

Hydrogen & green gases

FORUM



Development of the green hydrogen economy in the Region of Western Macedonia

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Cluster of Bioeconomy and Environment of Western Macedonia



<https://clube.gr>

- ☐ A regional innovation cluster established as a non-profit company on 14th of February 2014
- ☐ No member fees
- ☐ Funded by strategic consulting services and EU competitive projects

Our vision:

The creation of synergies between R&D and entrepreneurship to increase knowledge and innovation in Western Macedonia

Our Power... Our Members!!!



Public Sector



R & D



Environment



Social

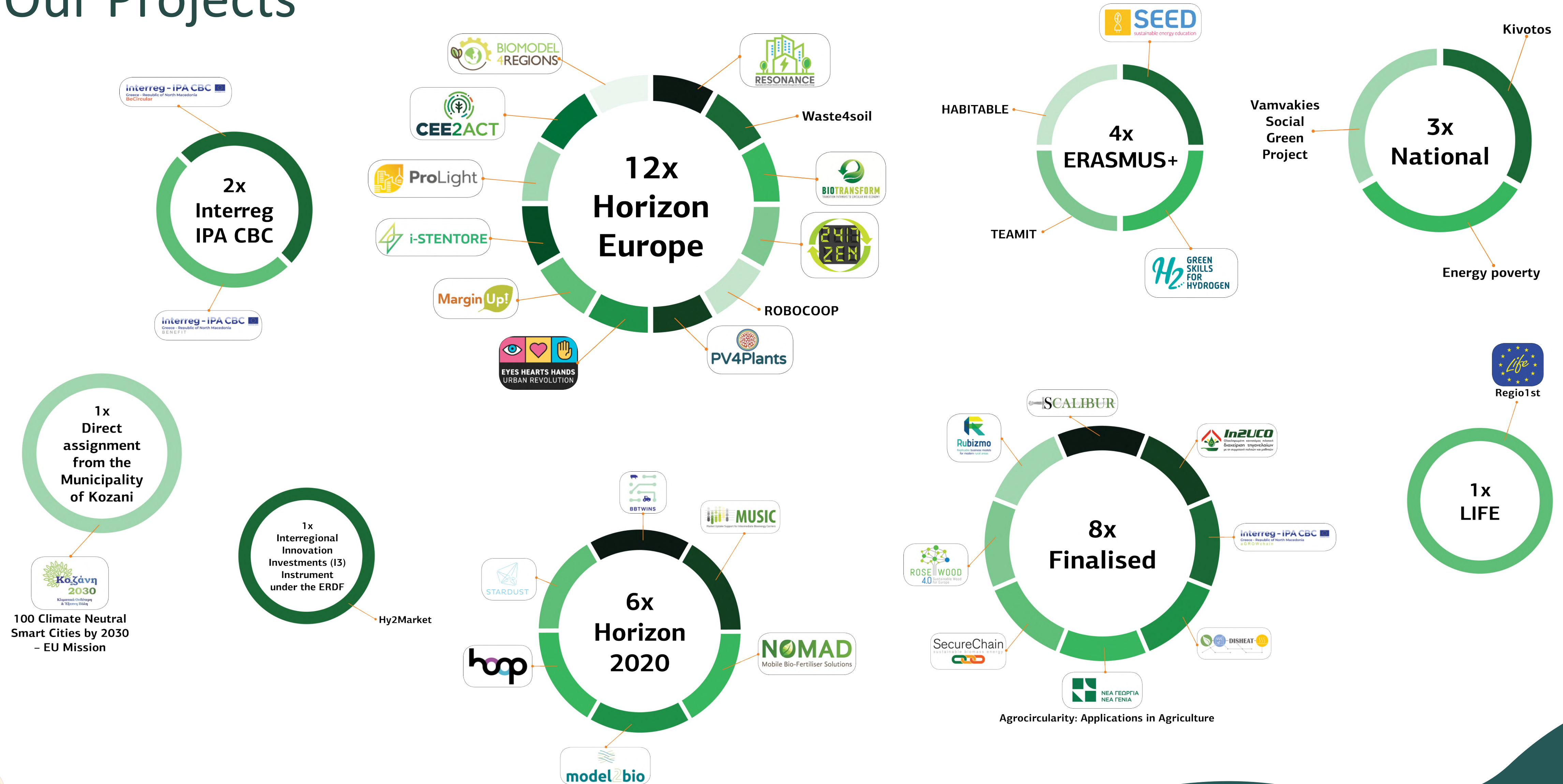
Entrepreneurship



Quintuple Helix

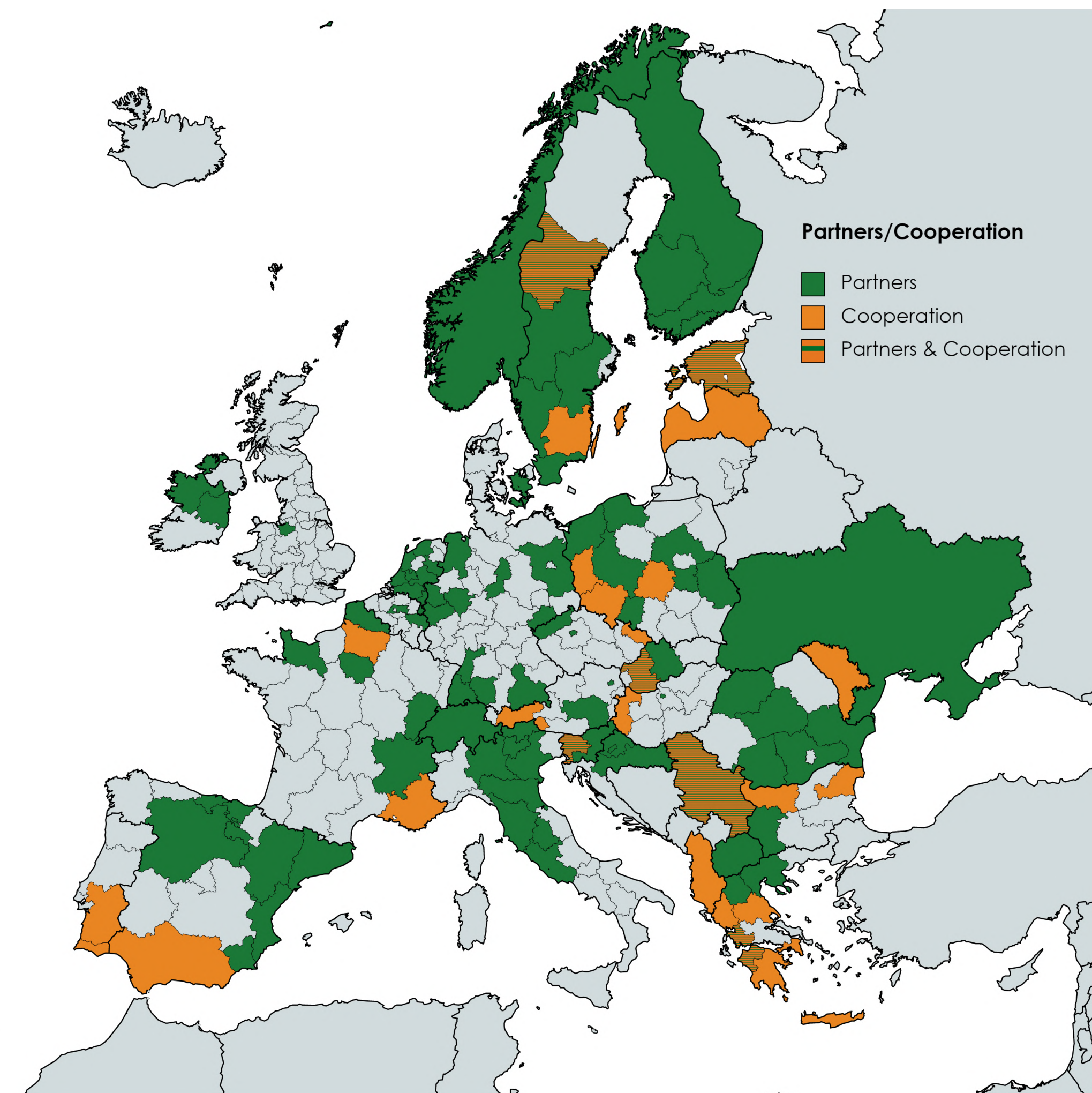
1. Public Sector
2. R&D
3. Entrepreneurship
4. Environment
5. Social

Our Projects



CluBE main target: EU added value!

- ❑ 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 
- ❑ 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 

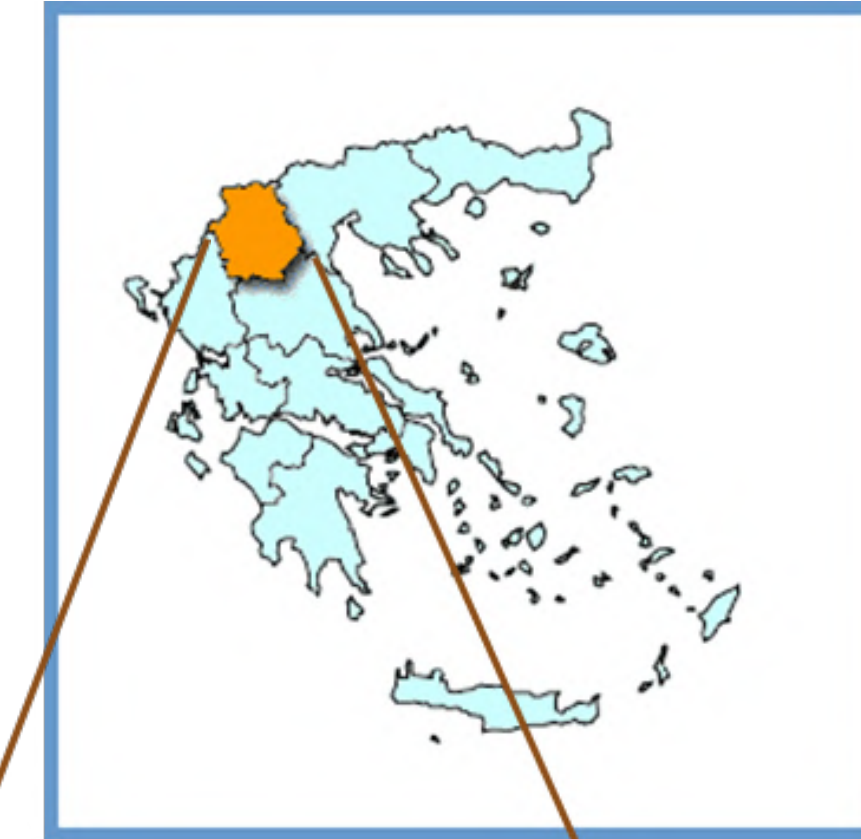


Region of Western Macedonia

Western Macedonia: landlocked Region in Greece - most intensive user of lignite

Area: 9,451 km² (7.16% of the total country)

- Pop. ~284.000 inh.
- 13 Municipalities
- Regional GDP PPS EU-28 avg: from 83% (2006) to 59% (2017)
- Unemployment 27,1% (2019), > 50% among youth
- Continental climate
- Mountainous, the only Greek Region without seacoast...



Lignite Industry in Western Macedonia

Lignite production and utilization – main features:

- Supplies electricity to Greek interconnected system since 1960, acting for several decades as the Greek energy pillar of economic growth due to the electricity low cost and utilization of domestic energy sources.
- 4 lignite fired power plants of 12 units in operation represented the 40% of thermal units and 20% of the total installed net capacity of the interconnected system in Greece.
- About 100.000 citizens of Kozani, Ptolemaida and Amyntaio heated by district heating systems from lignite power plants.



Western Macedonia

From coal to ???



- A new sustainable production model for the region
- A low carbon society promoting technical innovation

Strategic Initiatives on Hydrogen

CluBE's Hydrogen Projects Portfolio

- Pilot Positive Energy Building - InnoAGRIVET (The case of the Agri-Vet Centre as a Living Lab in Western Macedonia)
- GreenSkills4H2, Erasmus+ Project The logo for GreenSkills4H2, featuring a stylized 'H2' in blue and green, with the text 'GREEN SKILLS FOR HYDROGEN' to its right.
- Hy2Market, Interregional Innovation Investments (I3) Instrument / ERDF Project The logo for Hy2Market, featuring the text 'Hy2Market' in black, with a yellow circle containing the number '2' between 'Hy' and 'Market'.
- i-STENTORE, Horizon Europe Project The logo for i-STENTORE, featuring a stylized green and yellow lightning bolt icon to the left of the text 'i-STENTORE' in green.
- 24/7_ZEN, Horizon Europe Project The logo for 24/7_ZEN, featuring two blue arrows pointing in opposite directions (left and right) to the left of the text '24/7 ZEN' in blue.

GreenSkills4H2 (Erasmus+)



Shaping the Future of Hydrogen Skills

- 4year-period Vocational Training Programme (VET)
- Address the skills need of workers in declining sectors and transition regions
- **Upskilling and reskilling opportunities** → employment opportunities within the Hydrogen sector

CluBE is designing and implements reactive and urgent upskilling and reskilling programs for the Region of Western Macedonia



Region of Western Macedonia



Funded by
the European Union



Hydrogen
Europe



Hydrogen Europe
Research

GreenSkills4H2 (Erasmus+)

Masterclass: One-Day Hydrogen (Done)



Greece (CluBE & Advent Technologies)

- 03-07 July 2023 at UoWM, ZEP Area in Kozani
- Target audience: **undergraduate** and **postgraduate engineering students**
- Study visit (CERTH/CPERI)

Hydrogen Summer SchH2ool (Pending)



Next steps / training programs

- Urgent Training for the engineers of the Technical Chamber of Greece in **October 2023**
Target audience: Engineers affected by the transition and technicians
- Urgent Training for **SMEs** in Athens and Thessaloniki

TERRA – Next Generation Hellenic Hydrogen Valley at Western Macedonia

(Submitted on 18th of April – under evaluation)

- TERRA is a **Hydrogen Valley** that brings together business, knowledge and regional interests and has a tremendous upward perspective over a large part of the Balkans, South-Eastern Europe and the wider area of Eastern Mediterranean
- The Valley will be built **around** the nucleus of Hellenic Hydrogen's **100 MW electrolyser**
- Creating and building a Valley using the electrolyser as Hydrogen generator accelerates the transition, with an **annual production of 3,052 tons of Green Hydrogen** that will be utilised in the production of low and **no Carbon footprint** energy and industrial products and will be **injected in the natural gas grid** creating a **Hydrogen Backbone** of full **EU interest**
- High visibility actions in **mobility**:
 - 3 public transport buses
 - at least 5 public service cars

TERRA – Next Generation Hellenic Hydrogen Valley at Western Macedonia

- TERRA entails an investment of **239 mil EUR** initially by project partners
- Knowledge transfer and cooperation will take place with ZAHYR, TRIERES and CRAVE-H2 valleys and broader connected geographies in Egypt and S. Arabia
- Several thousand people will be employed during the realisation of the valley project, which will promote new skills development
- The consortium partners are creating a true new perspective in the region, transitioning from a traditional refinery complex to a state-of-the art future oriented energy and hydrogen ecosystem in the W. Macedonia region

Benefits of the creation of a clean technologies and hydrogen valley in Western Macedonia

The Western Macedonia Hydrogen Valley will:

- ✓ Further develop the hydrogen economy in Greece and will make the country a pioneer in hydrogen technologies in Southeastern Europe.
- ✓ Install high-tech hydrogen technologies in Western Macedonia.
- ✓ Reverse the brain drain by creating jobs of high technological / scientific level.
- ✓ Transform the region into a hub for re-skilling and up-skilling in hydrogen technologies.

Western Macedonia can be a pole of attraction for additional investments and joint ventures with strategic industry partners in areas such as energy, aeronautics, defense, automotive, etc.

Western Macedonia will become a research and development hub for the European hydrogen industry!

Thank you for your attention!



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of Western Macedonia**

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