

LIFE and the EU's Competitiveness Agenda:

Fostering innovation, strategic
autonomy and resilience for
sustainable growth



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European Commission

European Climate, Infrastructure and Environment Executive Agency

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EU contribution graph: the amount contributed by the EU to the project, with the percentage of the total project cost. LIFE projects financed since 2014 are publicly available on [QlikSense](#).

European Commission

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May 2026

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Introduction

In January 2025, the European Commission presented the [Competitiveness Compass](#), a roadmap to restore Europe's dynamism and boost economic growth. Building on the [Future of European Competitiveness report](#), it highlights three pillars essential for Europe's future: **innovation, strategic autonomy** and **resilience**. The LIFE Programme is a crucial catalyst in advancing these areas by directly contributing to the EU's strategic competitiveness.

The European Green Deal and the EU Clean Industrial Deal – together with flagship EU initiatives such as the Circular Economy Action Plan, the Net-Zero Industry Act, the Fit-for-55 package, and the Affordable Energy Action Plan – set an ambitious course toward a sustainable and competitive economy. Delivering on this vision requires **concrete solutions that drive innovation, enhance resilience and create new markets**.

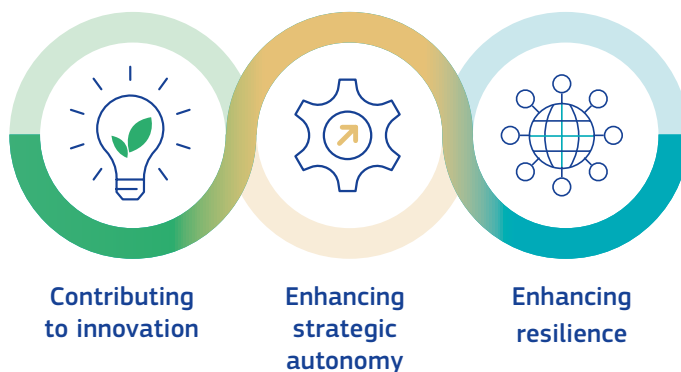
Within this policy framework, LIFE-funded projects drive innovation for competitiveness by accelerating the adoption of circular business

models, advancing decarbonisation solutions and fostering healthy ecosystems that underpin food and water security, sustain soil production and build resilience to climate change. They also promote advancements in clean energy transition services and technologies.

Beyond funding projects, the LIFE Programme invests in the competitiveness of Europe by demonstrating that environmental, climate and clean energy ambitions frequently translate into economic opportunities. By bridging the gap between research and market uptake, LIFE turns promising ideas into market-ready technologies and on-the-ground solutions.

To amplify this impact, LIFE mobilises private and public investments while promoting the large-scale deployment of clean technologies that strengthen Europe's competitive edge in fast-growing clean-tech markets and sustainable growth.

How LIFE strengthens EU's strategic competitiveness



LIFE: some key facts and figures

Mobilising funds to support green innovation, resilience and competitiveness

Between 2014 and 2023, the LIFE Programme mobilised over EUR 4 billion in total investments for **projects supporting green innovation, resilience and competitiveness**. The strong public-private partnership between the European Commission and the private sector is evidenced by the programme's ability to activate **significant complementary private investment**. LIFE also contributes to the European Investment Bank Group-run ELENA facility and InvestEU Advisory Hub, both of which leverage additional investments in addition to the figures mentioned in this section.

Supporting SMEs

Approximately 40% of all LIFE projects support small and medium enterprises (SMEs) in becoming essential players in clean-tech, sustainable production and circular economy solutions, as demonstrated through a series of platforms:

- nearly 230 LIFE co-financed innovations are showcased on the European Commission's [EU Innovation Radar \(IR\) platform](#), highlighting EU-funded high-potential innovations in the environment and climate action sectors;
- over 200 projects have received direct business-related support through the [LIFE Close-to-Market \(C2M\)](#) initiative;
- almost 150 key LIFE adaptation projects are showcased on the [Climate-ADAPT](#) platform.

SME innovation and market deployment



Supporting green innovation and an ecosystem of investment support tools

- **Green Assist** offers expert advisory for SMEs, project developers and public bodies to strengthen green business models and investment readiness,
- **European City Facility** helps local authorities develop investment concepts for climate action and sustainable energy,
- **European Local Energy Assistance (ELENA)** facility provides technical assistance for large-scale energy efficiency and renewable energy investments,
- **Project Development Assistance (PDA) for sustainable energy investment** aids local and regional authorities in preparing bankable projects in clean energy and climate action.

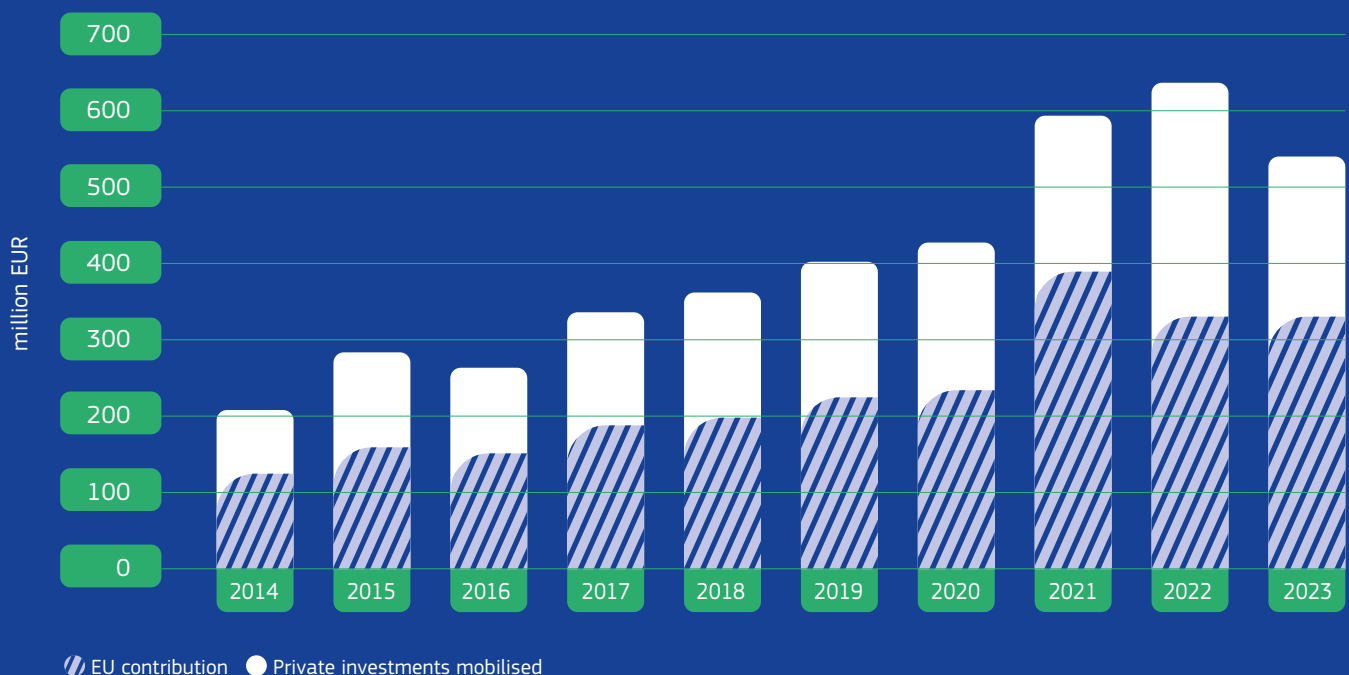
For example, since 2009, over 270 concrete investment projects have benefited from project development assistance support under the ELENA facility and PDA calls, enabling the aggregation of an investment pipeline in energy efficiency and the clean energy transition of over EUR 14 billion.

Annual investments in LIFE projects by the EU and private beneficiaries

Annual investments in LIFE projects that involve private beneficiaries have increased steadily, especially from 2020 onwards. The highest investment levels were recorded in 2021 and 2022, each exceeding EUR 600 million. Contributions to these projects from private companies also grew significantly, indicating stronger engagement from the private sector. The trend underscores the growing role of LIFE in mobilising both public and private financing for environmental and climate innovation.

Between 2014 and 2023, private sector beneficiaries participated in over 1 920 LIFE projects.

Annual investments in LIFE projects by the EU and private beneficiaries



Policy context

Key European policies and legislation that support sustainable competitiveness and correspond to LIFE initiatives are presented in the table below.

ADOPTED POLICY INITIATIVES	
	<p>MARCH 2020</p> <p>CIRCULAR ECONOMY ACTION PLAN Foundation of EU circular economy policy, improving product sustainability, product life cycles, waste reduction and resource efficiency</p>
<p>FIT-FOR-55 PACKAGE Legally binds EU climate targets across all sectors, and demands clean technologies and decarbonisation measures</p>	<p>JULY 2021</p>
	<p>MAY 2022</p> <p>REPOWEREU PLAN Accelerates renewable energy deployment and energy efficiency to reduce fossil fuel dependency and strengthen EU energy competitiveness</p>
<p>GREEN DEAL INDUSTRIAL PLAN Strengthens EU manufacturing capacity for net-zero technologies and clean-tech industrial leadership</p>	<p>FEB 2023</p>
	<p>MAY 2024</p> <p>CRITICAL RAW MATERIALS ACT Secures EU access to strategic raw materials through domestic capacity, recycling and diversified supply chains</p>
<p>NET-ZERO INDUSTRY ACT Boosts EU clean-tech manufacturing and investment conditions to secure industrial competitiveness in net-zero technologies</p>	<p>JUNE 2024</p>
	<p>AUG 2024</p> <p>NATURE RESTORATION REGULATION Legally anchors ecosystem restoration as an economic asset, strengthening long-term resilience and cost stability for EU industries</p>
<p>COMPETITIVENESS COMPASS (COMMUNICATION) Strategic roadmap to close the innovation gap, reduce dependencies and boost EU productivity and resilience</p>	<p>JAN 2025</p>
	<p>FEB 2025</p> <p>CLEAN INDUSTRIAL DEAL Overarching EU growth strategy linking industrial decarbonisation, climate action, clean-tech leadership and long-term competitiveness</p>
<p>ACTION PLAN FOR AFFORDABLE ENERGY Rolling package of measures to reduce energy costs, increase system resilience and protect industrial competitiveness</p>	<p>FEB 2025</p>
	<p>JUNE 2025</p> <p>WATER RESILIENCE STRATEGY Strengthens EU water security against droughts and floods, protecting agriculture, industry and public services</p>
<p>ROADMAP TOWARDS NATURE CREDITS A framework for valuing ecosystem services and enabling future markets for biodiversity and nature-based investments</p>	<p>JULY 2025</p>
	<p>JULY 2025</p> <p>CHEMICALS INDUSTRY PACKAGE / ACTION PLAN FOR THE CHEMICALS INDUSTRY Tackles high energy costs, unfair global competition and weak demand in the chemical sector while promoting investment in innovation and sustainability</p>
<p>SOIL MONITORING LAW Establishes EU-wide soil health monitoring to safeguard sustainable agriculture, carbon storage and long-term resource security</p>	<p>OCT 2025</p>
	<p>NOV 2025</p> <p>EU BIOECONOMY STRATEGY Promotes circular and sustainable use of biological resources to reduce pressure on natural resources, boost competitiveness and innovation, support green jobs</p>
<p>WINTER PACKAGE ON CIRCULAR ECONOMY Optimising the recycling of plastics, takes urgent measures to overcome market fragmentation and contribute to investments in an EU competitive and circular economy</p>	<p>DEC 2025</p>
PLANNED INITIATIVES	
	<p>2026</p>
<p>INDUSTRIAL DECARBONISATION ACCELERATOR ACT Aims to fast-track decarbonisation of energy-intensive industries to maintain EU heavy-industry competitiveness</p>	<p>CIRCULAR ECONOMY ACT Legislative package to accelerate circular transition via strengthening product durability, reuse, recycling and circular business models across the EU</p>



Contributing to innovation

The LIFE Programme drives **innovation to tackle environmental and societal challenges**. It prioritises resource efficiency, zero pollution, the circular economy, climate action, the clean energy transition and, nature and biodiversity protection. By bringing together private companies, research institutions, universities, public authorities and civil society organisations, LIFE connects research and market-uptake, to transform innovative project ideas into scalable, **market-ready solutions**.

Through collaboration and systemic change, LIFE accelerates **green and clean technologies**, and that is upskilling critical to the clean-tech revolution and reaching global net-zero goals. It simultaneously addresses issues such as underinvestment, fragmented value chains and insufficient incentives for sustainable production and consumption.

LIFE advances and promotes **circular economy principles** – for example, repair, reuse and remanufacturing – and advocates for product-as-a-service business models and low-carbon technologies. Such efforts aim to decouple economic growth from resource consumption and reduce emissions across key sectors.

By boosting industrial symbiosis, cross-sector innovation improves **resource efficiency, reduce emissions of greenhouse gases (GHG) and strengthens supply chains**. LIFE also engages with public authorities, service-providers and end-users across circular economy and clean energy transition sectors to develop new markets, services and technologies.



Thanks to LIFE, the LifeGigaRegioFactory project has developed tools which enable the industrialisation and expansion of a supply chain working across deep energy renovation projects. The tools have helped this supply chain to deploy more affordable solutions.

LifeGigaRegioFactory project team



Being part of the LIFE Programme has enabled us at the PlastLIFE project to rethink the sustainable circular economy of plastics in Finland. The EU funding is driving cross-border collaboration, scaling up of innovations, industry engagement, and also bringing unique opportunities to network, showcase results and influence policies.

PlastLIFE project team



Zero Emission LIFE IP has boosted sustainable competitiveness by rolling out zero-emission mobility options in Alpine public services, including charging stations, 30 hydrogen vehicles and raising awareness of sustainable initiatives. Thanks to LIFE, we are fostering innovation, reducing emissions, and our replicable models will strengthen local economies and accelerate the green transition.

Zero Emission LIFE IP project team

Over the years, the LIFE Programme has spearheaded innovation through numerous tangible projects.

In financial services innovation, the Belgian-led [DeliverEEM](#) project scales up the energy-efficient mortgage market ecosystem across Europe, boosting private investment in building renovations.

Across Belgium, Germany, France and Italy, [LifeGigaRegioFactory](#) is scaling-up support for the commercial deployment of affordable net-zero energy renovation solutions.

In Germany, [LIFE CLEANAIRMM](#) helped a start-up validate and scale a zero-emission alternative to fuel generators.

In Ireland, [Whey2LIFE](#) transforms whey permeate from dairies into protein-rich feed, renewable energy and fertiliser, reducing import dependence and creating resilient new value chains.

In Spain, [LIFE PST-SORT](#) recovers and reuses tonnes of car materials typically destined for landfill or incineration.

In Italy, [Zero Emission LIFE IP](#) is advancing hydrogen as a fuel across various transport modes, and [LIFE ATENA](#) helps reinforce Europe's competitiveness in agricultural machinery by demonstrating hybrid and fully electric compact tractors.

In Poland, [LIFE BIOBCOMPO](#) has developed car parts from lightweight, bio-based composites to cut transport emissions.

In Slovenia, [LIFE CEPLAFIB](#) developed new nozzles and sensors to repurpose waste from consumer plastics and newspapers.

In Finland, [PlastLIFE](#) is setting ambitious targets for recycling, reducing litter and swapping fossil fuel plastics for bio-based alternatives.



Thanks to LIFE, we have accelerated the development of lightweight and environmentally friendly automotive components, thereby strengthening our innovation capabilities and market position. This also contributes to our sector's transition towards sustainability and circular economy objectives.

LIFE BIOBCOMPO project team



Thanks to LIFE, at CEPLAFIB we have successfully transitioned from a concept to a real-life application, and kick-started circular innovations that would have otherwise remained out of reach. LIFE strengthened CEPLAFIB's competitiveness by enabling the launch of sustainable products that now travel around the world, in Adria Mobil motorhomes.

LIFE CEPLAFIB project team

These projects illustrate how LIFE projects go well beyond environmental improvements, **driving resource efficiency, reducing costs** and **enhancing cross-sector competitiveness**. They demonstrate that Europe can effectively leverage sustainability as a competitive advantage.

LIFE in action: selected project highlights

The following projects exemplify LIFE's significant contribution to sustainable competitiveness, aligning with the key objective of innovation. LIFE projects foster innovation through support for clean technologies, circular economy supply chains and solutions and green business models, across multiple sectors.



“

During the early stages of our journey, we had access to a strong network of partners and resources through the LIFE Programme. With this support, we conducted a first-of-its-kind comprehensive analysis of our technology which enabled us to scientifically prove that our products significantly lowered emissions and costs for our customers.

LIFE CLEANAIRMM project team



DeliverEEM

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Scaling up energy-efficient mortgages across Europe

BELGIUM (pan-European)

85%

EUR 1 500 000*

EU contribution

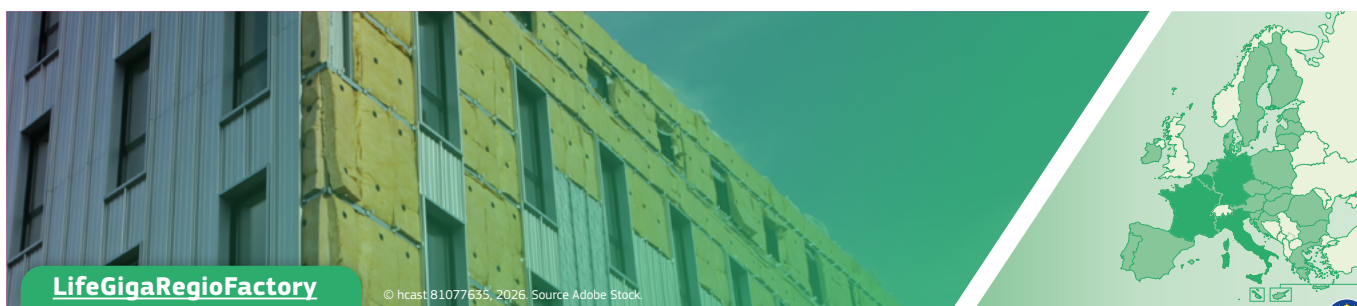
Substantial improvements, such as the retrofitting and construction of energy-efficient homes and infrastructure, are still required to meet globally agreed temperature limits.

DeliverEEM builds on the EU-funded Energy Efficient Mortgages Initiative (EEMI) to further progress in this specific sector.

DeliverEEM aims to scale up and accelerate the allocation of private finance to energy efficiency investments. It will expand a European-wide ecosystem that links banks, investors, valuers and consumers to incentivise private financing specifically for energy-efficient home renovations.

By integrating environmental, social and governance (ESG) factors into mortgages and how properties are valued, as well as creating scalable business models for financial institutions, the project **strengthens Europe's green finance market and competitiveness in sustainable lending**. It will provide tools, mechanisms, practices and blueprints to address the remaining challenges that are faced by the entire industry and value chains involved in home renovations.

Through capacity-building and market demonstration, DeliverEEM mobilises further investment in building renovations, reduces risk for lenders and homeowners, and supports the EU's transition towards a resilient, low-carbon financial system.



LifeGigaRegioFactory

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Promoting industrialised solutions for Net Zero energy renovation packages

BELGIUM, FRANCE, GERMANY, ITALY

95%

EUR 2 432 743*

EU contribution

LifeGigaRegioFactory addresses the need for a change of scale to be able to target 10% of the housing market by 2030 and renovate 1 million homes to a zero-energy level in an industrialised manner.

The project involves a complementary consortium from Belgium, France, Germany and Italy, including housing organisations and organisations acting as market development teams in different countries. The project actively supports social housing organisations in Belgium, France and Italy at different levels of maturity and experience in industrialised renovations, to analyse assets and develop renovation strategies for building stocks.

The project aims to trigger 12 000 home renovations to **achieve net-zero energy performance**, while significantly reducing costs and time for industrialised, fully integrated net-zero energy retrofits. It aims to build capacity to renovate 500 to 1 000 homes annually in the most advanced regions.

Five years after completion of the LIFE project, the ambitious target is to renovate 100 000 homes by 2030, with 35% of renovations in both France and Germany, 5-10% in Italy, 1-5% in Belgium, and the remainder spread across the EU. The project also intends to support the development of industrial tools to unlock a capacity to renovate 25 000 to 30 000 homes annually in these four countries by 2030.



LIFE CLEANAIRMM

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Replacing fuel-driven combustion generators

GERMANY

51%
EUR 899 013*

Small combustion generators are widely used for off-grid power, but they emit as much pollution in one hour as a car driving 250 km.

LIFE CLEANAIRMM – lead by the German start-up Instagrid – validated a clean alternative: lightweight, portable battery power systems based on innovative micro-inverter technology. Through the project, Instagrid piloted 90 units with construction companies across Europe and carried out in-depth environmental, social and economic assessments.

This evidence proved essential for the project’s market readiness and customer confidence.

Since then, Instagrid has moved to industrial production and has grown into **a clean-tech leader**, valued at EUR 360 million, raising EUR 125 million in private investment, shipping over 30 000 units and saving 104 kilo tonnes (kt) of CO₂ equivalent emissions.



Whey2LIFE

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Turning dairy by-products into value chains

IRELAND

36%
EUR 2 042 452*

In the dairy industry, a by-product of cheese production is whey permeate. It is usually disposed of by being pumped untreated into rivers and water bodies, scattered on soils, or used in an unprocessed form as animal feed and sold for little or no profit to farmers. However, these methods negatively impact the environment.

Whey2LIFE is transforming whey permeate into a valuable feedstock for biorefineries, enabling industrial symbiosis across dairy, feed, agriculture and energy sectors. By upgrading an anaerobic digester into a 10-14 kt/year integrated biorefinery, the project has achieved 100% valorisation of whey streams into high-protein yeast biomass for animal and aquaculture feed, renewable energy and nutrient-rich digestate for agriculture. This reduces dependence on costly soy imports,

inorganic fertilisers and fossil fuels, while cutting emissions of GHG.

Project results included:

- the processing of 19 800 m³ of wastewater in the anaerobic digester plant, instead of being discharged into public sewage systems;
- GHG and CO₂ savings;
- significant reduction in fertiliser use;
- and the creation of 10 jobs.

With the potential to scale up in other dairy regions, Whey2LIFE shows how **circular solutions can strengthen competitiveness** by creating new value chains, markets and local jobs from underused resources.



LIFE PST-SORT

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Recovering waste materials from cars for recycling and reuse

SPAIN

EU contribution

49%

EUR 749 149*

In Europe, 6 million vehicles are shredded annually and 1.5 million tonnes of automotive shredder residue (ASR) are sent to landfill or incinerated. ASR is a mixture of metals, plastics, glass, rubber, textile, foams and wood that can be recovered and sold, as demonstrated by a LIFE PST-SORT plant, which has an 84.5% recovery rate.

technology was tested on other waste streams, such as Waste Electrical and Electronic Equipment (WEEE), industrial waste, incineration bottom ashes, and mechanical and biological treatment plant solid waste.

The project resulted in **high revenues from recovered materials** and the sale of a fully operational recycling plant. Different ASR streams (light and heavy fluffs) have also been tested as part of the upscaling and diversification process. The

Over 500 tonnes of different automobile waste were processed with 49.7% of the different waste types being recycled and 34.9% for refuse-derived fuel. The technology shows great flexibility as it can be installed in existing recycling plants or in new facilities, and it generates two jobs per working shift.



Zero Emission LIFE IP

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Shifting to hydrogen-powered fuel cells for vehicles and public transport

ITALY

EU contribution

41%

EUR 7 927 070*

Transportation is responsible for nearly half of all CO₂ emissions in South Tyrol, northern Italy.

The project is **leveraging public-private partnerships** and building a viable green workforce in the energy sector, and sustainable transport and smart industries.

Zero Emission LIFE IP plans to facilitate the mass-uptake of sustainable mobility via three strategies:

- ① avoiding the need for transport where possible;
- ② changing modes of transport;
- ③ and improving the means of transport by deploying more carbon-friendly vehicles.

This involves shifting to hydrogen as a fuel source, deploying existing clean technologies – such as renewable energy, green hydrogen and electric mobility – and scaling up this approach across the region.

By the project's end, it aims to have deployed a fleet of 28 hydrogen fuel cell cars and 24 range extender vehicles, 33 electric charging stations, five hydrogen refuelling stations, a green hydrogen production plant and zero emission buses. These will be joined by a further 27 fuel cell buses, seven range extender waste trucks, 30 battery-powered electric buses, 34 vans, 38 cars and two road sweepers, funded through complementary actions. The expected result is a 15% reduction in traffic-based CO₂ emissions by the end of the project.



LIFE ATENA

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Electrifying specialised tractors for competitive, low-emission farming

ITALY

60%
EUR 1 874 257*



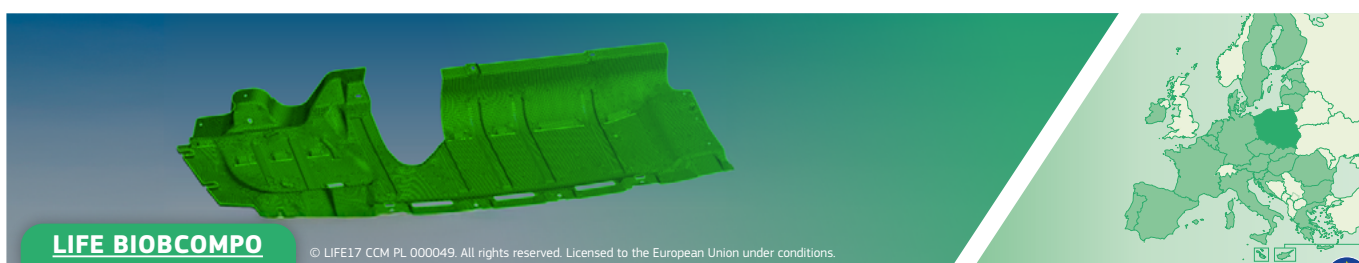
LIFE ATENA is accelerating the decarbonisation of European agriculture by introducing a market-ready modular platform for hybrid and fully electric compact tractors – a niche in which European manufacturers hold a strong global position.

Led by tractor producer Antonio Carraro, the project developed and field-tested two electrified tractor prototypes and five fully electric vineyard implements. Trials in Prosecco hill vineyards demonstrated substantial performance gains including 31-100% of fuel savings, up to 42% less lubricant oil dispersion, and significantly lower noise emissions.

By integrating high-efficiency electric drivetrains, rapid-charging batteries and standardised interfaces for electric

implements, LIFE ATENA positions European industry at the forefront of the emerging market for zero-emission specialised agricultural machinery. The project **strengthens EU competitiveness and strategic autonomy** by anchoring advanced electrification technologies, patents and manufacturing capacity in Europe.

The results pave the way for the commercialisation of hybrid and electric models and the scaling-up of electrified implements across high-value crops such as vineyards, orchards and steep-slope agriculture.



LIFE BIOBCOMPO

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Developing lighter, bio-based materials for car parts

POLAND

54%
EUR 1 887 056*



Transport is the only major sector in the EU in which emissions of GHG are still increasing.

LIFE BIOBCOMPO aimed to make the automotive industry more sustainable while boosting the EU's competitiveness by developing lighter bio-based composite materials and reducing the use of conventional fossil-based compounds such as glass fibres and talc. The resulting car parts are 8% lighter than conventional ones and fully recyclable.

The project produced, tested and installed formulae for 12 bio-based materials and produced 102 000 innovative car parts, which were installed in over 30 000 vehicles. Cars with parts

made of innovative materials – namely Alfa Romeo Giulia and Lancia Ypsilon – were lighter, consumed less fuel, and as a result, produced lower CO₂ emissions. Tests carried out during the project showed that the parts can also be used in Maserati (Grecale), Ferrari, Seat (Ateca), Volkswagen (T-Cross) and potentially in the production of parts for New Holland T7 and T670 tractors.

Over 50 new jobs have been created since the project's completion.



LIFE CEPLAFIB

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Manufacturing composite materials from plastic waste and recycled newspaper fibres

SLOVENIA



60%
EUR 1 099 211*

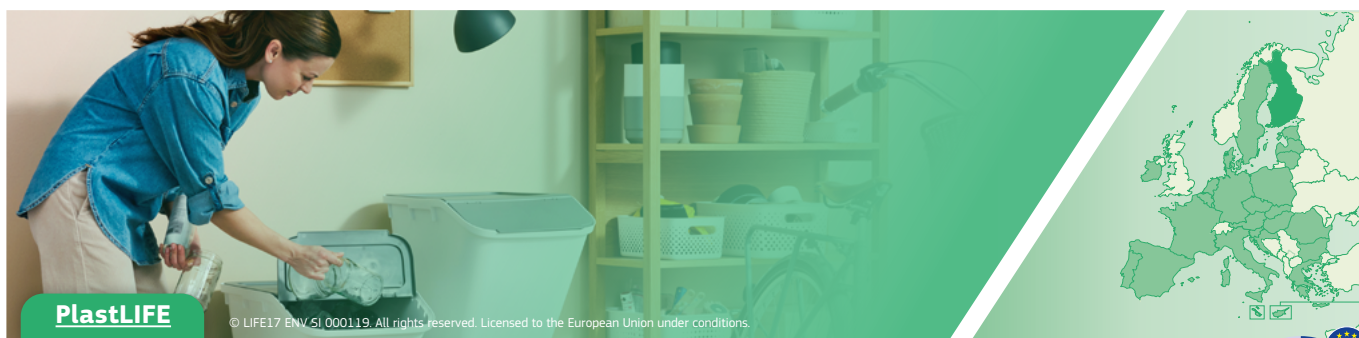
LIFE CEPLAFIB is a material composed of recycled post-consumer plastic waste and recycled newspaper fibres, used in the packaging, automotive and construction industries.

The LIFE CEPLAFIB project partners developed new software and hardware (nozzle and sensors) to adapt current manufacturing processes for the production of the innovative composite material, containing de-inked pulp (from recycled newspapers), recycled polypropylene and high-density polyethylene.

The project successfully tested LIFE CEPLAFIB in the production of thermoformed packaging trays, thermoformed protective automotive panels, hot-pressed pipe covers, and an injection-

moulded load-bearing distance holder for raising the flooring of recreational vehicles or mobile homes. It demonstrated very good mechanical and chemical properties and had a lower environmental impact than virgin plastic.

The manufacturing price is also competitive, with **good commercialisation prospects**. In a demonstration of competitive uptake, Slovenian motor-home manufacturer Adria has adopted the material and expects to use up to 200 000 elements, incorporating LIFE CEPLAFIB, per year.



PlastLIFE

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Implementing ambitious targets for plastic recycling and reduction

FINLAND



60%
EUR 11 955 784*

The global production of virgin plastics has increased 20-fold since the 1960s and is a major cause of environmental and health problems. There is an urgent need at a global level to transition towards a safe and sustainable circular economy for plastics.

PlastLIFE is implementing the **Plastic Roadmap for Finland** through ambitious quantitative targets for recycling, reducing litter and replacing fossil plastics with bio-based materials. It is mobilising funding and private-public collaboration between the Finnish public, industry and

decision-making bodies, with the aim of full implementation across Finland by 2035.

The project is expected to impact citizen behaviour through measures such as anti-litter drives and clean-up events, an increase in recycling and **promoting durable solutions and sustainable options** instead of single-use plastics. The project aims in particular to reduce the demand for primary plastics by at least 20% (or 520 000 tonnes) and to reduce coastal littering by 50% (to a maximum of 25 litter items per 100 metres of coastline) by the end of the project.



Enhancing strategic autonomy

The LIFE Programme helps build the EU's resilience across key strategic sectors by **boosting energy security** and **EU strategic autonomy in critical raw materials**. LIFE contributes to the roll-out of **clean energy solutions**, championing cleaner technologies, energy efficiency, renewables and less energy- and carbon-intensive processes.

It supports the phasing-out of fossil fuel imports from unreliable partners, thus **reducing EU energy dependencies**. Additionally, LIFE contributes to the transition away from natural gas use for heating and cooling, while supporting electrification, waste heat recovery and clean tech solutions.

Moreover, the LIFE Programme backs innovative processes and technologies that reduce reliance on critical raw materials and rare earth elements. By promoting reuse and substitution, it addresses supply chain dependencies and **enhances self-sufficiency**.

LIFE projects are already making significant strides in these areas.



Life PlasPLUS has demonstrated that it is economically and technically viable to separate plastics into their individual components for better recycling processes. LIFE has made closed-loop recycling and circular economy principles possible for the automotive, and electrical and electronic equipment industries and supply chains.

Life PlasPLUS project team



The LIFE Programme enables EXQUISHEAT to accelerate the development of standardised industrial heat pumps to be used in the food industry. This is strengthening the competitiveness of European heat pump manufacturers and supporting the transition to decarbonised and energy-efficient food production processes.

EXQUISHEAT project team



We want to turn rare earths from an imported risk into a recovered resource. By extracting these critical materials from electronic waste, we not only reduce dependency on imports, but also place increased value onto the goods that we once discarded.

INSPIREE project team

In Belgium, **LIFE PlasPLUS** developed an innovative process to recycle complex plastics from vehicles and electronics into high-quality raw materials.

In Belgium, Germany, Spain, Italy, Austria and Poland, **EXQUISHEAT** supports the uptake of standardised industrial heat pumps for sustainable food production in the European food and beverage industry.

Across Belgium, Germany, France, Italy and the Netherlands, **LIFE Street HP Reno** champions a visionary approach to upgrading residential heating systems through the collective purchasing of heat pumps.

In France, **LIFE-SBE4LCHCB** enhances Europe's self-reliance by developing smart building envelopes that integrate renewables, locally sourced natural materials and insulation.

Meanwhile, in Italy, **INSPIREE** is reducing the EU's reliance on China for rare earth permanent magnets, which are critical for renewable energy infrastructure.

In Italy, **LIFE-SYNFLUOR** strengthens Europe's strategic autonomy by converting fertiliser waste into synthetic fluorspar and green silica, reducing reliance on imports and creating circular value chains.

In Italy, **LIFE DRONE** boosts Europe's competitiveness in the battery sector by developing a cost-efficient circular process to recover high-purity graphite and NMC (Nickel-Manganese-Cobalt) cathode materials from end-of-life lithium-ion batteries.



LIFE Street HP Reno is driving the widespread adoption of heat pumps by supporting homeowners to collectively purchase and install renovations. Through pilot projects and engagement activities in France, Germany and Italy, homeowners are building trust and being shown that cost-effective renovations are possible.

LIFE Street HP Reno project team



The LIFE Programme enabled the development of a scalable, circular solution that transforms industrial byproducts into high-value materials – enhancing process efficiency, fostering cross-sector collaboration, and contributing to the EU's sustainable competitiveness.

LIFE-SYNFLUOR project team

LIFE in action: selected project highlights

The following projects exemplify LIFE's significant contribution to sustainable competitiveness, aligning with key objectives of strategic autonomy.

LIFE projects promote strategic autonomy by supporting innovative processes and technologies that reduce reliance on raw materials, rare earth elements, imported fossil fuels and energy intensive processes.



The LIFE close-to-market experts helped us reach the right market and focus on the public sector, where we see long-term growth for our project and solutions. We recommend that every innovator in Europe aims to join the LIFE Programme and, as a LIFE beneficiary, we can confirm that cooperating with the C2M experts is a smart move.

LIFE-SBE4LCHCB project team

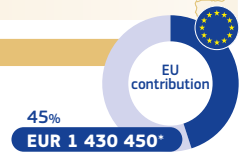


LIFE PlasPLUS

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Circular recovery of plastics and critical raw materials

BELGIUM



LIFE PlasPLUS has demonstrated an innovative process for turning complex mixed plastics from end-of-life vehicles and WEEE into high-quality secondary raw materials for the automotive and electronics sectors.

By combining separation processes, advanced sorting and pyrolysis, the project achieved industrial-scale recovery of key recycled plastic components. These are of stable quality, above industry standards, and can be used directly to produce car interiors and electronic components. The carmaker, Fiat, successfully tested recycled compounds at pre-industrial and

industrial scale, with some products containing 100% recycled materials.

The process also pioneers the recovery of the critical raw material antimony from flame-retardant plastics, reducing hazardous waste and creating new value chains.

With positive results and return-on-investment expected within 2.5 to 4 years, and **replication potential across EU countries**, LIFE PlasPLUS highlights how industrial symbiosis can transform plastic waste into strategic resources.

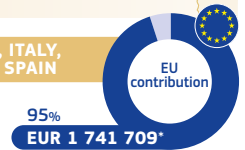


EXQUISHEAT

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Develop and roll-out of standardised heat pumps solutions for sustainable food production

AUSTRIA, BELGIUM, ITALY, GERMANY, POLAND, SPAIN



EXQUISHEAT aims to facilitate the roll-out of heat pumps in the European food and beverage industry, specifically for integration into industrial processes. This sector has considerable potential for the integration of industrial heat pumps, as most process temperatures fall within the accessible range of heat pumps, extending up to 200°C.

From October 2025 to September 2028, the project will focus on analysing industrial processes, developing standardised heat pump solutions for the food industry, and establishing a platform for collaboration between stakeholders from the food industry and heat pump technology providers.

EXQUISHEAT will establish a partnership between EU food companies and technology manufacturers to bridge the gap between users and providers of industrial heat pump solutions. The goal is to transition from a custom-built, project-by-project approach for each specific industrial plant and process, to **streamlined and standardised solutions** for processes with similar energy needs.

By the end of its implementation, EXQUISHEAT aims to trigger the installation of at least 20 new heat pump systems in the food industry.



LIFE Street HP Reno

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Street-wide approach for collective purchase of heat-pumps for energy integrated modules

BELGIUM, FRANCE, GERMANY, ITALY, NETHERLANDS

95%
EUR 2 138 198*



LIFE Street HP Reno aims to promote the collective purchasing of energy systems such as heat pumps for single-family houses or small collective houses located on the same street in France, Germany and Italy.

- The first task includes qualifying the typologies of individual housing at a district level, to identify buildings suitable for collective heat pump systems.
- The second is to develop 10 financing packages and five collective buy-in-scheme contracts, and retrofit solutions for residents and homeowners.

- Finally, the project will train and raise awareness among local authorities, installers and solution providers, as well as conduct marketing campaigns aimed at residents to encourage participation.

The project is expected to **stimulate large-scale demand** and help **reduce investment costs** of heat pump installations. Anticipated outcomes include a decision-making tool for 50 local authorities, cities, social housing organisations and renewable energy communities, facilitating the adoption and integration of these systems. The project expects to result in collective purchasing options and solutions for 800 homes.



LIFE-SBE4LCHCB

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Smart building envelopes for low-carbon construction

FRANCE

53%
EUR 677 369*



LIFE-SBE4LCHCB is demonstrating a scalable, universal, low-carbon smart building envelope that integrates timber structures, high-performance insulation, on-site renewables and smart energy management into a single, affordable system for new buildings across Europe.

By relying on local materials and European manufacturing, the project strengthens EU strategic autonomy, **reduces reliance on imported energy-intensive products** and anchors know-how and industrial capacity in the fast-growing smart-construction market.

Early results show major performance and cost advantages: energy use cut by up to 80%, lifecycle emissions reduced by at least 30% and construction costs lowered by 15%.

Backed by LIFE C2M support, the project beneficiary Ecoxia has converted this innovation into a growing market traction, expanding from private homes to public buildings, securing EUR 3 million in future sales for 2025-2026, and positioning itself to scale across the European market.



INSPIREE

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Recovering rare earth elements and reducing reliance on foreign mining industries

ITALY

60%
EUR 3 245 429*



Rare earth element permanent magnets (REE-PMs) are crucial components of renewable energy, electric mobility and electronic and industrial equipment. Europe faces a significant challenge in sourcing REEs as – for geological and processing reasons – their primary extraction in Europe is exceptionally difficult. 60% of global REE deposits are in China, which brings environmental repercussions and a dependency that might affect Europe’s future competitiveness.

INSPIREE is establishing Europe’s first large-scale facility for recycling used REE-PMs, commonly found in hard drives and end-of-life electric motors, **boosting a circular economy**, reducing electric waste and **decreasing reliance on REEs from China**. One key project aim is to increase the European processing capacity to 1 000 tonnes a year, to meet growing market demands and enhance the recycling level of REEs from WEEE.

However, components of the magnets – which include neodymium (Nd), palladium (Pd) and dysprosium (Dy) – can be extracted from used REE-PMs for reuse.



LIFE-SYNFLUOR

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Producing synthetic fluorspar and green silica from fertiliser waste

ITALY

60%
EUR 4 917 013*



LIFE-SYNFLUOR is pioneering a circular process to produce synthetic fluorspar – a critical raw material for the steel, aluminium and chemical industries – from fertiliser industry waste.

from China, Mexico and South Africa) cutting hazardous waste and creating synergies between the fertiliser, fluorine and tyre industries.

Led by FLUORSID with partner Pirelli, the project aims to demonstrate a patented technology that converts hexafluorosilicic acid waste into high-quality synthetic calcium fluoride and green silica for industrial reuse.

With industrial partners committed to replication, the project is expected to produce around 1 000 tonnes of synthetic fluorspar and 250 tonnes of silica, paving the way for **full market uptake and new circular value chains**.

This innovation strengthens Europe’s strategic autonomy by **reducing dependence on imported fluorspar** (mainly



LIFE DRONE

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Recovering critical raw materials from batteries

ITALY

54%

EUR 946 111*

EU contribution

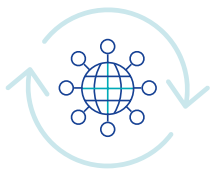
LIFE DRONE has developed an innovative circular approach to recycling end-of-year lithium-ion batteries. Its recycling process recovers high-purity graphite and directly synthesises nickel-manganese-cobalt cathode material, without separating individual metals.

This **circular approach reduces costs and environmental impact** compared with conventional methods, achieving recovery yields above 85% and graphite purity over 99%.

The project strengthens Europe's competitiveness and strategic autonomy in the fast-growing battery market by **cutting**

dependence on imported raw materials and supporting compliance with the EU Batteries Regulation and European Critical Raw Materials Act.

With promising results and strong industrial interest, the consortium is exploring upscaling to a 500 tonnes/year industrial plant in Italy or Germany, paving the way for market deployment of European-made recycled battery materials.



Enhancing resilience

The LIFE Programme addresses immediate environmental and societal challenges and sets the groundwork for **long-term economic resilience and sustainability** in Europe.

LIFE enhances the EU's environmental resilience by safeguarding climate, natural resources and biodiversity. Measures such as restoring soils, protecting EU waters, boosting natural habitats and improving air quality help preserve biodiversity health and resilience, which in turn, positively impact **human health and economic prosperity**.

The emphasis on **climate resilience** supports Europe in preparing for floods, droughts, heatwaves and wildfires. The result includes enhancing society's capacity to withstand the escalating impacts of climate change.

LIFE also fosters the transition to a circular economy and clean air, water and soil, reducing industrial emissions and encouraging sustainable consumption and production patterns. It further plays a key role in modernising and integrating the EU's energy system, to reduce both reliance on external sources and vulnerability to global disruptions.

LIFE initiatives help to strengthen the EU's economies and communities, as they become more resilient to shocks, stresses and changes. Such resilience helps secure a stable and prosperous future for generations to come.



LIFE-PROMETHEUS is using new technology to reduce by-catch of protected species and conserve marine habitats. It enhances sustainable competitiveness through innovative mitigation measures, such as electromagnetic deterrents or alternative fishing strategies. These include encouraging the fishing of invasive species and supporting sustainable ecotourism in coastal communities.

LIFE-PROMETHEUS project team



Thanks to the LIFE Programme and the LIFE TreeCheck project, many cities in Central Europe now have strategies, action plans and innovative tools available to tackle the urban heat island effect. Big cities are becoming more resilient to climate change, leading to the protection of vulnerable groups, such as elderly people.

LIFE TreeCheck project team



LIFE IP Rich Waters has significantly improved our water quality. Through LIFE, we have mobilised further funding to help launch 80 supplementary projects. LIFE has also brought more opportunities for our partners to increase their networks, knowledge and collaboration with potential organisations.

LIFE IP RICH WATERS project team

The LIFE Programme has actively enhanced environmental, climate, energy and socio-economic resilience across Europe through practical, on-the-ground initiatives.

Through [LIFE TreeCheck](#), green infrastructures such as green roofs, pocket parks, rain gardens and street trees are being rolled out to reduce heat and improve climate resilience across Czechia, Hungary, Austria, Poland and Slovakia.

In Ireland, [LIFE EcoSens Aquamonitrix](#) introduced a low-cost water quality sensor that safeguards water systems while reducing compliance costs for industry.

In the Mediterranean – Greece, Spain, France, Italy and Cyprus, [LIFE-PROMETHEUS](#), is employing innovative technologies and practices to protect fish species from overfishing.

Across Greece, Spain, Croatia, Italy and Portugal, [Plan4Cold](#) addresses the increasing demand for cooling in southern Europe by developing comprehensive assessment and localised heating and cooling plans.

In Spain and Portugal, [LIFE Olivares Vivos +](#) is preserving millions of hectares of olive groves, enhancing biodiversity and resilient farming practices.

In Italy, [PLANET FARMS LIFE](#) has demonstrated the market viability of large-scale vertical farming, cutting water, pesticide and fertiliser use while producing sustainable food at scale.

In Poland, [LIFE Archiclina](#) is protecting airports, shopping centres and carparks from extreme weather events, while [SoilLifeBoats](#) is improving soil health and carbon content through innovative soil improvers, reducing fertiliser dependency and fortifying food security in Germany, France, Poland and Slovakia.

Sweden's [LIFE IP RICH WATERS](#) is improving the Northern Baltic Sea River Basin environment by strengthening the implementation of the River Basin Management Plan and enhancing water resilience.



Through LIFE, LIFE Olivares Vivos + has demonstrated that biodiversity brings profitability to farming. It is possible to improve the competitiveness of olive groves by incorporating biodiversity as a fundamental part of business models. With the support of consumers, we must continue to show the increasing competitive value of nature within the agri-food market.

LIFE Olivares Vivos + project team

LIFE in action: selected project highlights

The following projects exemplify LIFE's significant contribution to sustainable competitiveness, aligning with key objectives of resilience.

LIFE projects enhance resilience by driving methods, solutions and technologies that support nature and biodiversity, climate adaptation, and circular economy and zero pollution.



The LIFE Programme is the most effective instrument for supporting green business innovations, with dedicated funding to develop solutions for the market. Thanks to LIFE, our multidisciplinary team developed the Archiclimate Assessment to assess climate vulnerability and risk in buildings, and Archiclimate Planning to incorporate nature into climate adaptation designs. Both methods are available in 32 different locations and across the EU market.

LIFE Archiclimate project team



LIFE TreeCheck

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Improving green infrastructure planning, tree by tree in Central and Eastern Europe

AUSTRIA, CZECHIA, HUNGARY, POLAND, SLOVAKIA

EU contribution

59%
EUR 924 053*

Urban green infrastructure is one of the most effective ways to mitigate urban heat island effects. It reduces surface heat absorption, increases solar energy reflection and water retention and improves the environment for citizens and communities by reducing temperatures, as well as boosting biodiversity. However, green infrastructure is not yet widely integrated into Central and Eastern European municipal strategies.

The project improved **green infrastructure planning** and decision-making processes through TreeCheck Pro software, the TreeCheck app and community projects. These have been used by citizens to increase their skills and have led to over 100 adaptation measures, 16 changes in strategic or legislation documents at city level and 11 changes at national level. The app continues to be used with over 50 000 downloads.

LIFE TreeCheck targeted areas in Austria, Czechia, Hungary, Poland and Slovakia with limited integrated climate adaptation action plans, weak implementation structures and low levels of public involvement and funding.



LIFE EcoSens Aquamonitrix

© iStock 239911180, 2026. Source: Adobe Stock

Water quality monitoring

IRELAND

EU contribution

59%
EUR 892 067*

LIFE EcoSens Aquamonitrix developed and brought to market a cost-effective, portable water quality sensor that enables near-continuous monitoring of multiple contaminants in various water systems. This reduced the need for maintenance and led to improved compliance with EU water legislation.

The **official market** launch in March 2021 took place in Spain, France and the UK, with future broader European and international sales in the pipeline. Target areas are wastewater treatment plants, catchment monitoring, industrial monitoring and aquaculture, and the technology showed strong market uptake potential, with EUR 1.6 million in annual cost savings projected from wastewater treatment plant trials. The project also created 8 jobs by its end with 42 more projected jobs within five years.

The project manufactured and validated 42 prototypes across 13 environments, prepared a manufacturing plan and designed a solid business plan for commercialisation.



Saving shark and other elasmobranch fish species in the Mediterranean

CYPRUS, FRANCE, GREECE, ITALY, SPAIN

60%
EUR 4 302 598*



In the Mediterranean Sea, elasmobranch fish species, which include sharks, rays, skate and sawfish, face three main environmental challenges:

- 1 by-catch from fisheries;
- 2 pressure from invasive species;
- 3 tourism.

LIFE-Prometheus is leading **climate-resilient business and ecotourism activities** in 12 hotspots to protect eight elasmobranch species. These include alternative fishing practices for 800 professional and recreational fishers, a Code of Conduct for divers and promoting shark-free products on regional menus.

The project aims to deploy deterrents and adapt fishing gear to reduce elasmobranch by-catch by at least 30% in the target areas, with the goal of reducing by-catch by 30 000 individuals by the end of the project. At least 55 fishing vessels will use these devices and around 200 fishers will be trained to use them across Cyprus, France, Greece, Italy and Spain. The project will also indirectly benefit seven other critically endangered species and their habitats in the same hotspots.



Addressing cooling demand, and sustainable heating and cooling planning in southern Europe

CROATIA, GREECE, ITALY, PORTUGAL, SPAIN

95%
EUR 1 632 121*



In Southern Europe, cooling demands and needs are increasing faster than in other European regions.

Plan4Cold seeks to assist local authorities, especially in pilot cities in Greece, Italy and Portugal, by drafting up to 10 sustainable local heating and cooling plans. The plans will impact more than 45 000 residents in the targeted cities. The project will create dedicated guidance, a toolbox of existing tools, and resources tailored for Southern European cities as well as capacity-building sessions.

The pilot cities are expected to motivate other municipalities to prepare similar plans through the use and adoption of Plan4Cold's guidance. Insights gained during the project shall be used to deliver policy recommendations at national, regional and local levels, and in turn, **boost the uptake of sustainable, efficient and passive cooling technologies.**



LIFE Olivares Vivos +

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Increasing the impact of Olivares Vivos in the EU

PORTUGAL, SPAIN

59%
EUR 4 166 970*



In the EU, olive groves cover more than 5.3 million hectares and are one of the main crops in Greece, Spain, Italy and Portugal.

As a result, LIFE Olivares Vivos + aims to enhance the value of sustainable olive oil production, improve ecosystem services and productivity, create new market opportunities – through eco-labels and certification schemes – and strengthen rural economies.

The aim of LIFE Olivares Vivos + is to halt biodiversity loss, not via the preservation of specific species or habitats, but by focusing on the functional biodiversity of olive orchards. The project focuses on protecting and enhancing habitats for birds, ground-dwelling insects, insect pollinators, weeds and woody vegetation, which allow olive groves to thrive. Thus, olive oil production is positively impacted through an improvement in the condition of the wider ecosystem.

In addition to **increasing competitiveness** within the olive oil sector, the project also has broader implications for rural economies and biodiversity through knowledge transfer to other woody crops, particularly vineyards.



PLANET FARMS LIFE

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Scaling sustainable food production through vertical farming

ITALY

55%
EUR 1 790 834*



Agriculture accounts for approximately 70% of global water use and up to 95% in economies heavily dependent on agriculture. Despite this, it remains one of the least efficient users of water, while at the same time, climate change is placing increasing pressure on already limited water resources.

turnover and created 28 new jobs, while cutting water use by 148 000 m³, pesticide use by 21 000 kg and fertiliser use by 95%. It has demonstrated how vertical farming can deliver strong environmental benefits alongside a **competitive business model**.

PLANET FARMS LIFE has proven the viability of large-scale indoor vertical farming by establishing Europe's first industrial vertical farm in Italy. Equipped with advanced air treatment, hydroponic irrigation and automated cultivation systems, the farm covers 10 000 m².

The project's success has attracted major retailers and consumers with fully traceable, pesticide-free products, laying the foundation for scaling vertical farming across Europe as a high-growth sustainable food market.

Between 2020 and 2024, it produced more than 500 tonnes of salads and basil-based products, which were sold in over 500 supermarkets. The project achieved EUR 2.4 million in annual



LIFE Archiclina

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Protecting major infrastructure from extreme weather events

POLAND

55%
EUR 1 272 868*



Climate change brings new threats in the form of frequent extreme weather, such as high temperatures, droughts, torrential rains, urban flash floods and violent storms. These impact infrastructure such as airports, shopping centres, car parks and other spaces with hard surfacing. In Poland, more than 300 facility managers were surveyed in 2020, highlighting the new climate change challenges they face each year and the resulting high insurance bills.

To address such concerns, LIFE Archiclina is transforming 32 large-scale commercial and transport infrastructures, including Katowice Airport, using vulnerability and risk

assessments, and introducing climate-resilient solutions including green infrastructure and water-saving measures. Adaptation plans are focusing on reducing site and surface temperatures, increasing rainwater capture, reducing energy bills and **boosting flood resilience**.

Expected project results include a 10°C decrease in surface temperature in the summer months by replacing asphalt with green roofs and walls. This will allow businesses to avoid the worst negative impacts of climate change on their **competitive performance**.



SoilLifeBoats

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Improving soil health with innovative soil improvers

FRANCE, GERMANY, POLAND, SLOVAKIA

60%
EUR 1 264 369*



Climate change and human activity are decreasing the quality of soils, which are essential for biodiversity and agriculture. Both cellulose and silicate minerals are key players in long-term carbon sequestration in soil. Rock cellulose pellets (RCP) produced from wastepaper fibres and rock-dust slurry waste have shown benefits for improving soil quality.

SoilLifeBoats is improving soil condition, mineral structure and carbon content through the agricultural and horticultural use of composite RCP. The soil improver captures CO₂ through enhanced rock weathering and increases water retention,

strengthening long-term soil fertility. By reducing reliance on fossil-based fertilisers, the project contributes to **sustainable agriculture, food security and climate resilience**.

The technology is being applied on a test ground of 18.5 hectares. The project aims to recycle 50 tonnes of cellulose waste and 50 tonnes of rock waste from the stone construction industry. Local communities and local waste agencies are being encouraged to implement new methods of recycling cardboard and stone waste, and the new technology is being promoted in five European cities.



LIFE IP RICH WATERS

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Boosting water bodies and fish populations in the Northern Baltic Sea River Basin

SWEDEN

31%

EUR 9 736 678*

EU contribution

The Northern Baltic Sea river basin comprises 1 214 streams, lakes and coastal waters, of which 80% have poor-quality ecological status.

LIFE IP RICH WATERS is improving the basin’s environment by strengthening the implementation of River Basin Management Plan (RBMP) and addressing water planning, eutrophication, connectivity of water bodies and pollutants through best practices and new technology to increase cost efficiency.

The project also enhances water resilience and climate change adaptation measures such as multifunctional water parks, farm-level water management plans and lake restoration. It is constructing fauna passages at four barriers to support fish

populations, testing techniques to rehabilitate contaminated areas and removing pollutants. A new coordinated approach has been proposed to improve the Baltic Sea environment, providing functional and **competitive solutions** to improve water and ecosystem quality.

Expected results include good status for 6% (115 out of a total of 1 788) of the surface water bodies currently at risk and, in the long term, up to 800 water bodies (45%), as an indirect result of the project activities. Other results include water planning documents created by 76 municipalities, addressing of eutrophication problems and reduction of phosphorus levels in 50 water bodies and establishing 25 water management plans for farms.

Conclusion

Since its inception over 30 years ago, the LIFE Programme has co-financed more than 6 400 projects across the EU, transforming Europe's environmental ambition into a strategic competitive advantage. By mobilising over EUR 4 billion in green innovation between 2014 and 2023, engaging nearly 2 000 private beneficiaries and fostering SME participation in clean tech and circular markets, LIFE has demonstrated that sustainability and competitiveness are intrinsically linked.

From creating new jobs and innovative business models to reducing dependency on

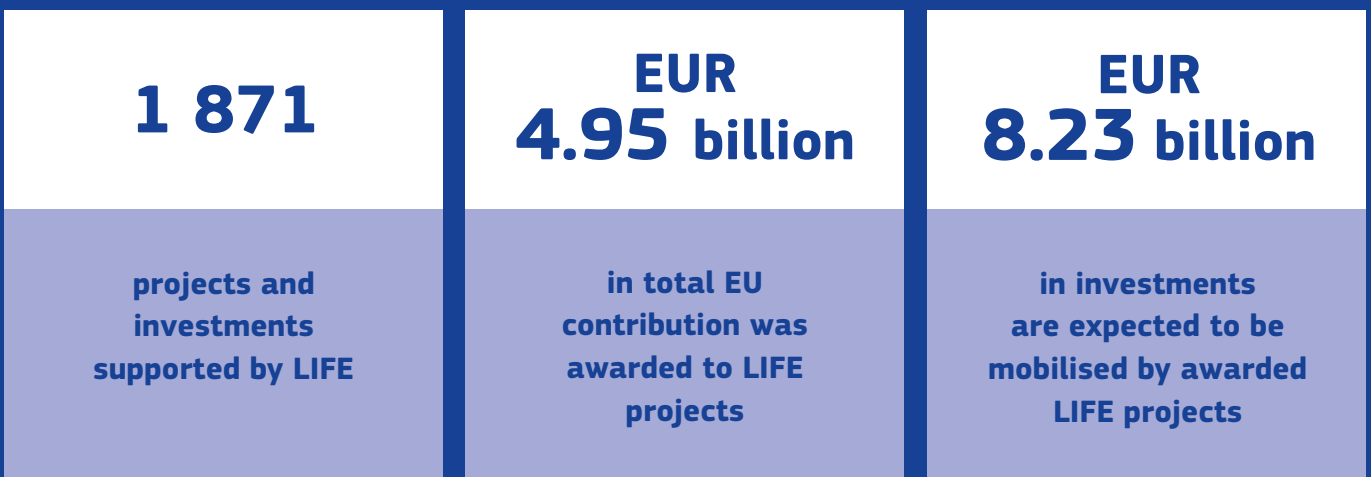
critical raw materials and enhancing Europe's resilience, LIFE empowers businesses, regions and citizens to lead the green transition. LIFE not only safeguards the environment but also strengthens Europe's strategic autonomy, opens new markets and contributes to long-term prosperity and a stable future.

All LIFE projects are consultable in an up-to-date, comprehensive [database of completed and ongoing projects](#).

LIFE Programme overall results: projects supported and investments mobilised

Overall figures highlighting LIFE's contribution to supporting projects that advance environmental and climate objectives, including nature-based solutions, circular economy, biodiversity protection, climate mitigation and adaptation, as well as innovative and market-ready solutions across Europe since 2014.

Projects and investments supported by LIFE (from 2014 onwards)




This brochure provides an overview of how the LIFE Programme is driving innovation and building resilience to tackle environmental and social challenges faced by EU citizens and businesses. The brochure highlights the achievements of 26 EU-funded projects, according to the following pillars: innovation, strategic autonomy and resilience. Key themes include: circular economy principles; biodiversity protection; renewable energy deployment; clean energy transition; raw materials recovery; climate action; adaptation planning; and reducing urban heat island effects. These LIFE projects are accelerating sustainable competitiveness across key sectors in Europe.


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