

Open data and industry-driven environment for multiphase and multiscale Materials Characterisation and Modelling combining physics and data-based approaches

OBJECTIVES

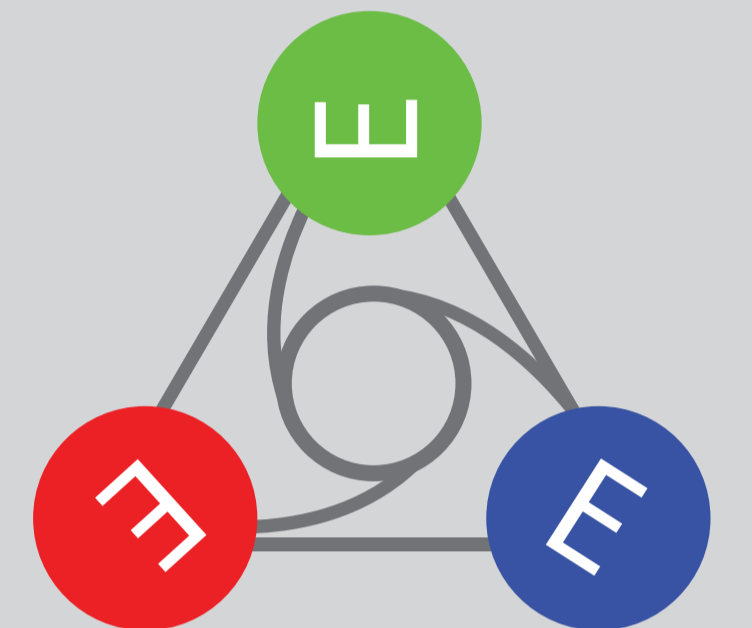


Accelerate advanced materials development

Develop a model-based innovation process to accelerate the materials' design, validation, characterisation methods and computational modelling

Traceability, Integrity and Interoperability

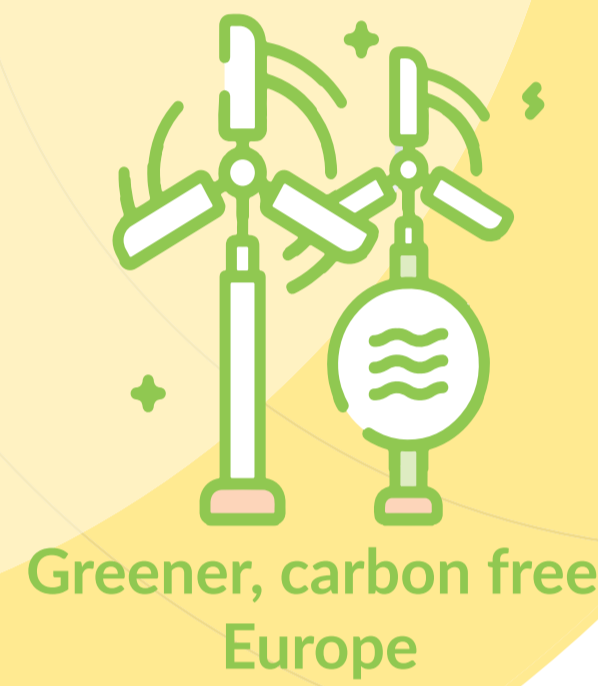
Enhance the interoperability and integration of characterisation and modelling data and workflows through a semantic approach



Open Data Repository

Create an open data repository based on semantic representation to connect design and manufacturing processes

MatCHMaker aims to reduce the time, cost and risks of developing and optimising advanced materials. This contributes to the **European Green Deal** to decarbonise the industry while enhancing people's quality of life.



USE CASES

Construction

Decrease CO2 emission and waste of cement production

Maximum substitution of clinker while maintaining equal/superior performance

MatCHMaker helps to build a predictive model for the strength of limestone calcined clay cements as a function of the replacement level, clinker mineralogy and fineness.

Energy

Solid Oxide Fuel/Electrolysis Cells (SOFC/SOEC)

Produce hydrogen without CO2 emissions and achieve the highest efficiency

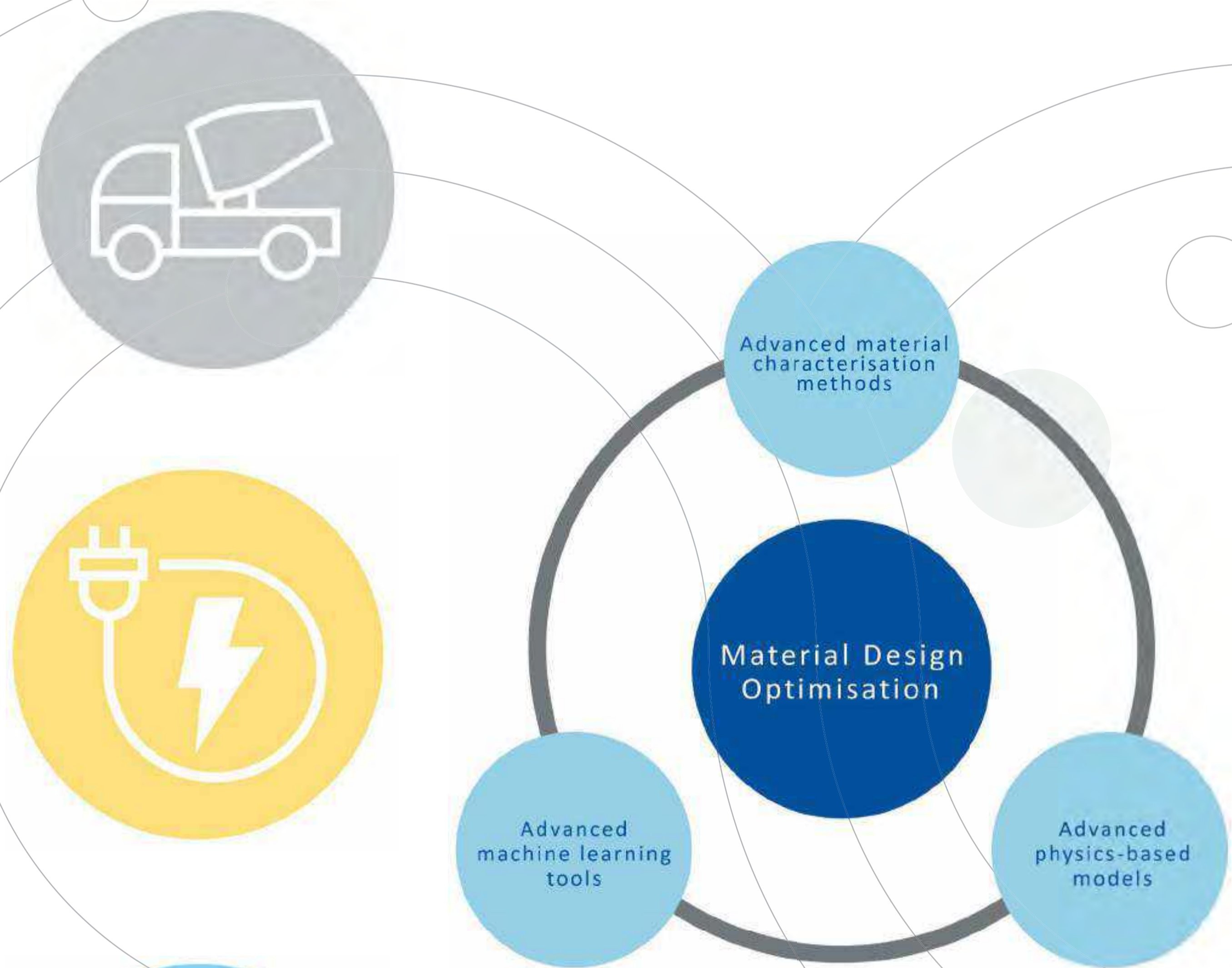
MatCHMaker will focus on cell technology, aiming to improve performance and mechanical robustness of electrochemical cells implemented in SOEC/SOFC via advanced modelling and characterisation.

Mobility

Proton-Exchange Membrane Fuel Cells (PEMFC)

Produce zero-emission power in multiple applications

The hydrogen fuel cell system has the flexibility to be used in cars, and tests for its use in boats and trains are under way. MatCHMaker aims to develop new future high performance material by enhancing analytical and computational analysis.



The MatCHMaker project aligns with the UN Sustainable Development Goals, especially with SDG Nr.9 **Industry, Innovation and Infrastructure** towards building a resilient infrastructure, inclusive and sustainable industrialisation and fostering innovation.

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