

D3.6 – Seminars provided through the web portal (2nd report)

**WP3 NA2 – Dissemination /
Communication activities, and
Exploitation Strategy**



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List of abbreviations

ALMA - AlmaScience

HMU – Hellenic Mediterranean University

ICN2 – Institut Català de Nanociència I Nanotecnologia

MCL – Materials Center Leoben Forschung GmbH

RISE – Research Institutes of Sweden AB

SMEs – Small-medium enterprises

TLO – Technical Liaison Office

UNOVA – Instituto de Desenvolvimento de Novas Tecnologias - UNINOVA

WP – Work package

WUT – Warsaw University of Technology

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1. Executive Summary

The deliverable **D3.6 - Seminars provided through the web portal** is part of WP3 – NA2 – Dissemination/ Communication activities and Exploitation Strategy. This document provides an overview of the virtual seminars and activities organised by EMERGE. The events are designed for various stakeholders, primarily focusing on early-stage researchers such as master's and PhD students, engineers, and research staff from the consortium. However, they are also open to external audiences.

This live document deliverable provides an update on D3.5 (M24), focusing on the period between M25 and M36. It includes details of a joint seminar in which EMERGE participated and the second series of online seminars that supported the 2nd EMERGE Summer School. *The D2.6 2nd Report on the EMERGE Schools* describes the school's content, speakers, abstracts, and participants in detail. Further information can be consulted on that deliverable.

2. Overview of the virtual seminars

From M25 to M36, virtual seminars continued to enhance researchers' knowledge in electronics and photonics, specifically focusing on the topic of EMERGE related to printed and flexible electronics. One significant achievement during this time was the engagement with the Printed Electronics Helix, which brings together global experts and stakeholders aiming for innovations in printed electronics, eco-manufacturing, and functional electronics.

2.1. Printed Electronics Helix

In the frame of the European project REFORM (<https://www.reform-project.eu/>), GA 101070255, some partners were involved in the preparation of a webinar for the [Printed Electronics Helix](#). The REFORM project is focused on creating printed green electronics using sustainable and eco-friendly materials. To achieve this goal, it's essential to collaborate with other projects and organisations that work in printed and large-area electronics.

The Printed Electronics Helix was created to encourage involvement and knowledge sharing among stakeholders throughout the industry's value chain. As a key project within the Helix, REFORM brings together renowned researchers, industry experts, high-tech SMEs, ambitious investors, and forward-thinking policymakers. The EMERGE partners have been invited to join as Helix members, allowing them to connect with organisations that already have or are seeking international funding for developing innovations in climate-neutral digital technologies, eco-manufacturing, and functional electronics. Helix members can promote engagement and collaboration by sharing essential results and findings on the platform, positioning themselves as leaders in their respective sectors.

The event occurred on 21st September 2023, reuniting invited speakers from academia, RTOs, industry and the Organic and Printed Electronics Organization (O-EA); please see Figures 1 and 2. In this event co-promoted by AlmaScience, Duncan Platt (RISE) participated as an invited speaker on the *State-of-the-art in Printed Electronics session* with the talk "[Industry](#)" presented the developments and available services at RISE, but also presented the EMERGE project, infrastructure and the opportunities for potential users.

The seminar was recorded and can be accessed at [Printed Electronics Helix Launch](#).



Figure 1 – Panellists from the Printed Electronics Helix Launch event.

	SESSION	TOPIC	SPEAKERS
11:00	Welcome and introduction		
11:05	The Crowdhelix platform for the REFORM Project	The launch of the Printed Electronics Helix	Cais Jurgens
11:15	State of the art in Printed Electronics	Latest findings Products on the market Latest innovations	Jiantong Li - KTH Royal institute of Technology Duncan Platt - RISE Maria Solander - VTT
5 minutes Q&A			
11:35	Links between the REFORM Project and the value chain	Environmental impact of printed electronics and market needs and trends How can innovation help the value chain Investment trends	Marios Sophocleous - eBOS Klaus Hecker - QE-A (Organic and printed electronics association) Antti Heikkilä - Acceler8
5 minutes Q&A			
12:05	The impact of REFORM and sister projects MADRAS and INN-PRESSME on Printed Electronics	1. Yolanda Alesanco - REFORM Project - "The REFORM Project for the environmental and sustainability challenges around functional electronics 2. Laura Lopez Suarez - MADRAS Project - Title TBC 3. ULLA Forsstrom - INN-PRESSME Project How OITB services help to scale lab results to proof of concept	
5 minutes Q&A			
12:25	Closing remarks		

Figure 2 – Program from the Printed Electronics Helix launch event.

2.2. EMERGE School (2nd edition)

The second school for PhD students and early-stage researchers was organised in 2024. Similarly to the first edition, it consisted of two main parts: online seminars (15-19 April 2024) and a hands-on training week in UNOVA facilities, with the collaboration of AlmaScience staff, in July 2024. This school primarily PhD students and early-stage researchers. The scope of the school was "**Responsible Electronics**", and it was open to everyone upon registration, with 336 registered students, 102 attending at least 30 % of the talks. However, the target audience was undergraduate, MSc students, PhD students or young researchers. Twenty leading experts in flexible, large-area printed electronics and photonics participated in online learning sessions. The sessions covered topics such as sustainable printed electronics, piezo-nanogenerators, microelectronics, and geopolitics. The scientific and technical sessions took place over five days, with a specific topic addressed daily.



1st day: Kick-off and responsible electronics fundamentals

The school began with an introduction to research infrastructures and the fundamental concepts of responsible electronics. Professors Pedro Barquinha and Konstantinos Rogdakis presented the EMERGE infrastructure and its accessibility for different stakeholders. Professor Andrea Ferrari provided insights into the applications of graphene and related materials.

2nd day: Advanced printing techniques

The discussion focused on advanced printing techniques and sustainable approaches in electronics. Dr. Valerio Beni explored screen and inkjet printing technologies. Prof. Zuzanna Żółek-Tryznowska discussed materials derived from natural resources for printed electronics, while Prof. Morten Madsen addressed advancements in organic photovoltaics, including scalable oxides and tandem solar cells.

3rd day: Sustainable electronics: Materials and Technologies

Materials and technologies for sustainable electronics and energy systems were discussed on the third day. Professor Jovana Milic discussed the multifunctionality of layered hybrid perovskites. Professor Antonio Guerrero explained the effects of contacts in halide perovskite memristor devices, and Professor Senentxu Lanceros-Méndez talked about sustainable inks for screen-printed sensors and actuators.

4th day: Sustainability and advanced technologies

The theme was the intersection of electronics with sustainability and advanced technologies. Prof. Libu Manjakkal discussed sustainable energy solutions for autonomous systems, including printed and coated electrodes. Dr. Elisa Donati introduced neuromorphic technology for closed-loop interactions. Prof. Mario Lanza presented on hybrid 2D/CMO microchips, and Ms. Sara Carniello addressed sustainability aspects in printed electronics.

5th day: Emerging technologies towards sustainable electronics

On the final day, they covered emerging trends and the broader context of sustainability in electronics and energy technologies. Prof. Alessandro Paccagnella explored the geopolitics of microelectronics and supply chain competition. Dr Abhishek Singh Dahiya discussed printed transient electronics and their sustainability. Dr. Oliver Werzer examined the role of nanogenerators and paper-based PCBs in making IoT more sustainable. Prof. Javier Minguez presented on digital neurotherapeutics, while Dr Henrik Sandberg and Dr Jens Hauch discussed advanced printing techniques and automation for accelerating energy materials development. Dr. Dagmawi Belaineh Yilma concluded with tools and techniques for assessing the environmental impact of electronics, and Prof. Aldo Di Carlo addressed sustainability in solar modules.



Figure 3 - Example of seminars prepared by the experts for the EMERGE School (2024 edition).