DH can continue by covering the needs of the local community with endogenous resources. Accordingly, DETIP (Ptolemaida DH Company) intended to organize the expansion of its activities in off-grid areas in order to reduce local costs of meeting thermal needs by providing thermal energy by combustion of biomass in decentralized boilers. The object of the project, therefore, was to employ and organize the use of biomass on the one hand in large district heating systems such as that of DETEPA and on the other hand in non-district heating networks, as DETIP was planning to implement. The objectives of the project were to map the region's biomass residues into GIS and to accurately calculate the available biomass to achieve optimal supply chain organization and cost savings (fuel costs representing more than 70% of operating costs) for both large applications and decentralized small applications. In the framework of the project, biomass combustion tests carried out to develop boiler specifications, while logistic facilitation tools created and an environmental footprint estimate of biomass use carried out in DH installations.

CluBE made the field trials and the studies for the accurate calculation of the available biomass in order to organise optimal supply chains both environmentally and economically for large applications and also decentralized small applications.

Project Duration: 03/2020-09/2022

Total Budget: 39.800,00€

Project's webpage: <http://disheat.gr/>

Agrocircularity: Applications in Agriculture (Agro-Circular Capacity Building – Training program aiming at enhancing Circular Economy in Agri-food sector), New Generation New Agriculture

- **“Agrocircularity: Applications in Agriculture”** project concerned the implementation of a vocational skills training program for the support of circular bioeconomy in the agrofood sector. It addressed to both established farmers who want to train in Agro-Circularity as well as to young professionals or unemployed people who desired to work in the agrofood sector.

The project duration was one academic year and provided participants with skills on four basic agricultural sub-sectors of the circular bioeconomy: (1) fruit-tree farming, (2) viticulture, (3) medicinal and aromatic plants and (4) beekeeping. Around 80 participants from the region of Western Macedonia trained, with roughly 20 per agricultural sector. The trainings focused on a variety of skills such as innovative growing methods, sustainable agriculture, product processing, making use of byproducts,

collaboration with end users, making use of financing tools, new business models, and new policies on a national and European level.

Additionally, the project focused on business development (using business canvas, innovation aspects, networking etc.), practical examples were presented, and trainees were assisted in developing and implementing their new business concept. An external committee was formed and evaluated the preliminary business ideas. These “best” ideas, were brought into direct contact with potential investors in a specialized matchmaking event, where beneficiaries had the chance to secure public (Regional Operational Programmes or the CLLD/Leader programme) or private (microfinance services or banks) funding for their ideas.

Consortium: Cluster of Bioeconomy and Environment of Western Macedonia, University of Western Macedonia-Department of Agriculture, Agronutritional cooperation of Western Macedonia Region

Project Duration: 12 months

Total Budget: € 86.910,00

Other initiatives and regional cluster activities:

White Dragon hydrogen IPCEI proposal

Coordination, technical support, and consulting services to DEPA Commercial SA (coordinator of White Dragon) and to the Regional Authority of Western Macedonia for the creation, establishment and submission of the White Dragon proposal.

DEPA Commercial, as project coordinator, in collaboration with Advent Technologies, Damco Energy (Copelouzos Group), PPC, DESFA, HELLENIC PETROLEUM, Motor Oil, Corinth Pipeworks, TAP and Terna Energy submitted to the Greek Government and the EU their investment proposal which **exceeds the amount of 8 billion Euro, for the development of an innovative integrated green hydrogen project** in Greece which covers the entire hydrogen value chain. The core of the project is based on the **gradual replacement of the lignite power plants of Western Macedonia and the transition to clean energy** having as final goal the de-carbonization of the country's energy mix. The "White Dragon" project will use **GW-scale renewable electricity for the production of green hydrogen** by electrolysis in Western Macedonia. Hydrogen will then be stored directly (short-term hydrogen storage) and indirectly (injection to DESFA's natural gas pipeline) and, subsequently, through high temperature fuel cells **will provide the country's power grid with electricity as a fixed base load co-generation unit of green energy and heat**. The generated heat, as a by-product of green electricity production, could initially have a complementary use to the district remote heating networks of West Macedonia, as well as in other applications that require heat and / or cooling in the future (industries, data centers, greenhouses, etc.).

Moreover, a main goal of the "White Dragon" project is the development, by the cooperating companies, of an integrated **Hydrogen Industrial Research Center** within the **high-tech R&D&I Hydrogen Hub** that will be created in Western Macedonia.



ISH Frankfurt



Frankfurt am Main
14. – 18. 3. 2017

CluBE accompanied the Chamber of Commerce and Industry of Kozani to successfully participate in the **International Fair ISH 2017** in Germany and actively contributed in supporting one-on-one business meeting and cooperation/partenariat discussions of the participating local district heating related companies.

GSEVEE



CluBE won a support voucher from the Hellenic Confederation of Professionals, Craftsmen & Merchants for the development of its own **Business Plan**, as well as the participation in a big thematic event to enrich its knowledge basis (European Biomass Conference and Exhibition, Vienna, Austria, 2015).

Events and Fairs

BCET 2019, Balkan Clean Energy Transition (BCET), International Conference & Fair



Balkan Clean Energy Transition Conference was a three-day event (19 – 21 September 2019) covering Clean Energy topics such as renewables, energy efficiency, smart cities, circular economy, mobility, governance, and citizen engagement, all of them leading the Balkan area throughout the post-coal transition.

In parallel with the Conference, the **Balkan Clean Energy Transition Fair** was a four-day exhibition (19-22 September 2019) showcasing new technological solutions that will make

Balkans cleaner and greener. The international conference and fair enhanced by interactive sessions of knowledge exchange to inspire attendees in current and future Clean Energy initiatives.

CluBE held a major role in co-organising and coordinating the event, together with the Kozani Chambers of Commerce and Industry. The event was also supported by the Region of Western Macedonia, the Municipality of Kozani, the University of Western Macedonia, the Chemical Process and Energy Resources Institute (CERTH/CPERI), the West Macedonia Development Company (ANKO) SA. BCET was under the auspices of the Technical Chamber of Greece (TEE), the European Economic and Social Committee (EESC), with the support of the EU Smart Cities Information System (SCIS) and the European Chemical Industry Council (CEFIC). The sponsors of BCET were COSMOTE, DEPA and ELPEDISON.

AGROTICA 2020



28th ΔΙΕΘΝΗΣ ΕΚΘΕΣΗ ΓΕΩΡΓΙΚΩΝ
ΜΗΧΑΝΗΜΑΤΩΝ, ΕΞΟΠΛΙΣΜΟΥ & ΕΦΟΔΙΩΝ

30|01 - 02|02
2020

ΔΙΕΘΝΗΣ ΕΚΘΕΣΙΑΚΟ & ΓΥΝΕΔΡΙΑΚΟ
ΚΕΝΤΡΟ ΘΕΣΣΑΛΟΝΙΚΗΣ

CluBE participated at the 28th International fair Agrotica, regarding Agricultural Machinery, Equipment and Supplies which took place in Thessaloniki from 30th of January 2020 to the 2nd of February 2020. The Fair has been a major success, achieving a triple record in exhibition participations, exhibition area coverage, and visitors. Within Agrotica, CluBE coordinated and manned a stand for the project “aGROWchain”, an Interreg IPA CBC Greece – Republic of North Macedonia project. More than 200 companies visited CluBE’s stand and showed interest for the project.



AGROTICA 2024

CluBE participated at the 30th International fair Agrotica, to inform the public about its work, its action and its objectives, through the projects it implements. CluBE currently have over 55 projects in our portfolio, of which about 20 projects are related to the bioeconomy sector.

Biomass Day Event



CluBE is one of the co-organizers of the “Biomass Day” national event that takes place every year in Athens since 2016 together with Hellabiom (Hellenic Biomass Association).

The Greek Bioeconomy Forum



CluBE has been among the founding members of the Greek Bioeconomy forum, aiming at **promoting Bioeconomy in Greece**. Among other events, CluBE co-organised the first Greek Bioeconomy Forum's event on the bioeconomy that was held in Thessaloniki, Greece. The event brought together key stakeholders from the bioeconomy sector to discuss the development of the bio-based industry in the country, funding opportunities, as well as Greek and European policies related to bio- and circular economy.

Innovative Agricultural Business Models Event



On the 2nd of February 2020, CluBE co-organised an event on Innovative Agricultural Business Models with the innovation consulting company Q-PLAN International in the framework of the 28th AGROTICA fair taking place in Thessaloniki, Greece. During the workshop, **current and future rural development policies** was discussed, successful **business cases** from Western and Central Macedonia, and other Greek regions was presented and several European projects were also invited to showcase **new business models** and tools to **support entrepreneurship** and enhance economic growth in the region.

Greek – German Chambers of Commerce and Industry

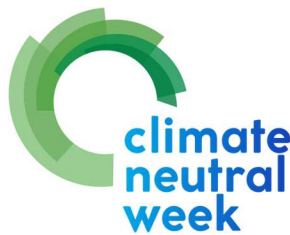


German-Hellenic Chamber of Commerce and Industry
Ελληνογερμανικό Εμπορικό και Βιομηχανικό Επιμελητήριο

CluBE participates in bilateral or multilateral meetings and events of the Greek – German Chambers of Commerce and Industry, aiming at reinforcing direct business cooperation development among

companies of the two countries. The open on-going dialogue has been developing among the two organisations and the efforts concentrate on bringing actors of the two countries together in order to match each other's needs on a bilateral basis and form cooperation alliances among two or more entities from the two countries.

Climate Neutral Week



Climate Neutrality Week was built through a series of events that aimed to raise awareness, inform bodies and businesses, and educate and entertain the public and wider local community around many issues related to climate neutrality.

It was organized on the initiative of the Bioeconomy and Environment Cluster of Western Macedonia (CluBE), in co-organization with the Region of Western Macedonia, the Municipality of Kozani, the Central Union of Municipalities of Greece (KEDE), DIADYMA S.A., ANKO, CSCP, Hellabiom and Enterprise Europe Network.

The event was held under the auspices of the Ministries of Environment and Energy, Development and Investments, Infrastructure and Transport and Digital Governance, the CIVINET (CIVITAS NATIONAL NETWORK Greece-Cyprus), as well as the European Climate Pact.

Within its framework, were organized:

1. Press conference
2. Capacity Building Workshop for Clean Energy in the Urban Environment
3. Panel Discussion on Clean Energy in the Agricultural Sector
4. Workshop on the conversion of digestate residue into high quality bio-fertilizers
5. Workshop on an innovative decision support tool for forecasting residual agricultural waste streams from the agri-food sector
6. Conference on: "Green and Climate Neutral Tourism"
7. Conference on: "Financial tools to achieve Climate Neutrality and Biowaste Utilization"
8. Climate Neutrality Congress

AGROTICA



20-23/10
2022

ΔΙΕΘΝΕΣ ΕΚΘΕΣΙΑΚΟ & ΣΥΝΕΔΡΙΑΚΟ
ΚΕΝΤΡΟ ΘΕΣΣΑΛΟΝΙΚΗΣ

CluBE was present at the 29th International fair of agricultural machinery, equipment and supplies "Agrotica" held in Thessaloniki from 20 to 23 of October 2022. In the context of Agrotica, CluBE coordinated and presented all of its projects, emphasizing on NOMAD and MUSIC through its booth. At the

same time, he participated in the presentation on "Innovative techniques for the utilization of agricultural residues and waste" held by CERTH with the assistance of CRES and CluBE.

Verde.tec

CluBE participated in Verde.tec held in Athens from March 17th to 19th, 2023.



HELEXPO

CluBE participated in the 87th Thessaloniki International Fair held in Thessaloniki from September 9th to 17th, 2023. As part of the TIF, CluBE informed visitors about its role and presented several European projects in which it is involved. Additionally, workshops were conducted with the project partners, CluBE members, and TIF visitors, making the information exchange more interactive.



BALKAN ENERGY FORUM

The Balkan Energy Forum, organized by the Ministry of the Interior (Macedonia and Thrace) and TIF HELEXPO, focused on new prospects and developments in the energy sector. The event took place at the Western Macedonia Exhibition Center, co-organized with the Kozani Chamber of Commerce and Industry, and supported by the Cluster of Bioeconomy and Environment of Western Macedonia (CluBE) and the University of Western Macedonia. Western Macedonia, chosen for its historical significance as the country's energy hub, rapidly advanced in clean technologies and renewable energy. Companies and organizations from Greece and Southeast Europe, specializing in renewable energy sources, hydrogen, energy storage, and energy efficiency, participated as exhibitors. The conference featured industry leaders, entrepreneurs, technocrats, scientists, and representatives. The goal was to establish the Balkan Energy Forum as a key platform for showcasing the latest energy technologies.



3rd JIVE ROADSHOW

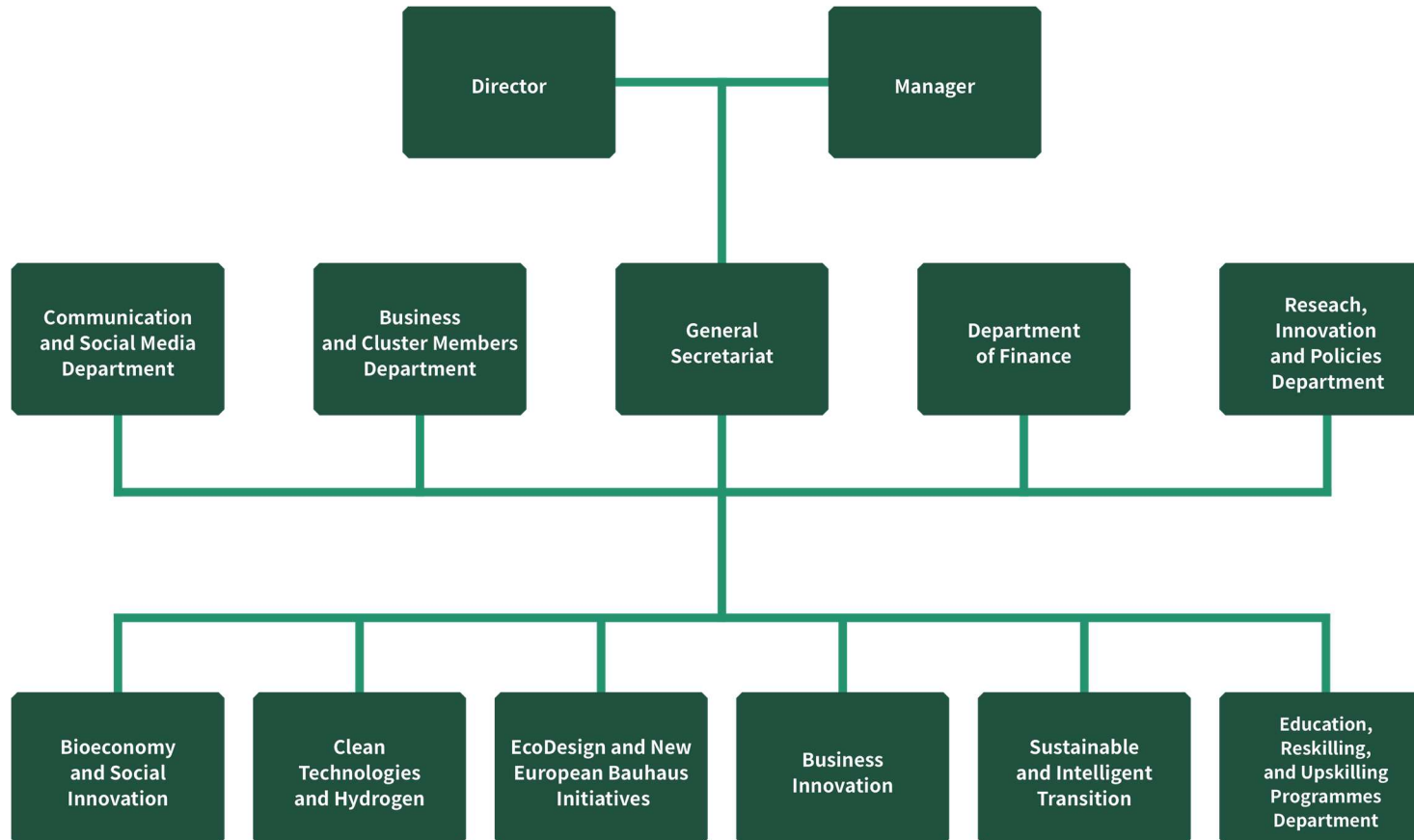
The 3rd JIVE Roadshow in Greece showcased the advancements in hydrogen-powered transportation, clean energy, and green hydrogen. The hydrogen bus, as part of the roadshow, made its first stop in Thessaloniki. This event was organized by the Western Macedonia Bioeconomy and Environment Cluster (CluBE) in collaboration with the European project TRIERES (small-scale hydrogen valley) and supported by Hellenic Hydrogen and Coral Gas, a subsidiary of the Motor Oil Group.

Forward Green Expo

The 'Forward Green' (FG Expo) trade show and conference is a HELEXPO endeavor designed to foster a fresh entrepreneurial mindset in Greece. It centers on promoting a circular economy, sustainable development, and the evolution of business models, all with the goal of preserving our natural resources and advancing toward a sustainable future. This innovative economic strategy addresses a range of interconnected processes necessitating a comprehensive circular framework. It commences with the utilization of raw materials and extends through the phases of production, distribution, consumption, and ultimately the recycling of products, all aimed at minimizing environmental waste.



Organisation Chart



KEY PERSONNEL

Key personnel		GENDER
Dr. Yannis Fallas, Co-Founder & Director of CluBE, Senior Expert He holds a PhD in Clusters in Traditional Sectors of the Economy from the Aristotle University of Thessaloniki and is a Dipl. Mining Engineer of National Technical University of Athens. He has been the Project Manager of many Innovation and Research projects and coordinated important Regional Innovation projects, such as the Regional Innovation Strategies (RIS and RIS+), the Regional Innovation Pole, the Regional Innovation Office of Western Macedonia, the successful proposal of the City of Kozani for the 100 Climate and Smart Cities by 2030, etc. He established and is currently the Director of the Bioeconomy and Environment Cluster in Western Macedonia (CluBE), coordinating the efforts of many European projects and numerous innovative initiatives. Representing CluBE, he is a member of international networks and fora such as the European Hydrogen Valleys Partnership, the Biobased Industries Consortium, the European Bioenergy Partnership, the Greenovate Europe network (member of the Board of Directors), Innovawood the former European Bioeconomy Stakeholders Panel of the European Commission (DG RTD), ICLEI – the Local Governments for Sustainability network, the Hellenic – German and the Hellenic – American Chambers of Commerce, the Regional Committee for Research and Innovation of Western Macedonia, the Greek Bioeconomy Forum (co-founder), etc		Male
Nikolaos Ntavos, Co-Founder & Manager of CluBE, Senior Expert He holds a Master in Mechanical Engineering from the University of Western Macedonia (UoWM) and he is a c. PhD in the area of green hydrogen at the same University. Since 2008 he has been working as a project manager for different EU Programmes (Horizon, FP7, IEE, Interreg, MED, LIFE) to several organizations besides CluBE, like the Region of Western Macedonia, the Regional Development Fund of Western Macedonia, the University of Western Macedonia, CERTH/CPERI and the Waste Management Company of Western Macedonia on different projects related to energy, bioenergy, hydrogen, bioeconomy and circular economy, industrial symbiosis, urban and rural development and entrepreneurship.		Male
Dr. Panagiotis Karagiannis, Senior Project Manager He holds a Diploma (BEng, MEng) in Electrical and Computer Engineering, and Master of Science (MSc) in Advanced Computing. His PhD is in the field of Distributed Constraint Optimization, Resource Allocation and Scheduling. He has developed and participated in numerous projects for the public and private sector, in diverse disciplines such as distributed and parallel processing, digital operational plans, digital innovation and sustainable growth. His core project management expertise comprises skills such as coordination of internal and external resources, third parties and vendors, optimization of planning for resource availability and allocation, as well as coordination of synergies for public authorities and private organizations.		Male
Dr. Georgios Martinidis, Senior Project Manager, Co-Head of Bioeconomy & Social Innovation Department He holds an undergraduate and postgraduate degree in psychology, a postgraduate degree in economics and politics, and a PhD on the role of the human factor in regional innovation systems and policies from the Aristotle University of Thessaloniki and is currently a postdoctoral scholar of the State Scholarships Foundation (IKY). He has more than ten years of experience in the implementation and administration of EC-funded and national research projects. His main research interests include the		Male

benchmarking of innovation, the factors that affect innovation output, social innovation, social inclusion, and the impact of psychological factors on everyday life.		
Angeliki Foutri, Senior Project Manager, Head of Bioeconomy & Social Innovation Department She holds a degree in Urban Planning and Regional Development from the University of Thessaly and a master's degree in Sustainable Development from Harokopeio University of Athens. She has extensive experience in proposal drafting and project implementation within a variety of EU programmes, such as ERASMUS+, LIFE+, INTERREG, ENPI CBC, etc. Angeliki has lately been very much involved in activities focusing on the sustainable development of peri-urban and rural zones.		Female
Dimitris Silikas, Senior Project Manager, Head of Business Innovation Department He holds a degree in Economics from Manchester Metropolitan University and a Post Graduate Diploma in Environmental Economics and Ecosystem Management. He has extensive experience in project implementation and management within a variety of EU programmes such as Interreg, LIFE, FP 6 and 7, INTAS Research Projects and Networks and many more. Dimitris has lately been involved in activities focusing in business development opportunities in the Region of Western Macedonia.		Male
Dr. Eleni Papista, Project Manager, Head of Clean Technologies & Hydrogen Department She is a post-doctoral researcher and a teaching fellow in the Department of Mechanical Engineering at the University of Western Macedonia in Kozani, Greece. She holds a diploma in Chemical Engineering and a master's degree in Nanosciences and Nanotechnologies from Aristotle University of Thessaloniki. In 2018 she received her PhD from the University of Western Macedonia. She has been involved as a researcher and as a responsible for administration and dissemination issues in several research programs financially supported by GSRT and EU (FP7, Life+ Program, ERANET MED, NSRF 2014-2020). Her research activities are focused on heterogeneous catalysis, CO₂ utilization, air pollution control (NO_x, VOCs, etc.) and biomass to energy conversion technologies. She is the co-author of 11 papers in international scientific journals, 26 in international and national conference proceedings (>160 citations, h=7).		Female
Katerina Tsepoura, Project Manager, Head of Secretariat She holds a postgraduate degree in Civil Engineering from the Democritus University of Thrace (Greece) and a Master of Science (MSc) in Engineering Project Management from the Hellenic Open University (Greece). She has been involved in several European Funded projects related to Energy Efficiency of Buildings, Bioenergy, Biomass Supply Chain, Wood Mobilisation and Smart Cities.		Female

Theodoros Gkiourkas, Project Manager, Head of Eco-Design & Bauhaus Department, Head of Events & Communication Department He holds a postgraduate degree in Civil Engineering from the University of Portsmouth, UK and a diploma in Transport Planning from the University of Surrey, UK. He has been involved in project implementation of European Funded programmes such as SSE, Interreg, Interreg – Med, EEA Grants – Renewable Energy Sources and Horizon 2020 related to Energy Efficiency of Buildings, Biowastes, Bioproducts, Intermediate Bioenergy Carriers (IBC) and Smart Cities.		Male
Stefanos Dodouras, Senior Project Manager, Head of Sustainable & Intelligent Transition Department He holds an undergraduate degree in Economics (BSc) and a postgraduate degree in Environmental Impact Assessment and Management (MA). The output of this PhD research was an integrated appraisal system, using soft systems thinking, based on fuzzy concepts, which can allow a deeper understanding of sustainable development. Working outside academia, he has more than ten years of experience in the implementation of EU-funded, privately financed and national research projects in the field of natural and cultural heritage management. Also, he served as the Head of Finance of an NGO based in Athens for the period 2018-2022.		Male
Kyriaki Spanidou, Financial Manager, Head of Financial Department She holds a bachelor's degree in financial sciences from the University of Macedonia (Greece). She is working to the Cluster of Bioeconomy and Environment of Western Macedonia as a Financial Officer. She has a great experience in review of financial statements, analysis of costs, expenses, and tax obligations regarding EU Funded Projects such as Interreg and Horizon 2020. She is responsible of the Financial Department of CluBE.		Female
Vasileios Balachtsis, Project Manager, Deputy Head of Sustainable and Intelligent Transition Department He holds a Diploma (BEng, Meng) in Mechanical Engineering from the University of Western Macedonia and a MSc degree in Carbon Capture and Transport from Cranfield University. He has long industrial experience as R&D and innovation manager at the company Mader in Stuttgart region in Germany. His main role was the further development of existing products, services, and business models. Moreover, he was responsible for the identification, analysis, testing and introduction of new innovative ones. Additionally, he was responsible for the conception and project management of large digitalization projects such as “the digitalization of the entire compressed air chain “. He also holds a PMP^(R) certification, has been involved and manages tasks and working packages of EU projects (Horizon Europe, Horizon 2020, Interreg CBC, Mission, Life etc.) related mainly to the climate neutrality, smart technologies & energy efficiency improvement and hydrogen.		Male

Christina Blachava, Communication & Project Manager, Co-Head of Events & Communication Department She holds a bachelor's degree in Agricultural Development from the Democritus University of Thrace (Greece) and a Master of Science (MSc) in Integrated Plant Protection and Environment Management Systems from the Agricultural University of Athens. She has an experience in proposal and implementation of business plan within a variety of programs, such as Rural Development Programs for individual entrepreneurs, groups of farmers, cooperatives, farmers, State Aid Programs, LEADER, etc. She has also been involved in agricultural consulting/advisory. Furthermore, she worked as a columnist on agricultural platforms for information purposes.		Female
Thanasis Ambas, Junior Agronomist He holds a bachelor's degree in Agricultural Development from the Democritus University of Thrace (Greece). He is involved in agricultural consulting/advisory. He is technical consultant for the Florina-Pelagonia.		Male
Dr. Athanasios Lampropoulos, Project Manager/Scientific Researcher He is a post-doctoral researcher at the University of Western Macedonia in Kozani, Greece. He holds a diploma in Mechanical Engineering and two master's degrees in water resources management and environmental technologies from Aristotle University of Thessaloniki and Democritus University of Thrace. In 2022 he received his PhD from the University of Western Macedonia. His research activities are focused on biomass to energy conversion technologies, heterogeneous catalysis and CO₂ utilization. He is the co-author of 10 papers in international scientific journals, 20 in international and national conference proceedings. He has been involved as a freelancer engineer in many projects concerning the energy upgrade of buildings and as a researcher in several research programs financially supported by GSRT and EU (LIGBIO-GASOFC, NANOCO₂, NANOLEFINS, BENEFIT, BBTWINS etc.)		Male
Dr. Georgios Varvoutis, Project Manager/Scientific Researcher He is a Chemical Engineer graduated from the Aristotle University of Thessaloniki, with a Ph.D in the catalytic CO₂ hydrogenation. He is currently active as a postdoctoral researcher in the University of Western Macedonia (UoWM), studying the production of light olefins via CO₂ hydrogenation. He participated in three research projects with respective scholarships from the Greek State and European Funds, namely two doctoral and one postdoctoral. Also, he has been awarded a research scholarship from the BRISK2 Horizon Project 2020. Between 8/2018 and 5/2022 he was employed as a Ph.D candidate in UoWM. Since 2022 he has been involved in several European projects and the drafting of proposals as a project manager and scientific researcher. During his involvement in the projects, he participated in laboratory experiments, feasibility studies, research papers writing and deliverables preparation. He has a strong R&D background, mainly in the fields of materials development in energy-related catalysis, physicochemical process simulation and feasibility assessment. He is an author of one dissertation and nine scientific journal papers, various national and international conference publications and he was part of the translation group of one scientific book from English in the Greek language.		Male

Dr. Valentina Plaka, Project Manager, Head of Education, Reskilling, and upskilling Programs Department She is an environmental scientist, who holds a Master's Degree in Environmental Policy and Biodiversity Conservation from the University of the Aegean, and a PhD in Environmental Communication and Education in the University of the Aegean. She was awarded with Award of Excellence as a postgraduate student from the University of the Aegean. Also, she leads research teams and environmental campaigns. She is interested in creating educational kits about environmental issues, training of environmental educators, promoting sustainable tourism and public health. She aims to educate and communicate environmental issues to the society towards a new lifestyle, according to sustainable development.		Female
Theodora Kalea, Project Manager, Deputy Head of Bioeconomy & Social Innovation Department She holds an Integrated master's degree in agriculture from the Department of Food Science and Technology of the Agricultural University of Athens and a Certificate of Pedagogical and Teaching Competence from the School of Pedagogical and Technological Education (ASPETE). She is a trained Oenologist as well as a certified and experienced Trainer in courses focused on Hygiene and Food Safety. She has more than 15 years of professional experience as a food scientist in the food industry, with expertise in implementation and certification of food safety and food quality standards. As an agronomist she has taken part in environmental actions such as tree planting and trainings in schools, as well as in the implementation, supervision, and certification of studies on the creation and maintenance of green areas and fire protection works.		Female
Katerina Vardaka, Junior Financial Manager She holds a degree in Economics from the Democritus University of Thrace (Greece). She has attended Specialization Programs at the University of Macedonia (UoM), she also has a license to practice the profession of Accountant - B' category Tax Technician as well as a teaching license. She has an extensive experience in accounting management having worked in both the Private and Public sectors.		Female
Evridiki Mandela, Junior Project Manager She holds a Diploma (MEng) in Mechanical Engineering from the University of Western Macedonia (UoWM) and is a Ph.D. Candidate in the field of heterogeneous catalysis at the same university. She belongs to the research team of Energy & Pollution Control Systems Engineering Laboratory (EPSEL) and participated in three research projects. She has also been awarded two doctoral scholarships, (between 04/2021 - 03/2022 and 4/2021-) from the Greek State and European Funds. Furthermore, she is conducting Quality Control Measurements for diesel fuels from ELINOIL fuel stations and has been involved as a Project Manager Assistant in research programs financially supported by EU (NSRF 2014-2020, RRP Greece 2.0). Her research interests are focused on heterogeneous catalysis, CO2 valorization, as well as catalyst design and development.		Female

Athanasia Ioannidou, Junior Project Manager She holds a diploma in Chemical Engineering from Aristotle University of Thessaloniki (AUTH). Her diploma thesis focused on the use of Perovskites as oxygen carriers in Chemical Looping Reforming. She performed her internship at Chemical Process and Energy Resources Institute at Centre for Research & Technology Hellas (CERTH), where she carried out chemical analyses on solid fuels (combustion and calorific value measurement of biomass and SRF samples).		Female
Ellie Mavroudi, Junior Project Manager She is an Architect Engineer, graduated from the Aristotle University of Thessaloniki (AUTH), with a Diploma Research Thesis on Urban Design and the Psychology of Space and a Diploma Design Thesis under the topic "Architectural Design and Reuse". She is working at the Cluster of Bioeconomy and Environment of Western Macedonia as a Junior Project Manager, responsible for the New European Bauhaus Initiative, in which the Cluster is a member. She is also involved in European Funded programs related to buildings renovation - Energy Efficiency of Buildings, the New European Bauhaus related programs, and Smart Cities.		Female
Dionysis Loizos, Junior Project Manager He holds a Diploma in Mechanical Engineering from the University of Western Macedonia. He specializes in the Structural Field and more specifically in manufacturing of aerospace materials. He has great knowledge on Computer Aided Design, Vehicle chassis construction, Modeling of dynamic systems, creating animations, 3D Printing and Coding. He was a member of the student's team Typhoon MotoRacing of the University of Western Macedonia that won the 2nd overall position among 37 teams at the international MotoStudent competition. He has work experience as computer technician as well as a car mechanic.		Male
Rafail Vasileios Mangiridis, Junior Communication Manager He holds a bachelor's degree from the Department of Administrative Science and Technology of the University of Western Macedonia. He has been working for the Kentepozidis Group of Companies, as bar restaurants and staff manager from 2016. Additionally, due to the Group's involvement in the construction of PV plants in the Kozani area, he had an active role in the company's public relations between 2020 – 2022.		Male
Evangelos Kalianiotis, Junior Communication Manager He is an IT Expert, specialized on computer repairing and take related problem solving, with over 15 years of experience. He has been working the last 8 years on local newspapers and digital printing firm as a Graphic Designer. Currently, he is learning about web design, social media marketing & promotion. He was elected VP of the local motorsport club, as well as organizing races for the panhellenic drift and hillclimb championship. He has also worked as a journalist, motorsport photographer and, he still writes articles about things and life.		Male

Kiki Avramidou, Junior Communication and Project Manager

She holds a Master's Degree (MSc) in Health Unit Management from the Hellenic Open University. Her Diploma thesis on "Investigation of the Psychological Effects due to COVID-19 in the Population of Greece" has been published at the 31st European Congress of Psychiatry in Paris. She is a graduate of the Department of Economics of the Aristotle University of Thessaloniki majoring in Business Economics. She is a member of the Hellenic Chamber of Economic and the Chamber's Financial Supervisor for the 5th Regional Department of Western Macedonia since September 2021. She also has experience in Public Relations, Communication, Marketing and Management.



Female

Amalia Marinou, Senior Project Manager

Dr Amalia Marinou, Materials Engineer and Research associate of Advanced Ceramics and Composites Laboratory of NCSR "Demokritos", Athens, Greece. Amalia Marinou was born in Kozani, Greece and earned a BSc, MSc and PhD in Materials Engineering. The MSc was in "Chemistry and Technology of Materials" and the PhD thesis on "Synthesis of high temperature coatings with new CAFSY method", in Department of Material Science and Engineering of the University of Ioannina in Greece. Both MSc and PhD focused on synthesis and characterization of protective coatings using different thermal spraying methods. In this current position (over 10 years), she coordinated and executed numerous of European and Greek research projects (mostly in relevance with space technology), as a part of the advanced materials and composites laboratory team. Also provides Quality Assurance and Failure Analysis services to industrial clients (ISO/ASTM Standard). Has shown leadership during collaborations with industrial and research partners, possesses strong communication skills and can adapt rapidly to new working environments while ensuring that deliverables are always met, even under tight deadlines. Amalia's research interests over the years have covered a wide range of fields in Materials Science and Engineering and include metals, ceramics and composites, thermal spraying coatings (flame, arc, plasma and HVOF) for high temperature protection, corrosion and wear resistance, advanced structural ceramics, hybrid composites with ceramic polymer and metal matrices, failure and toughening mechanisms of hard materials, wear and erosion of materials, production of a new type of multifunctional roof-tile with a photovoltaic system of organic solar cells (OSC) for energy production, embedded on its surface, catalysts coatings, advanced protection and propulsion systems for spacecraft and thermal sensors, combustion synthesis of catalysts and other nanomaterials, engineered ceramic-metal interfaces, and heterogeneous catalysts.

In the past she worked as an R&D Engineer for thermal spraying protective coatings in Pyrogenesis SA. She had participated in numerous RD projects funded by the European Commission and the European Space Agency and had published over 25 papers and conference presentations.



Female

Panagiota Karachristou, Junior Project Manager She holds a degree in Environmental Science from University of Ioannina, with postgraduate studies in Environmental Physics, AUTH, and Special Education, University of Frederick. She has worked as a teacher in Secondary Education, in Vocational Schools of DYPA and as an Adult Educator in Second Chance Schools. She holds a Teaching Qualification from the Higher School of Pedagogical and Technological Education (ASPATE) and she is Certified as Adult Educator (EOPPEP). She is interested in environmental education issues and environmental awareness actions. She has also worked as an Environmentalist, in collaboration with the Region of Western Macedonia and Technical Department.		Female
Theodouli Korka, Junior Project Manager She holds the integrated master's degree of the Faculty of Agriculture of the Aristotle University of Thessaloniki, with a specialization in plant production. During her studies she carried out her thesis by participating in the first experimental field of ELGO DIMITRA for the evaluation of industrial hemp varieties once the cultivation was legalized in 2016. After completing her studies, she worked for three months through the Erasmus+ program at the Botanical Garden of the University of Porto in Portugal. She has experience in the management of the CLLD-LEADER project for "Supporting the implementation of actions of Local Development Strategies with Local Communities Initiative of the Ministry of Rural Development and Food" gained through her work at the Development Organization of Local Government of Kozani (ANKO of Western Macedonia). She is currently completing her master's degree in business, Economics and Management at the Mediterranean Agronomic Institute of Chania, member of the International Centre for Higher Mediterranean Agricultural Studies (CIHEAM-MAICH), with emphasis on the circular economy.		Female
Danai Andreadi, Junior Communication and Project Manager Holder of a bachelor's degree in computer engineering and Telecommunications from the University of Western Macedonia. Her undergraduate thesis focused on Telemedicine Systems, while during her studies, she completed an internship at DEYA Kozani, where she was involved in website development and management. She also has a master's degree in digital marketing and E-Business. She has experience in managing social media, as she worked at an online pharmacy, where she was responsible for social media platforms and website management. She is also owner of an insurance agency.		Female
Maria Vorsia, Project Manager She holds a Degree in Agriculture from the Department of Agricultural Development & Agricultural Business Management of the Alexandro Technical Educational Institution of Thessaloniki. She is a certified trainer of the institute for adult continuing education of the institute. She has more than 15 years of professional experience as agricultural operations consultant, with expertise Agricultural development programmes. As an agronomist she has been involved in the implementation of various European and national programmes.		Female

Sofia Pouri, Junior Project Manager She holds a degree in Education Sciences in Early Childhood from Democritus University of Thrace (Greece). She has been involved in the implementation of activities for preschool children, including environmental education and has participated in 3 Erasmus+ projects. Sofia is also writing articles for a Greek online newspaper.		Female
Eleftheria Moraiti, Junior Project Manager Graduated from the Department of International and European Studies, University of Macedonia, where she studied from 2017-2022. Eleftheria Moraiti worked as an external expert in the Administrative Control of Required Documents of the funding payment requests of the approved beneficiaries of the project "Support of small and very small Businesses affected by Covid-19 in Central Macedonia" and "Support of small and very small Businesses affected by Covid-19 in Western Macedonia", for a year. Additionally, she gained knowledge in project management and implementation, as she worked for a year and 3 months, in LEVER S.A. where she was responsible for the communication and dissemination (social media, website, development of dissemination material) of European Projects, project management and organisation of events, under the scope of the projects' deliverables. Moreover, she assisted in the development of project proposals. Finally, she owns a certificate of Proficiency in Cambridge English, as well as a "Certificat Pratique" in French, C1, Sorbonne.		Female
Stefania Zourka, Junior Project Manager Stefania Zourka is a Lawyer. She holds a Master of Laws (LLM) degree of the Faculty of Law, of Aristotle University of Thessaloniki on International and European Legal Studies with specialization in Public International Law. She is a Senior Project Manager and Member of the Board of Directors of the youth-led think tank "Association of International and European Affairs (odeth.eu)".		Female
Konstantinos Letsios, Junior Project Manager He graduated with a degree in Mechanical Engineering from the Technological Educational Institute (TEI) of Western Macedonia and holds a Master's degree in Hydrogen Science and Technologies from the University of Western Macedonia (UoWM). He has experience working as a Construction Engineer at the PPC Power Plant "AHS Ptolemaida" and as a Construction Supervisor Engineer on the DESFA HPPL Western Macedonia Pipeline project.		Male

Efi Katsogiannou, Communication and Project Manager/Environmental Educator She is a Historian/Philologist with postgraduate studies in Public Discourse and Digital Media, completed her studies in pedagogical training at the Higher School of Pedagogical and Technological Education, specializing in Counseling and Guidance and Intercultural Education. She is Environmental Educator. Also, she has specialized in Social Media Marketing and Communication, Tourism Promotion and activities and involved with public relations and communication and is a creator of educational projects. She was a UNESCO researcher on Intangible Cultural Heritage, organizer of Festivals and creator of innovative actions. The professional experience in Organizations starts from 2015 until today where she was a consultant of the Municipality of Kozani about Culture, Environment and Education.		Female
Valentina Hira, Junior Project Manager She holds a diploma in Mechanical Engineering from the University of Western Macedonia and an Integrated Master. Since 2020 she has participated as freelance engineer in projects related to energy upgrading of buildings and has experience in managing 'Co-financed European programmes' such as Farmers Improvement Schemes. He is a Safety Technician in A', B' and C' Risk companies and holds a Group A' and B' Project Machinery Operator License.		Female
Brena Gaspar, Junior Project Manager She is an environmental engineer, specialist in environmental management & sustainable development and in agile project management. She started her career in the public sector, contributing with projects in the Amazon Rainforest, direction to carbon markets and protected areas. Also, she worked for the private sector with projects for solar energy and then, for startups, where she could contribute with small farmers, that are the suppliers of big companies, to the monitoring the Impact indicators (social, environmental and governance) and with these data, to be able to act and improve for best practices for the SDGs (Sustainable Development Goals). Internally, she was one of the responsible for the ESG policies of the company. I have a background of certifications about environmental monitoring, social impact, project management, ux-design, and skills for the green transition.		Female
Georgios Chaitidis, Junior Project Manager He holds a Diploma in Environmental Engineering and a Master of Science (MSc) in Advanced Engineering of Energy Systems. For the past 2 years he has worked as an Environmental Engineer in environmental projects such as the supervision and monitoring of the operation of sewage treatment facilities as well as the supervision of a telemetric monitoring network for environmental parameters of ground and surface water at nine stations. He has also worked as a teacher in Vocational Training Institutes, as an adult educator in DYPA seminars as he holds a Qualification from the Higher School of Pedagogical and Technological Education (ASPAITE) and he is Certified as Adult Educator (EOPPEP), and as a Front-End Web Developer for the past 6 years.		Male

Aikaterini Beini, Junior Project Manager She holds a degree in Spatial Planning and Development from the Department of Engineering, Aristotle University of Thessaloniki (AUTH). Her diploma thesis focuses on the composition of Energy Communities in Western Macedonia, specifically in Municipality of Florina, to restructure the energy system by increasing renewable energy projects. She performed her internship at a topographical engineering office, where she created Q-GIS maps referring to environmental and touristic themes.		Female
George K. Giannakis He holds an MBA from St. Joseph's University, USA, in Business Administration with a specialization in Production and Operation Management, as well as a Bachelor of Mechanical Engineering (BME) from Villanova University, USA. Working outside of academia, he has more than 28 years of experience and expertise in Industry, Petroleum Industry, Renewable Energy Industry as well as the Agricultural Products Processing Industry, undertaking a variety of roles and responsibilities as Manager. His professional experience is based on responsible roles in the Industrial Production & Maintenance departments of PETZETAKIS S.A. E, in Business Development and Technical Sales Support departments of Multinational Oil Companies Castrol & BP, with an emphasis on Specialized Industrial Lubrication Systems and Metal Processing Sector. In the renewable energy Sector. He has held a position as Director of case study, with an emphasis on the Production of Electricity from Biogas, for Eco Energy Ltd. He has also served as Project Director for Vendo Valley IKE, preparing a developing a study for an energy-independent, Fruit & Vegetable Drying Plant, to be assessed by SDAM for West. Macedonia.		Male
Vagia Gaidatzi, Junior Project Manager She holds an Integrated Master's in mechanical engineering from the University of Western Macedonia (UoWM). She has carried out a thesis focused on the computational analysis aerodynamics and performance of a small wind turbine horizontal shaft with shell. She performed her internship at DESINGERGON, industrial design company. Also, she is a postgraduate student in the Master's Program in Advanced Engineering of Energy Systems at the same university and her thesis entitled "Aerodynamic and aeroelastic characteristics of flexible wind turbine blades under periodic unsteady inflows". Finally, she works as a Junior Project Manager at the Cluster Bioeconomy and Environment Cluster of Western Macedonia (CluBE), at the department of Clean Technologies and Hydrogen.		Female
Paraskevi Alexiou, Junior Project Manager She is an Environmental Engineer, a graduate of the School of Environmental Engineering at the Democritus University of Thrace. She specialized in «Atmosphere, Energy and Climate Change» with her thesis titled "Exploring Business Executives' Perceptions of the Circular Economy through SWOT Analysis." Currently, she works at the Cluster of Bioeconomy and Environmental of Western Macedonia as a Junior Project Manager, in the Department of Energy and Climate Actions. With a significant background in sustainability, Paraskevi Alexiou is dedicated to improving quality of life and promoting practices that enhance sustainability and energy efficiency.		Female

Ioannis Grigoriadis, Project Manager

He holds an Integrated Master of the School of Agriculture of the Aristotle University of Thessaloniki (A.U.T.H.), Department of Agricultural Economics. He has worked as a professor of Agriculture in Secondary Education. He has worked as the owner of an agricultural supply store and an agricultural consultant. He participated in the development of education, training and information programs in the primary agricultural sector. He has experience in proposing and implementing business plans in European Union programs, NSRF and Rural Development Programs, in improvement plans, OSDE, geotechnical studies and expert opinions. He is a certification inspector for organic facilities.



Male

Nikolaos Kourkoutas, Junior Project Manager

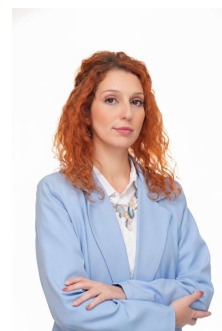
He is an Agricultural Science graduate with an integrated MSc in Animal Science and currently an active student of Veterinary Medicine. He has a strong interest in energy, environmental sustainability, and rural and regional development. His academic and practical experience includes sample organization, conservation of animal genetic resources, and conducting on-site inspections of livestock production units.



Male

Rafailia-Georgia Stiouki, Junior Project Manager

She is a graduate of the Department of English Language and Literature and has completed postgraduate studies in International Public Administration, as well as in International Relations, Strategy, and Security. She holds certifications in Special Education and Adult Education. In addition, she possesses an Executive Diploma in the Art of Diplomacy from the European Academy of Diplomacy. She has participated in numerous simulations of international organizations, conferences, and seminars, while also engaging in volunteer work with institutions and think tanks, such as the Association of International and European Affairs.



Female

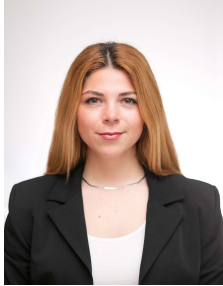
Athina Tsiarda, Junior Project Manager

Athina Tsiarda is an Electrical and Computer Engineer, a graduate from the University of Thessaly's School of Engineering, with a thesis on "Applying Design Thinking to Sustainability" which led to the creation of a digital application for smart sustainable purchasing choices. She participated in the Summer School of Aveiro, through the Erasmus+ program, on Design Thinking, Circular Economy and Sustainable Development. She is currently working at the Cluster of Bioeconomy and Environment of Western Macedonia as Junior Project Manager, in the Department of Sustainable and Intelligent Transition.



Female

Natalia Dokolianidou, Junior Project Manager She is a Mechanical Engineering student at the University of Thessaly, specializing in Organisation, Production, and Industrial Management. In the summer of 2024, she completed her internship at the Cluster of Bioeconomy and Environment of Western Macedonia and has since been working as a Junior Project Manager in the Department of Sustainable and Intelligent Transition.		Female
Evgenia Tsoumani, Junior Project Manager Holds a Diploma in Mechanical Engineering from the University of Western Macedonia. Her diploma thesis focused on the study of the effect of structural promoters (Ce, La) and reaction conditions on N₂O decomposition over low-loading (0.5% w/w) noble metal catalysts (Pt, Pd, Ir) supported on γ-Al₂O₃. She subsequently completed a Master's degree in Energy Resources and Technologies Management at the same university. Alongside her studies, she gained several years of professional experience in structured corporate environments, undertaking roles with a strong coordination and management focus.		Female
Eirini Panagiotidou, Junior Project Manager She holds a degree in Political Science from Democritus University of Thrace with distinction, as well as a Master's Diploma in the Postgraduate program "Governance – Regional Development" from the Department of Political Science of Aristotle University of Thessaloniki. She is currently studying at the School of Pedagogical and Technological Education (ASPETE) to obtain the Certificate of Pedagogical and Teaching Competence. She has international study experience, having completed two exchange semesters with the Erasmus+ program during her studies and has attended seminars on youth participation in democracy and financial management. She has volunteered at a parliamentary office, speaks English and German and holds the IT Knowledge Certificate. Today she is a Junior Project Manager at CluBE, with responsibilities that combine the contribution to the effective implementation of European programs, the communication with the company's partners and the administrative management.		Female
Anna Marinou, Junior Project Manager Holding a degree from the Department of Language, Philology, and Culture of the Black Sea Countries at Democritus University of Thrace. During her studies, she completed an internship at the Ephorate of Antiquities of Rodopi, focusing on the management of protocols and administrative services. She subsequently participated in the Supplementary Distance Education Program of the Center for Lifelong Learning and Continuing Education at the National and Kapodistrian University of Athens, specializing in 'Human Resources Development.' She has many years of experience in human resources management and administrative services, and she is currently in the process of completing her master's degree titled 'Human Resource Management, Communication, and Leadership in Organizations/Businesses' at the University of Western Macedonia.		Female

Archontia Triantafyllou, Junior Project Manager		Female
Anna Petrogianni, Junior Project Manager She is an excellent graduate of the Department of Chemical Engineering of the University of Western Macedonia. With a focus on Biotechnology-Food Technology, she prepared her diploma thesis on the topic "Innovative chemical and biochemical technologies for the synthesis of high value-added chemical products in the context of the modern biorefinery". During her studies, she did an internship at CERTH, in the fuel quality control laboratory. Her contact and familiarity with the subject of biorefineries, alternative fuels and biotechnology in general adequately prepared her for her position in the Bioeconomy and Environment Cluster of Western Macedonia as a Junior Project Manager, in the Bioeconomy sector.		Female
Triantafyllos Baltzis, Junior Project Manager Holder of a Bachelor's degree in Economics from the University of Ioannina. He has professional experience in renewable energy projects, having worked as a Project Engineer and Drone Operator, where he was involved in project coordination, field operations, photogrammetric surveys, and data analysis for energy infrastructure development. Since 2026, he has been working at CluBE – the Bioeconomy & Environment Cluster of Western Macedonia, as an Economist, contributing to initiatives related to bioeconomy, sustainability, and environmental development. He combines economic analysis with technical and project management expertise, supporting interdisciplinary and innovation-driven projects.		Male
Vaggelis Papastamkos, Junior Project Manager		Male

Contact info:

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