



Clean Hydrogen JU



National Infoday & International Brokerage Event on Clean Hydrogen Partnership 2024 Call

30.01.2024



Green and Digital Transformation in the 12th Development Plan (2024-2028)

"A stable, strong and prosperous Türkiye that is environmentally friendly, resilient to disasters, produces high value with advanced technology and shares income fairly in the Century of Türkiye"

Main Axes



Stable Growth,
Strong Economy



Competitive Production
with **Green and Digital**
Transformation



Qualified Human
Resources, Strong
Family, **Healthy Society**



Disaster Resilient Living
Spaces, **Sustainable**
Environment



Democratic Good
Governance Based
on Justice

"Science, Technology & Innovation"

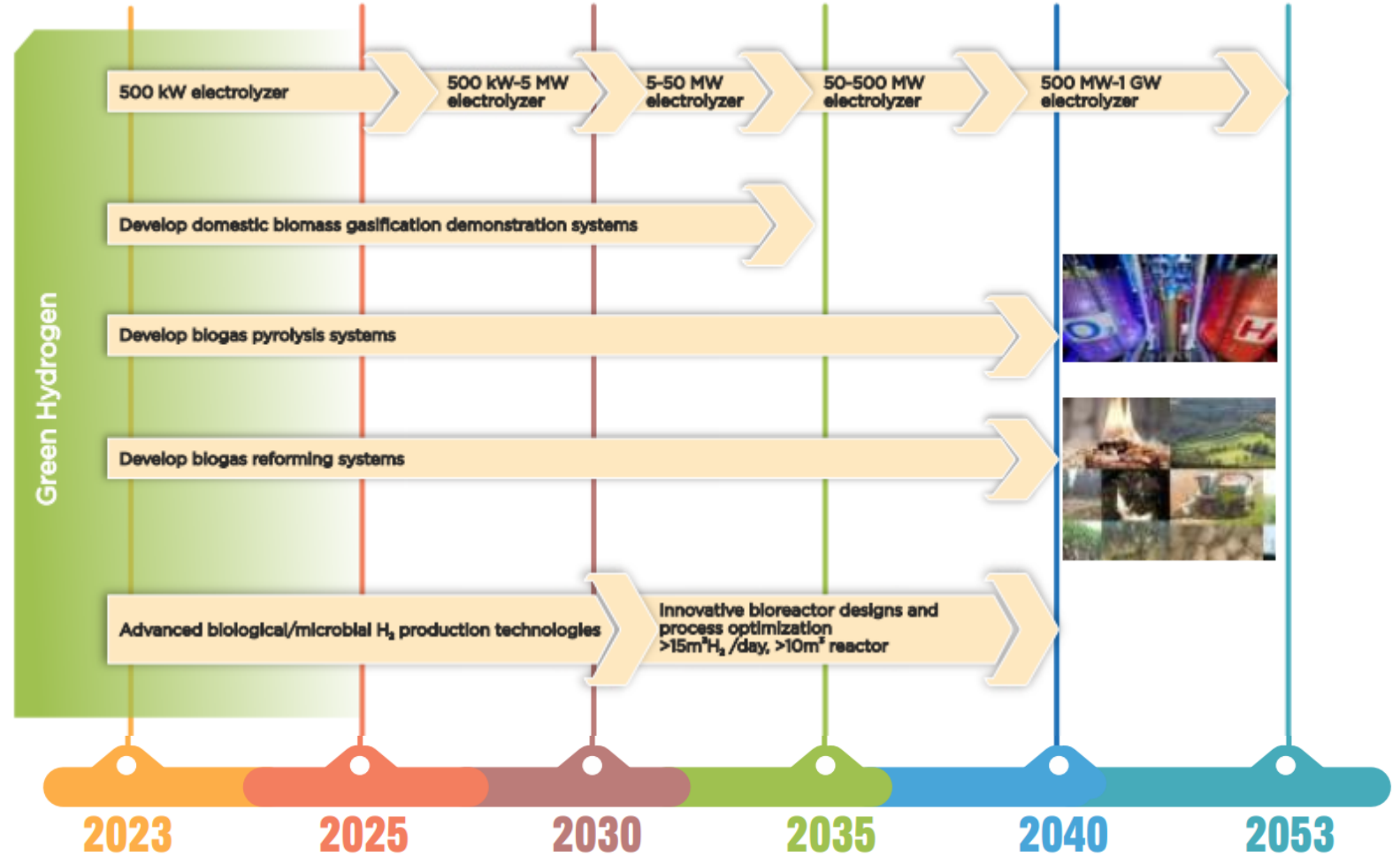
Policy/Measure Example:

"Support models covering the entire process from basic research to the final product will be developed for **platforms established in collaboration with universities, private sector and the public sector**"



Hydrogen Production Technologies Goal

Increase electrolyzer installed power capacity to 2 GW by 2030, 5 GW by 2035 and 70 GW by 2053.

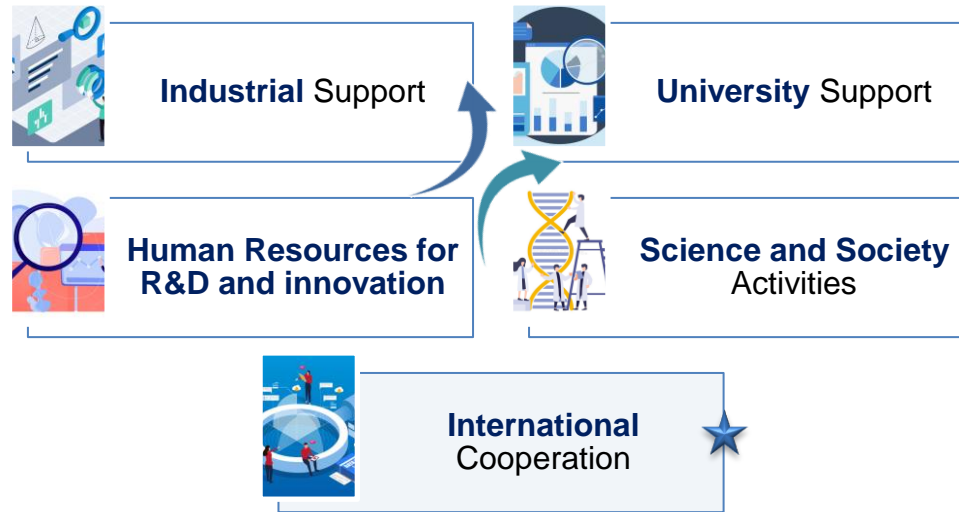


- R&D infrastructure support in scientific and technological areas
- Establish research centers and institutes in strategic areas to strengthen the technological infrastructure of the country



Establishment: 1963

Opportunities for the R&D and Innovation Ecosystem



TÜBİTAK's 60th Anniversary:
July 24, 2023



Note: Compiled from the duties given in Article 41 of the Presidential Decree No. 4, Section TÜBİTAK.



Directing Our Policy Tools Towards Achieving Impact

Transformations



Strategic Approach through TÜBİTAK Support Programs



We are supporting our R&D and innovation ecosystem holistically towards the net-zero carbon target of Türkiye for 2053 through the "R&D and Innovation Initiative for 2053"

Focusing on the Outcomes and Impacts of R&D and Innovation

Inputs



Economic Impact

Social Impact

National Security Impact

Target Oriented

New Knowledge Creation Models

Human Resources for Co-Creation

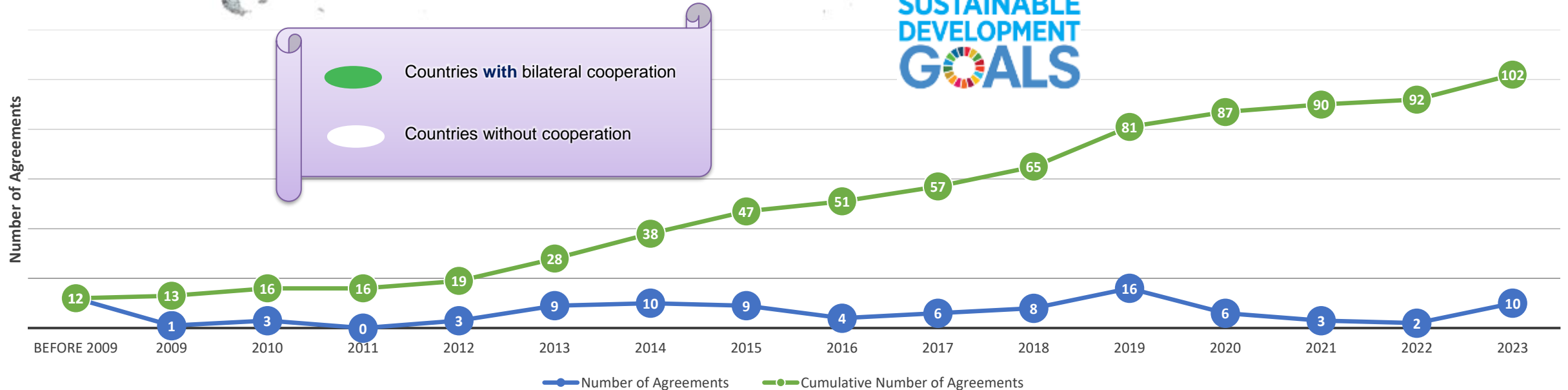
Based on the Approach of "Succeeding Together"

Global View International Scientific and Technological Cooperation

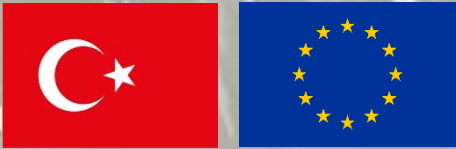


Bilateral Cooperation with 71 Countries – 102 Institutions

- Joint research and innovation projects, scientific activities, researcher exchange
- Additional cooperation with **100+ countries** through **multilateral unions & platforms**



EU Framework Programmes



EU's core funding programme for research and innovation



■ 2002

Turkey's participation in the program

TÜBİTAK has been the National Coordination Office since 2002.

Turkey's Performance

Project Applications: 8,320

Funded Budget: 297.3 M€

Funded Projects: 948

Success Ratio: %9.8

• **1328** Turkish Partners

• Number of **Coordinator**:

• before 2019: **7**

• as September 2021: **29**

■ 2014-2020

HORIZON 2020

■ 2021-2027

HORIZON EU

It is the biggest and most ambitious programme of its kind ever with a budget of over **€95 billion**.

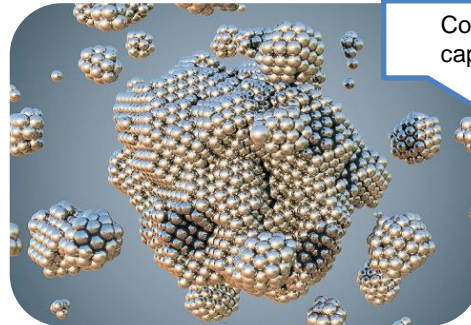
Turkey is officially associated to Horizon Europe since Oct. 27, 2021

H2020 Project Examples – Hydrogen Ecosystems

new generation
renewable energy
technologies



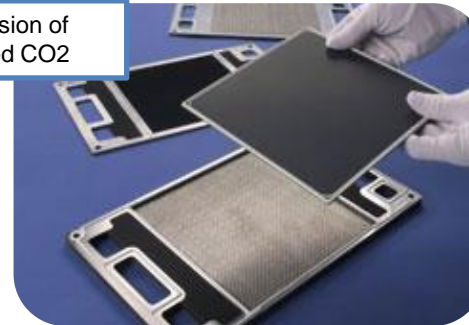
EBIO: Biofuels through Electrochemical transformation of intermediate BIO-liquids / TÜPRAŞ / Ufuk 2020 RIA



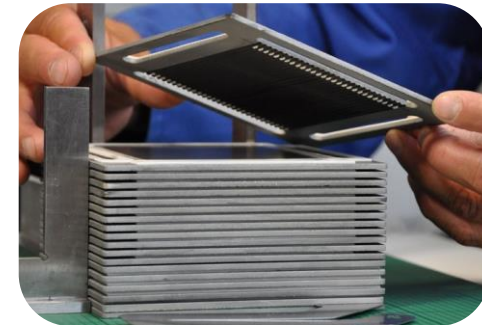
Conversion of
captured CO₂

COZMOS: Efficient CO₂ conversion over multisite Zeolite-Metal nanocatalysts to fuels and OlefinS / TÜPRAŞ / Ufuk 2020 RIA

COZMOS



CO₂Fokus: CO₂ utilisation focused on market relevant dimethyl ether production, via 3D printed reactor- and Solid Oxide Cell based technologies / SOCAR & PETKİM / Ufuk 2020 RIA



Verimli
entegre
downstream
süreçleri

MACBETH: Membranes and Catalysts Beyond Economic and Technological Hurdles / TÜPRAŞ / Ufuk 2020 IA



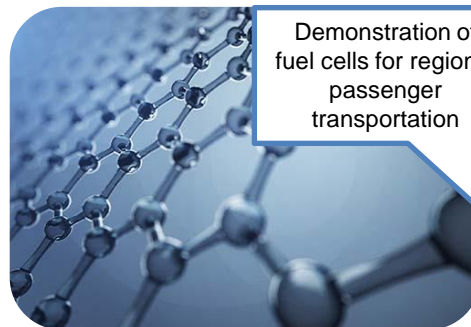
MACBETH
Membranes And Catalysts Beyond
Economic and Technological Hurdles

Catalytic
conversion of
hydrocarbons
with more
sustainable
methods



BiZeolCat: Bifunctional Zeolite based Catalysts and Innovative process for Sustainable Hydrocarbon Transformation / TÜPRAŞ / Ufuk 2020 RIA

BiZeolCat



Demonstration of
fuel cells for regional
passenger
transportation

COSMOS: Computational Simulations of MOFs for Gas Separations / Koç Üniversitesi / ERC Starting Grant

CoachHyfied



CoachHyfied: Coaches with hydrogen fuel cell powertrains for regional and long-distance passenger transport with energy optimized powertrains and cost optimized design "CoachHyfied" / OTOCAR ve FORD / + FEV (Third Party) / Ufuk 2020 IA

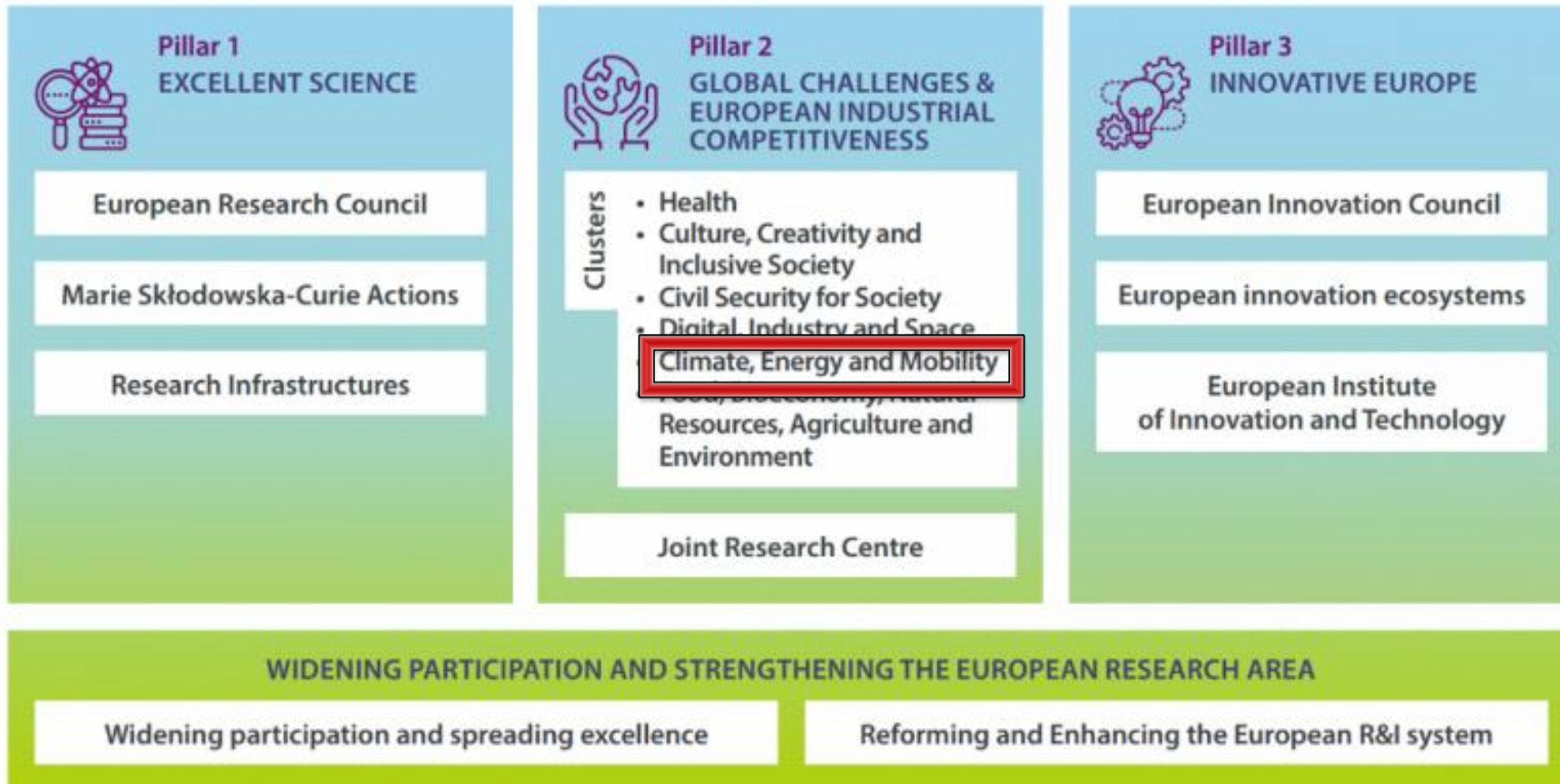


Underground
storage of
renewable
hydrogen

HyStorIES: Hydrogen Storage In European Subsurface / ODTÜ (Third Party)

hystories

THREE PILLARS FOR IMPLEMENTATION



HORIZON EUROPE PILLAR II - Global challenges & European industrial competitiveness

| CLUSTER 1: Health | CLUSTER 4: Digital, Industry & Space | CLUSTER 5: Climate, Energy & Mobility | CLUSTER 6: Food, Bioeconomy, Agriculture, ... |
|---|--------------------------------------|---|--|
| Innovative Health Initiative | Key Digital Technologies | Clean Hydrogen | Circular Bio-based Europe |
| Global Health Partnership | Smart Networks & Services | Clean Aviation | Rescuing Biodiversity to Safeguard Life on Earth |
| Transformation of health systems | High Performance Computing | Single European Sky ATM Research 3 | Climate Neutral, Sustainable & Productive Blue Economy |
| Chemicals risk assessment | European Metrology (Art. 185) | Europe's Rail | Water4All |
| ERA for Health | AI-Data-Robotics | Connected and Automated Mobility (CCAM) | Animal Health & Welfare* |
| Rare diseases* | Photonics | Batteries | Accelerating Farming Systems Transitions* |
| One-Health Anti Microbial Resistance* | Made in Europe | Zero-emission waterborne transport | Agriculture of Data* |
| Personalised Medicine* | Clean steel – low-carbon steelmaking | Zero-emission road transport | Safe & Sustainable Food System* |
| Pandemic Preparedness* <i>Co-funded or co-programmed</i> | Processes4Planet | Built4People | |
| | Global competitive space systems** | Clean Energy Transition | |
| | | Driving Urban Transitions | |

| | |
|--|--|
| | Institutionalised Partnerships (Art 185/7) |
| | Institutionalised Partnerships / EIT KICs |
| | Co-Programmed |
| | Co-Funded |

* Calls with opening dates in 2023-24

** Calls with opening dates not before 2022

PILLAR III - Innovative Europe

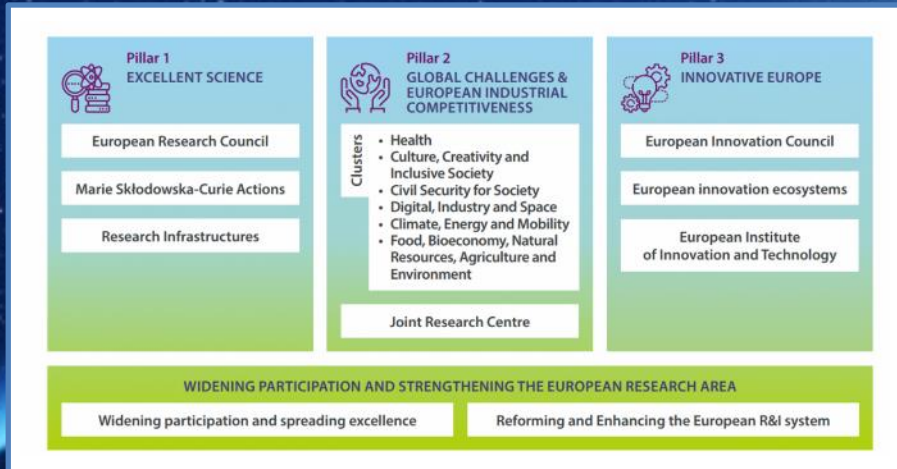
| EIT (KNOWLEDGE & INNOVATION COMMUNITIES) | SUPPORT TO INNOVATION ECOSYSTEMS |
|--|----------------------------------|
| InnoEnergy | Innovative SMEs |
| Climate | |
| Digital | |
| Food | |
| Health | |
| Raw Materials | |
| Manufacturing | |
| Urban Mobility | |
| Cultural and Creative Industries | |

CROSS-PILLARS II & III

| |
|-----------------------------|
| European Open Science Cloud |
|-----------------------------|

Recent Developments in the Horizon Europe Pillars of Implementation

Through co-creation based collaboration, 760 institutions from our ecosystem have joined forces in supporting all pillars of implementation of Horizon Europe with a **total of 458 different projects**.

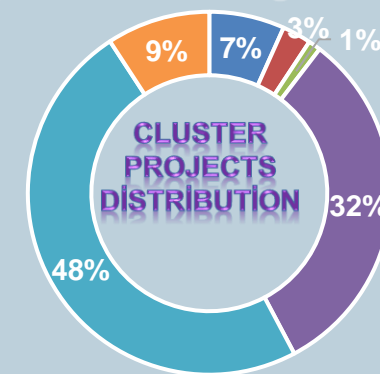


458 TOTAL PROJECT COUNT

- **760 PARTNER INSTITUTIONS**
- **231,7 MILLION EURO BUDGET**

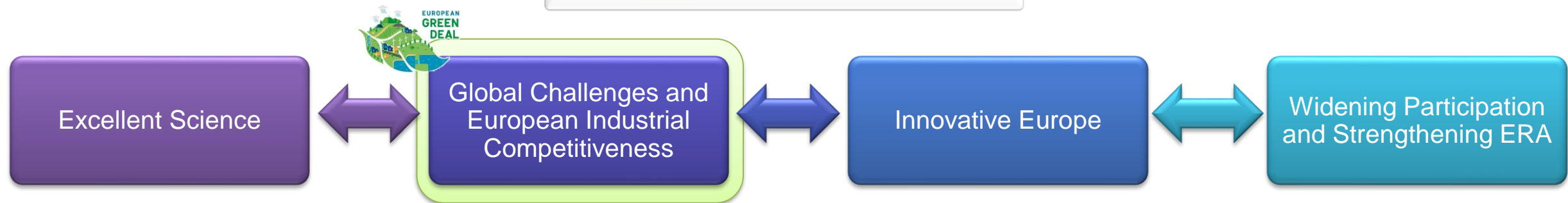


Project Shares According to Clusters *



- Health
- Culture, Creativity, Inclusive Society
- Civil Security
- Digital, Industry, Space
- Climate, energy, Mobility
- Food, Bioeconomy, Natural Resources, Agriculture, Environment

* (Non-Official Results)



Hydrogen related Capability and Infrastructure: HYSouth Marmara Project



Kale



➤ Largest Capacity Green Hydrogen Plant of the Turkish Industry

➤ Türkiye's First Regional Hydrogen Roadmap

➤ Investment Feasibilities in the Production of Green Hydrogen Derivatives

➤ First Commercial Production of a New Boron Chemical : Solid Phase Hydrogen Storage Material – Sodium BoroHydride

➤ Sodium BoroHydride-based New Power System

➤ Turkey's First Domestic Hybrid Ceramic Tile Kiln Using Hydrogen



Thank you for your attention.

Cluster 5 National Contact Points (Energy)

ncpenergy@tubitak.gov.tr

 **UfukAvrupa_TR**

 **TÜBİTAK Ufuk Avrupa Programı**