European Commission

State of play: May 2025

INNOVATION FUND
projects in Belgium

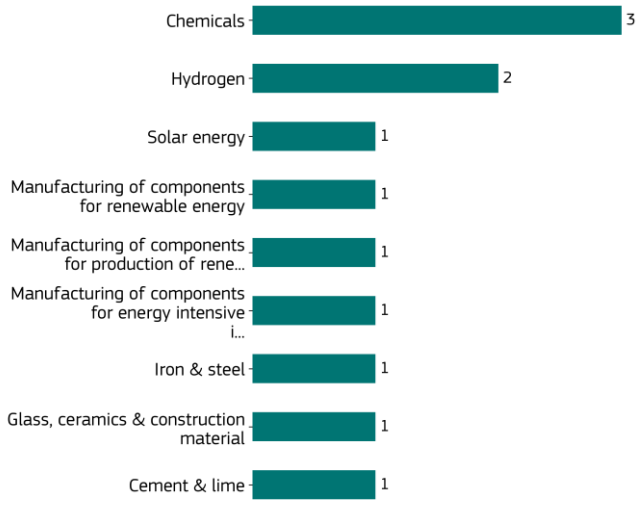
Funded by revenues from the EU Emissions Trading System (EU ETS), the Innovation Fund aims to encourage companies and public authorities to invest in cutting-edge low-carbon technologies with significant potential for reducing greenhouse gas (GHG) emissions in the European Economic Area (EEA). The Fund awards projects through calls for proposals and auctions[1].

Innovation Fund Calls

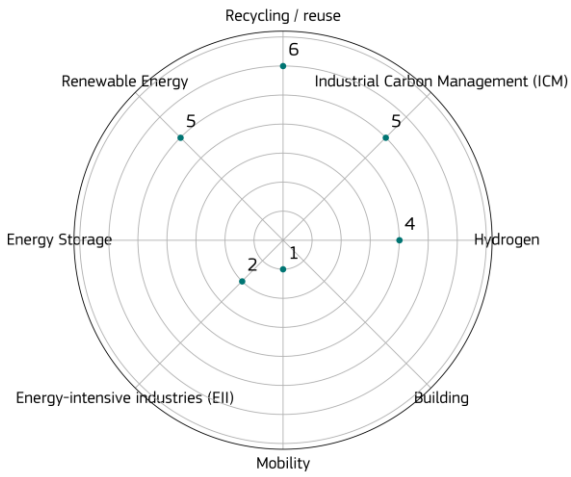
Currently, the Innovation Fund supports 12 project(s) (partially or fully)[2] implemented in Belgium with a total grant amount of EUR 1.2 billion. Their cumulative capital expenditure (CAPEX) is approximately EUR 5.5 billion.

These projects contribute to decarbonising European industries. Over their first ten years of operation, they are expected to reduce GHG emissions by 92,371,586 t CO_2 equivalent.

Projects per sector
Number of projects



Technology pathways[3] in the country
Number of projects



[1] *The figures presented are only for ongoing funded projects. Information on closed or terminated projects is only included under the funded projects table (when applicable). For definitions of ongoing, closed, and terminated projects, check the glossary on the last page of this document.*

[2] *"Partially" refers to projects located in multiple locations. For projects in multiple locations, the budget and GHG abatement have been attributed to the main country of implementation chosen by the project. See table below "List of awarded Innovation Fund projects" for detailed information.*

[3] *A project can choose multiple climate mitigation pathways and, therefore, have multiple technology pathways.*

Innovation Fund Auctions

Currently, the Innovation Fund doesn't support project(s) in Belgium yet.

Awarded Innovation Fund projects in Belgium

Net-zero technology projects

Acronym[4]	Title	Topic	Sector	Starting date	Participants	Expected GHG emission avoidance (t CO_2e)	Innovation Fund grant (EUR million)
Kairos-at-C	Kairos-at-C, Building strong momentum for massive decarbonisation in the EU through a unique end to end CCS project	InnovFund-LSC-2020-two-stage-2	Chemicals	01/11/2020	Air Liquide | AL Maritime | BASF ANTWERPEN	13,959,782	356.9
CO2ncrEAT	Cement-free building products with negative carbon footprints by using CO2 gas and by-product from respectively Lime and stainless steel plants	InnovFund-2021-SSC	Glass, ceramics construction material	01/06/2023	LHOIST | PREFER | FLUXYS | ORBIX	190,967	4.3
GO4ZERO	Towards a carbon negative large-scale clinker plant through first-ever demonstration of a groundbreaking flue gas recirculation concentration-based concept paired with a full CCS solution	InnovFund-2022-LSC-01-GENERAL	Cement lime	01/01/2024	AL E | Holcim BE | Air Liquide	10,045,932	230.0
GIGA-SCALES	GIGA-watt SCaling of advanced ALkaline water Electrolyser Separators	InnovFund-2022-LSC-03-MANUFACTURING	Manufacturing of components for production of renewable energy or energy storage	01/04/2023	AGFA	6,129,995	11.0
N2TR	NextGen Thermal Tire Re-use	INNOVFUND-2023-NZT-PILOTS	Chemicals	01/04/2025	Bolder Belgium | Bolder LLC.	587,776	32.3
H2BE	H2BE: the first 1GW low-carbon H2 production facility to enable and accelerate industrial decarbonisation, critical H2/CO2 infrastructure realisation and H2 market development in Northern Europe.	INNOVFUND-2023-NZT-GENERAL-LSP	Hydrogen	01/02/2025	ELECTRABEL | EQUINOR ASA	12,806,608	159.0
ZESTA	Zero Emission Steelmaking at ArcelorMittal	INNOVFUND-2023-NZT-GENERAL-LSP	Iron steel	01/04/2025	VESTAS | AMB | Storm Windpower	32,128,575	262.1
ENHANCE	European Network for Hydrogen and	INNOVFUND-2023-	Hydrogen	01/05/2024	E Poland | E France | ALLY |	3,302,226	110.0

[4] *Project with multiple implementation locations (in italics): the expected GHG emission avoidance and Innovation Fund grant refer to the entire project total, not the part in this country. This data is not included in the aggregated data for the country as presented above under 'Innovation Fund Calls'.*

Acronym[4]	Title	Topic	Sector	Starting date	Participants	Expected GHG emission avoidance (t CO_2e)	Innovation Fund grant (EUR million)
	Ammonia Carbon-Neutral Energy - Gateway for Hydrogen	NZT-GENERAL-LSP			ALIBV | E Germany | ALIB		
FUTURE	Food waste Upcycling for Transformative Utilization in Renewable Environmental lactic acid	INNOVFUND-2023-NZT-PILOTS	Chemicals	01/04/2025	3PLW	82,438	9.5
CircularSteam	Demonstration of modular 50 MW manufacturing plant for industrial steam heat pumps to decarbonize small - to - medium scale EU ETS I II facilities	INNOVFUND-2023-NZT-MANUFACTURING	Manufacturing of components for renewable energy	01/04/2025	Armstrong	1,378,476	4.7
Floating Sky	Floating Sky: FUSIO demonstrator	INNOVFUND-2023-NZT-GENERAL-SSP	Solar energy	01/04/2025	CIEL ET TERRE | TISOL	20,702	3.2
GRAND PIANO	GeneRating and UpscAling iNnovation in green hyDrogen Production: boostIng PEM and AEM techNologies in EurOpe	INNOVFUND-2023-NZT-MANUFACTURING	Manufacturing of components for energy intensive industries	01/05/2024	BEKAERT	11,738,109	23.6

Participants from Belgium in projects implemented in other country/countries

Acronym	Title	Topic	Country(ies) of implementation	Participants	Sector	Expected GHG emission avoidance (t CO_2e)	Innovation Fund grant (EUR million)
Volta Project	Hybrid mid-sized pilot furnace for flat glass	InnovFund-2022-LSC-04-PILOTS	CZ	AGC CZECH | AGC | SGG	Glass, ceramics construction material	92,500	12.2
ACCSION	ACCSION - Aalborg Portland Carbon Capture and Storage using Infrastructure Onshore in North Jutland	INNOVFUND-2023-NZT-GENERAL-LSP	DK	AL E POLAND | AL E FRANCE | AP | AL Denmark | ALI BV | AL E GERMANY | ALIB	Cement lime	15,077,949	220.1

Project overview

Acronym	Title	Abstract
Kairos-at-C	Kairos-at-C, Building strong momentum for massive decarbonisation in the EU through a unique end to	The main objective of the Kairos@C project is to create the first and largest cross-border carbon capture and storage (CCS) value chain to capture, liquefy, ship and permanently store CO2. Located in the Port of Antwerp, Kairos@C will establish a regional hub for innovative energy and carbon value chains. Kairos@C will develop a full industrial-scale CCS project that will encompass the CO2 capture from various industrial sources on the Zandvliet industrial platform, the CO2 transport by pipeline to the liquefaction and export terminal located in the same port, the shipping towards CO2 subsea storages in the North Sea and the permanent sequestration of the CO2 in these storages. The infrastructure in the Port of Antwerp will be built in a

Acronym	Title	Abstract
	end CCS project	phased approach and will be scalable. Kairos@C will enable the deployment of several pioneering technologies that together have the potential to avoid the emission into the atmosphere of 14 Mt of CO2 over its first ten years of operation. Among the project innovations are: a cryogenic CO2 capture process at industrial scale; an energy efficient CO2 liquefaction plant, with ten times the capacity of the largest CO2 liquefaction unit in operation today; and the development of a major functioning cross border shipping and storage CCS chain. The first major innovation is the deployment of CryocapTM, a cryogenic CO2 capture process, at industrial scale. This process enables the transition to a zero-carbon energy system as it consumes mainly electricity and it can use renewable electricity. The integrated multi-feed capture scheme will integrate CO2 capture and purification from five different sources located on the Zandvliet industrial complex: two hydrogen (H2) plants, two ethylene oxide (EO) plants, and one ammonia (NH3) plant. The project will focus first on the more concentrated CO2 emissions in the process streams, i.e. those generated as a by-product in a chemical process (ammonia and ethylene oxide) for which no alternative or costeffective low-carbon technology is available. This is a very cost-effective phased approach (vs full capture upfront investment), starting with the more concentrated emissions in the process streams and allowing integration of future expansions at a later stage. The second innovative element of the project is the use of an energy efficient liquefaction plant at a scale not realized before (ten times the capacity of the largest CO2 liquefaction unit in operation today) and tailored to the needs of the Antwerp port. The third innovative element is the development of liquid CO2 vessels on a hitherto unavailable scale, whereby the main innovation lies in an appropriate design and steel grade able to withstand both the pressure and weight of liquefied CO2. Kairos@C is a prominent example of Sustainable Energy Technology (SET) Plan strategy implementation, which looks for clusters and hubs linking a range of carbon and energy intensive industries to increase synergies. The project will support the Port of Antwerp in becoming a regional hub for innovative energy and carbon value chains. The project will also contribute to maintaining and reinforcing European industry's global competitiveness, in line with the EU Industrial Strategy. Kairos@C will be the first and largest reference for a cross-border liquid CO2 value chain in a multi-user environment due to a series of factors. First, Antwerp is the second largest European port (after Rotterdam) and fourth largest European industrial cluster. In addition, the BASF site located in the Port of Antwerp is the largest integrated chemical production complex in Belgium, where Air Liquide owns and operates two world scale hydrogen production units on which capture units will be added. Kairos@C will benefit from the synergies with the Antwerp@C initiative, such as the use of shared CO2 infrastructure within the port of Antwerp. Kairos@C is also a flagship project in terms of supporting decarbonisation of hard-to-abate sectors t
CO2ncrEAT	Cement-free building products with negative carbon footprints by using CO2 gas and by-product from respectively Lime and stainless steel plants	The objective of the CO2ncrEAT project is to contribute to the decarbonisation of the European construction sector, offering a new line of carbon negative precast materials, such as masonry blocks. This project offers a sustainable and environmentally sound alternative to the concrete manufacturing process that is traditionally used for those blocks. Instead of the traditional aggregates and binders used in masonry blocks, the new CO2ncrEAT process will reuse residues from slag recycling centres and CO2 captured from the exhaust gases of a lime manufacturing process. The project will lead to a relative greenhouse gas emissions avoidance of 176% compared to the reference scenario. Carbstone Technology® is a patented process developed by Orbix Solutions to produce precast elements for the construction sector. This is done through the combination of recycled by-products from the stainless steel industry and CO2 as binder. Thanks to the close collaboration between the members of the consortium, this technology will be adapted to directly use the industrial fumes from the lime kilns of Lhoist. CO2ncrEAT will use CO2 without purification or liquefaction. The energy needs of the process will be therefore greatly reduced and the masonry blocks will store more CO2 eq than the GHG emissions emitted during the manufacturing process. Based on an annual production of 130 000 tonnes of eco-friendly and durable blocks, in terms of greenhouse gas emissions avoidance CO2ncrEAT will avoid more than 190 000 tonnes of CO2 equivalent over its first ten years of operation.The foundation of the CO2ncrEAT project lies in the development of a strong local circular economy. The lime produced by Lhoist is used (outside the project) by the stainless steel industry in their production process (for purification purposes). The slag that is a by-product of stainless steel production is used by Orbix Solutions, which ensures the recovery of the carbonated mineral material. This will then become the raw material used for the manufacture of the carbonated masonry blocks by Prefer. The CO2 needed for the carbonated block is produced during the lime production by Lhoist and transported to the production plant by pipeline, which will built and operate by Fluxys Belgium. CO2ncrEAT will enable the four project partners to ensure the sustainability of their local businesses by offering a unique and innovative solution, in line with European climate objectives. Once implemented, the consortium will focus on the development of other types of precast products for the construction sector. This pioneering project can be easily replicated in Europe.
GO4ZERO	Towards a carbon negative large-scale clinker plant through first-ever demonstration of a groundbreaking flue gas recirculation concentration-based	The GO4ZERO project aims to put into operation an innovative pollutant free and carbon negative clinker kiln in the Holcim Obourg plant located in Wallonia, Belgium. The project will couple an oxy-combustion process with a large-scale carbon capture and sequestration system (CCS). The oxyfuel clinker kiln design significantly concentrates CO2 in its flue gases and, CO2 processing technologies, will make the project excel in carbon capture and purification. The processed CO2 will be transported by pipeline to the Antwerp@C CO2 Export Hub, where it will be liquefied and loaded onto CO2 ships for permanent and safe offshore storage beneath the North Sea. The project is expected to have 103% avoidance in relative greenhouse gas (GHG) emissions when compared to the reference scenario without implementing Carbon Capture and Sequestration. The project will combine several innovative technologies to produce a carbon negative clinker, ultimately supporting the construction sector in improving its sustainability. The CO2 intensity

Acronym	Title	Abstract
	concept paired with a full CCS solution	per tonne of clinker will be below the European benchmark value prior to carbon capture through low heat consumption, optimised combustion and gas recirculation conditions, as well as intensive use of alternative high-biomass content fuels and decarbonised raw materials. The cement portfolio will be further developed to reduce the embedded clinker factor (the amount of clinker in cement) and to push the use of new mineral components in substitution to clinker and slag. The plant will also contribute a very low level of indirect carbon emissions from energy input. This will be achieved through a combination of sourcing energy from a locally developed 30 megawatt (MW) floating photovoltaic farm, secured electricity through Power Purchase Agreements (PPAs), and the installation of a Waste Heat Recovery, yearly producing 50 gigawatt hours (GWh) of energy. Additionally, to reach the inlet gas specifications of the cryogenic purification unit (CPU), the design of the oxyfuel kiln is combined with cleaning technologies for flue gases, the combination of which will be the first of its kind (including a wet scrubber, thermal oxidiser, and selective non-catalytic reduction (SNCR)). A cooling condensing unit will extract water from the kiln gases and send it to a condensate treatment plant to comply with strict wastewater disposal conditions. The project is planning to produce annually more than 2.3 million tonnes (Mt) of carbon neutral cementitious materials - mainly cement, but also clinker - pioneering work on the path to a sustainable construction sector. It will also avoid more than 10 million tonnes CO2 equivalent of absolute GHG emissions over the first ten years of operation. The project will contribute to the European objectives to reach climate neutrality by 2050, and in particular to the Net-Zero Industry Act to reach 50 Mt per year of CO2 storage capacity in 2030. The dissemination of the project results, developed knowledge and lessons learned, will directly benefit all stakeholders throughout the project lifecycle, accelerating the roll-out of the oxyfuel process combined with an efficient Carbon processing unit. The project is expected to create 18 direct jobs for the oxyfuel kiln, auxiliaries and the CPU and 54 indirect jobs.
GIGA-SCALES	GIGA-watt SCaling of advanced ALkaline water Electrolyser Separators	The GIGA-SCALES project will establish a pioneering industrial-scale hydrogen membrane production plant, with up to 20 gigawatt (GW) capacity. The project introduces the latest generation of ZIRFON membranes which can boost stack electrical efficiency and reduce renewable electricity needs for electrolytic hydrogen production. This technology is expected to achieve 100% relative greenhouse gas avoidance compared to the reference scenario. Centrally located in Europe near major hubs and ports, the manufacturing plant will strategically anchor the value chain, ensuring reliable short-term supply to regional and European electrolyser manufacturers. The GIGA-SCALES project is a first-of-a-kind commercialisation of hydrogen membrane production and represents a major step towards a more ecologically responsible future. The project has an unmatched production scale of 20GW, and includes automated, defect-free production lines specifically designed to overcome current bottlenecks. This, plus the use of the highly efficient ZIRFON membranes, will reduce the Levelised-cost-of-hydrogen (LCoH) while setting new industry benchmarks. With the planned entry into operation already set for October 2025, the project will avoid an estimated 6.13 million tonnes of CO2 equivalent greenhouse gases over the first ten years of operation. Its energy-efficient practices are projected to save a total of 157 terawatt-hours (TWh) of renewable electricity, which is equivalent to an additional greenhouse gas emission reduction of 27.60 million tons of CO2 equivalent. The project is located in the heart of Europe's value chain, in the Northern part of Belgium, 10km from the Port of Antwerp-Bruges and 100km from the Port of Rotterdam, two major hotspots for future large-scale hydrogen production and distribution. The project has potential to advance the EU's clean tech hydrogen manufacturing leadership by shifting from pilot to full-scale production. This augments the value chain by answering industry hesitations with substantial membrane production, lowered hydrogen costs, and stakeholder collaboration. The project is set to create between 1000 and 2000 direct and indirect jobs in various sectors. By enhancing renewable hydrogen production and reducing costs, the initiative attracts businesses and investments, enhancing local and regional economies. Moreover, it opens broader integration of renewable hydrogen technologies, unlocking further potential for scalability and impact. By using new technology, cutting harmful emissions, and bringing social and economic advantages, the project moves us towards a more environmentally friendly future.
N2TR	NextGen Thermal Tire Re-use	The project aims to demonstrate that it can produce high-quality recovered carbon black commercially while minimising carbon deposits. Its pioneering continuous pyrolysis pilot plant will test a new decarbonisation technique for processing end-of-life tyres mainly used to produce recycled carbon black and pyrolysis oil. This innovative solution will increase energy efficiency and reduce greenhouse gas (GHG) emissions by up to 85% compared to virgin carbon black production. The resulting recovered carbon black is comparable to semi-reinforcing grades of commercial carbon black, with a predictable quality. A few companies have initiated tyre pyrolysis operations to recover both tyre pyrolysis and recovered carbon black, but the industry is still in its infancy, with low annual production volumes. Using a unique tyre pyrolysis process already verified and certified in the United States, N2TR's large-scale reactor plant will be able to recover both pyrolysis oil and carbon black. The plant is predicted to process 36 000 million tonnes of end-of-life tyres per year while maintaining consistent quality of carbon black and pyrolysis oil. The project will have four reactors working together in monthly operational cycles to achieve this production, allowing for a minimal production of 4 million tonnes per hour. Furthermore, the project addresses the ash content issue, a significant barrier to incorporating recovered carbon black in the tyre rubber market. The project is expected to achieve a GHG emission avoidance of 606 557 tonnes CO2e over its first ten years of operation. This reduction is comparable to removing approximately 131 000 cars from the road or powering around 73 000 homes for a year.

Acronym	Title	Abstract
		The project supports NextGenerationEU and RePowerEU plans to create a more sustainable and resilient Europe and will contribute to reducing net GHGs by 2030. The production of carbon black in Antwerp will reduce Europe's reliance on imports, promoting greater energy independence. Furthermore, the project contributes to the Circular Economy Action Plan by extracting and reusing carbon black and pyrolysis oil to produce new tyres, thereby closing the loop and promoting a circular economy. N2TR is expected to significantly impact the regional economy, creating approximately 54 direct jobs to operate the greenfield pilot plant. Additional job creation is anticipated among feedstock suppliers providing quality tyre chips to the facility. The project has the potential to create a circular value chain, engaging tyre manufacturers, waste collectors, and other stakeholders in the collection and processing of end-of-life tyres. The pilot plant's design allows for collaboration with one or more tyre manufacturers, enabling the allocation of one or more reactors to a specific partner.
H2BE	H2BE: the first 1GW low-carbon H2 production facility to enable and accelerate industrial decarbonisation, critical H2/CO2 infrastructure realisation and H2 market development in Northern Europe.	The project aims to establish a novel low-carbon hydrogen production facility along the Ghent-Terneuzen canal in Belgium. Low-carbon hydrogen (emitting less than 1.5 kg CO2 per kilogram of hydrogen) could replace fossil-based hydrogen and natural gas used in energy-intensive and hard-to-abate industries, thereby facilitating targeted decarbonisation initiatives in steel, chemical and heat/power companies. The facility could supply over 210 000 tonnes of hydrogen annually by 2030, supporting Northwest Europe's emergent hydrogen value chain. The project will achieve a relative greenhouse gas (GHG) emission avoidance of 94% over its first ten years of operation compared to the reference scenario. In terms of scale, the project will be the first of its kind in Europe to incorporate and combine proven state-of-the-art technologies for low-carbon hydrogen production. H2BE will demonstrate an energy-optimised, scalable and flexible design system for 1 gigawatt (GW) auto-thermal reforming (ATR) hydrogen plants. The integrated point-source carbon capture system will catch over 95 % of the carbon during production. The captured carbon will then be transported to be safely and permanently stored under the seabed on the Norwegian continental shelf. The project has a GHG emission avoidance potential of 12.8 million tonnes of CO2e over its first ten years of operation compared to the reference scenario. The project aligns with Europe's objectives to become climate-neutral by 2050 and reduce net GHG emissions by at least 55% by 2030. It contributes to the European Green Deal and its initiatives, notably the Net-Zero Industry Act and the REPowerEU Plan, by scaling up the domestic production of low carbon hydrogen to decarbonise hard-to-abate industries and deploying CO2 capture and storage capacity in Europe. It could also contribute to Europe's strategic autonomy by anchoring Belgium as a hydrogen and CO2 transport hub in the energy ecosystem. H2BE will accelerate the kickstart of the European hydrogen market by providing large volumes of low carbon hydrogen and serve as a key building block to deploy crucial hydrogen and CO2 infrastructure in Belgium. H2BE can contribute to Belgium's reindustrialisation by securing its industrial competitiveness and generating growth. The project could create up to 7 500 new jobs in the country, including approximately 220 employees in the H2BE plant. The future-proof design can be replicated on large industrial areas in other countries, such as the Netherlands, France, and Germany, with similar characteristics to H2BE (high hydrogen demand, proximity to North Sea, developing hydrogen infrastructure) further advancing the hydrogen economy.
ZESTA	Zero Emission Steelmaking at ArcelorMittal	The project will transform the steelmaking operations of ArcelorMittal in Ghent by replacing one of the two existing Blast Furnaces (BFs) with a new Direct Reduction Plant (DRP) and two Electric Arc Furnaces (EAFs). The project includes a 5-megawatt (MW) electrolyser to produce hydrogen for a new gas hub and carbon capture technologies to capture the remaining emissions from the DRP. The new installation will use hydrogen or natural gas as reducing agents instead of coal or coke. Reducing agents can remove oxygen from iron ore, allowing the iron to be extracted and converted into pure metal. In addition, the remaining BF will be retrofitted to enable the use of hydrogen-rich metallurgical gases sourced from a new gas hub. ZESTA aims to achieve a relative greenhouse gas (GHG) emissions reduction by 76% in its first ten years of operation compared to the conventional BF-BOF steelmaking route. The project goes beyond the state-of-the-art in the steel industry by creating a steel plant operating BF and DRP metallurgical routes. The DRP will be operated in a hybrid manner as it allows for hydrogen input and is also equipped with carbon capture equipment. The development of predictive metallurgic software tools will enable the efficient use of low-quality scrap materials without compromising the quality of the produced steel. ZESTA will allow future electricity grid balancing by flexibly operating the EAFs and electrolysers. Over its first ten years of operation, it will save 32 million tons CO2eq. ZESTA supports the steel industry transformation and contributes to Europe's ambitious climate targets. It will also help increase European resilience by developing clean tech solutions involving hydrogen use in steelmaking operations and Carbon capture and storage (CCS) technologies. The project's implementation will create direct and indirect regional job opportunities. As ArcelorMittal considers rolling out the concept to its other plants and steel producers, ZESTA is also expected to trigger direct and indirect employment at the European level. Thus, ZESTA will be key in transitioning to a sustainable European steel industry.
ENHANCE	European Network for Hydrogen and Ammonia Carbon-Neutral Energy - Gateway for Hydrogen	Air Liquide's strategic project aims at producing gaseous hydrogen through thermo-catalytic cracking of ammonia and at deploying a hydrogen liquefaction installation in the Port of Antwerp-Bruges. The project will replace natural gas with sustainable energy to produce gaseous and liquid hydrogen, which will allow the project to have 98% relative GHG emissions avoidance compared with the reference scenario.

Acronym	Title	Abstract
		The project will retrofit an existing steam methane reformer into an ammonia cracker. The project will also build a hydrogen liquefier based on Air Liquide's proprietary cryogenic technology. The design of the plant includes a specific focus on efficiency, reliability and minimum land use. The project will support the possibilities of importing hydrogen from long distances using ammonia as an intermediary energy carrier. ENHANCE will be one of the first landing grounds for the conversion of ammonia into hydrogen in Europe. The project plans to reduce CO2 emissions (in terms of absolute emissions avoidance) by more than 3 000 000 tonnes during the first 10 years of operation. The import of sustainable hydrogen through ENHANCE will benefit the industry and mobility sectors to decarbonise and it plans to contribute by 0.5% to the Repower EU goals , as well as to contribute to FuelEU Maritime and ReFuel Aviation goals of deploying sustainable fuels in the transportation sectors. Ultimately, the project will contribute to Europe's aim to be climate-neutral by 2050. ENHANCE will support the creation of an ammonia-to-hydrogen import value chain in the Port of Antwerp-Bruges. Based on typical ratios for sustainable hydrogen production jobs, the value chains of the project could potentially support more than 15 direct jobs and 2,500 indirect jobs, shared between different parts of the value chain, from production of electrolysers components to distribution through pipelines and with liquid hydrogen trailers.
FUTURE	Food waste Upcycling for Transformative Utilization in Renewable Environmental lactic acid	The project aims to build and operate a pilot installation in the Port of Antwerp (Belgium), introducing a new technology capable of converting food waste into high-purity lactic acid (LA). LA is then used to produce polylactic acid (PLA), a biodegradable bioplastic. The key innovation lies in the newly developed bioconversion, combined with fermentation and purification processes, eliminating the need for sugar-rich crops and slaked lime. FUTURE's process significantly avoids conflict with local food supply chains and reduces non-sustainable by-products and associated emissions of current production processes. The project aims to produce 4 103 tonnes of polymer-grade LA annually while avoiding 95% of greenhouse gas (GHG) emissions compared to the reference scenario. It is a highly effective solution for reducing climate impacts in the plastics industry. FUTURE addresses the food versus chemicals dilemma by using food waste instead of food crops as feedstock. The technology is unique in its ability to start from food waste and produce high-purity LA without generating gypsum by-products, making it more sustainable and cost-effective compared to current LA production processes. The project will employ a standalone facility model, enhancing operational flexibility and scalability. By focusing on recycling, circularity, and the use of renewable energy, FUTURE will contribute to significant GHG emissions avoidance. The project is expected to avoid 82 438 tonnes of CO2 emissions over its first ten years of operation, the equivalent emissions of approximately 17 000 conventional cars. FUTURE addresses key European policies, including the European Green Deal, the Circular Economy Action Plan, and the Renewable Energy Directive. By valorising food waste and producing sustainable bioplastics, the project supports Europe's goals of reducing waste, lowering GHG emissions, and promoting resource efficiency. It also contributes to Europe's strategic autonomy in industrial supply chains by reducing dependence on imported raw materials and fossil-based plastics. The project will significantly impact the local and regional economy by creating jobs and facilitating the development of business clusters and new value chains focused on sustainable waste management and bioplastic production. The project aims to create 27 direct and 62 indirect local jobs. By involving nearby feedstock suppliers, manufacturers, and service providers, the project will add value to the regional economy and enhance the resilience of the European economy. FUTURE plans to replicate the technology at multiple European sites, leading to further efficiency gains and cost reductions. The project's scalability potential could enable the widespread adoption of sustainable bioplastic production and contribute to a more sustainable economy.
CircularSteam	Demonstration of modular 50 MW manufacturing plant for industrial steam heat pumps to decarbonize small - to - medium scale EU ETS I II facilities	CircularSteam will build a facility in Belgium to manufacture up to 50 MW of high-temperature heat pumps yearly. These heat pumps, based on Armstrong's Circular Thermal® design concept, can generate superheated water or low-pressure steam up to 120°C that can be used for industrial applications. The project's heat pumps will also reuse the process waste heat – thus reducing the primary energy need by up to 70% and reducing the operation costs. The project will completely avoid relative greenhouse gas (GHG) emissions compared to the reference scenario, assuming that heat pumps will use renewable electricity. The deployment of heat pumps produced by the project can be a practical approach to decarbonising industrial heat up to 200°C and decreasing energy costs for the industry. CircularSteam will produce heat pumps using a novel technology based on the combination of a new compressor and a new refrigerant, which is safe, reliable, energy-efficient and has an ultra-low environmental impact in terms of GHG emissions. The generation of steam is achieved either through the use of a remote steam evaporator or through a new integrated steam-generating refrigerant condenser. The new manufacturing facility will be fully decarbonised as it will use renewable electricity and heat. It will allow for modular replicability and improved productivity through manufacturing best practices and automated information management. The factory will have its own test bench for testing the manufactured heat pumps and demonstrating the technology to visitors. Over its first ten years, the project will avoid 1.3 million tons of CO2 at end-user sites across multiple industrial sectors in Europe, such as food

Acronym	Title	Abstract
		and beverage, pharmaceuticals and chemicals. For reference, a 1 MW industrial heat pump allows a GHG reduction equivalent to the one of 500 domestic heat pumps. In total, the use of industrial heat up to 200°C represents an estimated 5% of Europe's GHG emissions. More than 30 000 industrial companies in Europe could benefit from CircularSteam's technology for a total potential of 100 000 MW heat pump deployment. In addition, the project will also help increase Europe's energy autonomy by using renewable energy instead of imported fossil fuels and improve its industrial competitiveness by decreasing the energy costs for manufacturing in Europe. The project will create 77 direct jobs and more than 300 indirect jobs across the European value chain, including equipment suppliers, energy auditors, engineering companies, project managers, and mechanical contractors. CircularSteam's heat pumps' main components are produced in Europe, strengthening the resilience of European supply chains.
Floating Sky	Floating Sky: FUSIO demonstrator	FLOATING SKY: The project introduces a breakthrough Floating PhotoVoltaic (FPV) solution called FUSIO®, which aims to reduce the current costs of FPV solutions. Following its demonstration with a 100-kilowatt (kW) pilot, Floating Sky will launch its first large-scale FPV production facility of 12.2MWp in Belgium. The floating structure's innovative design allows a catamaran to pass over it and have full access to the PV surface for inspection, cleaning, and replacement, thus eliminating the need for heavy, walkable structures that impact water ecosystems. The lightweight, ventilated structure of the floating PVs minimises water impact and improves cooling efficiency. This groundbreaking project is set to establish a new standard for inland FPV installations, completely avoiding greenhouse gas (GHG) emissions compared to the reference scenario. The FUSIO demonstrator introduces a novel, patented design with the shape of a triangular honeycomb structure, which is lighter and optimally distributes loads from wind and waves. Such a structure reduces costs and cuts operation and maintenance activities. This design also allows full access to PV panels for inspection and cleaning and increases electricity production by up to 5% due to the improved cooling effect of the water body. Floating Sky will generate around 12 GWh/year, sufficient to power 3 700 households in Belgium. In addition, FUSIO offers a scalable solution that avoids significant GHG emissions. The revised Renewable Energy Directive has set an ambitious target, raising Europe's binding renewable energy goal for 2030 to a minimum of 42.5% with an aspiration to reach 45%. The project aligns with Europe's climate policies by reducing fossil fuel dependence and expanding renewable energy use. Broader FPV deployment in Europe could offer a more diversified energy mix and a new technology to reach net-zero climate goals by 2050. The solution is cost-effective and biodiversity-friendly and can reduce GHG emissions in energy production through on-site solar generation. In addition, it requires relatively short supply chains and less plastic use because of its lighter structure. Designed for inland water bodies, FUSIO could be a competitive solution that addresses challenges like land scarcity and rising global renewable energy demand. From 2026 to its first ten years of operation, the Floating Sky's plant will avoid more than 20 000 tons of GHG emissions compared to the current European electricity mix emissions. Floating Sky will positively impact local job creation, with an estimation of more than 100 direct and indirect jobs created. Moreover, it will set a benchmark for biodiversity preservation and landscape integration as it will feature the installation of "bio huts" for fish and "floating gardens". The project aims to expand across Europe and offers solutions for hard-to-access sites with its easily transportable design, ideal for scalability. This will drive long-term cost reductions and further cost advantage, benefiting both renewable energy markets and regional economies committed to sustainable development.
GRAND PIANO	GeneRating and UpscAling iNnovation in green hyDrogen Production: boostIng PEM and AEM techNologies in EurOpe	GRAND PIANO: GeneRating and upscAling iNnovation in green hyDrogen Production: boostIng PEM and AEM techNologies in EurOpe The project aims to establish a first-of-a-kind automated GW-scale production line for Proton Exchange Membrane (PEM) Porous Transport Layers (PTL) and pioneer the first worldwide commercial production of Anion Exchange Membrane (AEM) PTL. Simultaneously, the project will manufacture a breakthrough Membrane Electrode Assembly (MEA) designed to reduce iridium usage in PEM electrolyser stacks by 90%, making this technology more cost-competitive and less susceptible to supply chain disruptions. The project will support the acceleration of renewable hydrogen deployment by manufacturing up to 39 GW of PEM and AEM electrolyser capacity over its first ten years of operation. The project is expected to achieve up to 100% relative greenhouse gas (GHG) emission avoidance compared to the reference scenario. GRAND PIANO innovates in both product and manufacturing processes. It will achieve this through three novel solutions: an automated production line on the GW scale of PEM PTL, commercial production of AEM PTL and commercial production of Alternating Catalyst Layer Structure MEA (ACLS MEA) for PEM. Thanks to these combined improvements, the project can achieve notable savings on critical raw materials such as platinum and iridium. Industrial-scale production of components (PTL) and subassemblies (MEA) will reduce costs, encourage more electrolyser installations and facilitate the transition to hydrogen-based solutions. The project is expected to avoid up to 11.7 million tonnes CO2e over its first ten years of operation. GRAND PIANO will support Europe's climate neutrality objectives for 2050, the Net-Zero Industry Act's aim of enhancing European manufacturing capacity and promoting industrial

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		competitiveness, and the goals of the Critical Raw Materials Act to increase resilience and reduce dependencies on certain materials. Located in Belgium, the project could significantly impact the local economy by creating approximately 200 direct and 2 100 indirect jobs across various sectors. By engaging local suppliers, the project will stimulate economic growth and foster job opportunities. By producing cost-competitive electrolysers that are more resilient to supply chain disruptions, GRAND PIANO could also attract new businesses and investments in the region.

Terminated projects

Acronym	Title	Topic	Participants	Sector	Innovation Fund grant requested (EUR million)
Columbus	A scalable and replicable solution to decarbonise industry by the combination of captured "fatal" CO2 from lime production with green hydrogen, to produce carbon-neutral synthetic E-methane	InnovFund-2022-LSC-02-INDUSTRY-ELEC-H2	ELECTRABEL | CARMEUSE	Refineries	68.6

GLOSSARY

Ongoing project: a project with a signed Grant Agreement currently under implementation.

Closed project: a project with a signed Grant Agreement that is formally completed.

Terminated project: a project with a signed Grant Agreement that was terminated during implementation.