

CLUSTER 5. CLIMATE, ENERGY AND MOBILITY

Areas of intervention



EU Policy Objectives

Cluster 5 addresses EU priorities aiming at:

- technological, economic and societal transformations required to achieve **climate neutrality**, and ensuring a **socially fair transition** that does not leave any EU citizens or regions behind;
- **better air quality**, **increased employment**, **social inclusion**, **sustainable resource management** (including biodiversity), and **reduced dependency on fossil fuels**;
- development of a wide portfolio of **cost-effective carbon-free alternatives** for each GHG-emitting activity, based on often in combination with **enhanced sector coupling**, **digitalisation** and **system integration**.

Primary UN – SDGs addressed by Cluster 5:



Secondary UN – SDGs addressed by Cluster 5:



Missions relevant to the activities addressed in Cluster 5:



Targeted impacts

Achieving an advanced knowledge base in **climate science** that can guide the development of required policy measures and **low-and zero-carbon technologies** essential to catalyse the transition to a climate-neutral emissions economy and society and for adaptation to the unavoidable climate change impacts.

New cross-sectoral energy/transport solutions enabling both the clean and sustainable energy transition and the decarbonisation of transport.

Achieve **cleaner, more efficient, more secure and competitive energy supply**, notably by boosting cost performance and reliability of renewable energy solutions and by making the energy grid more flexible and secure.

Support **cleaner, safer, affordable and sustainable energy demand side solutions** for all users, ensuring a just transition towards fully decarbonised, more energy efficient and renewable energy system reducing any negative impacts, and European dependency on energy import.

Significantly contribute to **net-zero greenhouse gas emissions and reduced air pollutants in and across all transport modes** protecting human health and achieving at the same time strengthened global competitiveness of the European transport sector, through the development and usage of new technological solutions in all transport modes.

New, affordable smart, inclusive and sustainable mobility services which will result in significant safety, environmental, health, economic and social benefits such as reduced accidents, decreased congestion, reduced energy consumption and emissions of vehicles, increased efficiency and productivity of transport operations, improved working conditions and the creation of new jobs.

Key R&I Orientations

| ADVANCE CLIMATE SCIENCE AND SOLUTIONS FOR A CLIMATE NEUTRAL AND RESILIENT SOCIETY

The efficient transition to a net-zero greenhouse gas emissions economy resilient to the impacts of climate change requires profound knowledge in various fields of research. Advancing climate science and creating a knowledge base to inform societal and social transition and to guide the development of policy measures, low-, zero-, and carbon negative technologies, as well as other solutions.

| CROSS-SECTORAL SOLUTIONS FOR DECARBONISATION

The energy sector and the two main sectors of energy use in cities and communities (housing and mobility) are closely interlinked and face many common challenges:

- Establish a competitive and sustainable European **battery value chain**;
- Strengthen the European value chain for near-zero carbon **hydrogen and fuel cells**;
- Develop sustainable infrastructure, services and systems for **smart and sustainable communities and cities**;
- **Empowering citizens** to engage in the transformation to a decarbonised society;
- Foster **emerging breakthrough technologies and climate solutions**.

| DEVELOP COST-EFFICIENT, NET ZERO-GREENHOUSE GAS EMISSIONS ENERGY SYSTEM CENTRED ON RENEWABLES

The transition of the energy system will rely on reducing the overall energy demand and decarbonising the energy supply side. In particular:

- Achieve global leadership in **renewable energy**;
- Develop flexible, zero greenhouse gas emission and citizen-centred **energy systems and grids**;
- Develop **carbon capture, utilisation and storage (CCUS)** solutions for the power sector and energy-intensive industries;
- Develop flexible and efficient **energy storage** solutions;
- Leverage more **public and private investments** in clean energy systems.

| DEVELOP DEMAND SIDE SOLUTIONS TO DECARBONISE THE ENERGY SYSTEM

Research and innovation actions aiming at fostering demand side solutions and improving energy efficiency are among the most cost effective ways to support decarbonisation. In particular:

- Achieve a highly **energy-efficient and decarbonised EU building stock**;
- Support **industrial facilities** in the energy transition.

| DEVELOP LOW-CARBON AND COMPETITIVE TRANSPORT SOLUTIONS ACROSS ALL MODES

Research and innovation activities are needed across all transport sectors, in order for the EU to reach its policy goals. In particular:

- Achieve **zero-emission road transport**;
- Enhance the competitiveness of **rail** as a low-carbon mode of transport;
- Make **aviation** cleaner and more competitive;
- Enable low-carbon, smart, clean and competitive **waterborne** transport;
- Reduce the **impact of transport on the environment and human health**.

| DEVELOP SEAMLESS, SMART, SAFE, ACCESSIBLE AND INCLUSIVE MOBILITY SYSTEMS

Europe needs to maintain the competitiveness of its transport industry and manage the transformation of supply-based transport to demand-driven, safe and sustainable mobility services. In particular:

- Make **automated and connected road transport** safe and competitive;
- Develop efficient and innovative **transport infrastructure**;
- Develop the future **transport network** and integrated **traffic management**;
- Enable **multimodal freight logistics** and **passenger mobility services**;
- Increase **transport safety** – per mode and across modes.

European Partnerships



Transforming Europe's rail system; Integrated Air Traffic Management; Clean Aviation; Clean Hydrogen; People-centric sustainable built environment; Towards zero-emission road transport; Mobility and Safety for Automated Road Transport; Batteries: Towards a competitive European industrial battery value chain; Clean Energy Transition; Sustainable, Smart and Inclusive Cities and Communities; Zero-emission waterborne transport.