MEDNIGHT

MEDITERRANEAN RESEARCHER' NIGHT
September 30 2022

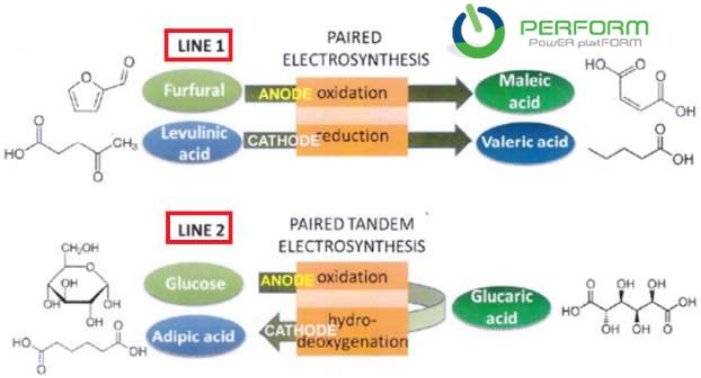
PowER platFORM (PERFORM)

Lab. of Catalysis for Sustainable Production and Energy (CASPE) – INSTM UdR UniME

WP 2: Electrode Platform Innovation

Project Topic	Selective transformation, by electrochemistry, of raw materials from biomass into intermediates
Relevance	Researches contributing to the transition from a fossil-based to a bio-based economy
EU Framework Programme	To build a society and a world-leading economy based on knowledge and innovation across the whole Union, while contributing to sustainable development
Duration	**H2020-EU 2019-2023**
Focus on	• Establishing a new infrastructure • Demonstrating the feasibility of this more sustainable approach in two showcases according to Line 1 and 2

HORIZON 2020



PERFORM PowER platFORM

Reducing CO_2 emissions

Replacing fossil fuels in production processes

Circular economy

PERFORM
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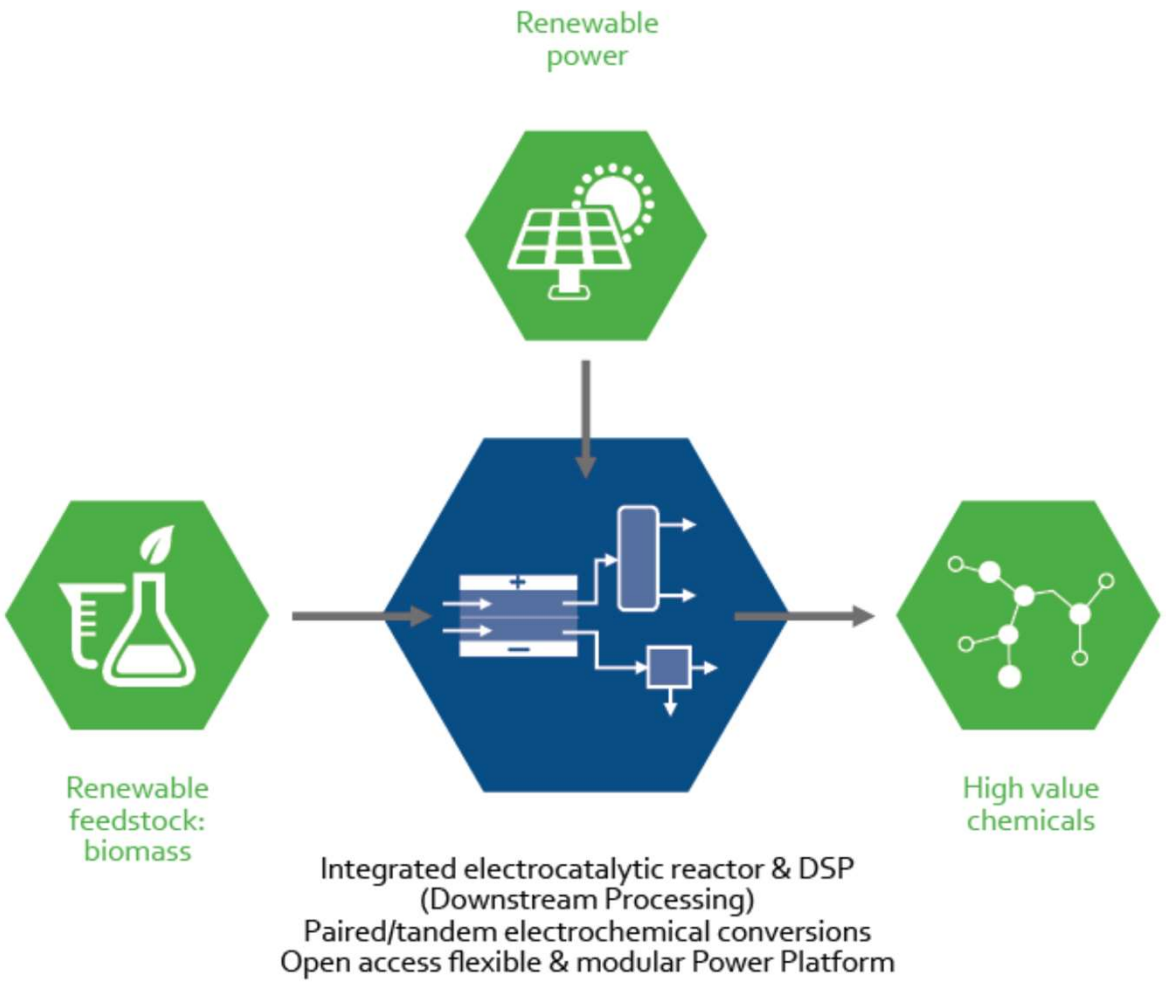
Il progetto PERFORM è un'azione di innovazione del Programma della Commissione Europea Horizon 2020 che migliorerà notevolmente le trasformazioni chimiche basate su materie prime di origine naturale



PERFORM'S AMBITION

https://performproject.eu/

Lo sviluppo e l'innovazione nel programma PERFORM mirano a due globali tendenze che guidano una grande transizione all'interno dell'Industria Chimica Europea volta a ridurre l'impatto ambientale:

PERFORM
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ELECTRIFICATION

Decarbonization of the industry is one of the bottlenecks in EU 2030 target for climate neutrality. With the increase in renewable energy production there is a big interest in the **electrochemical** industry as a tool to achieve carbon-neutral energy to drive chemical reactions.

SHIFT TOWARDS BIO-BASED FEEDSTOCK

In the continuous development towards a biobased economy, the concept of biorefinery will take an increasingly important role, enabling Europe to convert **biomass** into marketable products to meet demand in the food, chemicals, materials, and pharmaceutical sectors..

Horizon 2020
European Union Funding
for Research & Innovation

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°820723

IMPACTS

Reduce Environmental impacts

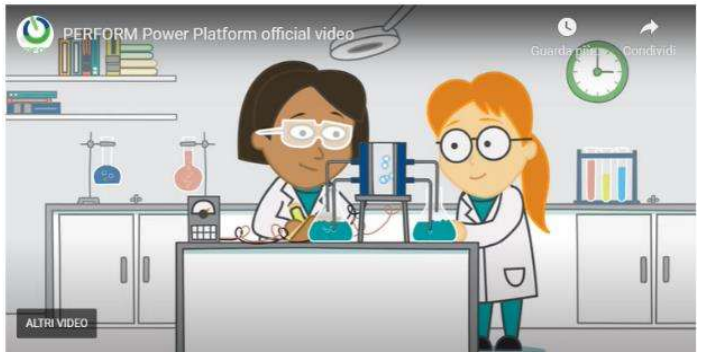
Reduce CO_2 Emission

Use local resources

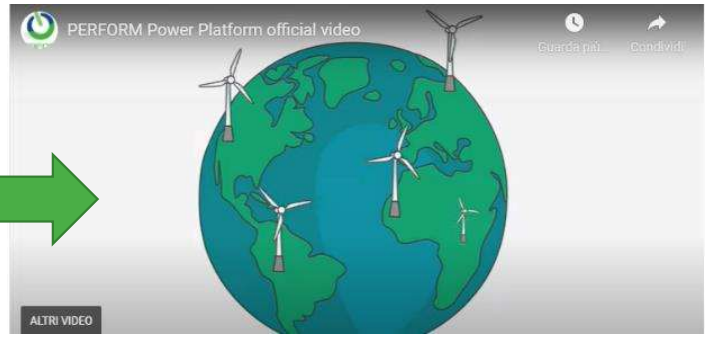
GOALS

PERFORM is expected to contribute to technology development to reduce the environmental impact of the chemical industry. The technology developed in PERFORM will reduce CO_2 emissions from the production of chemicals due to the efficient utilization of renewable biobased feedstocks and renewable energy. It will also be essential for a future sustainable society that uses local resources.

EUROPEAN TECHNOLOGY TO CATALYSE ELECTRIFICATION OF CHEMICAL INDUSTRY



L'elettrochimica ha un ampio range di applicazioni in molte differenti industrie.



Attualmente, sebbene l'industria chimica sia basata essenzialmente sui combustibili fossili, la conversione elettrochimica ha il potenziale per far diventare l'industria chimica più sostenibile.

Il progetto PERFORM è un Consorzio europeo the si prefigge di ridurre l'impatto ambientale della produzione chimica e di dimostrare ciò in un sistema di conversione elettrochimica flessibile a scala pilota.

I partner di PERFORM:

AVABIOCHEM
avantium
HYSYTECH
MISTI
NOVAMONT
Perstorp
RADICI GROUP
Sustainable INNOVATIONS
TNO innovation for life
UNIVERSITY OF HOHENHEIM
vito

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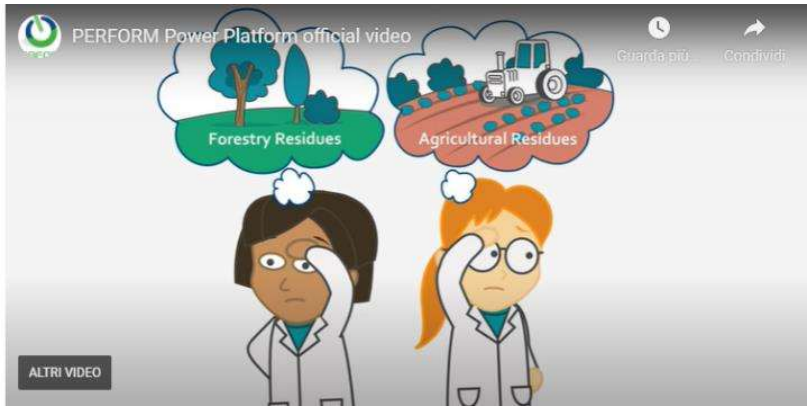
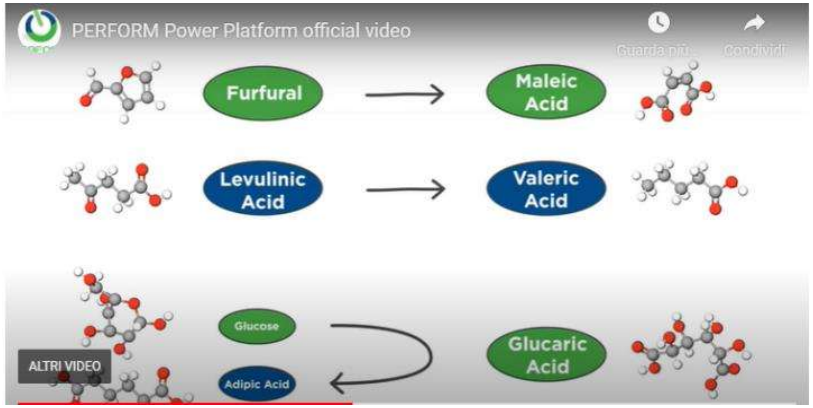
Grant agreement ID: 820723 - Funded under: H2020 - EU.2.1.3.5.3.
Sustainable, resource-efficient and low-carbon technologies in energy-intensive process industries

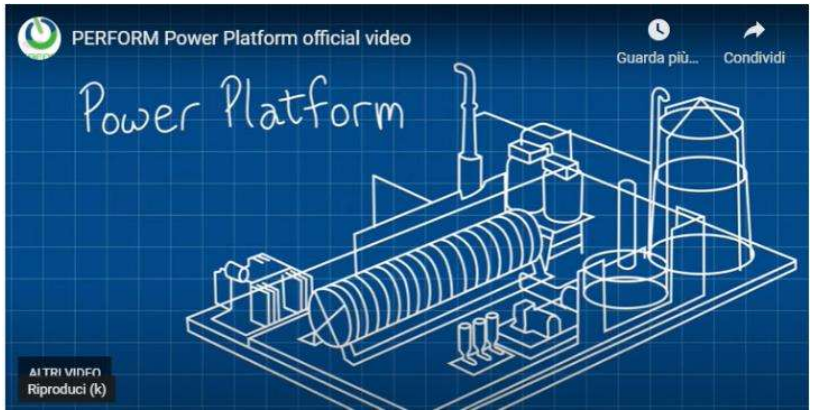
www.performproject.eu



PERFORM ha già identificato le materie prime provenienti da biomassa che possono essere convertite in prodotti chimici ad alto valore aggiunto. Questi ultimi possono poi essere usati per produrre plastiche bio-based.



Nell'ambito di PERFORM saranno sviluppate le vie di produzione elettrochimica di questi materiali.



PERFORM utilizzerà la conoscenze acquisite in questo ambito per la creare un impianto pilota.
Questo impianto dimostrerà la fattibilità dei due percorsi di trasformazione elettrochimica per produrre sostanze chimiche ad alto valore aggiunto da fonti biologiche.

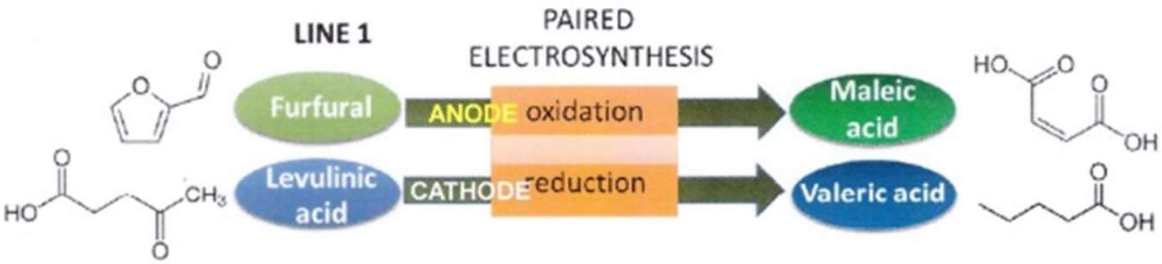
L'impianto PowERplattFORM sarà un sistema flessibile dove poter testare altre vie di conversione elettrochimica per aiutare a portare le tecnologie di conversione elettrochimica più prossime all'implementazione.

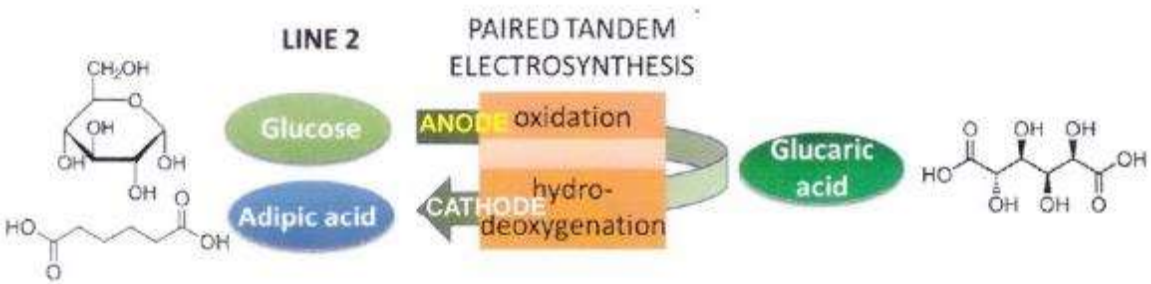
Compiti svolti presso UniME

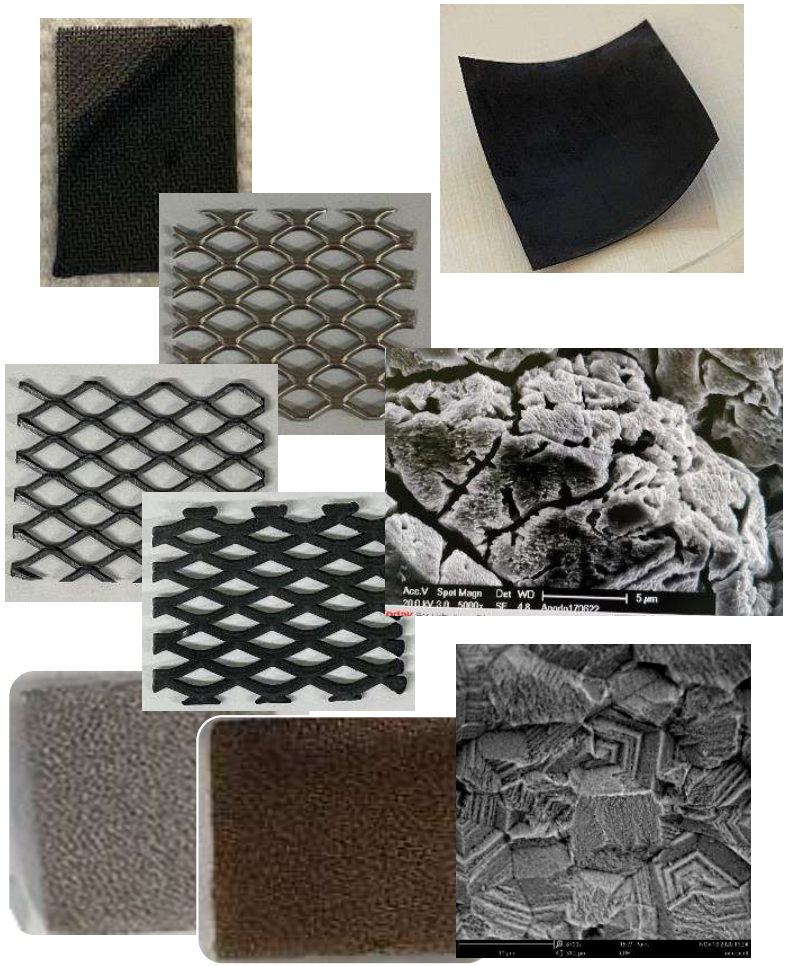
Lab. of Catalysis for Sustainable Production and Energy (CASPE)

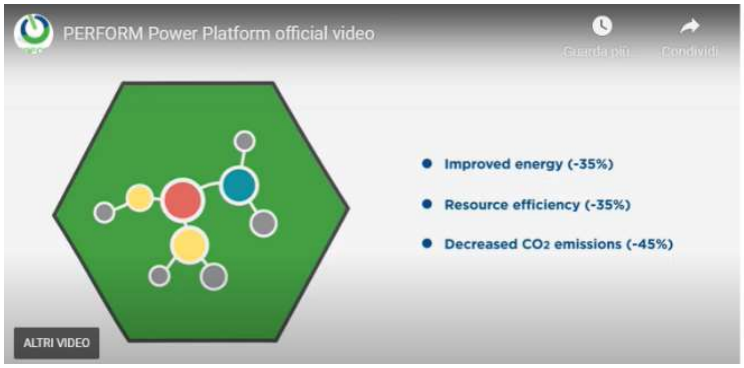
WP2: Electrode Platform Innovation

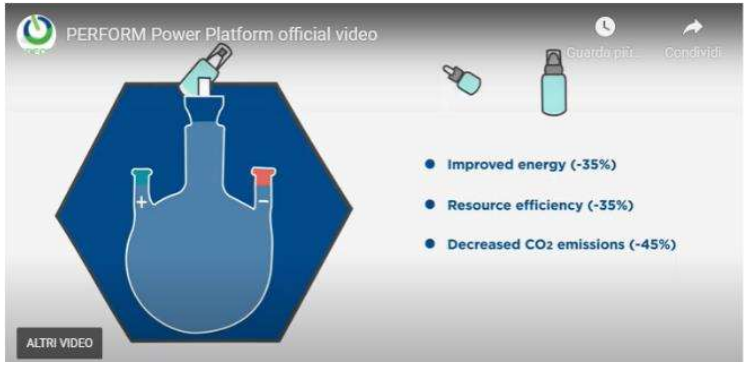
Obiettivi: realizzazione e sviluppo degli elettrodi catalitici





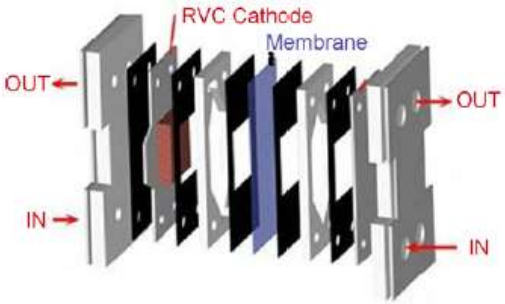


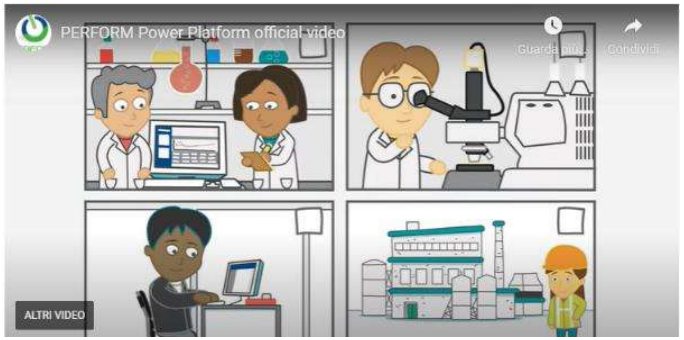




Questo approccio innovativo utilizza materie prime rinnovabili e meno energia durante la produzione dei prodotti chimici.

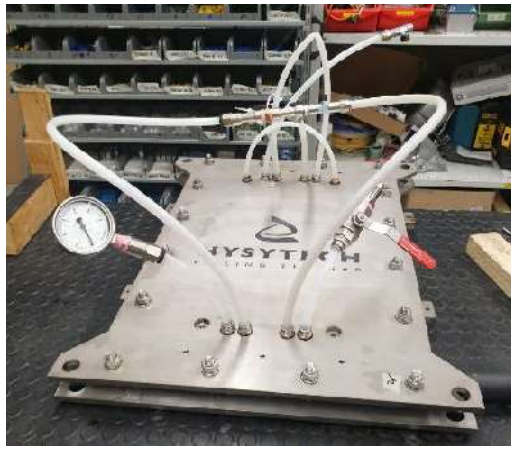
La squadra PERFORM testerà e ottimizzerà le tecnologie, misurerà l'impatto ambientale, l'efficienza e la redditività dei costi.





I prodotti chimici ottenuti saranno consegnati al consorzio che li testerà per le corrispondenti applicazioni.

Infine l'impianto sarà disponibile per i test per altri attori industriali.



WHO CAN BENEFIT FROM PERFORM?

Further research

Consumers of high-quality chemicals (universities, organisations) to use for research activities. Also, the innovations of the project will contribute to further research on this topic.

Agriculture chemicals

Valeric and maleic acid is in rising demand for agriculture chemicals manufacturing (pesticides, synthetic lubricants, etc.)

Food & beverage industry

For the fractions of glucaric acid (used as green and renewable food additive/health supplements), maleic (substitute for sugar in confectioneries) and valeric acid (used for flavour and perfume).

Detergent industry

Industry adopting glucaric acid as a replacement for phosphates in liquid detergents formulation.

Cosmetics & personal care industry

Maleic and valeric acid are widely used in the manufacturing of these products to add fragrance and balance ph.

Automotive industry

Interest for the glucaric and adipic acid fractions used for the manufacture of nylon 66 and for maleic acid for the manufacturing of polyester resins.