European Commission

State of play: May 2025

INNOVATION FUND
projects in Sweden

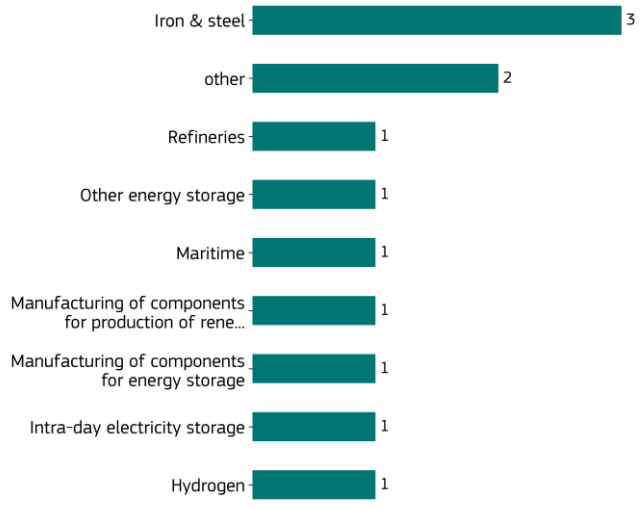
Funded by revenues from the EU Emissions Trading System (EU ETS), the Innovation Fund aims to encourage companies and public authorities to invest in cutting-edge low-carbon technologies with significant potential for reducing greenhouse gas (GHG) emissions in the European Economic Area (EEA). The Fund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

Innovation Fund Calls

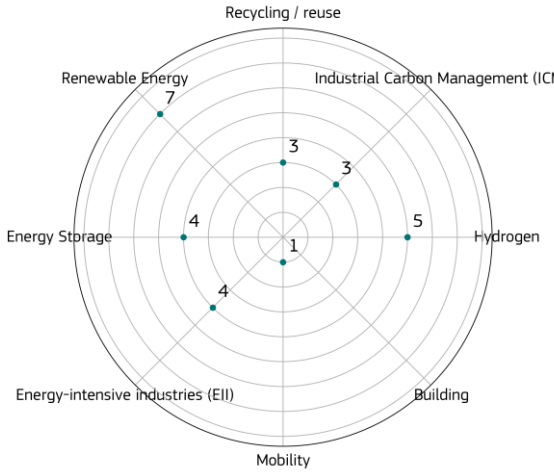
Currently, the Innovation Fund supports 12 project(s) (partially or fully)[2] implemented in Sweden with a total grant amount of EUR 1.0 billion. Their cumulative capital expenditure (CAPEX) is approximately EUR 11.8 billion.

These projects contribute to decarbonising European industries. Over their first ten years of operation, they are expected to reduce GHG emissions by 70,582,367 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 Sweden yet.

Awarded Innovation Fund projects in Sweden

Net-zero technology projects

Acronym[4]	Title	Topic	Sector	Starting date	Participants	Expected GHG emission avoidance (t CO_2e)	Innovation Fund grant (EUR million)
Green Foil project	Low CO2 Footprint Battery Foil for Li-ion Battery Production for Energy Storage	InnovFund-SSC-2020-single-stage	Other energy storage	01/04/2021	Granges	36,883,571	2.7
Beccs Stockholm	Bio-Energy Carbon Capture and Storage (BECCS) at the existing Combined Heat and Power-plant KVV8 at Värtaverket, Stockholm, Sweden	InnovFund-LSC-2020-two-stage-2	other	01/07/2021	Sthlm Exergi	7,834,149	180.0
HYBRIT demonstration	Swedish large-scale steel value chain demonstration of Hydrogen Breakthrough Iron-making Technology	InnovFund-LSC-2020-two-stage-2	Iron steel	01/04/2022	LKAB | HYBRIT | SSAB EMEA AB	14,296,430	143.0
BioOstrand	Biorefinery Östrand – The first commercial deployment of solid biomass-and-power-to- Sustainable Aviation Fuels technology line-up	InnovFund-2022-LSC-01-GENERAL	Refineries	01/01/2024	BioOstrand	8,762,169	166.6
Stegra	Stegra	InnovFund-2022-LSC-02-INDUSTRY-ELEC-H2	Iron steel	01/04/2023	Stegra	33,594,396	250.0
DAWN	200MW Production of thin-film solar by Sweden	InnovFund-2022-LSC-03-MANUFACTURING	Manufacturing of components for production of renewable energy or energy storage	01/09/2023	Midsummer	1,073,343	32.3
eMETHANOLxWSolution	Next Generation tanker vessel powered by e-methanol and wind assisted propulsion	InnovFund-2022-SSC	Maritime	01/10/2023	Terntank	44,815	2.8
INNOZHERO	Innovation for Zero Emissions in Helsingborg	INNOVFUND-2023-NZT-GENERAL-LSP	other	01/04/2025	Öresundskraft	1,869,656	54.1
TalnodeONE	Establishing Europe's First Natural Graphite Anode Production Facility for Sustainable Lithium-Ion Batteries	INNOVFUND-2023-NZT-MANUFACTURING	Manufacturing of components for energy storage	01/04/2025	TALGA GROUP | TALGA AB	2,089,727	70.0
SPACE	CarbonSmart Factory: Skövde Plant	INNOVFUND-2023-	Iron steel	01/04/2025	Powertrain | VGRE	341,503	49.4

[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)
	Approaching Carbon Elimination (SPACE)	NZT-GENERAL-MSP					
Norberg Mine Storage	Pumped Storage Hydropower Plant in a decommissioned mine	INNOVFUND-2023-NZT-PILOTS	Intra-day electricity storage	01/04/2025	Mine Storage | MS Norberg	212,439	20.2
GCP	Gävle Circular Park	INNOVFUND-2023-NZT-PILOTS	Hydrogen	01/11/2024	KHP AB | PLAGAZI AB	463,740	29.5

Participants from Sweden 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)
NorthSTOR PLUS	NorthSTOR+: Industrialising Green Optimised Li-ion Battery Systems for ESS	InnovFund-LSC-2021	PL	NV Systems AB | NVS Poland	Intra-day electricity storage	34,519,213	75.5
SKFOAAS	SKF RECONDOIL AS A SERVICE	InnovFund-SSC-2020-single-stage	ES	RECONDOIL | SKF	Refineries	15,293	1.6
L1X	Unlocking a bio-based future by turning globally available waste biomass into renewable building blocks	INNOVFUND-2023-NZT-PILOTS	SK	LIXEA SWEDEN AB	Chemicals	526,360	21.5

Project overview

Acronym	Title	Abstract
Green Foil project	Low CO2 Footprint Battery Foil for Li-ion Battery Production for Energy Storage	The market of EV sales has increased in the latest years and is forecasting to further increase within the coming years. Li-ion batteries demands will increase more than 20%+ from now till 2030 and beyond. The battery foil market which is used as the cathode current collector will see the same increase in the coming years. Granges Finspang see a good opportunity to enter this market due to several reasons. First the market in Europe is under supplied, battery manufacturers are forced to source material from China; Second the high CO2 footprint for the material from China is not in line with the call of "Green Battery" in Europe; Third import material also posts a significant risk to the supply chain of EU battery production. Granges Finspang has a vision to become the "sustainability leader" to the battery industry since the company's operation has a low CO2 footprint in comparison to European peer, and are constantly striving towards even further reductions on CO2 footprint. This supports Battery cell producers as well as OEMs future targets. Battery foil as a new product is new to European aluminum mills. To produce battery foil in Europe, current producers must invest heavily in news kills and capabilities. In preparation for

Acronym	Title	Abstract
		this project, Granges Finspang has made a solid technical, financial and commercial feasibility study for investing in new technologies for battery foil production in Finspang, Sweden with low CO2. The project total absolute GHS avoidance is 36,883,571 tones, and the project cost efficiency ratio is 0.073. The project will install an innovative surface treatment technology (corona treatment) and increase the use "end of life" aluminum scraps in production.
Beccs Stockholm	Bio-Energy Carbon Capture and Storage (BECCS) at the existing Combined Heat and Power-plant KVV8 at Värtaverket, Stockholm, Sweden	The Beccs Stockholm project will create a world-class, full-scale Bio-Energy Carbon Capture and Storage (BECCS) facility at its existing heat and power biomass plant in Stockholm. The project will combine CO2 capture with heat recovery, making the process much more energy-efficient than the process in a usual CCS plant. It will capture and permanently store large quantities of CO2 from biological sources, leading to carbon removals from the atmosphere, also called negative emissions. The Beccs Stockholm project has a potential to remove around 7.0 Mt CO2e over the first ten years of operation. Net carbon removals are seen as an increasingly important technology-based solution to climate mitigation, indispensable to reach climate neutrality in 2050. The project will also be a catalyst for paving the way for a new market of net carbon removals. Besides the actual negative emissions achieved, the project will also have a positive impact on the balance for renewable heat and electricity, resulting in additional around 0,8 Mt CO2e over the same period.
HYBRIT demonstration	Swedish large-scale steel value chain demonstration of Hydrogen Breakthrough Iron-making Technology	The HYBRIT (Hydrogen Breakthrough Ironmaking Technology) Demonstration project aims to revolutionize the European iron and steel industry, by replacing fossil-based technologies with climate neutral alternatives. The project plans to replace the coal-based blast furnace technology with direct reduction based on fossil-free hydrogen. The project will produce approximately 1.2 Mt of crude steel annually, representing 25% of Sweden's overall production, with the potential to avoid 14.3 Mt CO2eq of greenhouse gas (GHG) emissions over the first ten years of operation. A new, first-of-a-kind hydrogen production facility in Gällivare will be established, using a 500 MW electrolyser capacity powered by fossil-free electricity. The use of hydrogen enables the conversion of iron ore into sponge iron. The project will enable SSAB to replace two blast furnaces in Oxelösund with an electric arc furnace, using the sponge iron as the feedstock to produce high-quality steel without using coking coal in the reduction step. As access to renewable energy continues to increase, the project will lead the way to a full energy transition of the hard-to-abate, iron ore-based steel production across Europe. Iron ore-based steel will remain of strategic importance for the EU as it is the main approach to produce both high quality and high strength carbon steel; and not all steel can be produced via recycling and melting of scrap steel. The project will also support the local economy and help secure jobs that are otherwise at risk if the existing steel plants would have to be discontinued to enable Sweden's transition to a climate-neutral economy. Currently, crude iron production in coal-fired blast furnaces, followed by steel manufacturing using oxygen converters, represents 95% of the global steel production from iron ore. This route is particularly suitable to produce high quality and high strength carbon steel, however even a state-of-the-art blast furnace process results in generation of about 1.6 tons of CO2eq per ton of crude steel (global average approximately 2.2 tons of CO2eq per ton crude steel). The HYBRIT technology for iron and steelmaking have the potential to make this traditional way of producing steel obsolete. To this end, the HYBRIT Demonstration project plans to realise the breakthrough of fossil-free steel production by developing a complete, new value chain based on fossil-free hydrogen, resulting in an annual production of 1.2 Mt crude steel. This entails a significant degree of innovation at both technological and logistical levels: with regards to plant design, operating approach, construction, quality, reliability, availability, and maintenance. The HYBRIT Demonstration project includes the construction of a greenfield, first-of-a kind, full-scale plant for the direct reduction of iron ore with 100% hydrogen. This is a major innovation compared to the best available natural gas-based technologies, which can use hydrogen to only a limited extent. Moreover, the project includes fossil-free hydrogen production via a water electrolysis plant in Gällivare (500 MW), making use of the high shares of wind and hydropower in the electricity production of the region. This constitutes an unprecedented production capacity of fossil-free hydrogen, given that the global production capacity of electrolytic hydrogen amounted to less than 150 MW in 2018. Moreover, steel production with oxygen converters will also be phased out, as the sponge iron will be designed to be melted in an electric arc furnace. This is a technology that is already established for scrap-based melting but must now be adapted to high shares of hydrogen reduced sponge iron and the production of complex steel qualities. The HYBRIT Demonstration project will contribute to decarbonise a hard-to-abate sector, the iron and steel industry, by using hydrogen produced with fossil-free electricity. This is a very much-needed building block in industry to deliver the EU's
BioOstrand	Biorefinery Östrand – The first commercial deployment of solid biomass-and-power-to-Sustainable Aviation Fuels technology line-up	Biorefinery Östrand will contribute to the decarbonisation of the transport sector by creating a long-lasting solution for producing advanced biofuels and electro-fuels (e-fuels) from sustainable solid biomass and renewable electricity. The project will design, build and operate the world's first commercial scale biorefinery producing sustainable aviation fuel (SAF) and naphtha from solid forest residues. The project will deploy a breakthrough Anything-to-Liquid (XTL) pathway, solid biomass gasification and Fischer-Tropsch synthesis, with an electrolyser utilising renewable electricity. This will result in 100% relative greenhouse gas (GHG) emission avoidance compared to the reference scenario of fossil fuels. The project is pioneering solid biomass-to-biofuels production at commercial scale. It goes beyond the state-of-the-art in utilising sustainable solid biomass as a feedstock in SAF

Acronym	Title	Abstract
		production, and also delivers scale of operations, creating a major leap towards industrial production and leading the way for the future SAF industry. The technology set-up expands the feedstock base of SAF production to include solid forest industry residues – which helps to break the SAF industry's dependency on the limited pool of oleochemical feedstocks that are in use today. To increase the hydrocarbon yield, renewable hydrogen is added to the process, facilitating a more efficient use of the feedstock by turning more carbon into final product. The project showcases a cutting-edge integration of a biorefinery with a modern pulp mill, resulting in significant efficiency gains. This will lead to SAF and naphtha production, of which half are e-fuels half are advanced biofuels, with an accumulated GHG emission avoidance of 8.7 million tonnes of CO2 equivalent over the first ten years of operation. For reference, this is equivalent to twice the annual emissions from domestic aviation in Sweden. Biorefinery Östrand will contribute to the climate-neutrality target under the European Green Deal by bringing renewable fuels and a commercial solution for decarbonising transport to the market, particularly the hard-to-abate aviation segment. Notably, the Biorefinery Östrand project contributes directly to achieving the SAF targets proposed in the ReFuelEU Aviation Initiative, as well as the renewable hydrogen and self-sufficiency targets outlined in the REPowerEU Action Plan and the EU Hydrogen Strategy. The project contributes to the European value chain for advanced biofuels, starting with forest residues and locally produced renewable electricity and ending with filling the fuel tanks of the end-users with sustainable fuels. This provides both sustainability and robustness for the vital European transport economy – while simultaneously showcasing both a technology and a business model that can be replicated across Europe and beyond. The project is estimated to generate 60 direct and 660 indirect full-time equivalent per year of new green jobs which will also benefit the local economy.
Stegra	Stegra	The Stegra Innovation Fund project aims to build a greenfield integrated steel plant in Boden, northern Sweden, for the large-scale production of renewable hydrogen, green iron and green steel. Production is expected to start in 2025. The green steel produced will reduce greenhouse gas emissions by 33.4 million tonnes CO2 equivalent over the first ten years of operation, or by 87.3% (vs. relevant Emissions Trading System (ETS) benchmarks), and the volume produced would equal 5% of the total flat steel production in the EU. Electrolysis will be an integrated part of the plant, using fossil-free electricity to produce the renewable hydrogen needed to bring 5 million tonnes of green high-quality steel to the market by 2030. The direct reduction reactorrefines iron ore into direct-reduced iron (DRI). This is done by exposing iron ore to hydrogen, which reacts with the oxygen in the ore, forming steam as a residual product. Using the renewable hydrogen for this process instead of coal, which is typically used in integrated steel plants, allows the project to reduce CO2 emissions from the reduction process by more than 95%. The majority of DRI is transported in its hot state, inside the plant to the Electric Arc Furnace, while the rest is briquetted into hot briquetted iron (HBI), for storage and later use. In the Electric Arc Furnace, fossil-free electricity will be used to heat a combination of DRI and steel scrap to a homogenous melt of liquid steel. Liquid steel is further refined via traditional ladle furnace and RH degasser and is turned into solid products in an integrated process called "continuous casting and rolling," which enables a reduction of the energy consumption by 70% and replaces the natural gas that is typically used in the traditional process. Next, the product is further processed depending on customer requirements in our fully electrified downstream finishing lines, consisting of cold rolling, hot dig galvanizing line and batch annealing furnaces. The Stegra's Innovation Fund project aims to respond to the increased climate ambitions of the revised EU ETS Directive and contribute to the EU's overall climate ambitions. By contributing to the decarbonisation of the steel sector, the project is also perfectly aligned with the EU industrial strategy. Sweden has excellent conditions for this type of industrial project, due to abundant renewable energy sources, a solid supply of raw materials, highly skilled technical competencies, and ample land availability for large scale projects. Stegra will generate up to 2 000 direct jobs in the region, and a total of 10 000 including the indirect jobs. The project will also be part of a green industrial cluster in Northern Sweden, significantly contributing to a growing cluster of digital companies in the region.
DAWN	200MW Production of thin-film solar by Sweden	The DAWN project will establish Europe's largest manufacturing plant for flexible and lightweight Copper, Indium, Gallium and Selenium (CIGS) thin-film photovoltaic (PV) cells and panels. The project utilises Midsummers resource efficient solar cell manufacturing equipment (Midsummer DUO) to produce a solar panel with a minimal carbon footprint and material use. The factory will manufacture the solar cell and the solar panel in the same facility. Production is set to start in 2026 and gradually ramp up to 200 megawatt (MW) annual production by 2028. The project involves the construction of a greenfield building of 10 000m2, which will be used to scale up the proven solar cell manufacturing technology and integration of panel processes into a fully automated production line. The 200 MW production of flexible CIGS thin-film solar panels, represents a 100 times increase compared to the 2023 production capacity. The production will be energy and resource-efficient, resulting in a solar panel with an energy payback time that is less than one year. By using the DUO, complex and high melting materials can be efficiently deposited onto a stainless-steel substrate and in a single sequence, turn stainless steel into a fully functional solar cell. Solar cells are encapsulated between polymer sheets, thus becoming lightweight and flexible solar panels.

Acronym	Title	Abstract
		These thin-film solar panels are flexible and lightweight (~3 kg/m2) compared to traditional solar panels (~13-15 kg/m2) which use rigid glass and aluminium framing. The low weight makes it possible to apply Midsummers panels on buildings that have previously been inaccessible to solar installations, such as building with low load bearing roofs. Moreover, Midsummer solar cells can be recycled at a rate above 98% using recycling processes that are already commercially available. During a ten-year period, the electricity generated by the solar panels from the DAWN factory will have the potential to avoid 1.07 million tonnes CO2 equivalent of greenhouse gas emissions (GHG). The establishment of the DAWN factory will help to restart European solar cell and panel production contributing towards the RePowerEU goals with respect to installed solar energy and manufacturing capacity. Once fully operational, the DAWN factory will employ approximately 200 people, with 95% occupying direct operational roles. DAWN is also expected to generate around 400 indirect job opportunities. The factory will be able to serve as a blueprint for future manufacturing sites of European thin-film solar production through a copy-paste setup in empty facilities across Europe.
eMETHANOLxWSolution	Next Generation tanker vessel powered by e-methanol and wind assisted propulsion	The objective of the eMETHANOLxWSolution project is to demonstrate an innovative combination of foldable suction sails and a dual-fuel engine uniquely designed to fit the new hybrid tanker, thus enabling the use of e-methanol as fuel and wind for increased energy efficiency. The project will have a 100 % relative greenhouse gas (GHG) emission avoidance, as the technology used will be able to replace the conventional technology that uses fossil fuels, contributing to the decarbonisation of the shipping industry and customer's zero-emission supply chains of renewable fuels in the Baltic Sea and the North Sea. The project aims to produce one of the first coastal tankers in Europe that uses e-methanol as a main energy source in its operations. In addition, a wind assisted propulsion system (WPS) will be demonstrated for the first time in the newly built vessel, which will enable the best possible optimisation of the system. The project demonstrates the use of several technologies to push the emissions to zero in a novel stepwise combination and system integration in a real operational environment. Furthermore, the project promotes action towards improved energy efficiency in the maritime transport, especially with the WPS. In absolute terms, the combination of e-methanol and wind in a tanker will result in a larger annual emission avoidance compared to a state-of-the art newbuilt tanker. By contributing to the decarbonisation of the maritime sector, the project supports the development and deployment of innovative low-emission solutions and reaching the climate targets set by the International Maritime Organisation and the European Union, for instance through the EU Emission Trading System and the new FuelEU Maritime regulation. The project will set an example and share acquired knowledge to other shipping companies about innovative emission reduction technologies. Scaling these clean technologies to other vessels would further strengthen the available technologies for e-methanol and WPS as well as the e-methanol supply chains. The project will scale itself and convert the technologies to the other newly built and existing vessels in the future. Additionally, there is a high scalability potential to deploy both these clean technologies onboard different types of cargo ships.
INNOZHERO	Innovation for Zero Emissions in Helsingborg	INNOZHERO is a pioneer project in the waste-to-energy (WtE) sector that aims to install one of Europe's first carbon capture and conditioning (CCC) plants at the Filbornaverket WtE facility in Helsingborg, Sweden. The project will implement an end-to-end value chain for capturing, transporting, and storing CO2 to achieve climate-neutral district heating and waste incineration, and to generate negative emissions. INNOZHERO aims to capture approximately 200 000 tonnes of CO2 annually. During its first ten years of operation, the project is expected to prevent nearly 1.9 million tonnes of greenhouse gas (GHG) emissions from reaching the atmosphere, supporting the achievement of Helsingborg's net-zero targets by 2030 as part of the EU Climate-Neutral Cities initiative. As a replicable model, it aspires to become a reference in the global WtE sector's transition to carbon neutrality. INNOZHERO developed several innovations. On the one hand, the project will integrate a full-scale CCC unit in an existing plant with complete heat recovery, boosting the whole system's efficiency. On the other hand, INNOZHERO will generate new revenue streams by implementing Carbon Neutrality as a Service (CNaaS), offering climate-neutral waste treatment and carbon removal certificates. The project also provides significant carbon capture and storage (CCS) value chain advancements. Indeed, its optimised multimodal CO2 transport system (trucks, railways and ships) expands the inland CCS potential. By integrating CCS in the WtE sector, the project aligns with European and Swedish net-zero targets. It also supports the European Carbon Dioxide Removal (CDR) market and contributes to the EU's sustainable technology leadership. It bridges waste management and clean energy production, enhancing district heating and circular economy links. INNOZHERO's business model fosters demand for carbon-neutral solutions, boosting the European carbon credit market.

Acronym	Title	Abstract
		INNOZHERO enhances energy resilience and cost savings through improved district heating and energy efficiency while at the same time attracting investments. The project also strengthens the local and regional economies by generating high-quality jobs and contributing to skills development. By fostering a CCS business cluster and regional innovation ecosystem, the project contributes to developing a CCS value chain. INNOZHERO's scalable model in WtE plants sets the groundwork for further deployment, driving the net-zero transition in Europe. Last but not least, the project will support economic resilience by reducing the reliance on non-European supply chains for clean tech components and services.
TalnodeONE	Establishing Europe's First Natural Graphite Anode Production Facility for Sustainable Lithium-Ion Batteries	TalnodeONE Project addresses Europe's need for stable and secure supply of low-emission battery anode material, an essential component of lithium-ion batteries. With its EU-integrated natural graphite anode production facility in northern Sweden (from mining and processing to anode production), the project will produce 19,500 tonnes of active anode material (AAM) per year (equivalent of 16.25GWh of battery storage) for use in electric vehicles (EVs) and consumer electronics. TalnodeONE is expected to achieve 100% relative greenhouse gas (GHG) emission reduction compared to the reference scenario. Today all of Europe's AAM is imported with over 90% coming from China. Although graphite resources are found globally, AAM processing at scale is wholly China-dependent. This project will develop Europe's first fully integrated high-quality AAM production, combining innovative purification and anode processing technologies that enhance sustainability and safety while minimizing chemical use. The anode processing ensures high-quality coating and shaping is achieved while retaining graphite crystallinity yielding a high capacity (360mAh/g) AAM. The project's strategy to reduce emissions is underpinned by a 50% more resource efficient processing compared to current technologies as well as by using renewable electricity. The project will supply anode materials to produce over 2.6 million EVs, each with a lower carbon footprint. In absolute terms, the project will result in the avoidance of more than 2 million tonnes of CO2 equivalent GHG emissions over ten years of operation. TalnodeONE Project aligns with EU's climate ambitions and Green Deal Industrial Plan, substantially contributing to the EU manufacturing benchmarks outlined in the Net-Zero Industry Act. It also helps other industry actors to meet their obligations under EU's Battery Regulation. With natural graphite classified as a strategic raw material under the Critical Raw Materials Act, the project contributes to EU's goal of processing at least 40% of its annual consumption of strategic raw materials. Furthermore, as a green industrial project enabling EV batteries produced with a lower carbon footprint, the project is in line with Sweden's climate policy to achieve net-zero emissions by 2045. TalnodeONE Project is part of a growing green industrial cluster in northern Sweden and will make an important contribution to the local economy. It will directly employ approximately 100 full-time staff and 130 in indirect jobs in related sectors. Estimated 300 direct jobs will be required during construction. By producing low-emission natural graphite battery anode material in Europe, the project will also make a substantial economic contribution to the European automotive sector as it transitions towards zero-emission vehicle production in 2035. The design of the TalnodeONE Project allows for modular scaling up to meet increasing demand, with plans for future expansion already in consideration.
SPACE	CarbonSmart Factory: Skövde Plant Approaching Carbon Elimination (SPACE)	SPACE aims to decarbonise the Volvo Group Skövde foundry, which is responsible for 10% of the company's total operational greenhouse gas (GHG) emissions. The project will integrate electrification, hydrogen and advanced industrial Artificial Intelligence (AI) into its manufacturing process, leading to an 88% reduction in GHG emissions compared to the reference scenario. Notable innovations include a 22 megawatts (MW) AI-controlled peak shaving system and an energy storage capacity of 171 MWh achieved using innovative battery systems. As a result, SPACE offers optimised energy utilisation, reliable electricity availability, and improved grid stability. A core element of the project is replacing fossil sources by electricity and hydrogen in the Volvo foundry process: electrical induction furnaces powered by green electricity will substitute coke-powered furnaces and hydrogen will be used instead of propane gas. Additionally, the project will develop a scalable, end-to-end AI-driven platform fully integrated with IoT (Internet of Things) and advanced analytics. A heat recovery system will further enhance efficiency by capturing and redistributing energy, saving emissions annually equivalent to the energy use of 2 000 individual Swedish households. SPACE expects to avoid more than 341 000 tonnes of CO2e emissions over its first ten years of operation. By synchronising energy use with grid capacity, SPACE eases the strain on the energy infrastructure during peak demand; this, in turn, enhances overall grid stability. With its focus on renewable sources integration, the project sets a replicable model for sustainable manufacturing across Volvo Group sites and beyond. Furthermore, the project's ambitions align with Swedish climate targets, such as achieving zero GHG emissions by 2045 and with broader European goals in the European Green Deal and the 'Fit for 55' package. Through its impact on the overall grid stability, SPACE offers societal benefits by facilitating the electrification of other local industries and suppliers. By establishing a sustainable energy supply chain for one of Europe's largest foundries, the project actively supports the shift away from fossil fuels. Furthermore, the project will directly contribute to society with environmentally friendly products and manufacturing in Europe.

Acronym	Title	Abstract
Norberg Mine Storage	Pumped Storage Hydropower Plant in a decommissioned mine	The project aims to develop an energy storage plant using the site and workings of the old Norberg iron ore mine in Sweden, installing pumped storage hydropower (PSH) technology in a new setting. PSH is a proven, long duration, and high-capacity method of energy storage. In its simplest form, it comprises a lower and upper water reservoir. When electricity is in excess, water is pumped to a higher level, and when it is in demand, the water is released down and used for power generation. Using existing upper and lower reservoirs connected through the mine workings, the plant will be rated for 15 megawatts (MW). Norberg mine storage is expected to completely avoid greenhouse gas emissions compared to the reference scenario. The project will display a novel configuration for the different machines, which exceeds the current state-of-the-art technical capabilities. Contrary to traditional PSH facilities, Norberg mine storage's technology can operate in pumping and turbine modes, quickly switching mode and operate on ancillary services markets. Using underground mines, the project will also implement modern PSH with a limited environmental impact, reduce construction costs, and reuse existing infrastructures such as grid connections and roads. The project can store enough renewable electricity to cover the consumption needs of more than 17 000 households for six hours and support the local grid with stability. Over three years of operation, the pilot will save more than 63 732 tonnes of CO2 equivalent emissions. Norberg mine storage will be connected to the Nordic electricity grid and provide grid-balancing services to support the shift to renewable generation. This project aligns closely with the European Green Deal and renewable energy objectives by repurposing post-industrial infrastructure for clean energy storage, supporting sustainable resource use and following circular economy principles. Mine Storage (MSI) strengthens the integration of renewable energy sources into the Nordic electricity grid, contributing to Europe's energy resilience and reducing reliance on external energy sources. The project aims to minimise environmental impact thanks to its circular approach and the sourcing of industrial equipment manufactured in Europe. The project will contribute to a new value chain, creating opportunities for various sectors. MSI has estimated that 90 full-time construction employees and 10 direct jobs will be created during the project's operation. The mine storage-solution could be applied to 5 000 to 30 000 post-industrial European extraction sites. It would provide a circular economy approach to remediating brown-field sites while abating emissions with end-to-end clean energy storage.
GCP	Gävle Circular Park	Plagazi's pilot plant (Gävle Circular Park – 'GCP') is pioneering a circular approach to hydrogen production by converting waste - including non-recyclable materials such as wind turbine blades, plastics, automotive residues, and hazardous materials - into sustainable hydrogen via plasma gasification. It also simultaneously captures the produced CO2 by its operations to achieve a net-negative carbon footprint. The pilot plant will process 22 000 tons of waste annually, producing up to 4 000 tons of sustainable hydrogen. The project will lead to a relative greenhouse gas (GHG) emission avoidance of 206% compared to the hydrogen production from fossil fuels. Plagazi has developed a patented process for recycling previously non-recyclable waste into clean hydrogen. Unlike conventional hydrogen production, which relies heavily on fossil fuels, Plagazi's process harnesses the inherent energy in waste through a unique thermochemical recycling method. Advanced plasma arc gasification converts waste at a highly competitive cost and with a low CO2 footprint with one-third less water and approximately 80% less electricity compared to renewable hydrogen production methods like electrolysis. Unlike traditional waste-to-energy plants, which focus solely on energy recovery, Plagazi's unique technology transforms waste into multiple valuable products, including hydrogen, usable heat, vitrified slag, and metal by-products, while eliminating toxic elements and permanently sequestering CO2. This innovation will not only avoid 463 740 tons of CO2e in the project's first ten years of operation but also establish a scalable blueprint for future facilities. By transforming waste and capturing CO2, Plagazi supports circular economy principles and promotes the waste hierarchy while contributing to Europe's goals of reducing GHG emissions by at least 55% by 2030 and achieving climate neutrality by 2050. GCP reduces reliance on imported energy sources, advances the European Green Deal's objectives and supports the implementation of the Green Deal Industrial Plan by creating a viable alternative to incineration for waste disposal. Plagazi prioritises local suppliers capable of meeting plant specifications, thus fostering local job creation, strengthening regional business clusters focused on sustainable technologies and enhancing Europe's energy resilience. The pilot project in Sweden will directly create over 20 local jobs in construction, operation, and maintenance, with an additional 30 jobs expected once the pilot is expanded into a commercial production line. The project is crucial in developing local value chains across several sectors, including hydrogen transport, CO2 transport and storage, and renewable energy integration. Surplus heat from the process will be redirected to the local district heating network, optimising energy use and benefiting the local community directly. With its scalable and modular design, the Plagazi process can be deployed across Europe, driving cost reductions and energy resilience in regions with limited renewable energy sources.

Terminated projects

Acronym	Title	Topic	Participants	Sector	Innovation Fund grant requested (EUR million)

Acronym	Title	Topic	Participants	Sector	Innovation Fund grant requested (EUR million)
TFFFTP	Towards a Fossil Fuel Free Tissue Production	InnovFund-SSC-2020-single-stage	Essity H/H AB	Pulp paper	4.2
TLP	Thermoplastic lignin production - Creating a green industry to replace fossil-based plastics	InnovFund-SSC-2020-single-stage	Lignin Ind.	Chemicals	4.4
NorthFlex	Decarbonising temporary power flexible storage	InnovFund-SSC-2020-single-stage	BSAB | NVP	Intra-day electricity storage	4.4
AIR	Production of sustainable methanol as raw material for chemical products by first-of-a-kind Carbon Capture and Utilization process integrated with world scale electrolysis unit	InnovFund-LSC-2021	Perstorp Oxo AB | FORTUM | Uniper	Chemicals	97.0
HySkies	HySkies: A partnership to develop Sustainable Aviation Fuel	InnovFund-LSC-2021	LANZATECH BV | LANZATECH INC | LANZATECH UK | SHELL NEDERLAND | VATTENFALL AB	Refineries	80.2

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.