Goals and Objectives

Workflow of WaterProof

- Development of an efficient CO_2-conversion technology based on Carbon Capture and Utilisation (CCU)
- Efficient production of formic acid in adequate volumes
  - Successful application of CO_2-derived formic acid in leather tanning and in consumer cleaning goods
  - Successful production of solvents for metal recovery in waste(water) treatment

WaterProof aims to

- Source sustainable resources by replacing fossil feedstocks in order to produce renewable chemicals.
- Achieve climate neutrality through reducing GHG emission and industrial electrification.
- Create circularity in urban environments by connecting the waste sector, chemical industry and users of renewable chemicals.
- Transfer the successful concepts to urban communities in other regions, such as Colombia.

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Partners

Coatema Coating Machinery GmbH

cta Centro de Ciencia y Tecnología de Antioquia

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#WaterProofProject

June 2022 – May 2026

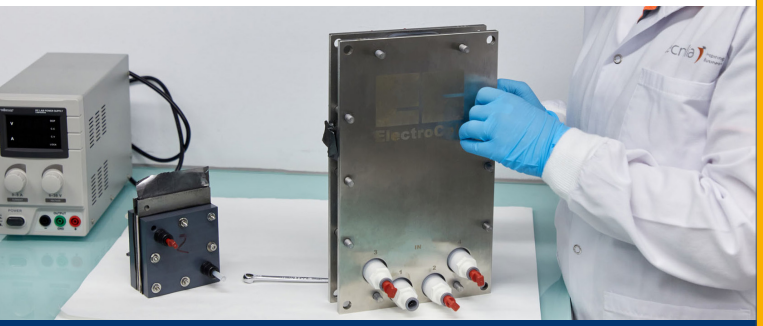
WATER PROOF

Urban Waste and Water Treatment Emission Reduction by Utilising CO_2 for the Production of Formate Derived Chemicals

waterproof-project.eu

The Power of Electrochemistry. From Fossil to Renewable. From Linear to Circular.

WaterProof's partners share the vision of an innovative, climate neutral and resource efficient technology to close the waste(water) carbon cycle.



The WaterProof Approach

At the heart of the WaterProof project is an electrochemical process converting captured CO_2 from waste incineration and wastewater treatment into formic acid. To increase the sustainability impact, the process can also run with renewable energies.

Not only does waste(water) treatment and processing provide the required CO_2 feedstock, it also will profit from the developed WaterProof technology and emission reduction. Peroxides that emerge as by-products of the CO_2 conversion can be used to purify wastewater from pesticides, antibiotics and pharmaceuticals.

The formic acid produced within WaterProof will be tested in different applications. While it will be directly used for sustainable tanning of fish leather, it will also serve as an active ingredient for consumer cleaning goods.

Furthermore, it can be chemically transformed to Acidic Deep Eutectic Solvents (ADES), which can be used for the recovery of precious metals from waste incineration ash.

Dying of fish leather after tanning with sustainable formic acid.
Source: Nordic Fish Leather

WaterProof is an interdisciplinary project that includes a collaborative team from science and industry, e.g., producers of fish leather and consumer cleaning products as well as waste(water) treatment facilities.

Reduction of CO_2 and other greenhouse gases, moving away from fossil to renewable feedstock and the creation of a circular economy are key elements in addressing climate change and pollution.

CO_2 has shown great potential as an alternative carbon source for fuels, chemicals and plastics and can be captured directly from point emissions and converted into renewable chemical building blocks.

If optimised and powered by renewable energy, this process can create negative emissions and supports the transformation to industrial electrification.

WaterProof will demonstrate this through a comprehensive Life Cycle Assessment (LCA), while its effect on social transformation will be monitored in a Social Life Cycle Assessment (S-LCA).