European Commission

Energy-intensive industries

Decarbonisation, energy efficiency and circularity for a climate-neutral and sustainable EU

Energy-intensive industries, while being fundamental to the economy, are both major energy users and major greenhouse gas emitters. The EU is addressing this challenge by funding research and innovation in climate-neutral and circular industries.

Research and Innovation

Energy-intensive industries (EIIs) are a key component of the EU's economy. The materials produced by these industries are used to construct buildings and infrastructure as well as making consumer goods and many other products that are integral to our daily lives.

However, they represent the second largest global source of CO_2 emissions. Although these industries have adopted greener processes in recent decades, they still represent 17 % of total CO_2 emissions within the EU. The major carbon footprints of EIIs mean their decarbonisation is indispensable to reaching climate neutrality.

12 EU-funded projects

The 12 Horizon 2020 research projects featured in this CORDIS Results Pack, funded within the SPIRE partnership, demonstrate technological pathways for decarbonisation, efficiency, and circularity in EIIs. They include a range of technologies that can reduce the CO_2 emissions of current processes, replace the need for fossil fuels, reduce energy and resource consumption and create new production routes with a lower environmental impact.

ACHIEF

Innovative high-performance Alloys and Coatings for HIghly EFficient intensive energy processes
Coordinated in France

ACHIEF developed novel high-performance materials and components for energy-intensive applications.

© ACHIEF project

CAPRI

Cognitive Automation Platform for European PRocess Industry digital transformation
Coordinated in Spain

CAPRI developed an advanced cognitive automation platform to enhance production performance.

© EIFFAGE INFRAESTRUCTURAS

COGNIPLANT

COGNITIVE PLATFORM TO ENHANCE 360º PERFORMANCE AND SUSTAINABILITY OF THE EUROPEAN PROCESS INDUSTRY
Coordinated in Spain

COGNIPLANT harnessed big data through advanced data analytics and machine learning for improved sustainability.

© Drpixel/stock.adobe.com

HIPERMAT

Advanced design, monitoring, development and validation of novel HIgh PERformance MATerials and components
Coordinated in Spain

HIPERMAT developed novel high-performance materials and components for energy-intensive applications.

© Fundación AZTERLAN

iCAREPLAST

Integrated Catalytic Recycling of Plastic Residues Into Added-Value Chemicals
Coordinated in Spain

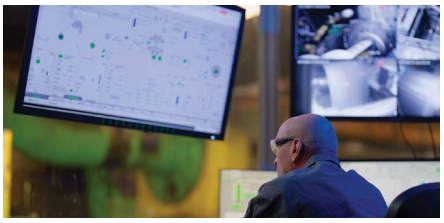
iCAREPLAST increased plastic waste recycling to produce valuable chemicals via efficient technologies.

© URBASER

INEVITABLE

Optimization and performance improving in metal industry by digital technologies
Coordinated in Slovenia

INEVITABLE fully digitalised monitoring technology to optimise metal manufacturing.


© SIJ Acroni

intelWATT

Intelligent Water Treatment Technologies for water preservation combined with simultaneous energy production and material recovery in energy intensive industries
Coordinated in Greece

intelWATT developed smart water separation technologies for water reuse, substances recovery and energy generation.


© BIA Kunststoff- und Galvanotechnik GmbH & Co. KG

LIBERATE

Lignin Biorefinery Approach using Electrochemical Flow
Coordinated in Spain

LIBERATE demonstrated electrochemical processes to convert lignin into high value chemicals.


© ramona4311/stock.adobe.com

PreMa

Energy efficient, primary production of manganese ferroalloys through the application of novel energy systems in the drying and pre-heating of furnace feed materials
Coordinated in Norway

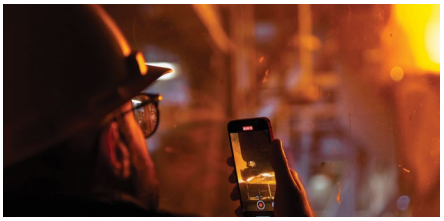
PreMa improved the efficient utilisation of energy and materials in the pretreatment of manganese ores for manganese alloys production.


© Casper van der Eijk

RETROFEED

Implementation of a smart RETROfitting framework in the process industry towards its operation with variable, biobased and circular FEEDstock
Coordinated in Spain

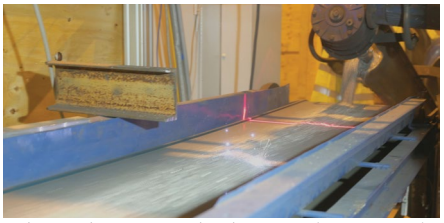
RETROFEED implemented new retrofitting technologies for efficient operation with variable and circular feedstock in metal, cement and ceramics industries.


© PITTINI GROUP

REVaMP

Retrofitting equipment for efficient use of variable feedstock in metal making processes
Coordinated in Germany

REVaMP implemented new retrofitting technologies for efficient operation with variable and circular feedstock in the metal, cement and ceramics industries.


© Markus Dargel, LSA - Laser Analytical Systems and Automation GmbH

SIDERWIN

Development of new methodologies for industrial CO_2-free steel production by electrowinning
Coordinated in France

SIDERWIN replaced carbon with electricity to turn iron oxide into iron metal for steelmaking.


© SIDERWIN

ZZ-06-24-062-EN-N

EU carves the path towards greener energy-intensive industries

Energy-intensive industry sectors need to reduce their carbon footprint and accelerate the transition to climate neutrality by providing affordable and effective clean technology solutions. These efforts will support the EU's long-term environmental goals while contributing to energy independence and security as well as resource autonomy for Europe.

Process industries such as chemicals, cement, steel, aluminium, glass or ceramics require large amounts of energy to turn raw materials into useful products, all the while generating carbon emissions and waste. The European Green Deal commits the EU to becoming the first climate-neutral continent by 2050 and stresses the need to develop breakthrough technologies in key industrial sectors by 2030. The European Industrial Strategy underpins the important role of industry in the transition to a green and digital economy.

The goals of climate neutrality and circularity are achievable with the aid of the right instruments and strategies. The EU's efforts in research and innovation include two public-private partnerships under Horizon Europe, Processes4Planet and Clean Steel, which support the development of net-zero and circular value chains across Europe. These partnerships build from the outcomes of the Horizon 2020 partnership Sustainable Process Industry through Resource and Energy Efficiency (SPIRE).

Learn more about
The European Green Deal: bit.ly/3LkXpyH
The Net-Zero Industry Act: bit.ly/3WYnc5U

This Results Pack is a collaboration between CORDIS and the European Health and Digital Executive Agency (HaDEA).

Luxembourg: Publications Office of the European Union, 2024

Follow us on social media too!
@EU_Hadea @hadea

Publications Office of the European Union

Print ISBN 978-92-78-44176-0 doi:10.2830/25526 ZZ-06-24-062-EN-C
PDF ISBN 978-92-78-44175-3 doi:10.2830/851368 ZZ-06-24-062-EN-N

europa.eu/!HRbmCD