



EU R&I policy for renewable fuels, biofuels and bioenergy under Horizon Europe

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A European Green Deal

Striving to be the first climate-neutral continent

The EU will:



Become
climate-neutral
by 2050



Protect human life,
animals and plants,
by cutting pollution



Help companies
become world leaders
in clean products and
technologies



Help ensure a
just and inclusive
transition

COM(2019) 640 final: The European Green Deal

COM(2020) 21 final: Sustainable Europe Investment Plan; European Green Deal Investment Plan

COM(2020) 22 final: Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the Just Transition Fund

European Green Deal Policy

An EU Strategy for Energy System Integration COM(2020)299 final

A Hydrogen strategy for a climate-neutral Europe COM(2020)301 final

EU Biodiversity Strategy for 2030 COM(2020)380 final

Sustainable and Smart Mobility Strategy – putting European transport on track for the future
COM(2020) 789 final

The European Climate Law

- The European Climate Law Regulation of 30 June 2021
- Union-wide climate-neutrality objective 2050
- New **2030** target of at **least 55% net** greenhouse gas emissions reduction
- Implementation through binding legislation across all Member States and sectors of the economy
- Recognition of the need to enhance the EU's **carbon sink**

Delivering the European Green Deal

A set of interconnected legislative proposals to deliver on the ambitious target and make key sectors of its economy fit for 2030. It is a policy mix that respects a balance between **pricing, targets, taxes, standards and support measures**

Pricing	Targets	Rules
<ul style="list-style-type: none"> • Stronger Emissions Trading System including in aviation • Extending Emissions Trading to maritime, road transport, and buildings • Updated Energy taxation Directive • New Carbon Border Adjustment Mechanism Targets 	<ul style="list-style-type: none"> • Updated Effort Sharing Regulation • Updated Land Use Land Use Change and Forestry Regulation • Amended Renewable Energy Directive • Amended Energy Efficiency Directive 	<ul style="list-style-type: none"> • Stricter CO2 performance for cars & vans • New infrastructure for alternative fuels • ReFuelEU: More sustainable aviation fuels • FuelEU: More and cleaner maritime fuel
Support measures		
<ul style="list-style-type: none"> • Using revenues and regulations to promote innovation, build solidarity and mitigate impacts for the vulnerable, notably through the new Social Climate Fund and enhanced Modernisation and Innovation Fund 		

ETS, CBAM, ESR, RED II, EED, Buildings D LULUCF, ETD, CBAM, AFID, CO2 standards, FuelEU Maritime, ReFuelEU Aviation, Gas Markets

Fit for 55 (2021)

RED II

- ✓ Increased collective binding target of renewables in EU's energy mix to **40%** by 2030 compared to 1990
- ✓ The share of **advanced biofuels** and **biogas** produced from feedstock listed in Annex IX Part A in the energy supplied to the transport sector is at least 0,2 % in 2022, 0,5 % in 2025 and **2,2 % in 2030**, and the share of renewable fuels of non-biological origin is at least **2,6 % in 2030**
- ✓ GHG emissions savings for biofuel, biogas, renewable fuels of non-biological origin and recycled carbon fuels, as well as renewable electricity shall be calculated for fuel supplied to **all transport modes**
- ✓ GHG intensity reduction of at least **13 % by 2030** in accordance by renewable fuels and renewable electricity supplied to transport (**recycled carbon** fuels can be accounted)
- ✓ The shares of advanced biofuels and biogas and of renewable fuels of non-biological origin supplied to aviation and maritime shall be **1,2 times their energy content**
- ✓ Renewable fuels of non-biological origin and recycled carbon fuels count if GHG savings **>=70%**
- ✓ Target for 49% of energy use in EU buildings to be renewable by 2030
- ✓ GHG criteria for biomass fuels apply to existing installations **>=5MW** (solid) and **>=2MW** (gaseous) and increased from **>=70%** until 31 December 2025 to **>= 80 %** from 1 January 2026
- ✓ Strict new bioenergy criteria to avoid unsustainable forest harvesting and protect areas of high-biodiversity value – support in accordance with the biomass cascading principle

EED

- ✓ Increase energy savings targets at EU level and make them binding, to achieve an overall reduction **36% by 2030**

ESR

- ✓ EU-wide reduction of **40% by 2030** in the transport, buildings, agriculture and waste sectors compared to 2005

LULUCF

- ✓ Increase EU's natural carbon sinks with new EU target of net GHG removals in the LULUCF sector of **310 Mt CO₂eq** from 2026 to 2030 t

ETD

- ✓ Energy taxation on **energy content** and environmental performance of energy products and electricity
- ✓ Possible for MS to exempt from taxation renewable electricity and renewable fuels of non-biological origin, advanced sustainable biofuels, bioliquids, biogas and advanced sustainable biomass fuels
- ✓ Energy products and electricity supplied for intra-EU air and waterborne navigation taxed

ETS

- ✓ By 2030 reduce sectors' GHG emissions by **61%**, compared to 2005 levels
- ✓ Carbon pricing for maritime, aviation, buildings and road transport
- ✓ Innovation Fund is increased by 50 million allowances

CO₂ Standards, ReFuelEU Aviation & FuelEU Maritime

- ✓ Emissions from cars should be reduced **by 55% until 2030** and new cars should have **zero emissions by 2035**. For vans, emission reduction target of **50% by 2030** and **zero emissions by 2035**
- ✓ In aviation, SAF share **>= 5% in 2030 & >=63% in 2050** (sub targets for synthetic fuels)
- ✓ In maritime, biofuels, biogas, renewable fuels of non-biological origin and recycled carbon fuels are taken into to reduce the GHG energy content **-6% in 2030 and -75% in 2050** from the 2020 average

HORIZON EUROPE

EURATOM


SPECIFIC PROGRAMME: EUROPEAN DEFENCE FUND
Exclusive focus on defence research & development

Research actions

Development actions

SPECIFIC PROGRAMME IMPLEMENTING HORIZON EUROPE & EIT*
Exclusive focus on civil applications

**Pillar I
EXCELLENT SCIENCE**




European Research Council

Marie Skłodowska-Curie

Research Infrastructures

**Pillar II
GLOBAL CHALLENGES & EUROPEAN INDUSTRIAL COMPETITIVENESS**




Clusters

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

Joint Research Centre

**Pillar III
INNOVATIVE EUROPE**



European Innovation Council

European Innovation Ecosystems

European Institute of Innovation & Technology*

WIDENING PARTICIPATION AND STRENGTHENING THE EUROPEAN RESEARCH AREA

Widening participation & spreading excellence

Reforming & Enhancing the European R&I system

Fusion

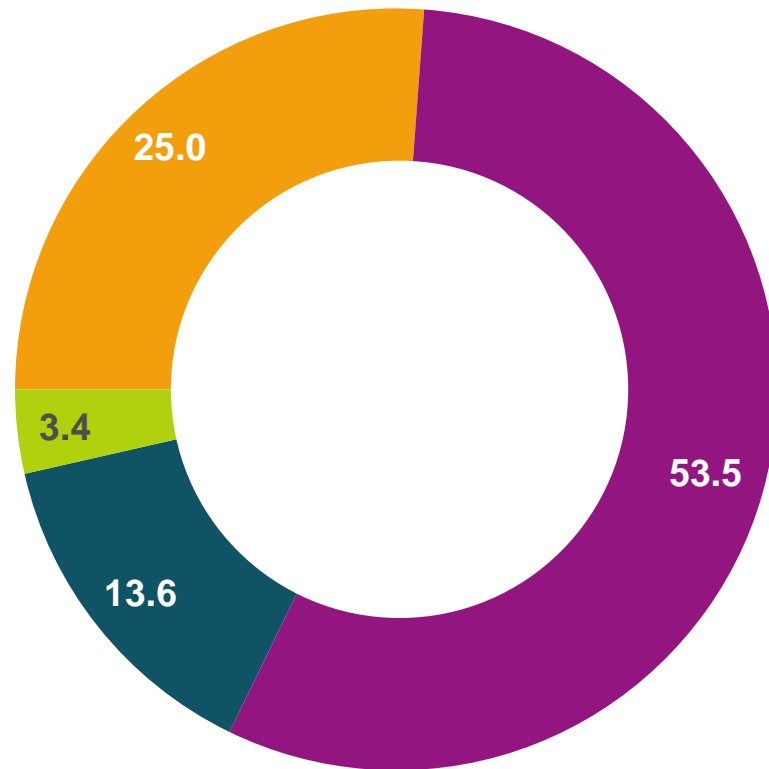
Fission

Joint Research Center

* The European Institute of Innovation & Technology (EIT) is not part of the Specific Programme

Horizon Europe Budget: €95.5 billion (2021-2027)

(including €5.4 billion from NGEU – Next Generation Europe – programme of EU for Recovery from COVID-19 crisis)

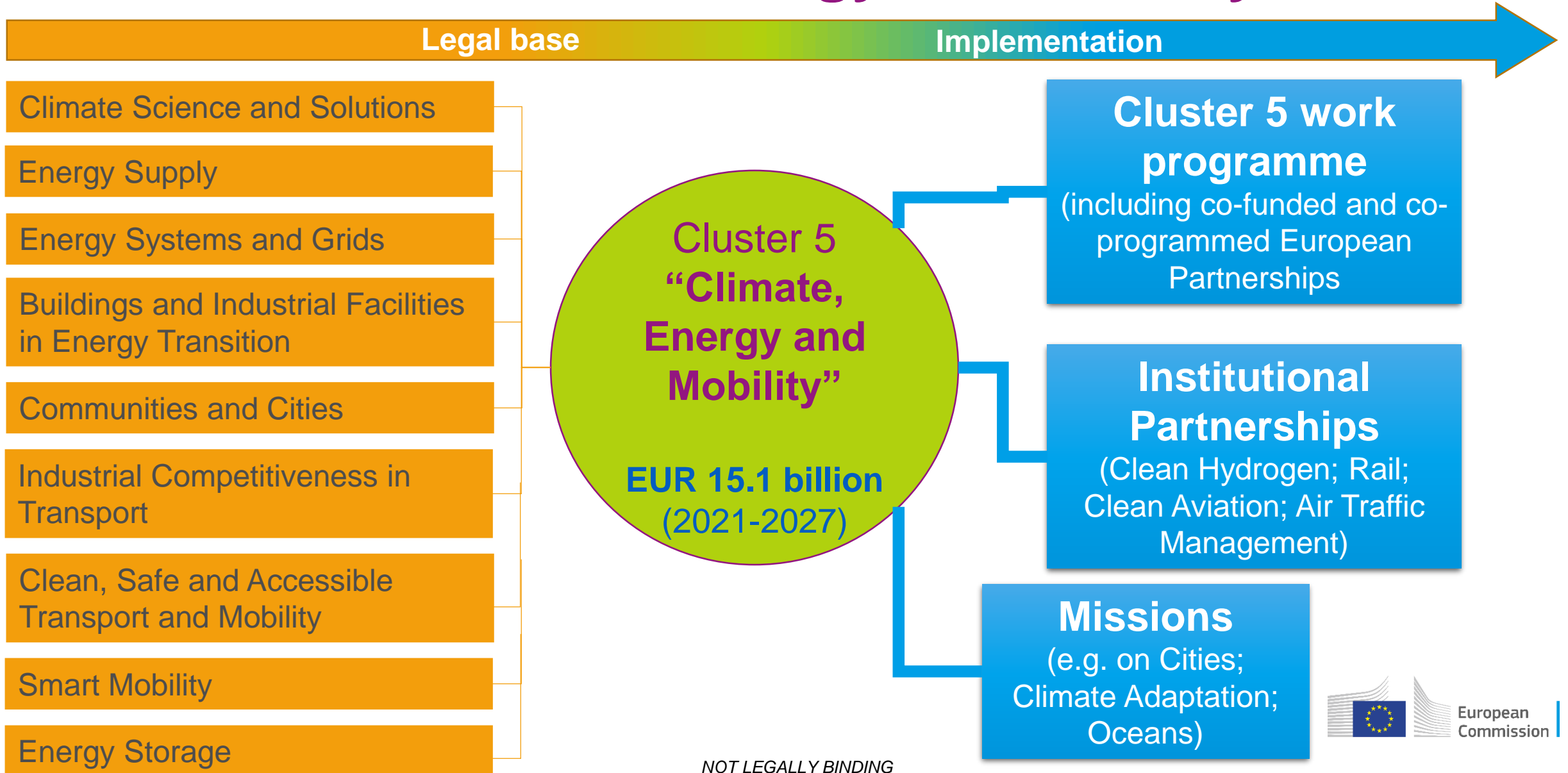


Political agreement December 2020

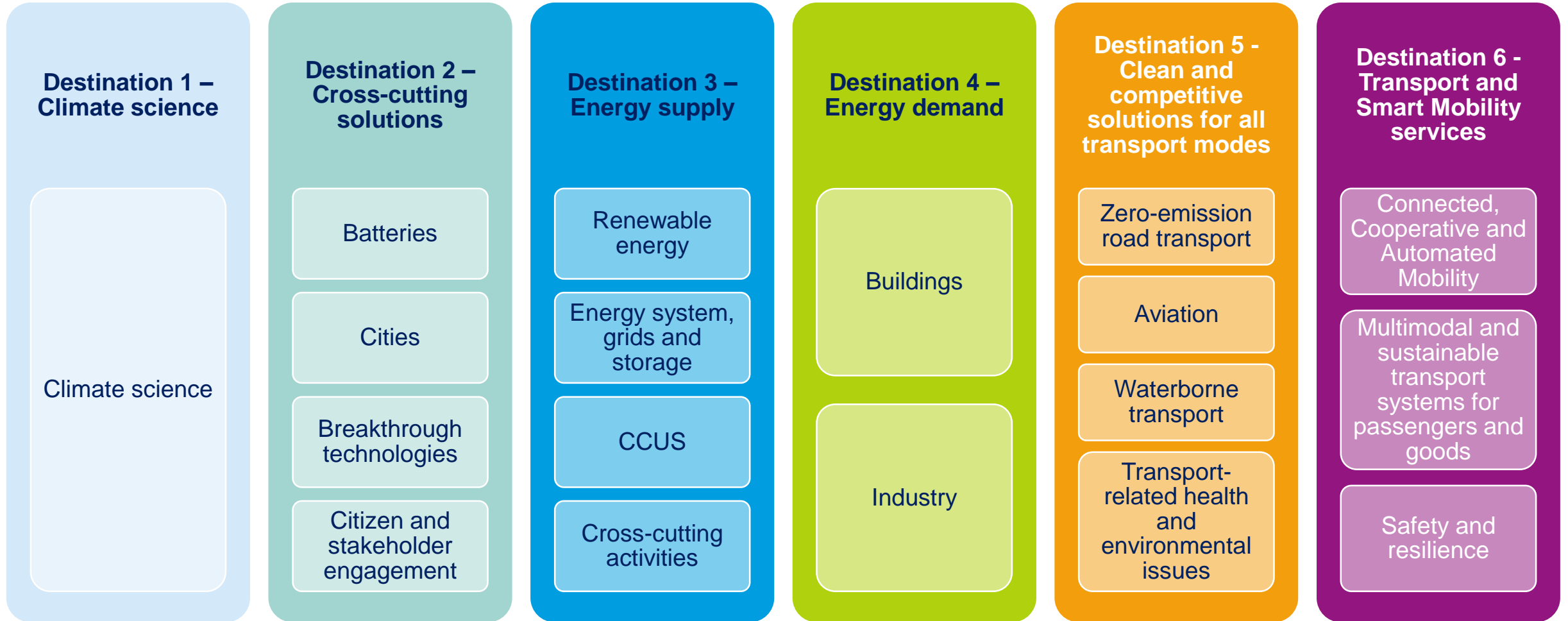
€ billion in current prices

- Excellent Science
- Global challenges and European ind. comp.
- Innovative Europe
- Widening Part and ERA

Cluster 5 - Climate, Energy and Mobility



Cluster 5 Work programme - overview



NOT LEGALLY BINDING

Horizon Europe

Cluster 5, 'Climate, Energy and Mobility'

Destination - Sustainable, secure and competitive energy supply

Expected Impact:

“More efficient, clean, sustainable, secure and competitive energy supply through new solutions for smart grids and energy systems based on more performant renewable energy solutions”

- 1. Fostering the European global leadership in affordable, secure and sustainable renewable energy technologies***
- 2. Energy systems, grids and storage*
- 3. Carbon capture, utilization and storage (CCUS)*
- 4. Cross-cutting (**ETIPs, SET Plan**) and leveraging more public and private investments in clean energy systems (**CET P**)*

Global leadership in renewable energy technologies

Climate,
Energy &
Mobility

- ❑ **Renewable energy technologies** provide major opportunities to replace or substitute carbon from fossil origin in the power sector, in heating/cooling, transportation, agriculture and industry
- ❑ **Advanced renewable fuels**, including synthetic and sustainable advanced biofuels, needed to provide long-term carbon-neutral solutions for the transport and energy-intensive industrial sectors

Main impacts for renewable energy and renewable fuel technologies

- ✓ Availability of disruptive technologies and systems in 2050
- ✓ Reduced cost and improved efficiency
- ✓ De-risking with a view to commercial exploitation of technologies
- ✓ Better integration in energy consuming sectors
- ✓ Reinforced European scientific basis and European export potential
- ✓ Enhanced sustainability of value chains
- ✓ More effective market uptake

Horizon Europe - Work Programme 2021 Climate, Energy and Mobility

Destination 3 - Renewable Energy

Opening: 24 Jun 2021 - Deadline(s): 19 Oct 2021

- HORIZON-CL5-2021-D3-01-04: Clean Energy Transition, Co-fund Action

Opening: 24 Jun 2021 - Deadline(s): 05 Jan 2022

- HORIZON-CL5-2021-D3-02-02: Sustainability and educational aspects for renewable energy and renewable fuel technologies, CSA
- HORIZON-CL5-2021-D3-02-03: Market Uptake Measures of renewable energy systems, CSA
- HORIZON-CL5-2021-D3-02-15: Support to the activities of the ETIPs and technology areas of the SET Plan, CSA

[wp-8-climate-energy-and-mobility_horizon-2021-2022_en.pdf \(europa.eu\)](#)

Horizon Europe - Work Programme 2021 Climate, Energy and Mobility

Destination 3 - Renewable Energy

Opening: 02 Sep 2021- Deadline(s): 23 Feb 2022

- HORIZON-CL5-2021-D3-03-02: Next generation of renewable energy technologies, RIA
- HORIZON-CL5-2021-D3-03-03: Hybrid catalytic conversion of renewable energy to carbon-neutral fuels, RIA
- HORIZON-CL5-2021-D3-03-08: Cost-effective micro-CHP and hybrid heating systems, RIA
- HORIZON-CL5-2021-D3-03-09: Carbon-negative sustainable biofuel production, RIA
- HORIZON-CL5-2021-D3-03-14: Demonstration of large-scale CHP technologies for a shift to the use of biogenic residues and wastes, IA
- HORIZON-CL5-2021-D3-03-16: Innovative biomethane production as an energy carrier and a fuel, IA

Horizon Europe - Work Programme 2022 Climate, Energy and Mobility

Destination 3 - Renewable Energy

Opening: 14 Oct 2021- Deadline(s): 26 Apr 2022

- HORIZON-CL5-2022-D3-01-01: Demonstration of cost-effective advanced biofuel technologies utilizing existing industrial plants, IA
- HORIZON-CL5-2022-D3-01-05: Demonstration of innovative plug-and play solutions for system management and renewables storage in off-grid applications, IA

Opening: 26 May 2022- Deadline(s): 27 Oct 2022

- HORIZON-CL5-2022-D3-02-03: Innovative renewable energy carrier production for heating from renewable energies, IA
- HORIZON-CL5-2022-D3-02-04: Technological interfaces between solar fuel technologies and other renewables, RIA
- HORIZON-CL5-2022-D3-02-05: Renewable energy carriers from variable renewable electricity surplus and carbon emissions from energy consuming sectors, IA

Horizon Europe - Work Programme 2022 Climate, Energy and Mobility

Destination 3 - Renewable Energy

- HORIZON-CL5-2022-D3-02-06: Direct renewable energy integration into process energy demands of the chemical industry, RIA
- HORIZON-CL5-2022-D3-02-07: Renewable energy incorporation in agriculture and forestry, IA
- HORIZON-CL5-2022-D3-02-08: Demonstration of complete value chains for advanced biofuel and non-biological renewable fuel production, IA

Opening: 06 Sep 2022 - Deadline(s): 10 Jan 2023

- HORIZON-CL5-2022-D3-03-02: Best international practice for scaling up sustainable biofuels, RIA
- HORIZON-CL5-2022-D3-03-03: Efficient and circular artificial photosynthesis, RIA
- HORIZON-CL5-2022-D3-03-06: Efficient and low-emission technologies for industrial use of combustion and gasification systems from low-value biogenic residues and wastes, RIA
- HORIZON-CL5-2022-D3-03-07: Development of algal and renewable fuels of non-biological origin, RIA



Thank you!

#HorizonEU

<http://ec.europa.eu/horizon-europe>

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