

#innovacion
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JORNADA INFORMATIVA– CALL 2020 JTI-FCH

Horizon 2020 JTI Hidrógeno y Pilas de Combustible



ESHORIZONTE2020

Portal español del Programa Marco de Investigación e Innovación de la Unión Europea

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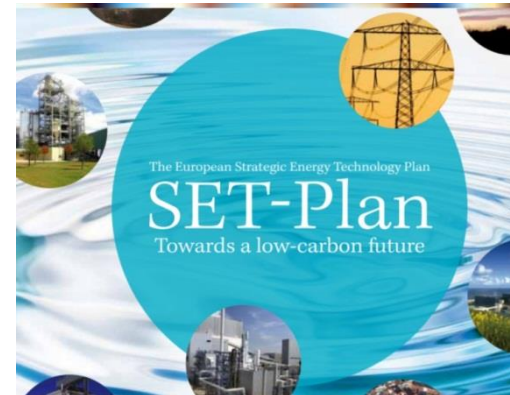
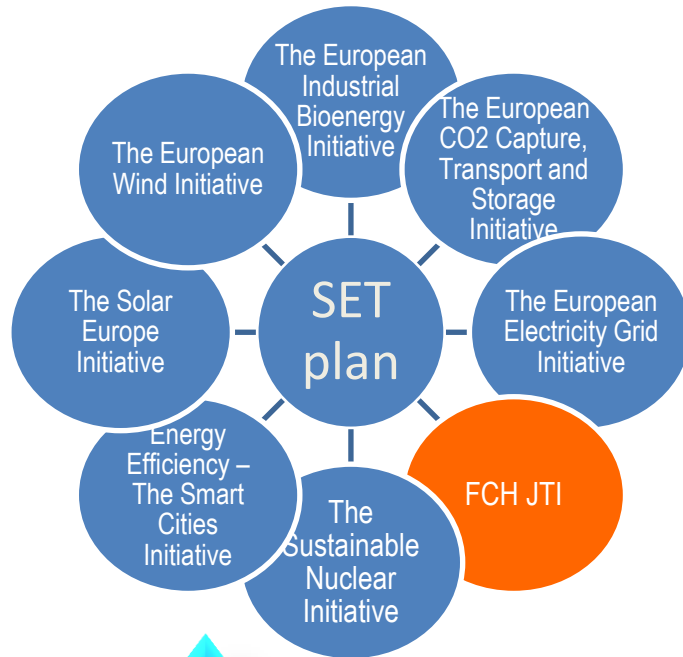
Madrid, 17 Febrero de 2020

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- **BACKGROUND and CONTEXTO POLITICO EUROPEO**
- **OBJETIVOS Y VISION**
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JTI-FCH Background

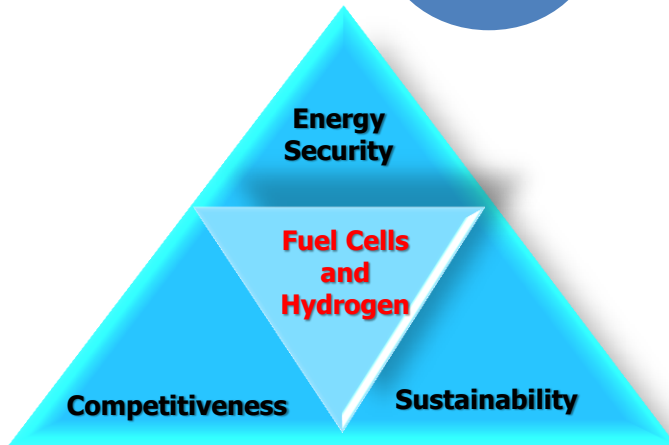


Fuel cells technology is a key technology for Europe towards the 20-20-20 goal by 2020

Joint Undertaking – Public Private Partnership
Council Regulations:

521/2008 of 30 May 2008 (FP7) : 470 M.€ (2008-2013)

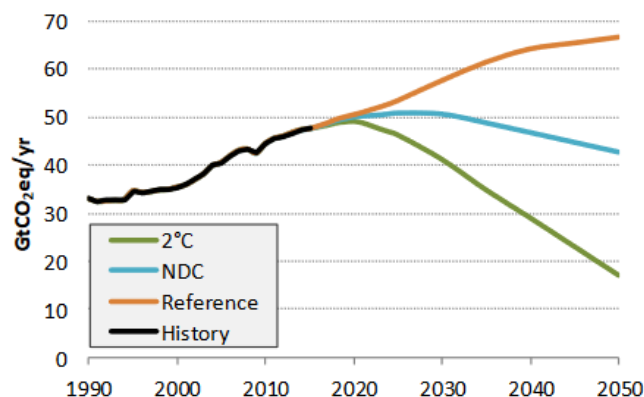
559/2014 of 6 May 2014 (H2020): 665 M.€ (2014-2020)



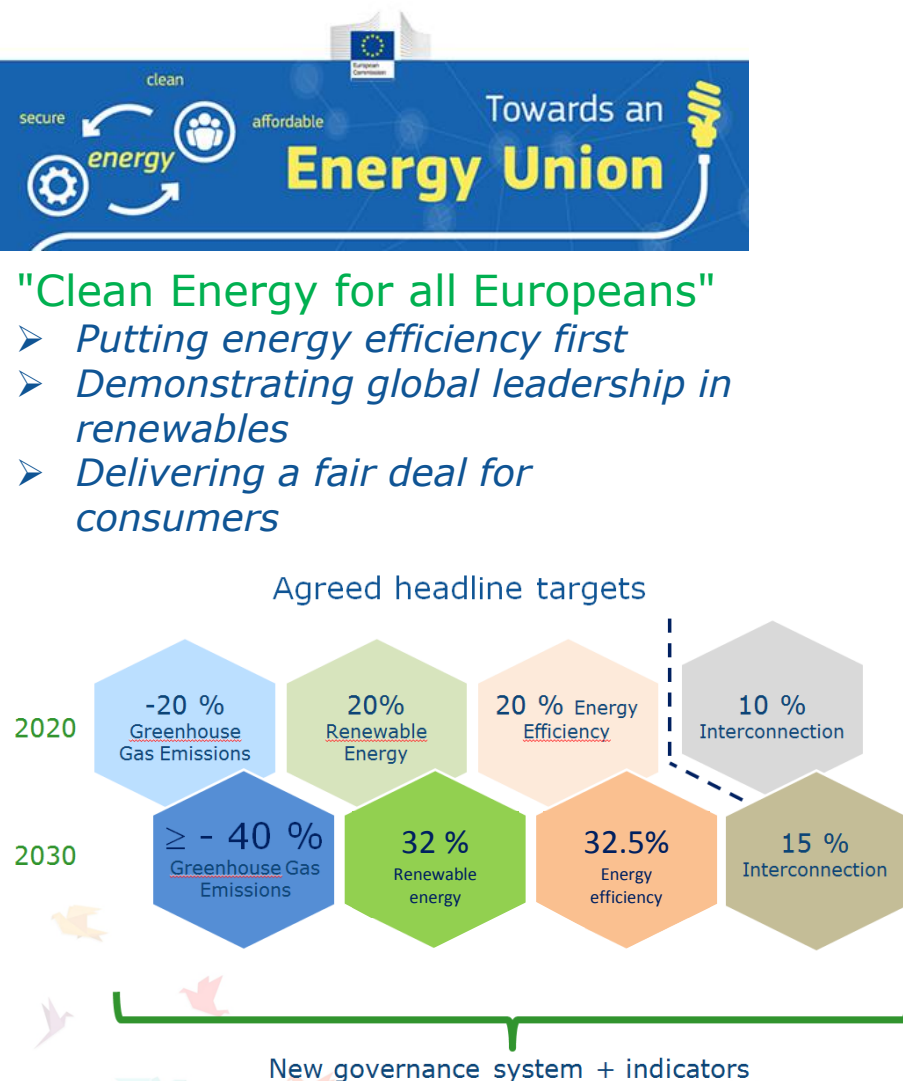
Contexto político Europeo

Paris Agreement

Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels



Source: POLES-JRC model, included in 'Clean Planet for All' (EC, 2018)



" Winter Package" – December 2016
(Clean Energy for all Europeans)
EU long-term vision for climate-neutral economy ('Clean Planet for all')

Other EU policy priorities

- Digital Single Market
- Jobs, Growth and Investments
- EU as a strong global actor

Political Context



Overall objective: Accelerating the development and **deployment of low-carbon technologies through cooperation among EU countries, companies, research institutions, and the EU itself**, based on common priorities and targets.

Priority Actions:

- 1+2. Improving performance and reducing cost of renewable energy (Action 1, 2)
3. Smart solutions for consumers
4. Smart Resilience and Secure Energy System
5. Energy Efficiency in Buildings
6. Energy Efficiency in Industry
7. Batteries and e-Mobility
8. Renewable Fuels and Bioenergy
9. Carbon Capture Utilisation and Storage
10. Nuclear Safety

Defining priorities

- SET-Plan Communication 2015

Setting targets

- Declaration of Intents

Implementation Plans (IP)

- Temporary Working Groups

Execution of IPs

Mission Innovation

Mission Innovation (MI) is a global initiative of **24 countries and the European Union** to dramatically accelerate global clean energy innovation.










Participating countries have committed to seek to **double** their governments' **clean energy research and development (RD&D) investments over five years**, while encouraging greater levels of **private sector investment** in transformative clean energy technologies.

<http://mission-innovation.net>

<http://mission-innovation.net/our-work/innovation-challenges/renewable-and-clean-hydrogen/>

Innovation Challenges: Midterm Results



| Smart Grids #1 | Off Grid Access to Electricity #2 | Carbon Capture, Utilization, and Storage #3 | Sustainable Biofuels #4 | Converting Sunlight #5 | Clean Energy Materials #6 | Affordable Heating and Cooling of Buildings #7 | new Hydrogen #8 |
|---|--|--|--|--|---|--|--|
|  Objective Enable future grids powered by affordable, reliable, decentralised renewable electricity systems. |  Objective Develop systems that enable off-grid households and communities to access affordable, reliable renewable electricity. |  Objective Enable near zero CO ₂ emissions from power plants and carbon-intensive industries. |  Objective Develop ways to produce at-scale widely affordable, advanced biofuels for transportation and industrial applications. |  Objective Discover affordable ways to convert sunlight into storable solar fuels. |  Objective Accelerate the exploration, discovery and use of new high-performance, low-cost clean energy materials. |  Objective Make low-carbon heating and cooling affordable for everyone. |  Objective Accelerate the development of a global hydrogen market by identifying and overcoming key technology barriers to the production, distribution, storage, and use of hydrogen at gigawatt scale. |
| Co-leads  CHINA INDIA ITALY | Co-leads  FRANCE INDIA | Co-leads  SAUDI ARABIA MEXICO UNITED KINGDOM | Co-leads  BRAZIL CANADA CHINA INDIA | Co-leads  EUROPEAN COMMISSION GERMANY | Co-leads  CANADA MEXICO | Co-leads  EUROPEAN COMMISSION UNITED ARAB EMIRATES UNITED KINGDOM | Co-leads  AUSTRALIA GERMANY EUROPEAN COMMISSION |
| Top Accomplishments in 2017 | | | | | | | Current Status |
| <ul style="list-style-type: none"> India & Australia launched calls for proposals in June to support effective collaboration among IC1 members. Collaboration agreements (India, US, UK, Italy) were announced on Nov. 16-18. 14 members contributed to the publication of the 2017 Country Report. | <ul style="list-style-type: none"> India & France launched calls for proposals in June/July and each selected 9 winning projects. Winners of the French competition focused on access to energy in African countries while winners of the Indian competition partnered with at least one MI country. | <ul style="list-style-type: none"> A CCUS experts workshop was held in Houston with 257 academic and industry participants from 22 countries and across 13 panels to establish the current state of CCUS technology. The workshop report will serve as an important signpost for future R&D activities in carbon capture, utilization, and storage technologies. | <ul style="list-style-type: none"> Launched survey in partnership with Biofuels Platform and IEA to better understand the landscape of biofuels technology and identify research gaps, priorities, and collaboration activities. India launched a funding call worth USD \$5 million, which can be replicated in other MI countries. | <ul style="list-style-type: none"> The EC launched an inducement prize called "Fuel from the Sun" to produce useful fuels using artificial photosynthesis. | <ul style="list-style-type: none"> Mexico hosted the inaugural workshop in September, which catalyzed subsequent workshops hosted by Canada and laid the foundations for a collaborative research project to accelerate the discovery of clean energy materials. | <ul style="list-style-type: none"> An Extreme Efficiency Cooling Prize is being developed in conjunction with the Rocky Mountain Institute. A collaborative research project with the IEA is underway to develop an integrated heating, cooling, and power system for buildings. | <ul style="list-style-type: none"> Launched at the third Mission Innovation Ministerial in May 2018. A deep-dive workshop is planned for October 2018. |

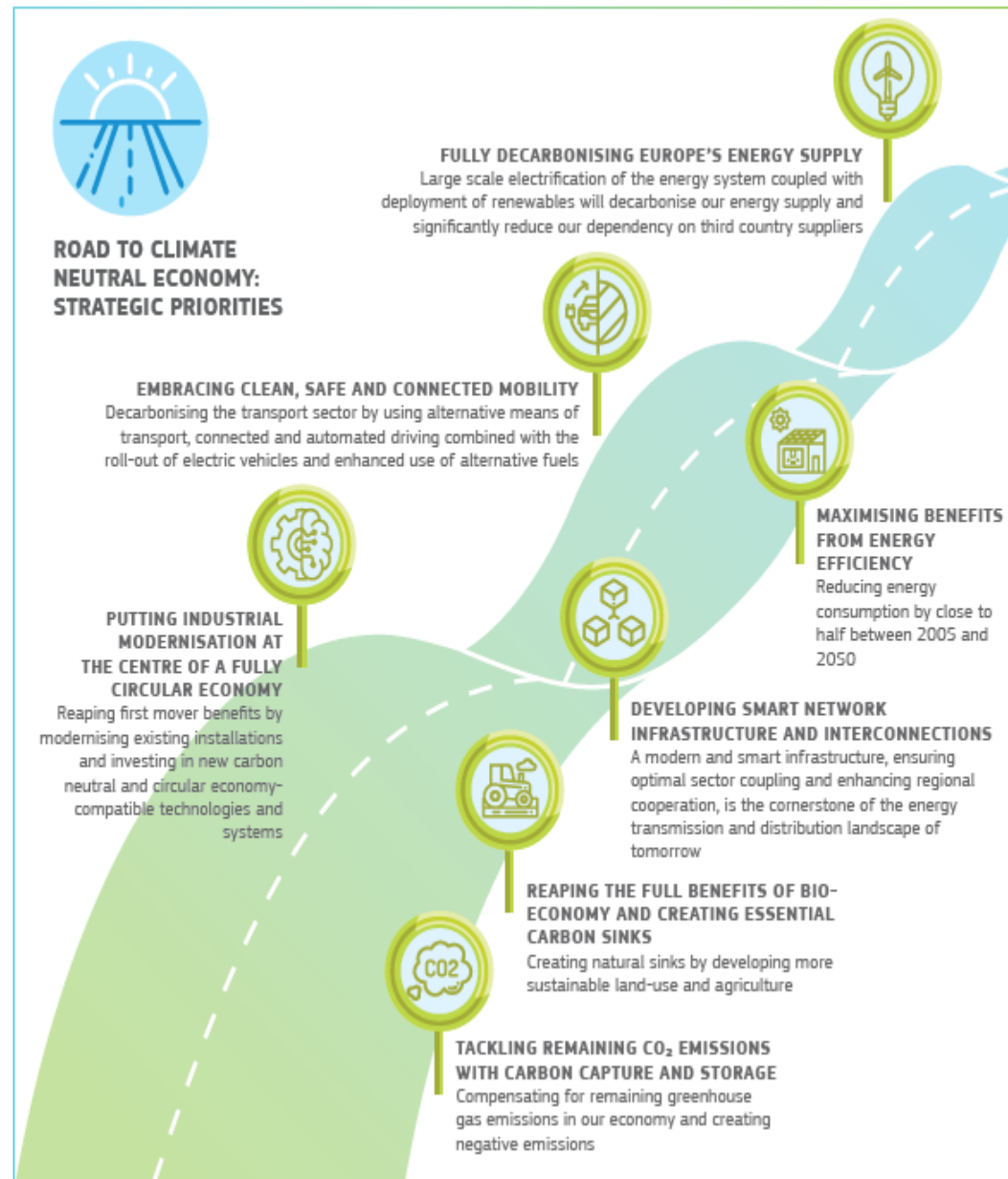
Political Context

2050 long-term strategy

On 28 November 2018, the Commission presented its strategic long-term vision for a prosperous, modern, competitive and climate-neutral economy by 2050

*“Hydrogen can then contribute to decarbonise various sectors: first, as **storage in the power sector** to accommodate for variable energy sources; second, as an **energy carrier option used in heating, transport and industry** and, finally, as a **feedstock for industry** such as steel, chemicals and e-fuels in those sectors that are most difficult to decarbonise.”*

*“**Power-to-X technologies** refer to technologies that allow transforming **electricity into synthetic gases (hydrogen, methane or other gases)** and liquids. Hydrogen produced with carbon-free electricity combined with CO₂ from sustainable biomass or Direct Air Capture can make a carbon-neutral alternative of the same molecules as natural gas or oil, and thus can **be distributed via existing transmission/distribution system** and used by existing installations and applications.”*



The GREEN DEAL – 11 Dic 2019

https://ec.europa.eu/info/sites/info/files/european-green-deal-communication_en.pdf



"The European Green Deal is our new growth strategy. It will help us cut emissions while creating jobs." Ursula von der Leyen, President of the EC



"We propose a green and inclusive transition to help improve people's well-being and secure a healthy planet for generations to come." - Frans Timmermans, Executive Vice-President of the EC



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The GREEN DEAL – 11 Dic 2019

European Green Deal

European Commission Communication and Roadmap (December 2019)



EU industry needs ‘climate and resource frontrunners’ to develop the first commercial applications of breakthrough technologies in key industrial sectors by 2030. Priority areas include clean hydrogen, fuel cells and other alternative fuels, energy storage.

*Partnerships with industry & Member States will support research & innovation on transport, including batteries, **clean hydrogen**, low-carbon steel making, circular bio-based sectors and the built environment.*

*The regulatory framework for energy infrastructure should **foster the deployment of innovative technologies and infrastructure**, such as smart grids, **hydrogen networks** or carbon capture, storage and utilisation, energy storage, also enabling **sectorial integration**.*

JTI-Public-private partnership with a focused objective

EU Institutional Public-Private Partnership (iPPP)



To implement an optimal **research and innovation programme** to bring FCH technologies to the point of market readiness by 2020

FCH-2-JU - OBJETIVES

Market readiness of a portfolio of clean, efficient and affordable solutions for our energy and transport systems

TRANSPORT

Clean Transport

Reduce Fuel Cell System Costs for transport applications

Minimal use of critical raw materials

Reduce platinum loading

ENERGY

Clean Hydrogen Production

Increase efficiency and reduce costs of Hydrogen production, mainly from water electrolysis and renewables.

H2 Storage for grid balancing

Demonstrate on a large scale hydrogen's capacity to harness power from renewables and support its integration into the energy system.

Heat & Electricity Production

Increase fuel cell efficiency and lifetime

FCH 2 JU PROGRAMME STRUCTURE

- Multi-annual Work-Plan 2014-2020 (support H2020)
- EU budget: **665 mill. EUR**
- Objectives: reduce the (production) **cost**, increase the **lifetime**, increase the **efficiency**, reduce '**Critical raw materials**'

TRANSPORT

- Road Vehicles
- Non-road vehicles and machinery
- Refuelling infrastructures
- Maritime, rail and aviation applications

ENERGY

- Hydrogen production and distribution
- Hydrogen storage for renewable energy integration
- Fuel Cells for power & combined heat & power generation

CROSS-CUTTING

e.g. standards, safety, education, consumers, awareness,...

Budget Distribution 2014-2020

| BUDGET – 655 M.€ | Research and Innovation | Innovation | Total |
|--------------------------|-------------------------|------------|-------|
| Transport Pillar | 14,5% | 33% | 47,5% |
| Energy Pillar | 14,5% | 33% | 47,5% |
| Cross-Cutting Activities | | | 5% |
| TOTAL | 29% | 66% | 100% |

Call 2014 – Budget 93 M.€
 Call 2015 – Budget 123 M.€
 Call 2016 – Budget 117,5 M.€
 Call 2017 – Budget 116 M.€.
 Call 2018 – Budget 73,2 M.€.
 Call 2019 - Budget 80,8 M.€
 Call 2020 - Budget 93,0 M.€

- Implemented mainly through calls for proposals
- Follow H2020 Rules of Participation



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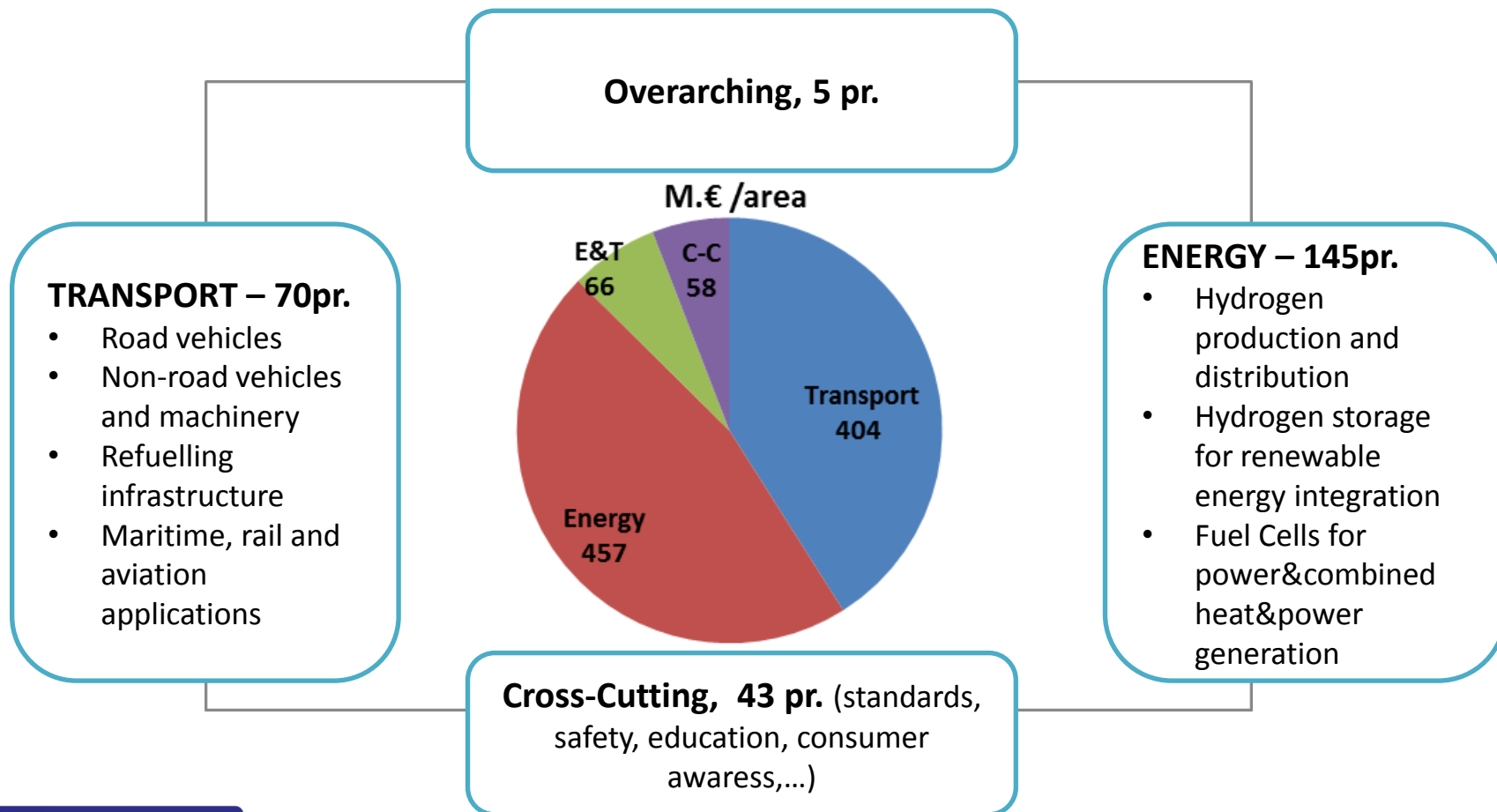
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PROYECTOS APROBADOS en JTI-FCH

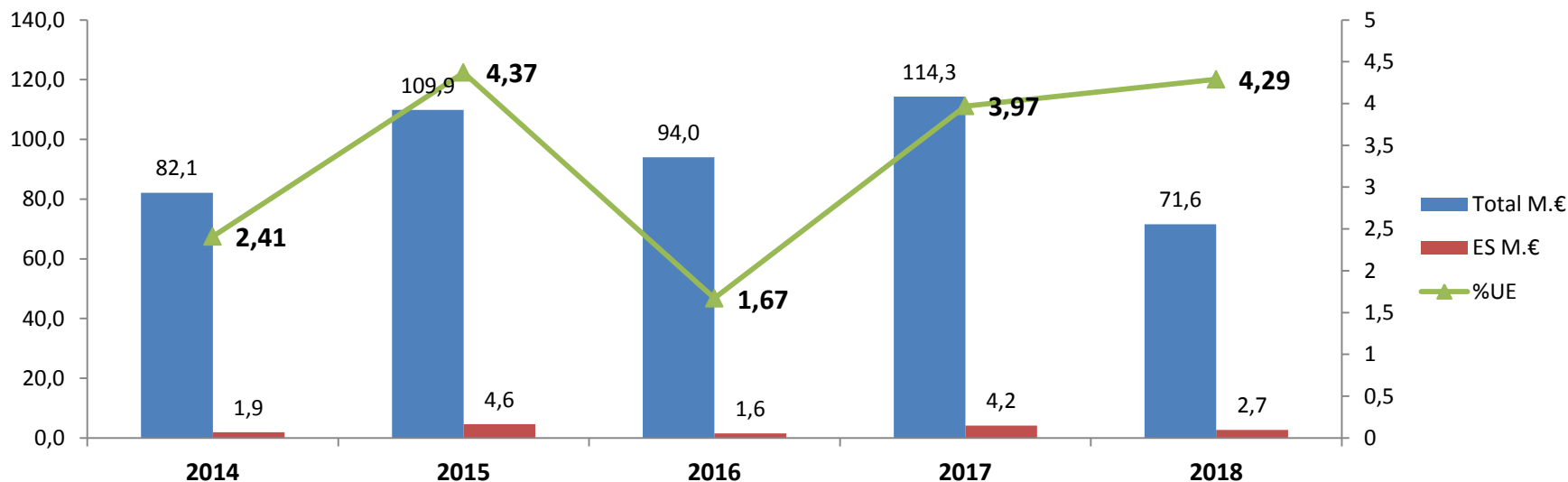
2008-2019

263 proyectos apoyados con una ayuda concedida de **985 M.€**

Similar cantidad en financiación privada



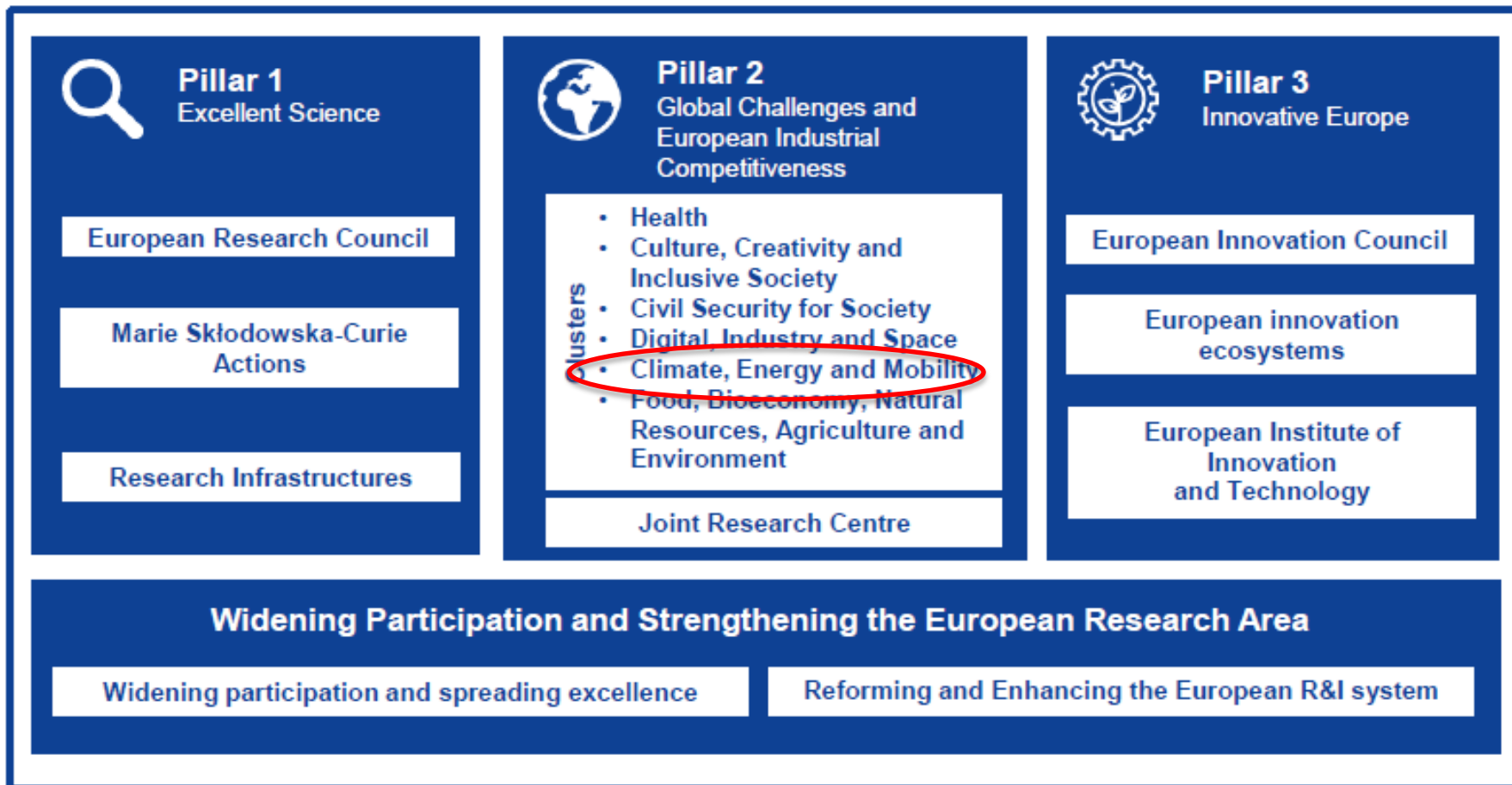
Resultados Españoles en FCH JU



| | | 2014 | 2015 | 2016 | 2017 | 2018 |
|-----------------|----------|-------|-------|-------|-------|-------|
| Proyectos | Nº Pytos | 15 | 15 | 19 | 24 | 19 |
| | Part ES | 4 | 7 | 4 | 8 | 4 |
| | % | 26,7% | 46,7% | 21,1% | 33,3% | 21,1% |
| Participaciones | Total | 158 | 149 | 177 | 224 | 163 |
| | ES | 7 | 16 | 6 | 11 | 9 |
| | % | 4,4% | 10,7% | 3,4% | 4,9% | 5,5% |
| | Lider ES | 4 | 1 | 1 | 0 | 2 |

Horizon Europe: evolution not revolution

Horizon Europe: Preliminary structure



Source: European Commission

Áreas de Intervención – Cluster 5

CLUSTER 5: CLIMATE, ENERGY AND MOBILITY

4.1 Advance climate science and solutions for a climate neutral and resilient society

4.2 Cross-sectoral solutions for decarbonisation

4.2.1 Establish a competitive and sustainable European battery value chain

→ 4.2.2 **Strengthen the European value chain for low-carbon hydrogen and fuel cells**

4.2.3 Develop sustainable infrastructure, services and systems for smart and sustainable communities and cities

4.2.4 Foster emerging breakthrough technologies and climate solutions

4.3 Develop **cost-efficient, net zero-greenhouse gas energy system centred on renewables**

4.3.1 Achieve global leadership in renewable energy

4.3.2 Develop flexible, zero greenhouse gas emission and citizen-centred energy systems and grids

4.3.3 Develop carbon capture, utilisation and storage (CCUS) solutions for the power sector and energy-intensive industries

4.3.4 Develop flexible and efficient energy storage solutions

4.3.5 Leverage more public and private investments in clean energy systems

4.4 Develop **demand side solutions to decarbonise the energy system**

4.4.1 Empowering citizens to engage in energy markets

4.4.2 Achieving a highly energy-efficient and decarbonised EU building stock

4.4.3 Support industrial facilities in the energy transition

4.5 Develop **low-carbon and competitive transport solutions across all modes**

4.6 Develop **seamless, smart, safe, accessible and inclusive mobility systems**

H2020
Challenge 5
(climate)

H2020 Energy &
Transport Challenge
and LEIT-NMBP

H2020 Energy &
Transport Challenge and
LEIT-NMBP and SC5

H2020
Energy
Challenge

H2020 Energy
Challenge

H2020 Energy
Challenge

H2020
Transport
Challenge

https://ec.europa.eu/info/sites/info/files/research_and_innovation/strategy_on_research_and_innovation/documents/ec_rtd_orientations-he-strategic-plan_122019.pdf

Lessons Learned from Horizon 2020 Interim Evaluation



Support breakthrough innovation



Create more impact through mission-orientation and citizens' involvement



Strengthen international cooperation



Reinforce openness



Rationalise the funding landscape



Key Novelties Horizon Europe

European Innovation
Council

R&I Missions

Extended association
possibilities

Open science policy

New approach to
Partnerships

Source: European Commission

Strategic plan gives direction to the work programme

Horizon Europe
legislative
package

Strategic Plan
2021-2024

Work
programme
2021-2022

Calls for
proposals

Main Features

Early involvement and extensive exchanges with Member States

Extensive exchanges with the European Parliament

Consultations with stakeholders and public at large

Source: European Commission

De interés...

JTI-FCH

Call 2020: <https://www.fch.europa.eu/page/call-2020>

Info-day 2020: <https://www.fch.europa.eu/page/info-day-2020>

Contexto Político:

Contexto Político:

SETIS: <https://setis.ec.europa.eu/>

ENERGY UNION: https://eur-lex.europa.eu/resource.html?uri=cellar:1bd46c90-bdd4-11e4-bbe1-01aa75ed71a1.0001.03/DOC_1&format=PDF

WINTER PACKET: <https://ec.europa.eu/energy/en/news/commission-proposes-new-rules-consumer-centred-clean-energy-transition>

ACEI: https://eur-lex.europa.eu/resource.html?uri=cellar:3473410d-b7de-11e6-9e3c-01aa75ed71a1.0001.02/DOC_3&format=PDF

2050 long – term Strategy: https://ec.europa.eu/clima/policies/strategies/2050_en

MISSION INNOVATION: <http://mission-innovation.net/>

GREEN DEAL: https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en