

RESEARCH & INNOVATION TO DRIVE THE CLEAN ENERGY TRANSITION & CLIMATE NEUTRALITY

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The [European Green Deal](#) package on energy and climate will make EU policies fit to deliver net greenhouse gas emissions reductions of at least 55% by 2030, compared to 1990 levels, and set Europe on the path to climate neutrality by 2050.

This requires action to prevent methane leaks, facilitate market entry of renewable and low-carbon gases, encourage building renovation, develop sustainable carbon removal systems, and address the social and labour impacts of the climate transition. R&I will accelerate a fair and sustainable transition in these five areas:

REDUCING METHANE EMISSIONS IN THE ENERGY SECTOR

The Research Fund for Coal and Steel supports the mitigation of methane emissions from coal mines that are closed or in the process of closing, and their connected infrastructures. [Horizon 2020](#) research and innovation projects on biomethane and synthetic renewable methane greatly contribute to cost-effective and sustainable decarbonisation of fossil natural gas markets.

REVISION OF THE THIRD ENERGY PACKAGE FOR GAS TO REGULATE COMPETITIVE DECARBONISED GAS MARKETS

Horizon 2020 projects and [Horizon Europe](#) initiatives advance research on methane reductions, analyse biomethane standards, and deal with related aspects of regulation and harmonisation of European biomethane markets. Important initiatives, in particular the Clean Hydrogen Partnership, show the high potential of hydrogen integration into the gas system and the need for hydrogen infrastructures in the context of hydrogen valleys.

REVISION OF THE ENERGY PERFORMANCE OF BUILDINGS DIRECTIVE

Research and innovation brings new developments in the energy efficiency and integration of renewables in buildings, circularity, renovation toolkits and digitalisation. The European Partnership Built4People and the Horizon Europe Mission '[Climate-neutral and smart cities](#)' will help to streamline the testing, upscaling and replication of integrated and systemic solutions for different contexts, in co-creation with industry, stakeholders and citizens.

RESTORING SUSTAINABLE CARBON CYCLES


Research and innovation supports the removal and storage of atmospheric CO₂ through enhanced carbon sequestration in ecosystems (e.g. forests, peatlands) and upscaling of industrial solutions such as carbon capture, use and storage. The Horizon Europe Mission '[A Soil Deal for Europe](#)' aims to test, demonstrate and upscale carbon farming solutions. The Circular Biobased Europe public-private partnership will support sustainable bio-based solutions to reduce our dependence on fossil carbon. The Processes4Planet public-private partnership should lead to resource efficient, flexible CO₂ capture and utilisation technologies.


SOCIAL AND LABOUR ASPECTS OF THE CLIMATE TRANSITION


The transition to carbon-neutrality must be just and fair. Compensation for losses suffered, job creation, skills development and structural support are important, but not enough to ensure lasting support from citizens.


New, more inclusive governance mechanisms are needed, that involve people directly in decision-making and policy-design affecting all aspects of their lives, from work, to health, to social wellbeing. Social innovation also has a role to play here, helping to develop and implement new ideas to tackle pressing social challenges by empowering citizens. The [Group of Chief Scientific Advisors](#) to the European Commission published a [Scientific Opinion](#) with policy recommendations, including the creation of an inclusive and participatory societal environment that supports low-carbon energy choices.


SELECTION OF HORIZON 2020 AND RFCS PROJECTS CONTRIBUTING TO THE CLEAN ENERGY TRANSITION & CLIMATE NEUTRALITY


 The aim of the **THyGA** project (budget €2.5 million) is to understand the impact of blends of natural gas and hydrogen for use in residential and commercial appliances. The project is testing around 100 residential gas appliances, such as boilers and cookers, in order to provide safety and performance guidance for manufacturers and end-users.


 Recovering and harnessing methane emissions from coal mines to generate clean energy and chemicals are the core objectives of the methods developed and tested by the **METHENERGY+** project (budget €1.9 million).


 The **BIOSURF** project (budget €1.9 million) developed methodologies and guidelines for certification and registration of biomethane to foster its production and use for electricity and as a transport fuel.


 The **REGATRACE** project (budget €3 million) is creating a renewable gas trade centre in Europe: an efficient trading system based on issuing and trading biomethane/renewable gas certificates. This will increase the investment and uptake of biomethane in Europe moving closer to the green energy system.


 The **ENTRANCES** project (budget €3 million) is investigating the challenges facing carbon-intensive regions in transitions. The project aims to engage in particular with young people, who, while facing many of the biggest challenges, hold the greatest innovation potential.

 The **GROWINPRO** project (budget €3 million) delivers an agent-based model providing the best policy mix of green innovation and regulation to keep warming below 2 C° and achieve sustainable and inclusive growth.

 Reducing energy consumption in multi-storey buildings is important for meeting the EU energy efficiency targets. Positive energy buildings (PEBs) generate more energy than they consume. The **EXCESS** project (budget €9.2 million) is developing new low-cost user-centric PEB solutions for the European housing market, promoting a high quality indoor environment for the comfort and well-being of the occupants

 The **SmartENCity** project (budget €31.5 million) demonstrated in 1,847 homes across Europe how to better use renewable energy for heating and smart lighting. As a result, citizens reported significant energy savings, CO2 emissions reductions and lower bills.

 Leading waste management companies, technology developers and research organisations teamed up with four European cities in the **SCALIBUR** project (budget €11.7 million) to transform urban food waste and sewage sludge into high value-added products such as biopesticides and bio-based plastics. This will increase the recycling rate of cities and create new circular economy business opportunities.

 The **RECO2DE** project (budget €7.9 million) is developing and testing methods to take CO2 from waste gases in the cement industry and reuse them within the same plant to produce new recycled products. It has the potential to decrease the CO2 emissions of a cement plant by at least 20%.

More information on the projects funded by Horizon 2020 is available at cordis.europa.eu