



Flexible, predictive and Renewable Electricity powered electrochemical toolbox For a sustainable transition of the catalyst-based European chemical industry

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## SHORT DESCRIPTION OF THE PROJECT

The FIREFLY project is developing electrically driven technologies for metal recycling from used materials, such as spent, waste and off-specification catalysts available in Europe. Using advanced technologies, we're turning them afterwards into valuable resources for new products. This includes an experimental modelling, optimisation and engineering approach. The entire process uses renewable electricity like sunshine or wind power. By using renewable energy, FIREFLY is not just recycling, but it is doing that in a way that's kind to our planet. Plus, it saves money, wind and sun are free and unlimited.

Smart tools, such as artificial intelligence and machine learning, will turn the FIREFLY process more competitive. After modelling them, they will analyse rich data, making sure the most suitable chemical treatment is used to recycle each sample of waste metal-based catalyst. FIREFLY will also develop production methods for (electro)catalysts for innovative (electro)chemical processes, as sustainable alternatives to traditional production routes associated with high temperatures, use of chemicals and lack of circularity, which are not eco-friendly.



## WHY IS IT IMPORTANT?

Scientific impact: Electrification of the industrial production process by shifting from the chemical conversion process to an electrochemical conversion process.

Technological impact: Efficient integration of renewable electricity to drive the conversion process and Overall material savings (waste reduction) compared to the classical production routes.

Economic impact: Energy savings compared to the conventional production routes and Competitive costs of the new process technology and its integration in the processing line, including upstream and downstream.

Societal impact: Significant reduction of CO2, including the emissions related to the generation of electricity.













