European Commission

LIFE and energy intensive Industries

Photo: European Commission/Philippe Huguen

LIFE projects have developed highly innovative and applicable technologies and methodologies for significantly reducing primary energy use and CO_2 emissions in Energy Intensive Industries (EIIs), while contributing to the implementation and development of the Industrial Emissions Directive and the Energy Efficiency Directive. Proposed technologies have shown great potential and some have been considered as Best Available Techniques (BAT) for diverse industrial processes.

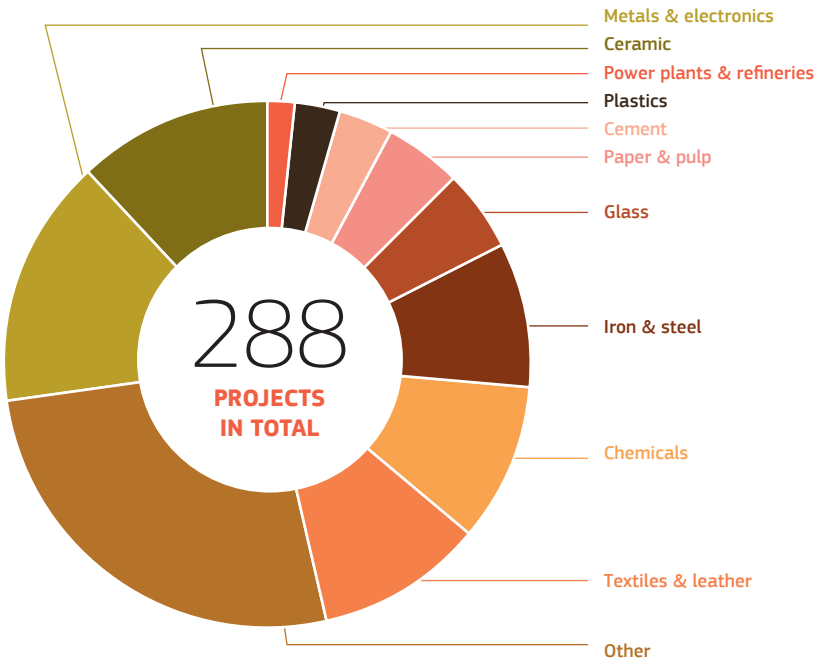
Technologies and Methodologies

For instance, numerous LIFE projects contributed to the growth of the waste heat recovery market in Europe, developing innovative systems to transform recovered heat into energy. Such systems lead to significant reductions in total energy consumption along with improved performance of the fume depuration plants in EII applications. Other LIFE projects demonstrated how laser-furnaces technologies for EII manufacturing processes can be used in the firing phase, resulting in a considerable reduction in GHG emissions.

In line with the Circular Economy Action Plan and the Roadmap to a Resource Efficient Europe, LIFE projects recently demonstrated the feasibility of transforming waste streams that are considered difficult to recycle into new EII-related products.

Information & Governance

LIFE Information and Governance projects have facilitated a move towards a low-carbon economy and industrial decarbonisation, particularly by supporting policy-makers in the design and implementation of the new EU ETS legislation. Projects have also developed monitoring tools that encourage the continuous improvement of low-carbon development strategies and support the good reporting on ETS revenues along with the allocation of funds.



€ 254 M
EU CONTRIBUTION

€ 732 M
TOTAL BUDGET

Environment & Climate Action

SOLID LIFE

SOLID LIFE produces cement and concrete products offering superior performance for the same cost and with a 70% reduction in CO_2 emissions compared to conventional Portland cement at existing production sites.

Some 60% of the CO_2 emissions in cement manufacturing are generated during the high-temperature transformation of limestone.

Through pilot-scale and industrial trials, the ongoing project aims to show the CO_2 savings that are possible compared to Portland cement.

The Solidia Concrete end-product is stronger and more abrasion resistant and durable, gaining as much strength in one day as Portland cement gains in 28 days.

The Solidia patented innovative technology makes use of a low-calcite and non-hydraulic binder in the production of cement and then uses the cement to cure concrete with CO_2 instead of water. The low lime content and reduced kiln temperatures associated with Solidia cement production allow both the CO_2 released through the decomposition of limestone and the CO_2 emitted from the combustion of fuel to be reduced by 30%. Moreover, the curing process sequesters around 250 kg of CO_2 per tonne of cement used. The project will establish the market readiness of the technology.

Read more:
https://www.solidlife.eu/

Photo: AGC/Emmanuel Croo

HOxyGas

HOxyGAS lowered the environmental impact of producing automotive glass through an innovative hot oxy-fuel combustion technology.

Flat glass is used to make windscreens, windows for vehicles and buildings, and solar thermal panels and photovoltaic modules. But its production consumes large amounts of energy and produces high greenhouse gas emissions.

The HOxyGas project demonstrated an cleaner technology based on the use of hot oxy-fuel combustion technology that consumes only natural gas and oxygen. The project constructed a pilot furnace that produced around 500-520 tonnes/day of high-quality coloured flat glass for the automotive market.

The innovative hot oxy-fuel combustion technology achieved an average energy savings of 18.7% compared to a traditional gas-air furnace, as well as a 5% decrease of CO_2 emissions, equating to annual savings of 4 800 tonnes. The project also reduced NO_X emissions by 85% and SO_X emissions by 82%, equating to annual savings of 745 000 tonnes and 220 000 tonnes respectively.

This technology can be applied to all flat glass manufacturing plants, as well as other production processes that use melting furnaces.

Read more:
http://www.agc-hoxygas.eu/

LIFE TEXTILEATHER

LIFE TEXTILEATHER demonstrated the feasibility of Multiple Laser Surface Enhancement (MLSE) technology as a more sustainable alternative of producing textile and leather products.

Finishing treatments that provide textiles and leathers with special characteristics, such as water-proofing, antibacterial and fire-retardant properties, are generally wet batch processes that consume great amounts of energy and water. The project applied on a semi-industrial scale the dry and continuous MLSE approach to leather and textile finishing operations. MLSE is a laser and high frequency plasma energy source treatment that applies thin and consistent layers on the surface to improve a material's performance. The MLSE technology was applied to different leather and textiles through a range of finishing and tanning processes.

The use of MLSE technology in textile manufacturing led to a 99% reduction in energy consumption and a total reduction of dangerous chemicals, such as perfluorocarbons. This results in a 90% reduction in carbon footprint and a significant reduction in production costs.

The project strongly supports the principles of the Industrial Emissions Directive (2010/75/EU) in relation to the BAT in the textile and leather sectors.

Read more:
http://textileather.eu/

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Photo: Pixabay/SD-PicWes

Photo: Pixabay/jarmoluk

H-REII DEMO

H-REII DEMO installed an innovative integrated fumes purification system with an Organic Rankine Cycle (ORC) that generates electricity by recovering heat from the electric arc iron and steel furnaces.

The project demonstrated the viability of a heat recovery system that is completely integrated into a fume extraction plant. It uses water in a closed loop process for cooling waste fumes, while operating at a higher temperature and pressure than traditional methods. Generating power from effluents, mostly considered as waste, can drastically reduce energy consumption of fume depuration.

The pilot ORC heat recovery plant, which was integrated for the first time into an existing steel production process, led to significant energy savings of around 500 MWh and emission savings of around 190 000 tonnes of CO_2 during the course of the project.

A wide penetration of ORC heat recovery systems in energy-intensive industries will make a significant contribution towards meeting EU emission targets.

Read more:
http://www.hreii.eu/it/index.php

LIFE SIDE

LIFE SIDE contributed to the design and implementation of the new EU ETS legislation.

This information and governance project aimed to provide policy-makers with a support package that covers the need for information on the economic functioning of the EU's Emission Trading System and its effective communication among stakeholders.

The project team's role was to provide a critical mass of knowledge on four areas where legislative action is foreseen:

Free allocation of emission allowances; impact on innovation and investment (macroeconomic effects); interaction with energy policies, and international dimension and extension of EU ETS worldwide (after the Paris Agreement).

The project created a forum for policy-makers and stakeholders, as well as a network of EU ETS experts to advise the project team. Four policy briefs produced by the project were expected to become a reference text for policy-makers and academics.

Read more:
http://lifesideproject.eu/

LIFE CLAYGLASS

LIFE CLAYGLASS demonstrated the environmental benefits of producing ceramic tiles by using any type of recycled glass as a flux material.

Through a process of vitrification, clay is hardened, tightened and partially glassified at high temperatures in the production of ceramics. The project showed that it is possible to use on an industrial scale difficult-to-recycle glass streams in the clay mix.

The project reduced production costs by 3–7.5% and CO_2 emissions by 13–19%. The process of adding recycled glass to natural clay in manufacturing bricks lowers annual CO_2 emissions by between 1 800 and 4 500 tonnes at medium-size ceramic industries with an average production of 300 tonnes/day.

For stoneware clay, 10% glass additions achieved a reduction of baking temperature of around 100°C, and the bricks manufactured maintained the clinker brick condition. Similarly, for white clay a maximum temperature reduction of 120°C was achieved.

Read more:
http://www.lifeclayglass.es/

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Policy Framework

EU ETS and EIIs

The EU ETS remains the cornerstone of EU climate policy and the main instrument for reducing industrial greenhouse gas (GHG) emissions in a cost-effective way.

It was launched in 2005 as the world's first major carbon market, restricting the volume of GHGs that can be emitted by more than 11 000 heavy energy-consuming industrial installations in Europe. Emission allowances are capped at a level set by the EU, and companies either receive or buy individual allowances. The cap is reduced over time so that the amount of emissions gradually decreases.

The 2030 Framework and the EU ETS reform

The 2030 policy framework aims to make the EU's economy and energy system more competitive, secure and sustainable. It sets a binding target to reduce EU domestic GHG emissions by at least 40% below the 1990 level by 2030. In the post-2020 period, the EU ETS will be reformed and further strengthened. To achieve the 40%-reduction target in GHG emissions set out in the 2030 framework for climate and energy policy, the sectors covered by the EU ETS will need to reduce their emissions by 43% compared to 2005 and the total amount of emission allowances will need to be further reduced.

The long-term goal to 2050 and the Paris Agreement

The European Commission 2050 Roadmap suggests that by 2050 the EU should cut its emissions to 80% below 1990 levels, by emphasising how all sectors can help the transition to a low-emission economy. Furthermore, the Paris Agreement established the goal of keeping the increase in global average temperature to well below 2°C above the pre-industrial level, triggering energy-intensive industries to make efforts to reduce their carbon dioxide emissions. For example, they have drawn up sectoral roadmaps and implemented best available techniques. LIFE has been the catalyst for the development of innovations that lower emissions.

EU legislation on EIIs

COM(2011)112
A **Roadmap** for moving to a competitive low carbon economy in 2050

COM(2013) 169 final
A **2030 framework** for climate and energy policies

2003

Directive 2003/87/EC: establishes a system for **GHG emission allowance trading** within the Union and amends Council Directive 96/61/EC

2009

Directive 2009/29/EC: amending Directive 2003/87/EC so as to **improve and extend** the GHG emission allowance trading scheme of the Community

Directive 2009/125/EC: establishes a framework for the setting of **eco-design requirements** for energy-related products

2010

Directive 2010/75/EU: recasts seven Directives related to **industrial emissions** into a single clear and coherent legislative instrument

2011

2012

Commission Implementing Decision (EU) 2012/134 establishing BAT conclusions, under Directive 2010/75/EU on industrial emissions for the manufacture of **glass**

Commission Implementing Decision (EU) 2012/135 establishing BAT conclusions, under Directive 2010/75/EU on industrial emissions for **iron and steel** production

2013

Commission Implementing Decision (EU) 2013/163 establishing BAT conclusions, under Directive 2010/75/EU on industrial emissions for the production of **cement,** lime and magnesium oxide

2018

Directive (EU) 2018/410: amending Directive 2003/87/EC to enhance **cost-effective emission reductions** and low-carbon investments, and Decision (EU) 2015/1814

Learn more

ec.europa.eu/life
LIFE programme
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LIFE programme

How to apply for LIFE funding

The European Commission organises annual calls for proposals.
Full details are available at http://ec.europa.eu/environment/life/funding/life.htm

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