NEWSLETTER #2
From September to December 2024

Funded by the European Commission, DECODE is a groundbreaking collaborative project. Our mission is to develop and showcase the first decentralised cloud-based platform that unites multiple laboratories in a shared effort to accelerate the design and integration of energy materials.

Latest DECODE Project Updates!

Consortium Meeting #2

The DECODE partners held their second consortium meeting on November 21-22 in Strasbourg, France, hosted by CNRS (National Centre for Scientific Research). The main focus of the presentations and discussions was on assessing the methods and tools in modelling and characterization that had been collected recently, as a crucial effort within Work Package 1. Special attention was given to understanding the local reaction environment (LRE) and rationalizing the distribution of reaction conditions andrates (DRR) in electrocatalytic layers of electrochemical systems. Following the meeting, the BOSCH team led a workshop that involved in-depth exchanges about the creation of property-correlation trees and identifying knowledge gaps based thereon.

The following link takes you to more pictures of the committee meeting!

Project's and partners' presentation campaign

Euroquality, our dedicated partner leading theWork Package on Communication, Dissemination, and Exploitation, conducted two key communication campaigns on LinkedIn.

The first, a Project's Presentation Campaign, aimed to provide an easy-to-understand overview of the DECODE project.
The second campaign focused on presenting our partners and their roles in the project.

Please check out the summaries of these campaigns on our website: ☺

Project's presentation

Partners' presentation

Work in progress!

Update on Work Package 1:
"Requirements, Knowledge, and Development"

DECODE partners involved in this work package, which is led by **CNRS** and running until July 2025, are currently intensively pursuing the three following key objectives:

Evaluate DECODE methods and tools in modelling and characterisation — Assess methods and tools in terms of four orthogonal parent attributes — "maturity", "resource requirements", "interoperability", and "integration complexity" — and "utility" as a separate, context-dependent assessment layer.

Develop experimental and theoretical approaches — Identify and address knowledge gaps in understanding the local reaction environment (LRE) and the distribution of reaction conditions and rates (DRR) for electrochemical systems of gradually increasing complexity (from model interface to realistic electrode).

Devise next-generation descriptors — Use the gained knowledge to develop improved descriptors for understanding chemical reaction behaviours.

Update on Work Package 2:
"Integrated characterisation and modelling toolkits"

Led by the **Paul Scherrer Institute (Switzerland)**, our second work package aims to establish a seamless workflow that connects insights from WP1 on LRE, DRR, and electrode media properties with device metrics. This innovative approach will enable correlation analysis and the identification of optimal multiparametric descriptors. WP2 will also harmonize lab testing practices, conduct multiscale and multimodal characterizations, and use advanced techniques to assess the relationships among structure, properties, activity, and stability.
The months of December 2024 and January 2025 have been dense in meetings of partners, focusing on experimental or modeling-based research to consolidate a correlative workflow of characterization methods and tools (Task 2.1) and develop in parallel a seamless modeling workflow (Task 2.2), respectively, and prepare for the integration of the parallel workflows into one, as a primordial version of the DECODE Fabric.

Launch of Work Package 3:
the development of the DECODE Cloud Platform is underway!

In December 2024, the team at **Forschungszentrum Jülich** (IET-3), the DECODE coordinator, kicked off the third work package of DECODE, titled "Developing DECODE Cloud Platform". Running until February 2027, this work package aims to develop the underlying modules for deploying the DECODE platform. This will involve building and implementing a central processing unit (CPU) and developing state-of-the-art fine-tuning methods to retrain models embedded in the DECODE FOUNDRY.

Breaking News Highlights

In September 2024, the European Commission launched the Clean Energy Technology Observatory (CETO), an initiative to **monitor research and innovation activities in clean energy technologies.** CETO provides data-driven analysis to support the annual report on the competitiveness of clean energy technologies, thus contributing to the implementation of the SET-Plan and the development of research policies.

The European Innovation Council (EIC), in its 2024 Tech Report, highlighted **34 emerging technologies with the potential to transform European industries**. This report identifies early trends in innovative technologies with major potential for Europe's economic growth and technological competitiveness. By aligning itself with the EU's objectives, DECODE is contributing to the transition towards a greener and more sustainable energy ecosystem.

The International Summit for Action on Artificial Intelligence was held in Paris on 10-11 February 2025. The summit, organised by France and India, brought together **heads of state, governments, businesses and researchers to discuss joint action on AI**. Discussions focused on topics such as the inclusive governance of AI, cybersecurity, the environmental impact of AI, and the manipulation of information.

Exciting DECODE Project Events

Recent Events

4-6 Sept. 2024

DECODE presented at the 1st Workshop of the Hydrogen Network-of-Networks

From September 4-6, 2024, DECODE was presented at the 1st Workshop of the **Hydrogen Network-of-Networks: Research and Education Accelerated by Connections in Clean Hydrogen (REACH2).** This event took place at the University of Connecticut, USA. The workshop provided an excellent venue for FZJ researchers to showcase DECODE's innovative approach to accelerating the development of clean energy materials and technologies.

More

November 2024

Redox Shields 2024 Workshop

Universiteit Leiden highlighted the groundbreaking work of the DECODE project at the Redox Shields 2024 Workshop **"Spatiotemporal Complexity in Electrochemistry: From Experiments to Models"**. Karen van der Akker's intervention focused on **"Disentangling local electrolyte effects with RDE for HER".**

(Picture: Astrid Eckert / TUM)

More

2-4 Oct. 2024

European Big Data Value Forum (EBDVF) 2024

European Big Data Value Forum (EBDVF) was held on October 2-4 in Budapest. This prestigious event brought together industry leaders, researchers, business developers, and policymakers to discuss and shape the future of Data and AI. FZJ presented DECODE as part of the **"Enabling Cloud Connected Labs of the Future"** session.

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10 October 2024

10th RUHR-Symposium

On October 10th, 2024, the **10th RUHR-Symposium** brought together industry and academia to discuss Artificial Intelligence for Functional Materials. DECODE was showcased by **HTE** in the session on **"Materials Processes: From Automation to Autonomous [...]"**. The event was attended by around 100 participants.

More

26-27 Sept. 2024

7th Industry Workshop on Advanced Alkaline Electrolysis

The **7th Industry Workshop on Advanced Alkaline Electrolysis,** held on September 26-27, 2024, in Dresden focused on fostering exchange between academia and industry. The conference was well-attended, with over 300 international visitors, including a significant delegation from Spain. HTE showcased its electrochemical testrigs and introduced a new flexible cell concept for internal GDL/PTL compression control as part of DECODE's WP4.

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Upcoming Events

DECODE Partners will reunite in Renningen, Germany, this April.

Stay tuned!

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