



European
Commission

INVESTMENT SUPPORT FOR ECOSYSTEMS

ENERGY INTENSIVE INDUSTRIES

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The Energy-Intensive Industries (EIIs) ecosystem covers a broad range of sectors such as chemicals, steel, paper, plastics, mining, extraction and quarrying, refineries, cement, wood, rubber, non-ferrous metals, glass and ceramics. The sectors included in the ecosystem are characterised by a high energy and carbon intensity and by being at the starting point of many value chains, providing raw, processed and intermediate materials.¹ The industries of the EII ecosystem employ 7.8 million people in Europe and provide a value added of EUR 549bn (4.55% of the EU total). In 2019, they were responsible for 22% of total EU greenhouse gas emissions.

As a major emitter of greenhouse gases, the EII ecosystem has a major role to play in climate mitigation. Between 1990 and 2015, the EIIs already reduced their emissions significantly, and, since 2014, with an average yearly rate of 15 % mostly through energy efficiency measures and other incremental improvements; but to achieve climate neutrality by 2050, a fundamental shift to sustainability – including accelerated and deep decarbonisation and a shift to circular economy – is required².

In July 2021, the European Commission adopted the package to deliver the European Green Deal – a package of 13 legislative proposals jointly designed to deliver on the targets of the European Green Deal, namely to decrease GHG emissions by at least 55% (compared to 1990 levels) by 2030, and to achieve climate neutrality by 2050. Particularly relevant for the EII ecosystem within this package is the proposal to strengthen and extend the EU Emission Trading System (ETS), which includes a substantial increase in the size of the Innovation Fund. Furthermore, the proposed EU Carbon Border Adjustment Mechanism – covering the iron and steel, cement, fertiliser, aluminium and electricity sectors – would address carbon leakage and increase global ambition on climate change mitigation. Finally, the proposed amendment of the Renewable Energy Directive not only increases the renewable energy target to 40%, but it also puts

1 A more detailed explanation of the ecosystem is provided in Annex 1.

2 The modelling underlying the Commission's policy proposals for delivering the European Green Deal calculates that industry's emissions of around 600 million tonnes CO₂-eq. in 2015 would have to decrease by around 23% by 2030. The in-depth analysis accompanying the EU Long-Term Strategy estimated that reductions of at least 95% by 2050 are in line with the economy-wide climate neutrality target now enshrined in the European Climate Law.

in place a certification system for renewable hydrogen and mandates quotas for renewable hydrogen consumption in industry and transport.

Starting in March 2020, and driven mainly by demand shocks in downstream industries, annual production in the EU EIs dropped significantly in 2020. In 2021, the recovery, though supported by increasing consumer spending and government recovery packages, remains uneven across the EI ecosystem. The recent increases in producer prices in the course of 2020 and 2021 have particularly impacted energy and raw materials, sectors on which European countries are highly dependent on supply from third countries.

The update of the EU Industrial Strategy published in May 2021 highlights the need to accelerate the green and digital transition of EU industry and its ecosystems. In the consultation process on Energy Intensive Industries ³, stakeholders were invited to provide solutions to improve the strategic autonomy of the ecosystem as well as its environmental and social performance. The consultation stressed insufficient investments into strategic raw materials, the highly concentrated supply structures and the insufficient respect of environmental and social standards. Proposed possible actions aimed in particular at promoting low-carbon technologies and circular models for the reuse of waste. Strong focus was also given to the digitalization of the ecosystem, especially cybersecurity concerns, digital skills as well as the improvement of production processes through digital solutions.

Energy Intensive Industries (EII) and the Recovery and Resilience Facility (RRF): The needs of this ecosystem are targeted directly by countries' Recovery and Resilience Plans (RRPs) through EII-related measures in broader components, as the RRF Regulation provides that each Member State must devote 37% of its total allocation to measures that support the green transition ⁴.

Main figures and findings⁵:

Number of Member States' RRP analysed: **22 (approved plans)**

12 Member States have included in their RRP measures covering the energy-intensive industries ecosystem.



Total direct investments in the energy intensive industries ecosystem are EUR 6.7bn. This represents 1.5% of the total RRP amount.

Please note that figures for energy-intensive industries presented in this fiche are based on GROW tagging methodology and ecosystem definition and take into account the 22 plans approved by the Commission and endorsed by the Council in 2021.

³ COM SWD (2021)277 final. For a resilient, innovative, sustainable and digital energy-intensive industries ecosystem: Scenario for transition pathway

⁴ The Recovery and Resilience Plans are composed of reforms and investments, grouped into coherent components. Each component should reflect related reform and investment priorities in a policy area or related policy areas, sectors, activities or themes, aiming at tackling specific challenges, forming a coherent package with mutually reinforcing and complementary measures.

⁵ Based on DG GROW ecosystem methodology detailed in Annex 1.

The **examples** highlighted below provide concrete cases of the expected impact for a selection of measures ⁶:

Several Member States plan to support breakthrough innovation as well as the deployment of advanced technologies to decarbonise the EII via research and innovation instruments. The scope of these research and innovation investments range from improving the energy efficiency of processes and decarbonising industry's energy mix up to deploying carbon-free processes and carbon capture, storage and use. **Spain** will set up an energy storage R&D centre to develop solutions for industrial hydrogen applications, including production, storage and transport of green hydrogen (estimated cost EUR 82m), whilst **Greece** will support the development of the first CO₂ storage facility in Greece (estimated cost EUR 300m). **Estonia** will set up a Green Fund to support firms whose products, services or processes are characterised by research-intensive green technologies and can contribute to decarbonising industry. **France** will ramp up existing technologies solutions as well as disruptive technologies to improve the energy efficiency of processes, decarbonising industry's energy mix (especially heat), and deploying carbon-free processes and carbon capture and storage or use (e.g. demonstrators, patenting and bringing to market innovations). **Germany's RRP** will contribute to funding a programme for decarbonisation in industry (estimated cost EUR 450m). The objective of the measure is to help industry shift from highly emission-intensive production processes to low GHG processes, targeting companies in energy-intensive industries with GHG emissions emanating from the production process covered by the EU emissions trading scheme (in particular, steel, cement, lime, chemicals, non-ferrous metals, glass and ceramics).

In parallel, a number of investments will provide incentives for firms to use clean technologies in industrial processes. Several RRP include actions to reduce the energy consumption and GHG emissions of industrial companies and support SMEs and large firms increase energy efficiency in their industrial processes. **France** will help the decarbonisation of the industrial sector, responsible for around 21% of GHG emissions in France, supporting projects that cover either energy efficiency of industrial companies (including energy-intensive industries) or investments to improve industrial processes in order to reduce GHG emissions. **Croatia** will finance productive investments in green technologies that contribute to an energy and resource efficient economy in energy-intensive industries, including metalworking, textile, food, chemical, construction and woodworking industries. **Slovakia** will set up an industry decarbonisation scheme to reduce the greenhouse gas emissions through project support to industrial enterprises (estimated cost EUR 362.7m) and **Romania's RRP** will contribute to improve energy efficiency in the industrial sector, such as reducing energy consumption, developing systems to digitise energy consumption metering, and increasing energy and heat self-consumption (estimated cost EUR 64m).

Some Member States have the intention to **promote hydrogen projects specifically targeted to reduce carbon emission in the energy-intensive industry ecosystem.** **Germany** will support integrated projects along the entire hydrogen value chain; the objectives are to build large electrolysis capability (up to 500MW of electrolysis capability) and support German and European hydrogen transport and storage infrastructure (estimated cost EUR 1 500m). **Italy** will develop initiatives to use hydrogen in industrial sectors that use methane as an energy source for thermal energy (cement, paper mills, ceramic, glass industries, etc.). **Austria** will promote integrated projects along the hydrogen value chain, especially covering hydrogen production, storage and applications, focusing in particular on energy-intensive industrial and mobility sectors that are difficult to decarbonise (estimated cost EUR 125m). **France** will also contribute to develop French value chains for the production of renewable and low-carbon hydrogen, and for the use of this hydrogen in downstream, end-use sectors, such as transport and industry.

In addition, **Member States have also included reforms to accompany the proposed investments**, such as improving the legislative framework to facilitate investments in energy efficiency in industry and increase the resilience of the industrial sector. As such, **Romania** will put forward a comprehensive reform to reduce the

⁶ Using quantitative data extracted from the Milestones & Targets reported in the annexes to the Council Implementing Decisions approving the National Recovery and Resilience plans of the Member States.

energy intensity and to boost energy efficiency in industry. The reform intends to remove obstacles to energy performance contracting, introduce market surveillance for energy efficiency to ensure product compliance with eco-design standards, to create a monitoring system for the implementation of the recommendations from energy audits in the ETS sectors and to introduce new standards for green financial instruments. **Slovakia** will adopt a competitive scheme for the reduction of greenhouse emissions in industry that will support the uptake of the best currently available technologies in industrial processes, targeting low carbon processes and technologies in industry and the adoption of energy efficiency measures.

ANNEX I – Description of the Energy Intensive Industry Ecosystem

The Energy-Intensive Industries (EIs) ecosystem covers a broad range of sectors such as chemicals, steel, paper, plastics, mining, extraction and quarrying, refineries, cement, wood, rubber, non-ferrous metals, glass and ceramics⁷. They also supply intermediate products to each other and to many downstream sectors of the economy, are closely integrated with energy providers as well as with the waste and recycling industries due to their need for secondary raw materials.

When measures in the RRP facilitate the green transition of some of those sectors, they are tagged as related to the EI ecosystem. This means that all the measures linked to the decarbonisation of EI industries are included.

The EIs fiche includes the investments and reforms related to many different mature technical options to move to net-zero emissions, depending on the industry: more energy efficient, digitalised processes; direct use of renewable resources; electrification; the use of clean hydrogen, sustainable biomass and sustainable bioenergy as a renewable feedstock or energy source to replace fossil fuels; carbon capture, utilisation and storage; increased circularity to retain material value and reduce the need for primary raw materials extraction; etc.

In addition, some measures have been identified as aimed mainly at improving the EI ecosystem. In this sense, EIs require significant investments into research and innovation, so all those activities have been counted as relevant for the ecosystem and included in the fiche.

Besides the challenge of reducing its own greenhouse gas (GHG) emissions, the EI ecosystem also has a role to play as an enabler of decarbonisation in other ecosystems, considering the whole life cycle of products and services used. However, this fiche describes exclusively measures impacting EI industry; therefore, measures related to transport or the renovation wave are already covered by other ecosystems and should not be listed here (e.g., battery-related measures or renovation of buildings will not be included).

7 As defined in the [ASMR 2021](#) (SWD(2021)351) accompanying the communication on “[Updating the 2020 New Industrial Strategy](#)” (COM(2021)350)