



*DE-centralised Cloud labs fOr
inDustrialisation of Energy materials*

DELIVERABLE 6.5

Interim report for
D6.2: Report on communication and dissemination activities

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DELIVERABLE 6.5 – VERSION V2

WORK PACKAGE 6



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Nature of the deliverable		
R	Document, report	X
DEM	Demonstrator, pilot, prototype	
DMP	Data Management Plan	
OTHER	Software, technical diagram, etc	

Dissemination level		
PU	Public (<i>fully open</i>)	X
SEN	Sensitive (<i>limited under the conditions of the Grant Agreement</i>)	
EU CI	EU Classified (<i>eu-restricted, eu-confidential, eu-secret under Decision 2015/444</i>)	

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Document objective and executive summary

The aim of this interim report on communication and dissemination activities (D6.5) is to provide a detailed account and assessment of communication and dissemination activities carried out as part of the implementation of the DECODE project.

This report shows that DECODE has implemented a comprehensive communication and dissemination strategy during the first 18 months, targeting key stakeholders for results uptake through various channels. The project has developed impactful materials and actively managed online platforms to share updates and results, encompassing social media, website and newsletters. Partners have contributed to dissemination efforts, raising awareness and engaging audiences with tailored messages through participation in international topical events or publications in high impact journals. DECODE has been represented at several conferences and workshops. A few publications have been created and the project has gained media coverage across Europe. The project's communication and dissemination performance are regularly monitored, ensuring progress towards its targets.

This deliverable gathers the communication and dissemination activities that occurred between December 2023 (M1) and May 2025 (M18) and their impact. This interim report is the first version of Deliverable 6.2, that will be updated at M36 (D6.6) and one more time at M48 (D6.2).

This deliverable demonstrates that DECODE fulfils the requirements set out in the Grant Agreement to disseminate results (GA article 17) and in the Horizon Europe Rules for Participation (Regulation (EU) 2021/695, article 39 on exploitation and dissemination of results).

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1. Introduction

Well-coordinated communication and dissemination activities are crucial for the success of the DECODE project. Therefore, DECODE partners have decided to dedicate a work package to this purpose: WP6 “Communication, Dissemination and Exploitation”, led by Euroquality (EQY).

The activities described in this deliverable were planned in the *Plan for the Dissemination and Exploitation, including communication activities* (D6.1), submitted at Month 6 (May 2024) and regularly updated throughout the project.

Their purpose is to raise awareness and inform identified target audiences about the DECODE project, its objectives, progress, and results at appropriate times during the project lifecycle. Besides raising awareness and informing target audiences, dissemination activities also aim at fostering the adoption of project results for practical purposes by stakeholder groups that can directly benefit from them.

The identified target audiences for DECODE are specialised in clean energy materials and their integration into electrochemical cells for the purpose of deploying sustainable technologies, such as those needed in a green hydrogen economy. They have been grouped into three (3) categories, namely:

1. **Research and scientific community:** researchers and engineers specialised in materials physics and (electro-)chemistry; in polymer-based fuel cell and electrolyser technologies; in hydrogen research and industry; in the study of transport phenomena in porous media.
2. **Industrial enterprises, including SMEs, and business supporting organisations:** representatives of target groups like developers of diagnostic or testing equipment; energy materials developers; companies active in the development of energy materials and their integration into electrochemical cells; customers who concentrate on basic materials characterisation methods; industry research labs actively looking to participate in and leverage cloud-connected labs; companies developing manufacturing processes; players within mid- to down-stream value chain: component and cell developers, device manufacturers, component vendors.
3. **Policy makers:** European Commission, EIC, EMIRI, Inter-governmental mission innovation, non-governmental organisations.

Communication activities also target the general public. The key messages addressed to each of these targets are described in D6.1, section 1.1.

This report provides a comprehensive account and assessment of the communication and dissemination activities implemented between Month 1 (December 2023) and Month 18 (May 2025) of the DECODE project. These activities are presented by grouping them by activity type (communication, dissemination) and then by communication or dissemination channels, as identified in D6.1 (e.g., website, scientific publications, organisation of workshops, ...). Within each of these sections, the description of the activities carried out will be organised around the following points: brief reminder of the main purpose(s) of the activity, list of contributing partners, activity description, assessment of the activity impact against key performance indicators (KPIs), identified at the beginning of the project in D6.1, and an overall impact assessment. A conclusion will summarise the results and lessons learned.

2. List of partners

DECODE beneficiaries are the followings:

No	Participant organisation English name	Type of organisation	Acronym	Country
1	FORSCHUNGSZENTRUM JULICH GMBH	Research Organisation	FZJ	Germany
2	ROBERT BOSCH GMBH	Company	BOSCH	Germany
3	HTE GMBH THE HIGH THROUGHPUT EXPERIMENTATION COMPANY	Company	THE	Germany
4	NEL HYDROGEN ELECTROLYSER AS	Company	NEL	Norway
5	COMMISSARIAT A L'ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES	Research Organisation	CEA	France
6	UNIVERSITEIT LEIDEN	University	ULEI	Netherlands
7	CENTRO DE INVESTIGACIONES ENERGETICAS MEDIOAMBIENTALES Y TECNOLOGICAS	Research Organisation	CIEMAT	Spain
8	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS	Research Organisation	CNRS	France
9	INSTITUT NATIONAL POLYTECHNIQUE DE TOULOUSE	Research Organisation	INPT	France
10	RHEINISCH-WESTFAELISCHE TECHNISCHE HOCHSCHULE AACHEN	Research Organisation	RWTH	Germany
11	DANMARKS TEKNISKE UNIVERSITET	University	DTU	Denmark
12	HELMHOLTZ-ZENTRUM BERLIN FUR MATERIALIEN UND ENERGIE GMBH	Research Organisation	HZB	Germany
13	EUROQUALITY SAS	Company	EQY	France

DECODE associated partners are the following:

No	Participant organisation English name	Type of organisation	Acronym	Country
1	PAUL SCHERRER INSTITUT	Research Organisation	PSI	Switzerland
2	SIMON FRASER UNIVERSITY	University	SFU	Canada
3	UNIVERSITE DE STRASBOURG	University	UNISTRA	France

3. Communication and dissemination supports

3.1 Introduction

During the first months of the project, EQY has developed and made available to all partners as well as to the public (on SharePoint for partners and on the project website for the public) the communication and dissemination supports described in the following. As further explained in D6.1, these materials are key elements of DECODE communication and dissemination strategy that can be mobilized in various situations, both off- and online.

3.2 DECODE visual identity: the graphic charter

To begin with, EQY developed the project's graphic charter. This document is fundamental, as it defines the visual identity of DECODE by determining the graphic rules and standards to be followed for all its communication, both internal and external. Its main aim is to ensure visual consistency across all communication media of the project, further described in this report. The key elements of DECODE graphic charter are the following:

Logo

The logo is one of the most important elements of the graphic charter. Indeed, it represents the symbolic representation of the project, must be found on all communication media of the project, and it is from this logotype that the visual identity of the project was built.

The graphic charter specifies the different versions of the logo (see examples of the allowed declination below, Figure 1) as well as its authorised uses, such as minimum size, clear zones and preferred placements. The logo has been designed to be easily recognisable and memorable.



Figure 1. DECODE logo and examples of allowed declination

Colour palette

DECODE's graphic charter also defines the main and secondary colours to be used in the project's communication and dissemination supports. An overview of this palette can be found thereafter.

	#5BC5C3	R: 91 G: 197 B: 195	C: 60% M: 0% Y: 28% K: 0%
	#223E7C	R: 34 G: 62 B: 124	C: 100% M: 88% Y: 22% K: 8%
	#5BC5C3 - #223E7C	R: 91 - 34 G: 197 - 62 B: 195 - 124	C: 60% - 100 % M: 0% - 88% Y: 28% - 22% K: 0% - 8%

Figure 2. DECODE colour palette

Typography

In addition, the project's graphic charter determines the font to be used for titles, headings and paragraphs, while specifying rules on the font size, spacing and other typographic aspects. The selected typography was "Plus Jakarta Sans" due to its proportions, which allows for a high impact in tightly set lines of both large and small text. Additionally, its curves convey a warm and soft character.

Templates for Word and PowerPoint presentations

Finally, DECODE partners are provided with the templates they need for word documents and powerpoint presentations related to the project, whether for internal or external use. These templates also respect the graphic standards defined in the charter, as described above.



Figure 3. DECODE Word template



Figure 4. DECODE Power Point template

3.3 DECODE communication and dissemination materials

EQY has developed a range of printed promotional materials with the dual objective of capturing attention and presenting the DECODE objective, concept, innovations, key features, and expected outcomes in a synthetic and easily understandable way. These materials thus facilitate the transfer of knowledge on the project from researchers to both the general public (communication) and to stakeholders (dissemination). They have been displayed or distributed during events.

Available materials are as follows: DECODE flyer and kakemono. They are presented hereafter and comply, as can be seen, with the standards set by the project's graphic charter.

Flyer



DECODE
Decentralised Cloud labs for the industrialisation of Energy materials

COLLABORATION AND FUNDING
16 partners 8 countries
7M EU-funds 2023-2027

PROJECT
The discovery and mobilisation of high-performance materials for clean technologies is an essential element in Europe's transition to a green and sustainable future. This requires accelerated development and strategies to address geopolitical threats and ensure raw material supply chain security. **DECODE is a collaborative project** funded by the European Commission and coordinated by Forschungszentrum Jülich (FZJ). **It aims to create and demonstrate the first decentralised, cloud-based platform of a kind, to align the efforts of multiple laboratories on a common goal, viz. accelerating the design and integration of energy materials.**

INNOVATIONS
DECODE FABRIC/FOUNDRY – for searching, connecting and mapping tools
Provides a pre-trained reinforcement learning to collect and evaluate methods and tools, available or under development, employing semantic searches, knowledge graphs, and ontology-enabled meta-data mapping.
DECODE IRL (Integration Readiness Level) Assessment – for scoring methods and tools
Implements a scoring system to assess the utility of methods and tools in modelling and characterisation.
DECODE (AI-enabled) CPU – an end-to-end digital agent orchestrating the entire workflow
Coordinates access and lines the usage of modelling and characterisation methods and tools for a specific material integration challenge.

VISION
DECODE aspires to revolutionise the process, by which materials and functional components for clean energy technologies are developed, integrated, and assessed. Focusing on sustainable hydrogen technologies, i.e., fuel cells and water electrolysis, the DECODE platform implements flexible and adaptable research infrastructures to help eliminate or drastically reduce the use of Critical Raw Materials (CRM), such as Pt and Ir, and to replace fluorine-containing polymers by less harmful alternatives.

DEMONSTRATION OF THE PLATFORM
Disruptive innovation in the energy technology domain requires a high level of integration: from one scale to another, moving from sub-component materials and simple model systems to a complete device, and from one laboratory to another, connecting data flows and analyses from a multitude of methods and tools in characterisation and modelling.
To realize and demonstrate this integration, DECODE will carry out use case studies.
The demonstration case will focus on a fundamentally well-understood technology, with extensive data sets existing, viz. polymer electrolyte fuel cells (PEFC). The proper use case will be to integrate novel fluorine-free ionic polymers into catalyst layers of these cells. For this case, competencies and capabilities are highly aligned among DECODE partners.
Thereafter, the same integration challenge will be evaluated on other technologies (exploratory cases), including polymer electrolyte water electrolysis as well as the corresponding alkaline electrochemical energy technologies.

DECODE EXPECTED RESULTS

- Develop and field-test methodologies of multi-scale and multi-technique characterisation and modelling
- Prioritise and tackle critical gaps in materials-related knowledge
- Develop a modular cloud-based platform for AI-driven workflow orchestration, assessment, and recommendation of modelling & characterisation methods and tools.
- Demonstrate and validate the DECODE decentralised platform.
- Ensure the exploitation of the project results towards alternative materials feedstocks and a circular economy.

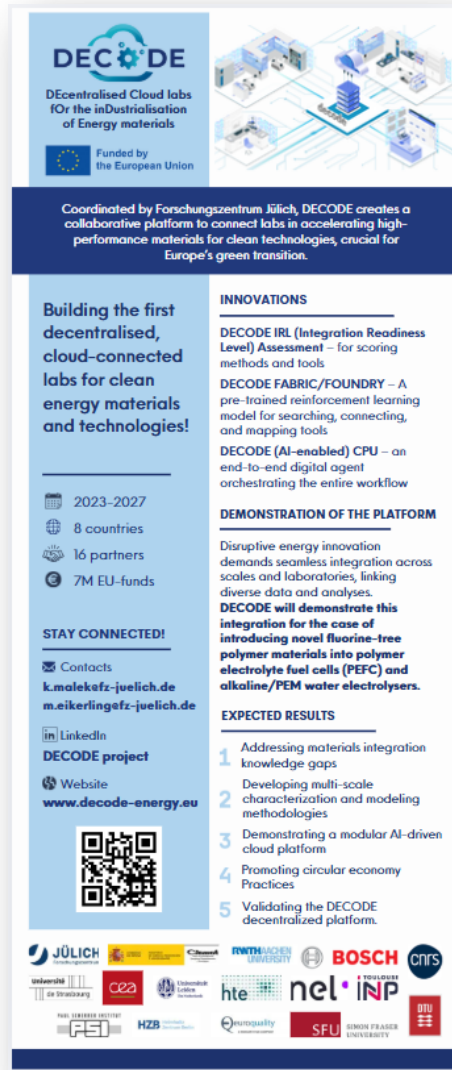
PROJECT PARTNERS
JÜLICH, CE2, CHORUS, RWTH AACHEN, BOSCH, CNRS, UNIVERSITÉ DE STRASBOURG, UNIVERSITÉ LUDWIG-MAXIMILIANS, hte, nel, INP, FZJ, HZB, SFU, SIMON FRASER UNIVERSITY, etc.

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Figure 5. DECODE flyer

Kakemono

The project's kakemono is available in the common SharePoint folder (too big to add here).



DECODE
DEcentralised Cloud labs
for the inDustrialisation
of Energy materials

Funded by
the European Union

Coordinated by Forschungszentrum Jülich, DECODE creates a collaborative platform to connect labs in accelerating high-performance materials for clean technologies, crucial for Europe's green transition.

Building the first decentralised, cloud-connected labs for clean energy materials and technologies!

- 2023-2027
- 8 countries
- 16 partners
- 7M EU-funds

STAY CONNECTED!

Contacts
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LinkedIn
DECODE project

Website
www.decode-energy.eu

INNOVATIONS

DECODE IRL (Integration Readiness Level) Assessment – for scoring methods and tools

DECODE FABRIC/FOUNDRY – A pre-trained reinforcement learning model for searching, connecting, and mapping tools

DECODE (AI-enabled) CPU – an end-to-end digital agent orchestrating the entire workflow

DEMONSTRATION OF THE PLATFORM

Disruptive energy innovation demands seamless integration across scales and laboratories, linking diverse data and analyses.

DECODE will demonstrate this integration for the case of introducing novel fluorine-free polymer materials into polymer electrolyte fuel cells (PEFC) and alkaline/PEM water electrolyzers.

EXPECTED RESULTS

- 1 Addressing materials integration knowledge gaps
- 2 Developing multi-scale characterization and modeling methodologies
- 3 Demonstrating a modular AI-driven cloud platform
- 4 Promoting circular economy Practices
- 5 Validating the DECODE decentralized platform.

Partners: JÜLICH, RWTH AACHEN UNIVERSITY, BOSCH, CNRS, hte, nel, INP, SFU, HZB, FZJ, CEA, Fraunhofer, etc.

Figure 6: DECODE kakemono

4. Report on communication activities

4.1 Introduction

As outlined in the *Plan for Dissemination and Exploitation, including Communication Activities* (D6.1), communication means taking strategic and targeted measures for promoting the project/action itself and its results to a multitude of audiences, including the media and the public, and possibly engaging in a two-way exchange. The aim is to reach out to society as a whole and, as well, to specific audiences while demonstrating how EU funding contributes to tackling societal challenges.

This section presents a comprehensive account and assessment of the communication activities carried out as part of Work Package 6 – Task 6.2 in the framework of the implementation of the DECODE project, led by EQY.

4.2 Website of the project

Purpose of the project

The website (<https://decode-energy.eu/>) is the main communication instrument of DECODE and contains project information for all three target groups identified in D6.1: research and scientific community, industrials and policy makers. The website is an easy and inexpensive means to reach all stakeholders. It makes them able to follow the project's progress and peruse its results and, thereby, increases the impact of the project.

Description of the activity

The DECODE website is available at this link: <https://decode-energy.eu/>. As a reference communication tool, the website address is displayed in all communication material of the project. The website was built in a product-oriented manner to foster the interest for potential future users of the DECODE decentralised cloud-based platform. It aims to create, maintain and enlarge the follower stakeholder community highlighting methods, tools and technologies used and promoting the results of the project. More generally, it presents the project, the partners, the demonstration cases, the platform and the project results.

Newsletters are produced throughout the project duration and published on the project website. Scientific and technical publications and articles are also published during the project implementation. Finally, events such as conferences, workshops, training and summer schools relevant to or organised by DECODE will be advertised. The DECODE website was developed by EQY and launched at Month 6 (May 2024). The website is available in English.

The website is regularly updated, specifically the News & Events page. The newsletters and publications and deliverables are also uploaded when published.

The main menu of the website is the following:

- **Home page:** The homepage includes an overview of the key project's information (see figure 6), followed by a map of Europe including the partners' logos, as well as a short, textual description of the project.
- **About:** Highlighting the project's major assets, the key elements of the DECODE platform (i.e. IRL, DECODE FABRIC, and CPU), a detailed diagram of the project's innovations and activities, and a paragraph about the consortium.
- **Resources:** This section will be updated by the partners as project milestones are achieved and public deliverables are approved by the European Commission.
- **Partners:** Presentation of all the project's partners.

- **News & events:** The partners will maintain contact with project followers and stakeholders and share with them upcoming events where DECODE partners will be present.
- **Contact.**
- **Footer:** The footer includes the EU acknowledgement, as well as the links to DECODE's social media platforms and newsletter's registration.

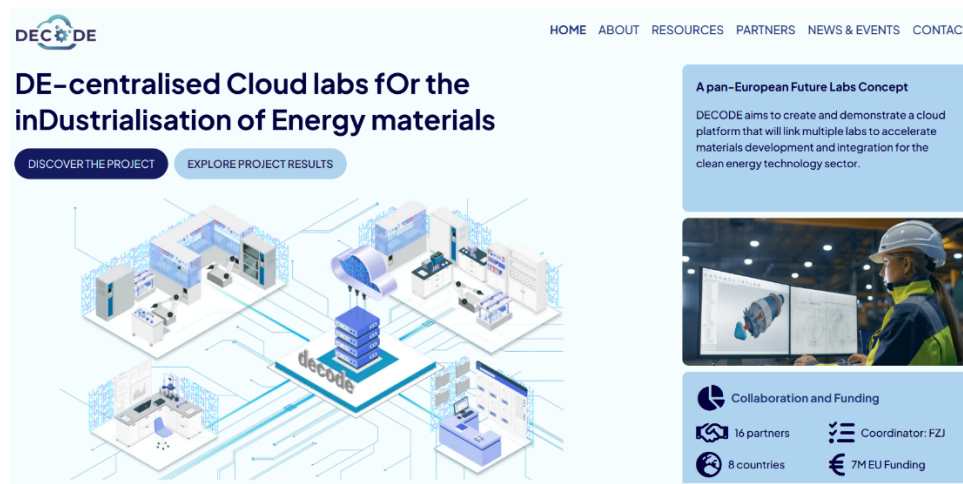


Figure 7. DECODE website homepage

Assessment of the activity's impact

Since its launch, i.e., from M7 (June 2024) to M17 (April 2025), the website gathered 1,768 visits, with 666 unique visitors. According to the KPI target set in D6.1, this corresponds to a poor impact. However, as highlighted by Figure 8 below, visits of the website did not really start until M12 (November 2024), meaning that the visibility of the website improved throughout the months and that the performance described here is concentrated over 7 months, whereas the KPI target (5,000-7,000 visits) is set per year. Efforts to improve the visibility of the website will be reinforced in the coming months.

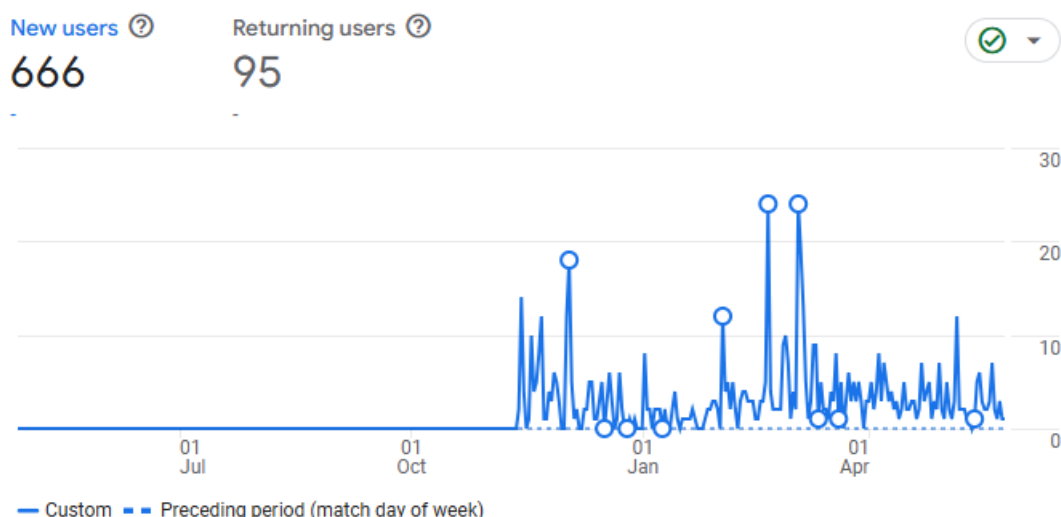


Figure 8. Website users activity between M7 and M18

Table 1. Website impact

KPI	Target set by the C&D Plan (D6.1)	Performance achieved
Visit per year on the project website	Good impact: 5000-7000	1768 (M12-M18)

4.3 Social media

Purpose of this activity

The social web LinkedIn is used to increase the project visibility widely and at low cost. The purpose is also to make connections with other projects and research groups. These connections are valuable as they increase the exploitation and innovation potential of developments carried out within the project. This social media is used by 2 manners:

- Thanks to partner's accounts;
- Thanks to DECODE administrative accounts on LinkedIn.

Description of the activity

Posts are made on DECODE LinkedIn account and shared by partners to increase their visibility. The main content is not very deeply scientific but more general. It invites the reader to see the website and have access to more information there, including results like deliverables and publications. Several communication campaigns were launched on LinkedIn.

Main communication campaigns:

- Project's presentation campaign (April 2024)
- Partners' presentation campaign (June 2024)
- "Meet our team" campaign (March 2025)

Other posts on LinkedIn:

- Launch of the DECODE project (December 2023)
- Wishing Merry Christmas (December 2023)
- Kick Off Meeting and CM announcement and update (every 6 months)
- Launch and announcement of the newsletter (twice a year)
- Participation of DECODE partners in workshops, events and conferences
- Interviews with women involved in DECODE as part of the International Women's Day 2025

In total, 59 posts were published on LinkedIn between December 2023 and May 2025, corresponding to the good impact KPI of 39.3 posts on average per year.

Table 2. List of LinkedIn posts published

#	Purpose of the post	Date of publication
1	Launch of the DECODE project	05/12/2023
2	Merry Christmas	22/12/2023
3	Kick-off Meeting	22/01/2023
4	Workshop "From Research to Industry: How Characterisation and Digitisation Change the Game"	01/02/2024
5	Discover the DECODE project	15/04/2024
6	Project's presentation campaign – 6 posts associated	22/04/2024
7	Announcement of the presentation campaign	04/06/2024
8	Start of the presentation campaign – 16 posts associated	11/06/2024

9	The DECODE project celebrates its first Consortium Meeting	14/06/2024
10	DECODE contribution to Future Labs Live Basel workshop	25/06/2024
11	DECODE project is proud to be a sponsor at the European Big Data Value Forum (#EBDVF) 2024 in Budapest	12/09/2024
12	Fantastic "Enabling Cloud Connected Labs of the Future" Session today at EU BDVA - Big Data Value Association Forum	02/10/2024
13	Unlock the Power of Intellectual Property in Technology Transfer: don't Miss #HaDEA's Workshop Today!	08/10/2024
14	DECODE Consortium: A Leap Forward in Clean Energy	08/10/2024
15	Launch of the DECODE project newsletter	13/11/2024
16	Launching Our First DECODE Project Newsletter!	14/11/2024
17	DECODE at Redoxshield Workshop 2024	25/11/2024
18	The DECODE project hold its second Consortium Meeting	05/12/2024
19	Highlights from DECODE project's 2nd Consortium Meeting	23/12/2024
20	Celebrating Women in Science - Karen Van Den Akker	04/03/2025
21	Celebrating Women in Science – Ezgi Arat	06/03/2025
22	"Meet our team campaign" - 16 posts associated	11/03/2025
23	The first DECODE Platform User Workshop	23/04/2025
24	Highlights from DECODE project's 3rd Consortium Meeting	15/05/2025

Assessment of the activity's impact

The impact of LinkedIn posts was tracked through the Communication & Dissemination tracker. DECODE has garnered strong interest from the LinkedIn community, with 317 followers gained in 18 months. This audience includes researchers and potential end-users (engineers and industry people). The visibility of posts is high, with an average of 569 impressions per post.

Table 3. LinkedIn impact

KPI	Target set by the C&D Plan (D6.1)	Performance achieved
Posts per year on social media	Good impact: >30	39.3
Views per post on social media	Good impact: 500-1 000	569
Views per year on social media posts	Good impact: 10 000-30 000	18 365
Total size of follower communities	Good impact: 300-500	317

4.4 Newsletter

Purpose of this activity

The newsletter aims to provide comprehensive and direct updates about DECODE to an interested community. Its key purpose is to communicate project news more thoroughly than social media, reaching a broader audience and offering in-depth insights beyond typical digital platforms.

Description of the activity

The newsletter subscription is available on the website. The subscription link was also shared directly via the partners networks and was also shared on LinkedIn. Newsletters have not been used at the beginning of the project, to take time to create a follower community, and to focus efforts on the website creation and on social media management. Starting in November 2024, 2 newsletters were published throughout the project.

The first Newsletter was sent in November 2024 and focused on the kick-off and first consortium

meeting, the launch of the DECODE website, the progress of WP1 and the launch of WP2, the recent events the DECODE partners participated to and the upcoming ones.

The second Newsletter was sent in February 2025 and focused on the topics addressed during the second consortium meeting held on November 2024, the two communication campaigns run in 2024, the progress of each WP1, WP2 and the launch of WP3, the recent events the DECODE partners participated to and the upcoming ones.

Assessment of the activity's impact

DECODE audience grew to 81 recipients as of May 2025. Reception and clicks statistics improved regularly as more newsletters were sent.

Table 4. Newsletter impact

KPI	Target set by the C&D Plan (D6.1)	Performance achieved
Number of people who have subscribed to the newsletter	Good impact: 100-300	81
Percentage of people opening the newsletter	Good impact: 30-50%	37.5%

4.5 Popular Scientific Articles and Press Releases

Purpose of this activity

DECODE partners will publish popular science articles, as well as press releases at important stages of the project's evolution. The aim of these publications is to make the project more visible and more understandable for a wide, non-expert audience.

Description of the activity

Not applicable yet.

Assessment of the activity's impact

Not applicable yet.

Table 5. Impact of popular scientific articles

KPI	Target set by the C&D Plan (D6.1)	Performance achieved
Number of popular science articles published	Good impact: 5-7	0 (RP1)
Number of reads per article	Good impact: >1000	NA

4.6 Videos

Purpose of this activity

Two videos will be developed throughout the project to (1) present the project's concept and (2) the main achievements. The videos need to be quite simple and addressed to general audience and policy makers.

Description of the activity

At the moment, the first cartoon-style animated video on the project's concept is under development and will soon be available on YouTube and shared on LinkedIn and the website. It will explain in approximately 3 minutes:

- which global challenges the DECODE project is addressing;
- what the aim of the DECODE platform is and how it works;
- who the partners are;
- which demonstrations cases will be considered.

It will present the project in a generally accessible form to be understandable for a wide audience.

Assessment of the activity's impact

Not applicable yet.

5. Report on dissemination activities

5.1 Introduction

As outlined in D6.1, dissemination stands for the public disclosure of the results of the project. It is an active process of promotion and awareness-raising right from the beginning of a project. It makes research results known to various stakeholder groups (like research peers, industry actors, policymakers) in a targeted way, to enable them to use the results in their own work.

This section presents a comprehensive account and assessment of the dissemination activities carried out as part of Work Package 6 – Task 6.2 in the framework of the implementation of the DECODE project, led by Euroquality.

5.2 Scientific and technical publications

Purpose of this activity

The publication of scientific articles by the DECODE project partners meets the objective of disseminating the results of the project to scientists, but also to others who might learn from these results, such as the industry actors, authorities and policymakers, or members of the civil society. This is aimed at maximising the results' impact, allowing other researchers to go a step forward, and contributing to the advancement of the state of the art.

To this end and in line with the requirements of Horizon Europe as set out in Article 17 of the DECODE Grant Agreement, immediate open access (free-of-charge access for any user) to all peer-reviewed scientific publications that are related to the results of the project has been ensured.

Description of the activity

Between M1 and M18, 2 scientific publications have been published. They are listed in the table below.

Table 6. Scientific publications published in the framework of the DECODE project

#	Type	Title	Author(s)	Title of the Journal/Proc./Book	DOI and/or URL
1	Journal article	LLM-Based Knowledge Graph Construction from Materials Research Scientific Literature	Nasrin Mohammad, Max Dreger, Diego Collarana, Mohammad J. Eslamibidgol, Michael Eikerling, Kourosh Malek	Digital Discovery	DOI:10.5281/zenodo.13945250
2	Journal article	Theory of Electro-Ionic Perturbations at Supported Electrocatalyst Nanoparticles	Yufan Zhang, Tobias Binninger, Jun Huang, Michael Eikerling	Physical Review Letters	DOI: 10.1103/PhysRevLett.134.066201

Assessment of the activity's impact

Although the expected number of scientific publications has not yet been achieved during this first year, numerous publications on the project's activities are currently being prepared. Indeed, in

addition to the 2 published articles, publications on the project's results shall be soon disseminated in 2025 and 2026.

Table 7. Publications' impact

KPI	Target set by the C&D Plan (D6.1)	Performance achieved
Number of scientific publications per year	Good impact: 20	2 at the end of RP1
Number of publication downloads	Good impact: >2 000	<i>To be determined at the end of the project</i>

5.3 Participation in conferences and events

Purpose of this activity

Participating in events enables to reach targeted audiences (e.g., researchers, industries, engineers) and share information about the project to them in person for more impact.

Description of the activity

Between M1 and M18, DECODE partners participated in 23 events, online and in person.

Table 8. List of events and workshops

Event name	Type	Target audience Reached	Date	Location	Partner
Joint workshop - modeling and characterisation on projects - presentation on behalf of the topic DE-01-12	Clustering activities	EU Institutions	Feb 26, 2024	Online	FZJ
Materials Week/AMI2030	Conferences	EU Institutions	17/06/2024	In person	FZJ
AABC Europe 2024	Conferences	Industry, business partners	15/05/2024	In person	HTE
Future Lab Conference	Conferences	Innovators	June 26-27, 2024	In person	FZJ
Helmholtz AI	Conferences	Research communities	June 12-14, 2024	In person	FZJ
EU-MACE COST ACTION meeting and joint	Collaboration with other EU-funded projects	EU Institutions	Jan 25-26, 2024	In person	FZJ

workshop on "Digitalisation and Automations Boost Materials Research"					
2024 Accelerate conference	Conferences	Industry, business partners	Aug. 6-9, 2024		FZJ
EUROCORR 2024	Conferences	Research communities	Sept. 1-5, 2024	In person	CIEMAT
Catalytic-Chemical Processes for Tomorrow	Conferences	Research communities	August 22, 2024	In person	HTE
REACH2 workshop #1	Clustering activities	Research communities	Sept. 4-6, 2024	In person	FZJ
10th RUHR-Symposium	Conferences	Research communities	October 10, 2024	In person	HTE
7th Industry Workshop Advanced Alkaline Electrolysis	Conferences	Industry, business partners	Sept. 26-27, 2024	in person	HTE
RedoxShields workshop 2024	Conferences	Research communities	October 31-November 1, 2024	In person	ULEI
GDCh Electrochemistry 2024	Conferences	Research communities	Sept 16-19, 2024	In person	PSI
5th PSI Electrochemistry Day	Other	Research communities	Sept. 18, 2024	In person	PSI
ECS meeting Hawaii	Conference	Research communities	October 6-11 2024	In person	FZJ
6th PSI Electrochemistry Day	Other	Research communities	05/03/2025	In person	PSI
21st Symposium on Modeling and Experimental Validation of Electrochemical Energy Technologies	Conferences	Research communities	11/03/2025	In person	PSI

s					
Symposium Advances in Imaging and AI for Energy Technologies	Conferences	Research communities	21/03/2025	Hybrid, FZJ	FZJ
21st Symposium on Modeling and Experimental Validation of Electrochemical Energy Technologies	Conferences	Research communities	March 11-12 2025	In Person	ULEI
The Netherlands' Catalysis and Chemistry Conference	Conferences	Research communities	March 10-12 2025	In Person	ULEI
REACH2 Network meeting	Clustering activity	Industry, business partners	April 6-9, 2025	In person	FZJ
FutureLab London	Conference	Research communities	May 14-15, 2025	In person	FZJ

Assessment of the activity's impact

The implementation and results of communication and dissemination activities is monitored thanks to an online tracker. This includes participation in events.

During this first reporting period, DECODE partners participated in 23 events, online and in person. Within these, the number of presentations on the project at international conferences reached 17. Therefore, the number of presentations at international conferences is already quite close to the KPI objective set for the end of the project. The estimated average number of people attending per event was >500 during RP1 - corresponding to an excellent impact - including researchers, industrials, decision makers, investors, engineering and press & media. DECODE was disseminated through oral and PowerPoint presentations, flyers and roll-ups at all these events.

Table 9. Impact of dissemination through participation to events

KPI	Target set by the C&D Plan (D6.1)	Performance achieved
Number of presentations at international conferences	Good impact: 20	17
Number of people attending per event	Good impact: 100	<500

5.4 Organisation of workshops, webinars and summer schools

Purpose of this activity

Findings of the project will be migrated into training and workshop material to be widely disseminated and implemented in different types of activities detailed below.

Description of the activity

Three types of activities with specific content will be delivered:

- **M.Sc. courses:** lecture courses are regularly being taught on *Theory and Simulation of Electrochemical Materials*, *Interface Theory and Computational Electrocatalysis*, *AI for Accelerated Materials Modelling and Design* by FZJ-IET-3, and *Energy Conversion and Storage* by UNISTRA.
- **Demonstration workshops** both organised by project partners (CIEMAT, DTU, FZJ) and external ones. These workshops include data handling, MAPs, standards and ontologies. A two-day workshop will be organised by CIEMAT to provide a general introduction to the DECODE project and presentations of the latest developments in fuel cell research by each partner. Presentations from invited researchers, industry or government will be included. Attendance is open to scientific community, students, and general public. CIEMAT groups will show some of the facilities used for DECODE. The presentations will be available on the DECODE page. In case of time constraints, it is possible to extend the workshop to a third day or to combine the partners' presentations to shorten them.
- **HQP training campaigns** covering cutting edge know-how in theory and computation as well as digitalisation and materials informatics, organised by FZJ-IET-3 with participation and contributions from all project partners.
- **Summer schools** organised by FZJ-IET-3 and HZB. DECODE will be hosting a week-long training summer school focused on the topic *Acceleration and Automation of Energy Materials Integration*. The school will cover multiple aspects of materials acceleration methodologies using AI/ML, in-line and off-line characterization techniques and modeling-based component and cell diagnosis. This includes experimental aspects of automated synthesis and characterization, integrating simulation methods in materials design, and machine learning methods for de-centralized labs. Experts from different fields will hold lectures and provide hands-on tutorials on their subjects. participants will:
 - Learn transversal skills for automating materials characterization and resultant data collection and management.
 - Form connections with other researchers directly involved in accelerated discovery and integrations across Europe.
 - Tour autonomous labs and see them in operation, discuss considerations directly with researchers.

Between M14 and M18, FZJ and EQY began planning these activities and coordinating the partners' involvement.

Assessment of the activity's impact

Not applicable yet.

Table 10. Impact of the organisation of workshops/trainings/summer schools

KPI	Target set by the C&D Plan (D6.1)	Performance achieved
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Number of demonstration workshops organised	Good impact: 2	0
Number of HQP training campaigns	Good impact: 3	0
Number of summer schools organised	Good impact: 2	0
Number of students participating to the M.Sc. courses	Good impact: 50	0
Number of participants per HQP training	Good impact: 60	0

5.5 Networking activities

Purpose of the activity

The goal is to engage in networking activities with other projects, existing/future Horizon Europe projects or other national projects on related topics, in view of enhancing the pool of available data, facilitating methodical advances, and increasing awareness for and adoption of DECODE's scientific-technical results and methodical developments. Sister projects' will be contacted through their coordinators and collaboration opportunities, including but not limited to, joint dissemination of results will be exploited.

Description of the activity

DECODE partners participated in two workshops where they had the opportunities to exchange with other projects:

- A joint workshop organised by HADEA, in which other European funded projects on the same topic (HORIZON-CL4-2023-DIGITAL-EMERGING-01-12) were funded;
- The first workshop of the NSF Accel Net Network of Networks: Research and Education Accelerated by Connections in Clean Hydrogen (REACH2).

Between M1 and M18, different links were made with other projects.

DigiCell: Battery material characterisation and digital twins for cell to pack performance in agile manufacturing pilot lines and automotive field

- **Description:** On the path to Europe's green industrial shift, reliability and innovation in battery technology stand at the forefront. With this in mind, the EU-funded DigiCell project will focus on the intricacies of advanced functional materials at a multi-scale level. It will introduce a digitally integrated framework. This framework enhances the manufacturing processes of high-performance Lithium-ion batteries and beyond. By employing innovative characterisation methods and machine learning, DigiCell significantly reduces production costs, materials waste, and CO2 footprint. The project's holistic approach emphasises open-source algorithms, data standardisation, and quality assessments, ushering in a new era of efficiency and sustainability in battery production.
- **ID:** 101135486
- **Dates:** 1 January 2024 - 31 December 2026
- **Coordinated by:** KEYSIGHT TECHNOLOGIES GMBH Austria
- **Project's website:** <https://www.digicell-project.eu/>

Hyway: Multiscale Characterisation and Simulation for Hydrogen Embrittlement Assessment: Development of an Open Knowledge Platform to Foster Capability Integration

- **Description:** HyWay aims to develop adaptive multiscale material modelling and characterisation suites for assessing interactions between hydrogen and advanced metallic materials and demonstrate their capabilities on hydrogen storage and transport components.

Advanced materials application like hydrogen technologies is essential for achieving the EU carbon neutrality goal. However, deploying hydrogen technologies needs a tremendous effort to complete the infrastructure, requiring efficient material assessment suites, enabling industries to be more effective in developing and working with materials. Furthermore, since hydrogen is stored and transported in several forms, the material assessment suites must be flexible and capable of revealing hydrogen-material interactions in various conditions. The HyWay suites contain 3 key modules: Physical realm, Virtual world, and Data and knowledge management platform (DKMP). The Physical realm will advance experimental capabilities to reveal hydrogen-material interactions by compiling characterisation methodologies across length scales. The Virtual world will develop a multiscale and multiphysics materials modelling framework for disclosing how hydrogen alters changes in advanced materials under various service conditions. The Physical realm and the Virtual world are interdependent and complement each other through the data exchange between modules. We will establish the DKMP to facilitate the data exchange and merge material research disciplines.

HyWay will ensure the productive allocation of investments required in constructing the hydrogen infrastructure. We will strengthen European capability in steering green transition with digital technologies and future emerging enabling technologies and ensure an open strategic autonomy by supporting the transformation of the EU energy mix to be dominated by hydrogen. The consortium comprises renowned experts from academia and industries across the EU and will support Ukraine on its European path.

- ID: 101135374
- Dates: January 2024 to 31 December 2027
- Coordinated by: TEKNOLOGIAN TUTKIMUSKESKUS VTT OY (Finland)
- Website: <https://hywayproject.eu/>

MaMMoS: MAgnetic Multiscale MOdelling Suite

- Description: Magnetic materials are essential for many applications in energy, information, and communication technologies. However, the complex phenomena at different length and time scales often limit the development of new magnetic materials and devices. The goal of this project is to develop a magnetic multiscale modeling suite that will allow the design and optimisation of magnetic materials and devices based on multiscale modelling, characterisation, and numerical optimisation. To achieve interoperability between software and analysis tools, we will establish a domain ontology for magnetic materials. We will collaborate with EU magnet industry to create standards for linking simulation software for magnetic materials from first principles simulations and micromagnetics to device level simulators. MaMMoS will use artificial intelligence (AI) to fuse modeling and characterization data. AI methods will identify and correct systematic errors in the simulation data, enabling more accurate predictions. Moreover, AI models can fill gaps where measurements are not available. AI models can also serve as a surrogate in multi-objective optimisation. Optimisation will guide further experiments or simulations, reducing the development time. In MaMMoS, we will apply this approach to speed up the development of permanent magnets with reduced critical elements for electric machines and to optimise the layout of magnetic field sensors for high linearity range. The MaMMoS software will be validated against benchmarks defined according to the industrial requirements for electric machine and sensor design. The multiscale magnetic materials modeling suite will be made open source to enable easy access to high-end simulation tools. Interoperability will facilitate data sharing and reuse among researchers and industries. Interpretable machine learning will reveal insights into the physics and chemistry of magnetic materials and guide the discovery of new materials for the European green deal.
- ID: 101135546

- Dates: 1 January 2024 to 31 December 2027
- Coordinated by: UNIVERSITÄT FÜR WEITERBILDUNG KREMS (Austria)
- Website: <https://mammos-project.github.io/>

Assessment of the activity's impact

Table 11. Impact of participation to clustering events

KPI	Target set by the C&D Plan (D6.1)	Performance achieved
Number of relations with relevant projects	Good impact: 8-15	3
Number of participations to events/workshops/task groups organised by the EMMC and EMCC	Good impact: 3-5	2
Number of joint activities with RESILIENCE-01-39 (CSA)	Good impact: 2-4	0

6. Conclusion

The DECODE project will continue to implement the *Plan for the Dissemination and Exploitation, including Communication Activities* (D6.1) to reach and engage its target audiences throughout the project lifecycle until November 2027.

From M1 to M18, the key achievements were the following:

- Visual identity: a comprehensive graphic charter was developed, ensuring consistent branding across all project communications.
- Online presence: the project website and social media channel (LinkedIn) served as effective platforms for disseminating information and engaging stakeholders.
- Promotional materials: a range of materials including flyer and roll up and presentations were created to support communication efforts.
- Scientific dissemination: the project contributed to the scientific community through a few publications and participation in many conferences and events.

The communication and dissemination activities are raising awareness about DECODE's objectives and results among various target groups, including the research community, industry professionals, policymakers, and the public.

In conclusion, the DECODE project's communication and dissemination activities are playing a crucial role in disseminating project results, promoting its innovations, and engaging key stakeholders in the field of green energy materials and technologies. Efforts will continue throughout the duration of the project. A second update of this report will be made in November 2026 and the final version will be ready for November 2027.