

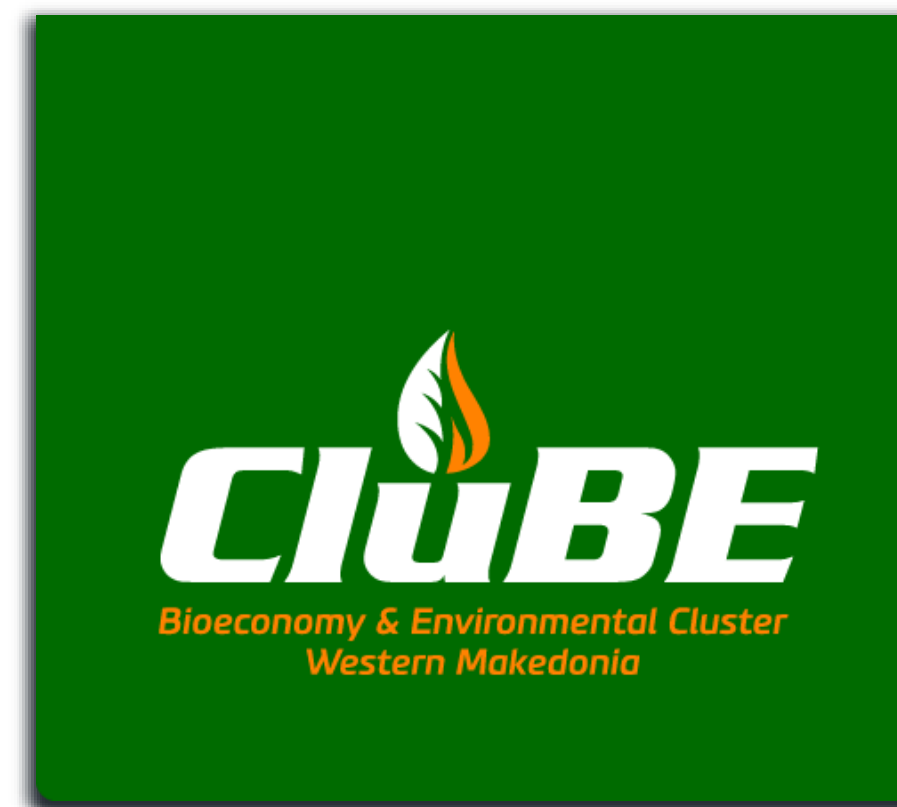


Hydrogen and decarbonization mission
Torino- 29 June / 1° July 2022

CluBE

Bioeconomy & Environment Cluster

Western Macedonia



In collaboration with



And in collaboration with the Regional
Innovation Clusters of Piemonte



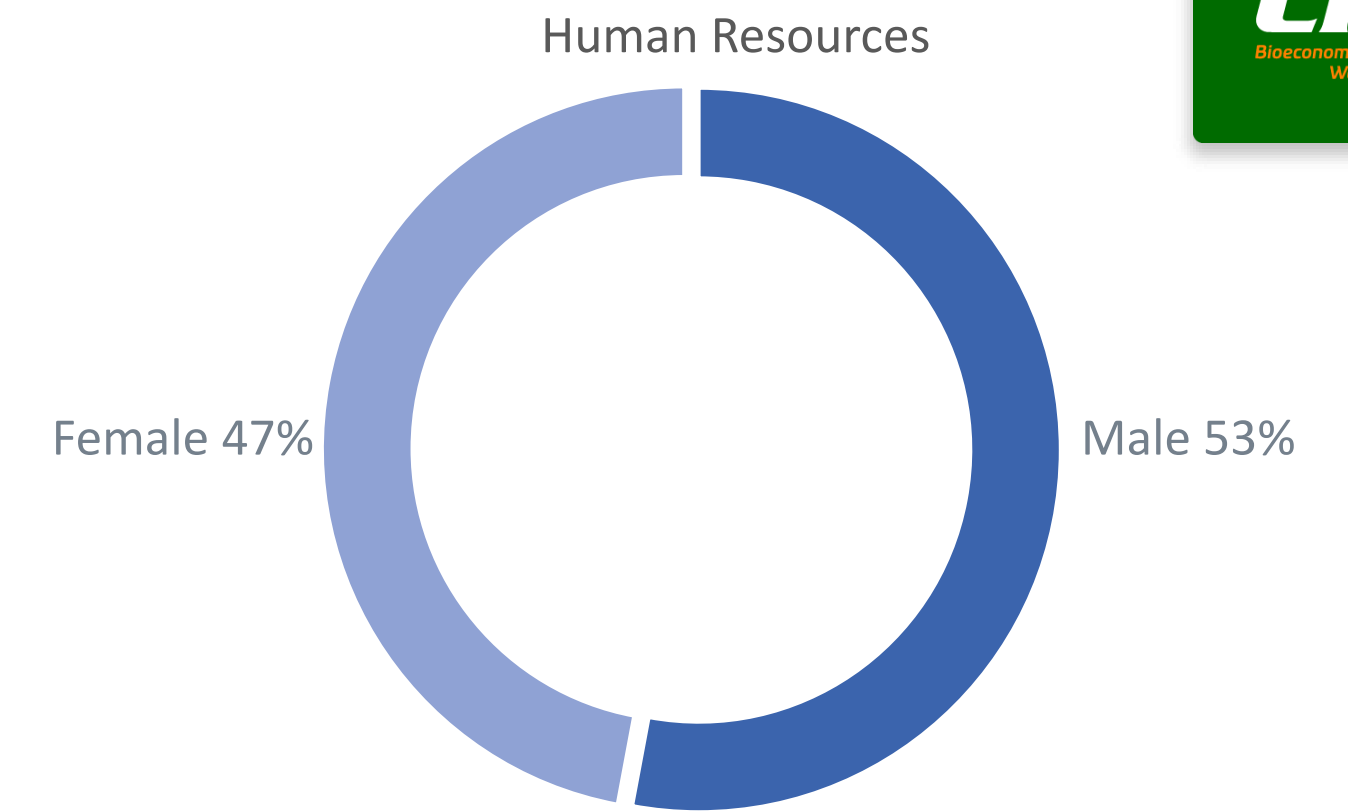
per una crescita intelligente,
sostenibile ed inclusiva
www.regione.piemonte.it/europa2020
INIZIATIVA CO-FINANZIATA CON FESR

The company: about us

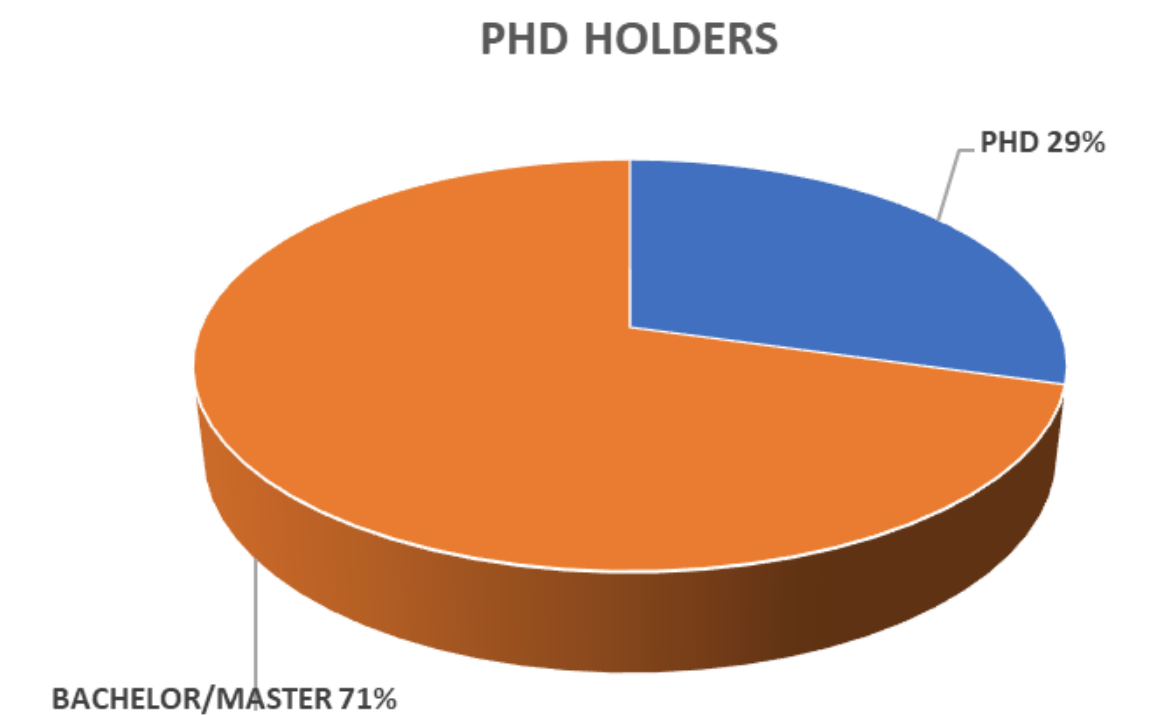
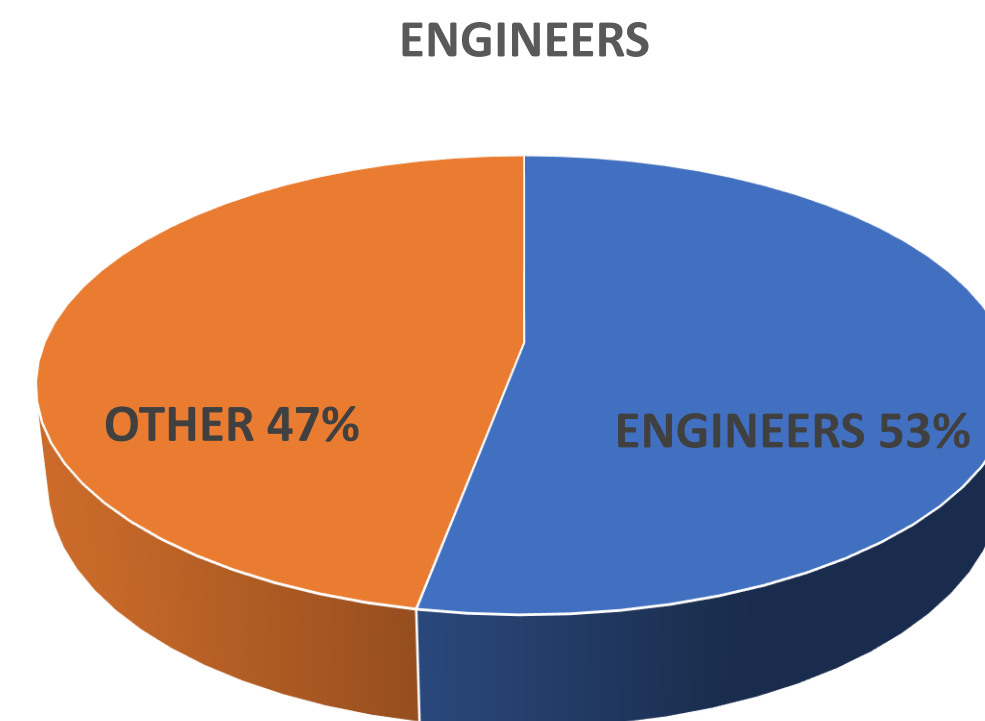
- Formally established in 2014
- Not for profit company
- Bottom up approach
- 17 employees
- Emphasis on Human Resources
- Gender Balance
- Seat in Kozani, Western Macedonia, Greece

CluBE

Hydrogen and decarbonization mission
Torino- July 1^o 2022



Invest in knowledge



CluBE Members: a rich ecosystem with more than 40 Quintuple Helix Members



- Public sector
- R&D
- SMEs
- Environment
- Social

The Region of Western Macedonia

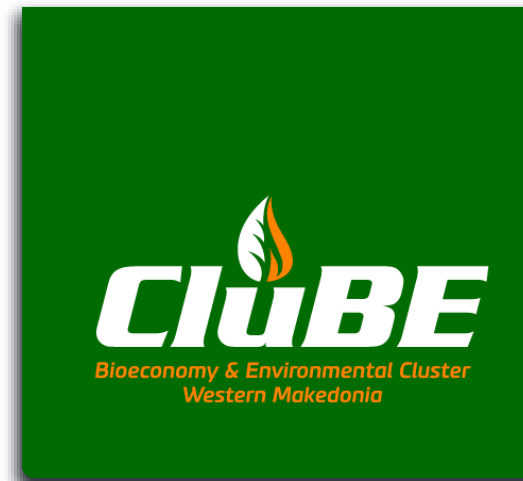
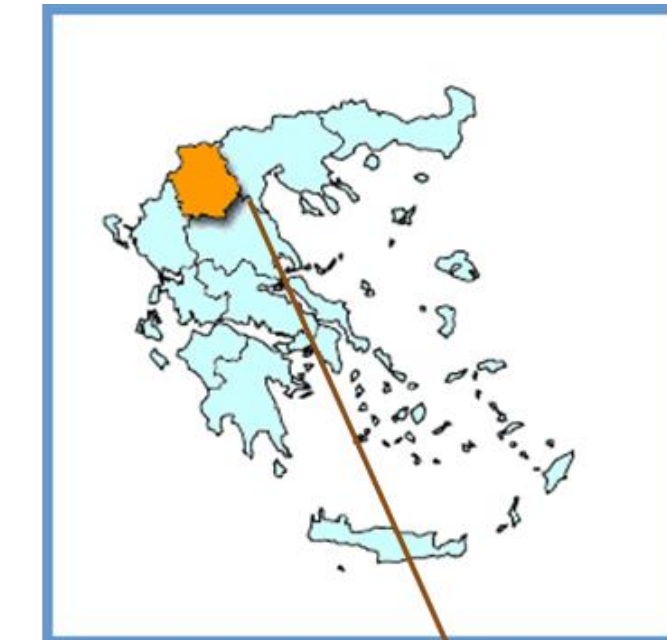
- Population ~284.000 inh.
- 13 Municipalities
- Regional GDP PPS EU-28 avg: from 83% (2006) to 59% (2017)
- Unemployment 27,1% (2019), > 50% among youth
- Continental climate
- Mountainous, the only Greek Region without sea coast



Pindos National Park "Valia Kalda"



Vasilitsa Ski resort



Energy Sector in Western Macedonia – Public Power Corporation & District Heating



Power

- 4 lignite mines 40 Mtns / yr
- ≈ 50% total GR MWe1 until 2012
- ≈ 12,5% from lignite (March 2020)
- ≈ 20.000 jobs
- > 200 cooperating SME's

District Heating

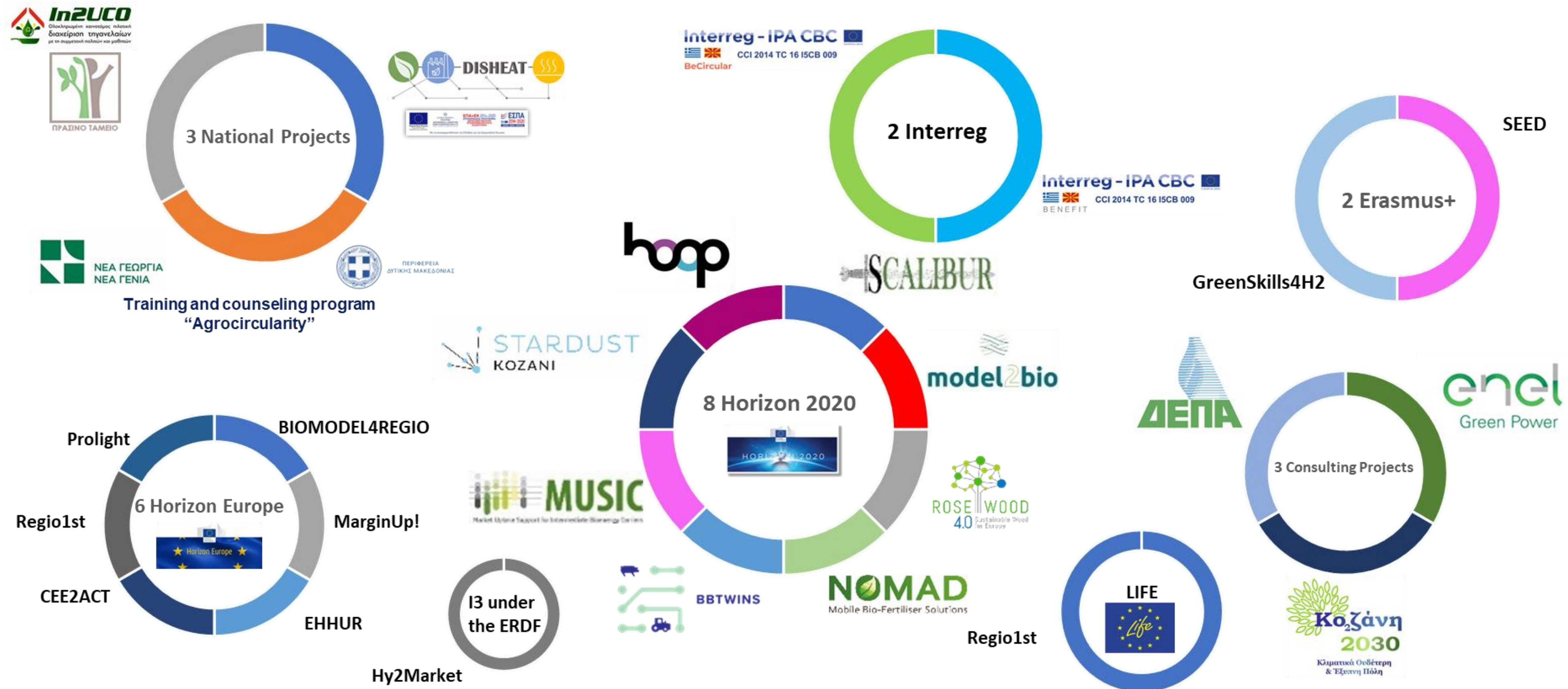
- 3 / 5 DH in the country
- 3 / 4 municipal DH

Challenge
Lignite plants
decommissioning by
2023
Except 1 Unit in 2028



- Development of common business and R&D in the fields of **Bioeconomy and Environment**
- Mobilize **resources** to bridge the gap
- Energetic exploitation of **biomass** and other **RES** for District Heating and industrial, commercial and domestic use
- Development of the **green hydrogen economy** for storage and transport
- Promotion of **Bioeconomy** as a major decarbonization pillar for the regional economy
- Organizing local **biomass supply chains**
- Increasing the share **of biofuels in the energy mix** of transportation fuels
- **Optimization** of heating systems
- Biomass development (energy **plantations**, forest management, certif. schemes, etc.)
- Energy **efficiency** in industry, services, households / collective models
- **Cooperation models** (ESCO's, energy cooperatives, ...)
- Promote the concepts of **smart cities and villages**

CluBE - Project Portfolio





Projects on Hydrogen

GreenSkills4H2 (Erasmus +)

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

Hy2Market - I3-2021-INV1 (Innovation investments Strand 1)

- Realize a more mature hydrogen value chain across Europe
- European frontrunners (Northern Netherlands, Upper-Austria and Rhone Aples) connected and joined forces with emerging hydrogen regions (Iberian Peninsula, Sicily, Western Macedonia-Greece)
- Companies in collaboration with national entities are enhancing the Hydrogen-Ecosystem in their region
- CluBE will evaluate aspects of hydrogen compression, the variable and partial use of hydrogen in power plants and industrial sector



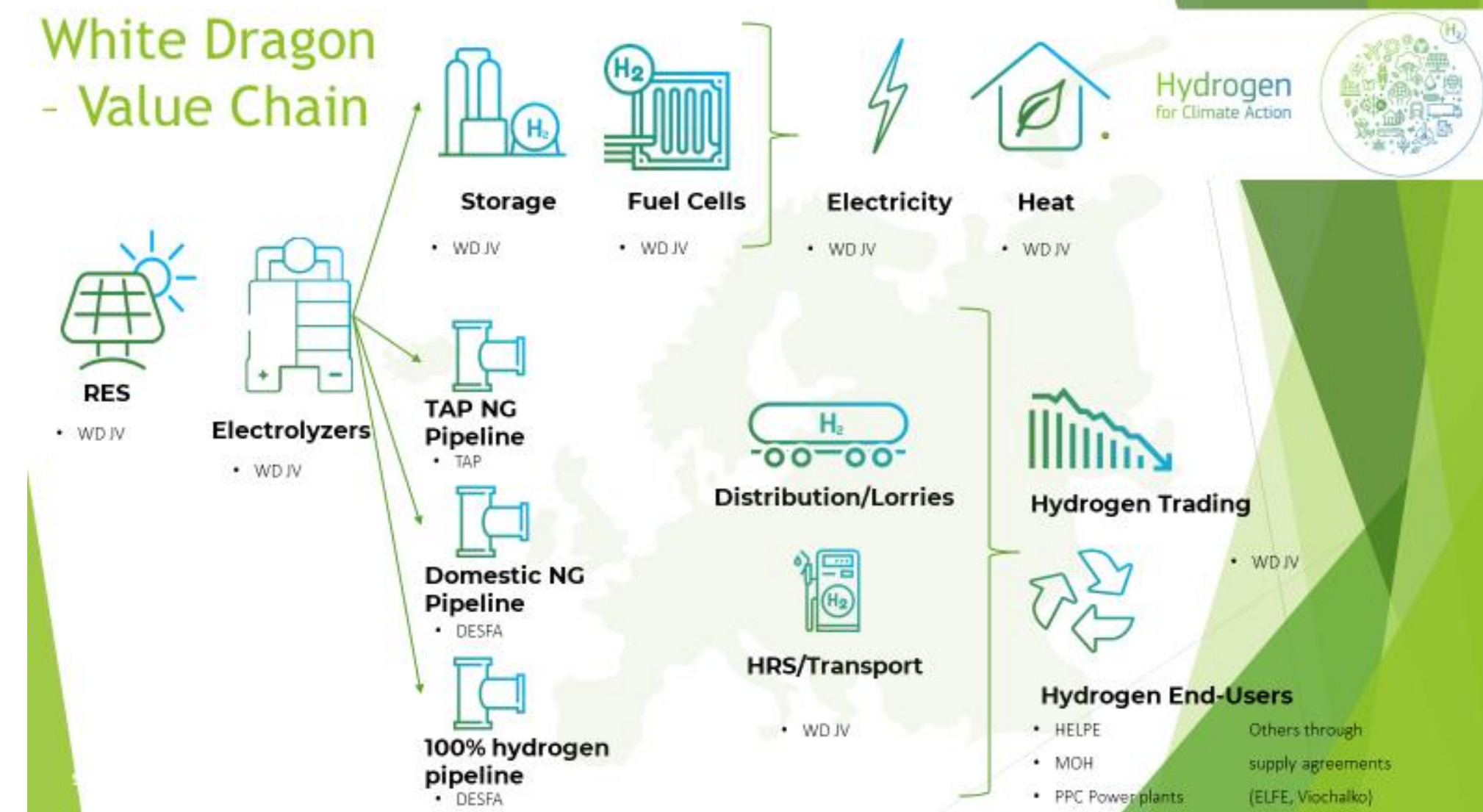
Strategic Initiatives on Hydrogen

White Dragon (IPCEI)

- Use of 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.
- 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.

Just Transition Fund (Prasino Tameio)

Use of sewage sludge for Hydrogen production





Other Strategic Initiatives

100 Climate Neutral Cities

- Kozani local alliance for Climate and Smart City

Digital Innovation Hub

- Core member of the Consortium

Circular Economy

- Circular Economy Park for Western Macedonia

National Centre for Knowledge in the Energy sector

- Member of the consortium selected

Bioeconomy

- Biorefinery
- Mobile extraction unit for aromatic residues

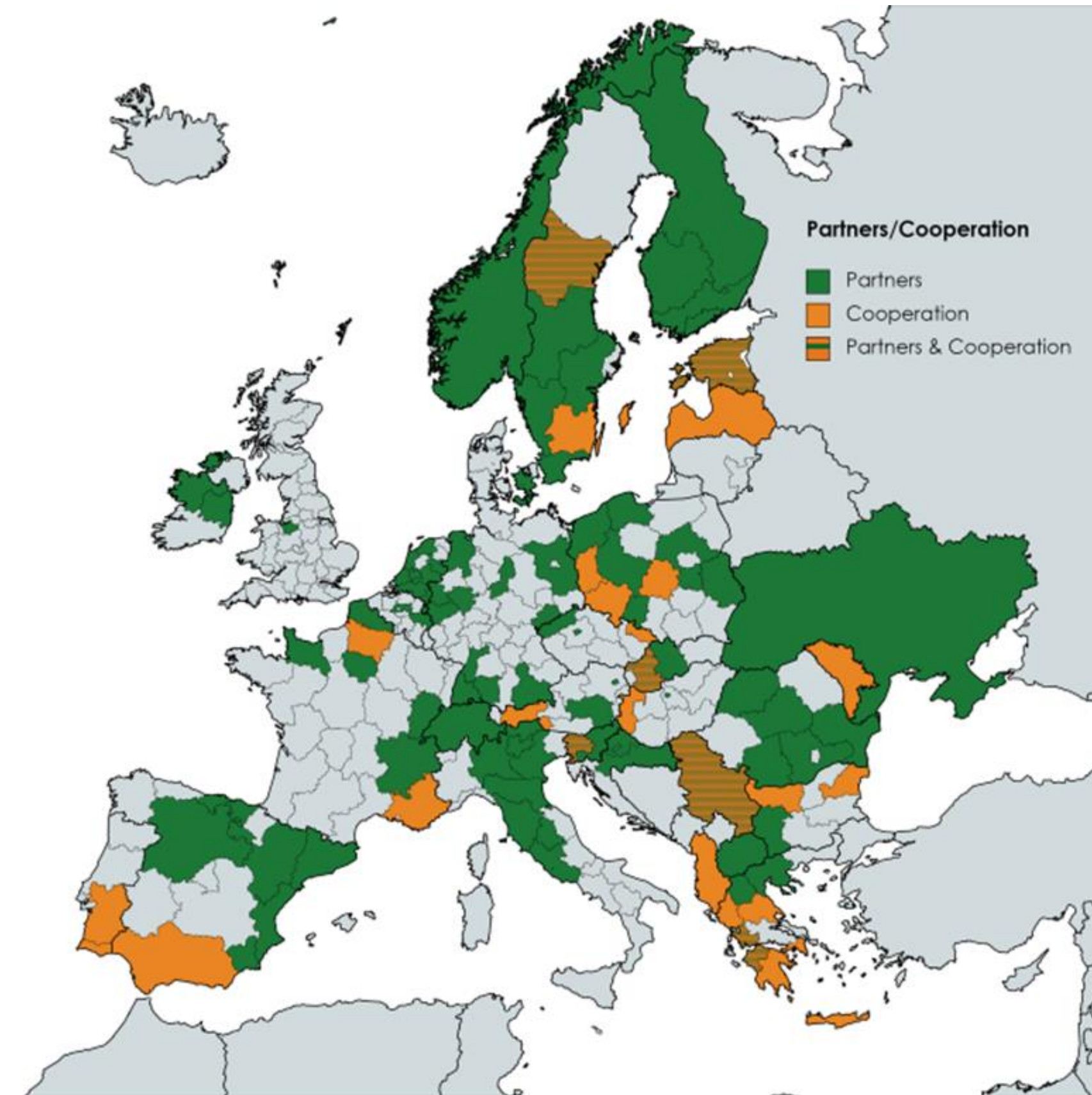
Energy Efficiency

- Financial Innovative Processes for Energy Efficiency (PDA)



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
- 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



What are we looking for

Hydrogen and decarbonization mission
Torino- July 1^o 2022



- **Networking & Collaborations on decarbonization and hydrogen initiatives**
- **Project partners/Technology providers for Electrolysers and Fuel Cells**
- **Project partners/Technology providers for system's integration to the hydrogen value chain**
- **New clients that need consultancy on decarbonization and hydrogen projects**
- **Exploring new markets**
- **Gaining additional expertise & insights from the industrial sector**
- **Discussion on common problems to find solutions at EU level**



What can we offer

- Local / regional case-demo coordinator
- Stakeholder identification and engagement
- Mobilization of local ecosystem
- Communication and dissemination at local, national and EU level
- Replication at regional, national and international level, with a special focus on Balkan area
- Expertise in decarbonization process - Green Fund
- Expertise in hydrogen projects - White Dragon and others projects
- Expertise in Smart Cities projects – Kozani & Mission of 100 Climate Neutral and Smart Cities

Hydrogen and decarbonization mission
Torino- July 1^o 2022



There is life after Coal

Thank you for your attention !!!!

Project Officer: Vasileios Balachtsis
Tel. +30 6948632681
Email: v.balachtsis@clube.gr

Cluster of Bioeconomy and
Environment
of Western Macedonia

ZEP Area - Kozani
Tel. +30 24610 56627
Email: info@clube.gr
www.clube.gr

Director: Dr. Yannis Fallas
Tel. +30 6946465947
Email: i.fallas@clube.gr

Manager: Nikolaos Ntavos
Tel. +30 6979774457
Email: n.ntavos@clube.gr