



# R&I policy in renewable fuels and bioenergy

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# REPowerEU: Joint European action for more affordable, secure and sustainable energy COM(2022) 108 final

Increase the resilience of the EU's energy system by controlling energy prices, securing gas storage and reduce dependency on fossil fuel imports by ramping up the production of biomethane and hydrogen, decarbonizing industry and increasing renewable energy use

Speed up **renewables permitting** to roll-out renewable projects and grid infrastructure improvements

More rooftop **solar panels, heat pumps and energy savings** to reduce our dependence on fossil fuels, making our buildings more energy efficient

Diversify **gas supplies**

Double the EU **biomethane** goal to produce **35 billion cubic meters** per year by 2030

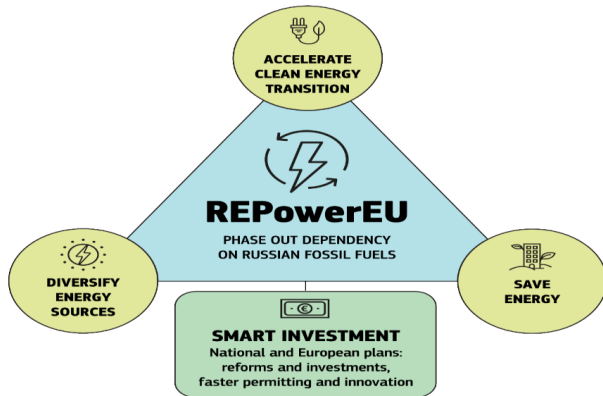
**A Hydrogen Accelerator** to develop infrastructure, storage facilities and ports, and provide additional **15 million tones** renewable hydrogen (5 Mt domestic and 10 Mt imported)

**Decarbonize industry** by accelerating the switch to electrification and renewable hydrogen and enhancing our low-carbon manufacturing capabilities

# REPowerEU Plan COM(2022) 230 final

## Pillar I- Energy savings

## Pillar II – Diversification of energy supplies



## Pillar III – Accelerate roll-out of renewable energy

- Increased energy efficiency target from 9 to 13%

- Secured LNG imports and higher pipeline gas deliveries
- EU Energy platform for voluntary common purchases of gas, LNG, and hydrogen
- EU Energy External Engagement Strategy build long-term partnerships with suppliers

- Increased RES target from 40 to 45% - massive scaling-up and speeding-up of renewable energy in power generation, industry, buildings, transport

- EU solar strategy to double PV capacity in 2025, install 600 GW in 2030
- EU solar rooftop initiative with legal obligation for all types of new buildings
- Double rate of deployment for heat pumps, integrating geothermal and solar thermal in district and communal heating
- Speed up permitting for major renewable projects, and include in the Renewable Energy Directive recognizing renewable energy as an overriding public interest

- Hydrogen Accelerator for production, infrastructure and storage
  - 10 Mt domestic production and 10 Mt imports in 2030 to to replace natural gas, coal and oil
  - 2 Delegated Acts on definition and production of renewable hydrogen
  - 200 million € additional to support Hydrogen Valleys
  - Complete first Important Projects of Common European Interest by summer

- Bio methane Action Plan to double the EU bio methane production to 35 billion m<sup>3</sup>/y by 2030
  - Bio methane Industrial Alliance
  - Financial incentives to increase production, also through Common Agricultural Policy
  - R&I support to innovative technologies

- Decarbonize industry by accelerating the switch to electrification and renewable hydrogen
- EUR 225 billion already available in loans under the RRF
- R&I for materials, circularity, bio methane innovative production, solar flagship, hydrogen valleys, Cities Mission, regulatory sandboxes

# The contribution of EU Research & Innovation to the REPowerEU objectives



## BOOSTING THE HYDROGEN PRODUCTION AND IMPORTS

R&I is needed to further develop the technology to boost hydrogen production from 5.6 million tonnes to 20 million tonnes by 2030.



## DECARBONISING INDUSTRY

R&I actions will further accelerate the pathway to a decarbonised industry. The Commission together with the aviation, steel, hydrogen, waterborne, rail, and process industries, is co-investing €13.1 billion through Horizon Europe Partnerships.



## ACCELERATING THE ROLL-OUT OF SOLAR ENERGY

The European Commission's Solar Strategy Communication has a strong R&I component:




## ENERGY SAVINGS AND ENERGY EFFICIENCY IN BUILDINGS

Based on innovative solutions developed through previous EU R&I programmes, current R&I activities will focus on scaling up solutions to realise energy savings and efficiency.



## FURTHER STRENGTHENING EU INTERNATIONAL ENERGY ENGAGEMENT

 MISSION INNOVATION AND THE BREAKTHROUGH AGENDA

 COOPERATION WITH AFRICA AND THE MEDITERRANEAN REGION

- The Commission will co-invest with Member States
- €1.1 billion through the Clean Energy Transition and Driving Urban Transition co-funded Partnerships and will revamp the Strategic Energy Technology Plan by the end of 2022, to align its activities with REPowerEU and the European Green Deal.



## SPEEDING UP RENEWABLE PERMITTING

R&I provide direction to minimise the time for roll-out of renewable projects and grid infrastructure improvements.



## DOUBLING THE EU AMBITION FOR BIO METHANE AND PRODUCE 35 BILLION CUBIC METERS PER YEAR BY 2030

R&I in innovative technologies are needed to boost the bio methane and renewable fuels production.

# “Fit for 55” package

Revision of Renewable Energy Directive II

- Collective binding target of renewables in EU’s energy mix to **40%** by 2030
- **Advanced biofuels** and **biogas** produced from Annex IX Part A feedstock in energy supplied to transport at least 0,2 % in 2022, 0,5 % in 2025 and **2,2 %** in 2030, renewable fuels of non-biological origin at least **2,6 %** in 2030
- GHG intensity reduction at least **13 %** in 2030 by all renewable fuels and renewable electricity supplied to transport

Revision of the Effort Sharing Regulation

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

Revision of the Emissions Trading System Directive

- By 2030 reduce sectors’ GHG emissions by **61%**, compared to 2005 levels
- Carbon pricing for maritime, aviation, buildings and road transport from 2026

Revision of the Land Use Land Change and Forestry regulation

- 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

ReFuelEU Aviation legislative proposal

- In **2030** SAF at least **5%** of which synthetic aviation fuels share at least **0.7%**, rest being advanced biofuels(**4,3%**)
- In **2050** SAF at least **63%** of which synthetic aviation fuels at least **28%**, rest being advanced biofuels (**35%**)

FuelEU Maritime legislative proposal

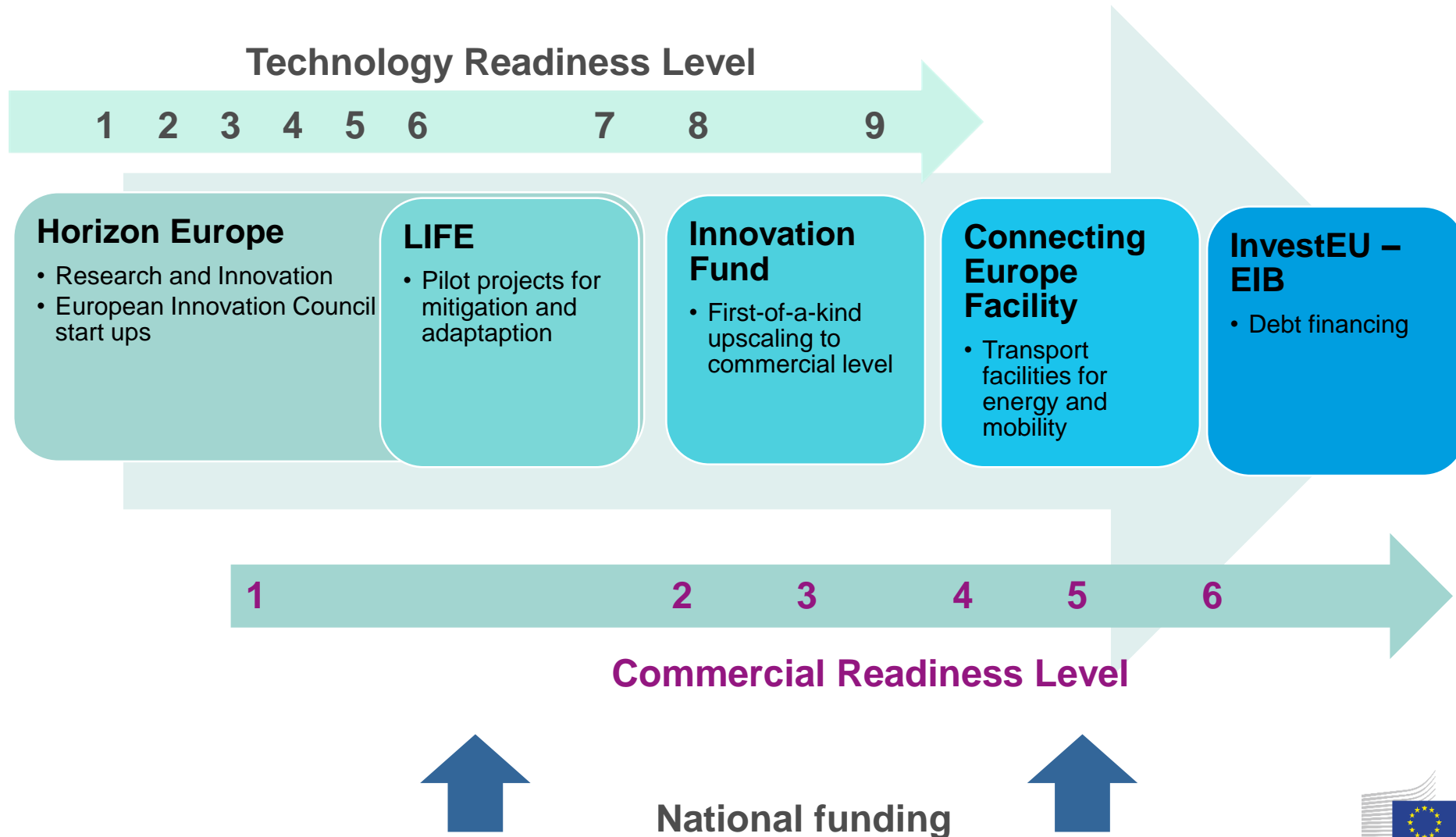
- Biofuels, biogas, renewable fuels of non-biological origin and recycled carbon fuels are taken into account to reduce the GHG content of the energy in ships by **-6% in 2030 and -75% in 2050** from the 2020 average

Revision of the Energy Taxation Directive

- Exemptions for renewable electricity, renewable fuels, advanced biofuels/ bio liquids/ biogas/ biomass fuels



# EU Funding Programmes



# Horizon Europe - Work Programme 2021-2022

## Climate, Energy and Mobility - Destination 3 Renewable Energy

### Renewable fuels Topics

- Hybrid catalytic conversion
- Carbon negative biofuel production
- Algal and non-biological renewable fuel technologies
- Bio methane production
- Viable advanced biofuel production
- Value chains for renewable fuels
- International cooperation for scale-up of sustainable biofuels
- Renewable energy technologies in agriculture and forestry for energy and waste needs
- Renewable energy carriers from variable renewable electricity and carbon emissions
- Coupling solar fuel technologies to other renewables
- Artificial photosynthesis technologies

### Bioenergy Topics

- Micro-CHP and hybrid heating systems
- Large-scale CHP technologies from biogenic residues and wastes
- Industrial and low-emission combustion and gasification from biogenic residues and wastes
- Renewable energy carriers for heating
- Direct integration of renewable energy into chemical process energy

### Other actions

- Studies on development of industrial capacity for drop-in advanced biofuels, pre-commercial procurements for commercial cargo-shipping and aviation advanced biofuels, prizes for development of renewable energy systems

# Horizon Europe *Cluster 5, 'Climate, Energy and Mobility'* Destination - Sustainable, secure and competitive energy supply

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## **HORIZON-CL5-2022-D3-03-02**

Best international practice for scaling up sustainable biofuels

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Foster international cooperation to develop best practices and concepts along the entire value chain for accelerating the scale-up of sustainable biofuels worldwide (RIA, EUR 9 million, Opening 6 Sep 2022, Deadline 10 Jan 2023)

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## **HORIZON-CL5-2022-D3-03-07**

Development of algal and renewable fuels of non-biological origin

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Develop and improve algal and/or non-biological renewable fuel technologies (other than for hydrogen as a final product), through developing synthetic pathways including biological, biochemical, thermochemical, electrochemical processes or combinations of them (RIA, EUR 15 million, Opening 6 Sep 2022, Deadline 10 Jan 2023)

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## **HORIZON-CL5-2022-D3-03-03**

Efficient and circular artificial photosynthesis

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Development of novel artificial photosynthesis technologies, which allow for improved efficiency of light harvesting, conversion to electrochemical potential and energy fixation to carriers with strictly implementing circularity by design and efficient use of carrier and (photo)catalyst materials through novel photo electrochemical or bio-based (bio-hybrid) or biological pathways for solar fuel production (RIA, EUR 10 million, Opening 6 Sep 2022, Deadline 10 Jan 2023)

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## **HORIZON-CL5-2022-D3-03-06**

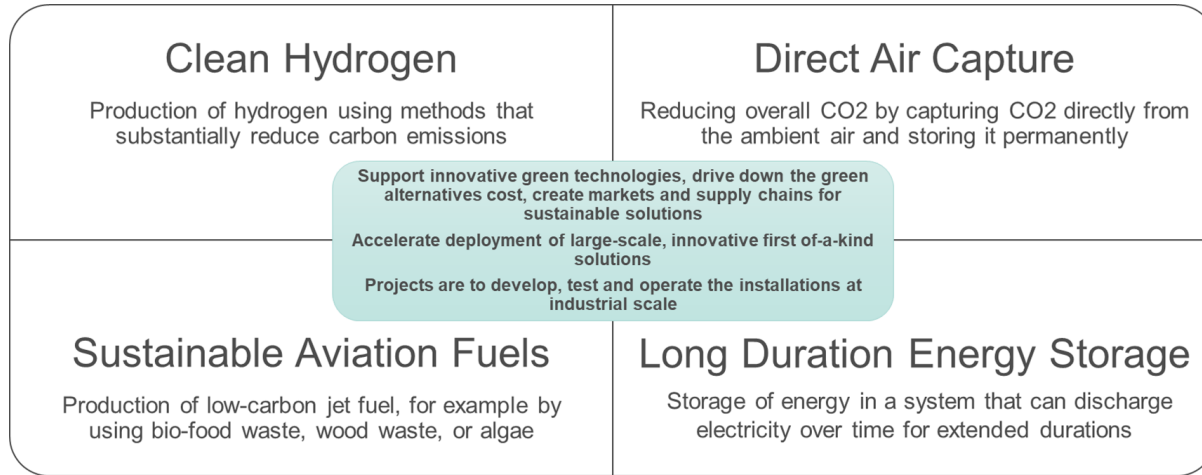
Efficient and low-emission technologies for industrial use of combustion and gasification systems from low-value biogenic residues and wastes

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Development of technologies for optimization of advanced biofuel flexible systems regarding upstream multi-feedstock, logistics, feeding, ash management, combustion or gasification processes and effluent emissions and their effective integration into industrial process energy environment (RIA, EUR 10 million, Opening 6 Sep 2022, Deadline 10 Jan 2023)



# EU Catalyst Partnership



## 1:1 risk sharing

The EU and Breakthrough Energy Catalyst share the risk. Grants and investments will be matched 1:1

The EU-Catalyst partnership offers different forms of finance to close the financing gap of a project. This includes grants and other types of investments, such as quasi-equity, equity and contract subsidies, for example **companies committing to purchase** the resulting green products.

## \$1bn / €820m mobilized

The EU and Breakthrough Energy Catalyst will together mobilize \$1bn / €820m for a minority stake in the project. Projects will at least match that with their own contribution.

## HOW TO APPLY

## 1:3 leverage

The EU-Catalyst partnership will provide up to 50% of the required financing. The projects need to raise at least 50% themselves. So for each euro from the EU budget, the partners will raise at least 3 euros themselves.

During 2022-26, requests for proposals in the four focus areas evaluated against ambitious criteria, including: scalability, impact and path to economic viability.

Select and propose potential projects to the EIB to assess them based on agreed processes and rules, in relation to the Horizon Europe and the Innovation Fund funding contributions. The assessment and the decision to use EU funds will be independent from that of Breakthrough Energy Catalyst



## **HORIZON-CL5 - Other Actions – Indirectly Managed Actions - 7**

Contribution to  
InvestEU blending  
operation under the  
Green Transition  
product

Framework to identify European projects deploying innovative technologies, business models and approaches to reduce the green premium

**Renewable H<sub>2</sub>**: electrolyzers, at 100 MW and above, large scale hydrogen end-use industry applications

**Sustainable aviation fuels**: innovative SAF notably advanced biofuels and RFNBOs

**Long duration energy storage**: Chemical, electrochemical, thermal and mechanical technologies and optimized storage system for large capacity and long duration

**Direct air capture of CO<sub>2</sub>**: viability regarding fate of the captured CO<sub>2</sub> (i.e. underground storage or use), renewable energy source for capture, vicinity to CO<sub>2</sub> transport and storage infrastructure

EIB loans and quasi-equity (or a combination) drawn from Innovation Fund, this Horizon Europe action, or InvestEU budget, blended with non-reimbursable components funded by this Horizon Europe action

Open to all applicants meeting the set eligibility criteria here and InvestEU Green Transition product

Projects' selection and financing procedure follows the InvestEU Regulation: EIB checks financial viability and performs full due diligence, the Commission assures eligibility under the 'policy check' procedure

Ensure technologies and IP benefit EU interest, in particular by focusing on MS/AC projects

Indirectly Managed Action, EUR 50 million, TRL 6-8, Opening 2<sup>nd</sup> quarter 2022, Legal Entity EIB as the implementing partner under InvestEU

# Mission Innovation 2.0

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Launched on 2 June 2021, supports in the next decade action and investment in research, development and demonstration to make clean energy affordable, attractive and accessible to all this decade and accelerate progress towards the Paris Agreement goals and pathways to net zero

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**Innovation Platform:** Insights, Collaborate, Accelerate

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**Innovation for International Sustainable Aviation Fuel:** forge global partnerships for sustainable and cost-effective strategies for Sustainable Aviation fuels, **co-lead India**, USA, participants **EU**, CN, NL, DK

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**Integrated Bio refineries**, co-lead **India**, NL, participants **EU**, BR, CA, UK supported by IEA, IEA Bioenergy, HLCAC, Nova Institute (Germany), CEM, Biofuture Initiative

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**Missions:** Bring together dynamic and delivery-focused, high ambition alliances between countries, corporations, investors and research institutes

Launched 4 April 2022

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Develop and demonstrate innovative solutions to accelerate the commercialization of integrated bio refineries, with a target of replacing 10% of fossil-based fuels, chemicals and materials with bio-based alternatives by 2030

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Advance sustainable bio refining pathways and technologies to support the development and commercialization of bio-based fuels, chemicals and materials, by also considering process energy demands.

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Support de-risking new and emerging technology, while improving the cost-competitiveness of bio-based alternatives, notably biofuels

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Members will (a) promote research, development, and innovation across the bio refining supply and value chain, (b) advance pilot-scale demonstration projects for sustainable bio refining technologies, and (c) collaborate with industry and standards-setting organizations to support regulatory development for these new products



# Thank you!

## #HorizonEU

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