Newsletter III

Towards a wide-spread HVDC-based power system enabled by new highly efficient cable and fibre optic monitoring system

EasyDC-FOS EU Project

easydcfos-project.eu

Funded by
the European Union

Towards a wide-spread HVDC-based power system enabled by new highly efficient cable & fibre optic monitoring systems

COUNTRIES 4

EU GRANT ~ 5.5 M€

MONTHS 32

PARTNERS 12

CALL

HORIZON-CL5-2024-D3-01

TOPIC

HORIZON-CL5-2024-D3-01-15

PROJECT NUMBER

101172806

COORDINATOR

RDT-LUMIKER

TYPE OF ACTION

HORIZON Research and Innovation Actions

UPCOMING EVENTS

FOWT Conference

Montpellier, 24-26 March

WindEurope

Madrid, 21-23 April

EDITORIAL

Dear subscribers,

Welcome to the third issue of the EasyDC-FOS Newsletter.

In this edition, we are pleased to share more detailed information on the development of the HVDC cable prototype being carried out within the project, together with an overview of the ongoing tasks and expected results associated with this work.

This newsletter also highlights two major events in which EasyDC-FOS has recently taken part, both of which have significantly contributed to increasing the project's visibility and strengthening its dissemination efforts across the HVDC and broader energy community.

We invite you to explore the updates included in this issue and to follow our progress through our website and our LinkedIn page (@EasyDC-FOS EU Project).

We hope you enjoy reading this new edition of the EasyDC-FOS Newsletter.

EasyDC-FOS project partners

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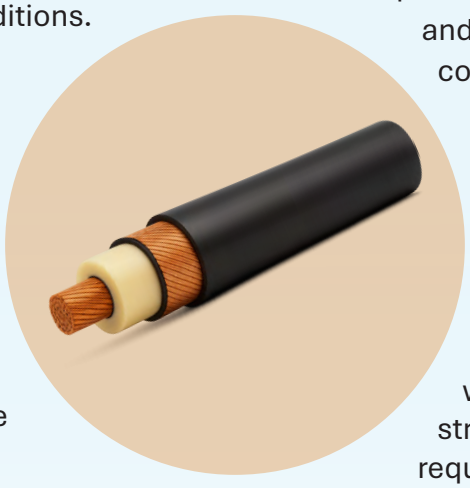
TECHNICAL PROGRESS

HVDC Cable Prototype

The partners advanced the **development of the 525 kV/90 °C HVDC XLPE cable prototype**, completing key manufacturing and testing steps and preparing the ground for upcoming diagnostic and validation activities.

Manufacturing and Preliminary Testing

- Performed small-scale material tests to improve understanding of XLPE behaviour under HVDC conditions.
- Conducted conductor test trials, identified as a major manufacturing risk, to validate prior to feasibility full production.
- Completed the full cable manufacturing process.



- Internal operations (specifications, test planning, and allocation of test engineer) and AC&DC routine testing successfully completed.
- Cable design report completed and issued after the validation of the internal routine test.
- Held coordination meetings with partners to define the sensing strategy and prepare the test procedures required to evaluate the sensors.

Insulation Diagnostics and Electrical Characterisation

Upcoming work will focus on detailed insulation diagnostics to characterise the cable's electrical behaviour under HVDC operation.

Direct insulation diagnostic assessment

Preparation of insulation peels before and after testing

Measurement of space charge using the PEA (Pulsed Electro-Acoustic) method

Measurement of conductivity on peels

Extrapolation of results to a 640 kV system

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Sustainability and Cost Analysis

- A preliminary **Life Cycle Assessment (LCA)** was carried out to evaluate the environmental impacts of the newly developed cable system.
- **Life Cycle Costing (LCC)** was performed to analyse cost aspects across the full lifetime of the system.
- **Several cable configurations** were assessed: benchmark system, newly developed cable and an aluminium-based design.
- Next steps include refining the analysis, performing a social LCA, and conducting a more detailed eco-design assessment.

Partners

Nexans, a global **industrial leader in the manufacturing of HVAC and HVDC cable systems**, is responsible for the development of the EasyDC-FOS cable prototype. The company supports high-voltage operators worldwide by delivering reliable and advanced interconnection solutions, and within the project, it leads the innovation activities related to cable design and manufacturing.

Nexans
ELECTRIFY THE FUTURE

GreenDelta

GreenDelta is an independent **sustainability research and consulting company** with extensive experience in Life Cycle Assessment (LCA), Social LCA (SLCA) and Life Cycle Costing (LCC). Within EasyDC-FOS, GreenDelta leads the sustainability assessment of the solutions developed in the project, including the improved XLPE materials addressed.

DISSEMINATION ACTIVITIES

During this period, the consortium has continued advancing the project's visibility across the European HVDC community through a series of targeted dissemination actions. These activities aimed at sharing technical progress, engaging with relevant stakeholders, and positioning EasyDC-FOS within ongoing discussions on next-generation HVDC cable technologies.

EasyDC-FOS Takes Part in the European Researchers' Night 2025

EasyDC-FOS was presented at the latest edition of the **European Researchers' Night**, a major outreach initiative held simultaneously in more than 460 cities across 25 European countries. The event brings science closer to society, promotes dialogue between researchers and citizens, and encourages young people to explore scientific careers.

The activities **organised in Santander by the University of Cantabria** attracted more than 6,000 visitors, including school groups, families, and university students. Throughout the afternoon and evening, attendees engaged with over 300 researchers through hands-on demonstrations, interactive experiments, and educational exhibits showcasing advances in multiple scientific fields.

The European Researchers' Night is funded by the Marie Skłodowska-Curie Actions (MSCA) under the Horizon Europe programme. Each year, it highlights the relevance of scientific research and showcases the role of researchers in addressing major societal challenges.

EasyDC-FOS at Jicable HVDC'25

EasyDC-FOS was presented at **Jicable HVDC'25**, one of the most **specialised international forums focused exclusively on HVDC cable systems.** Held from 20–22 October 2025 in Turin, the symposium brought together leading experts from industry, academia and research centres working on the design, operation and monitoring of next-generation HVDC transmission infrastructure.

Technical tutorial on HVDC monitoring

The consortium contributed to the event with a **dedicated tutorial on Monitoring Systems Tailored for HVDC Applications,** delivered by Manuel Muñoz (RDT-Lumiker) and Ralf Albrecht (AP Sensing), with support from the RDT-Lumiker team. The session offered an in-depth overview of current monitoring approaches, technical challenges in DC environments, and developments being advanced within EasyDC-FOS.

RDT-Lumiker presented technical insights on photonics solutions, Optical Current Transformers (OCTs), sensing and monitoring technologies for AC and their ongoing evolution towards DC through the EasyDC-FOS project were shared. Particularly, their new Current and Partial Discharge Fiber Optic Monitoring System was presented together with the functionalities it can deliver.

AP Sensing introduced Distributed Fiber Optic Sensing (DFOS) solutions for continuous HVDC cable monitoring and how these systems can provide real-time data on temperature, strain and vibration by using DTS, DSS and DAS, enabling fault detection, asset surveillance and extended sensing ranges up to 300 km through optical amplification.

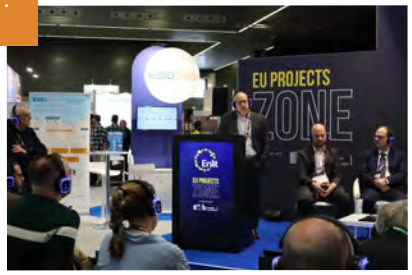
Moreover, our project colleague Espen Doedens Ph.D., **Nexans** Product & System responsible HVDC Extruded, gave one of the **opening lectures in the conference** as the Chairman of the International Scientific and Technical Committee of Jicable'25.

Jicable HVDC'25 provided a highly specialised environment to disseminate the project's technical progress and engage with experts working directly on HVDC cable technologies. The tutorial received particularly strong interest and positive feedback from the scientific community, reinforcing the relevance of EasyDC-FOS developments and the value of the project's contributions to ongoing research and innovation in the field.

EasyDC-FOS at Enlit Europe 2025

Enlit Europe is one of the **leading energy events in Europe**, bringing together the full sector ecosystem. The programme covers major trends in generation, transmission, distribution, storage and digitalisation, with a strong focus on modernising electricity grids and advancing next-generation HVDC technologies.

EasyDC-FOS had a strong presence at Enlit Europe 2025. The project was showcased across several spaces and activities throughout the week, contributing to technical exchange and visibility within the HVDC ecosystem.



EU Project Article

EU Project Zone Podcast

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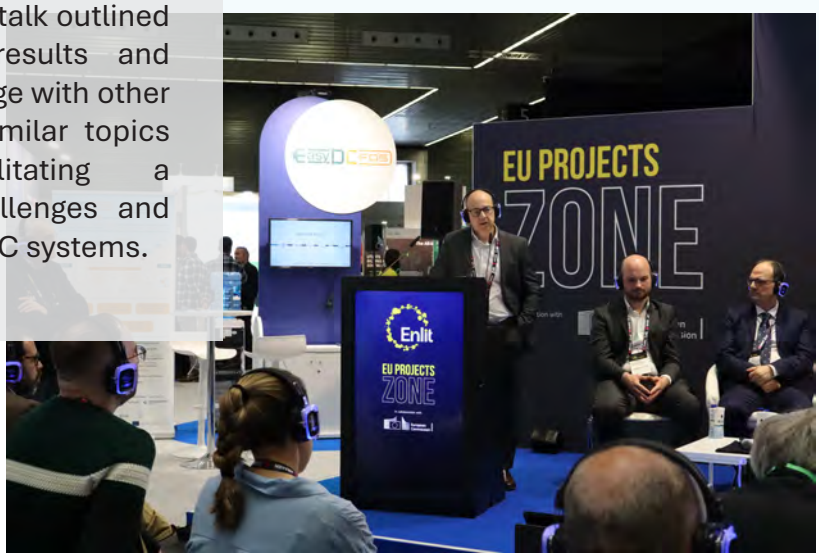
General Assembly and Stakeholder Advisory Board meeting

The consortium held its **General Assembly meeting**, where WP leaders presented the latest technical achievements and reviewed the milestones planned for the next period. Additionally, a dedicated meeting slot was shared with the **Stakeholder Advisory Board (SAB)** members, so as to update them on the latest project developments since the constitution meeting in September and discuss on the most relevant topics for them in more detail, such as sensor development and simulation and modelling activities.

EU Project Zone

Manuel Muñoz Luengo, Project Coordinator, delivered a **presentation** in the DC Technologies session of the **EU Project Zone**. The talk outlined the project's objectives, initial results and expected impact, and shared the stage with other EU-funded initiatives working on similar topics (CABLEGNOSIS Project), facilitating a constructive exchange on the challenges and opportunities in next-generation HVDC systems.



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EasyDC-FOS

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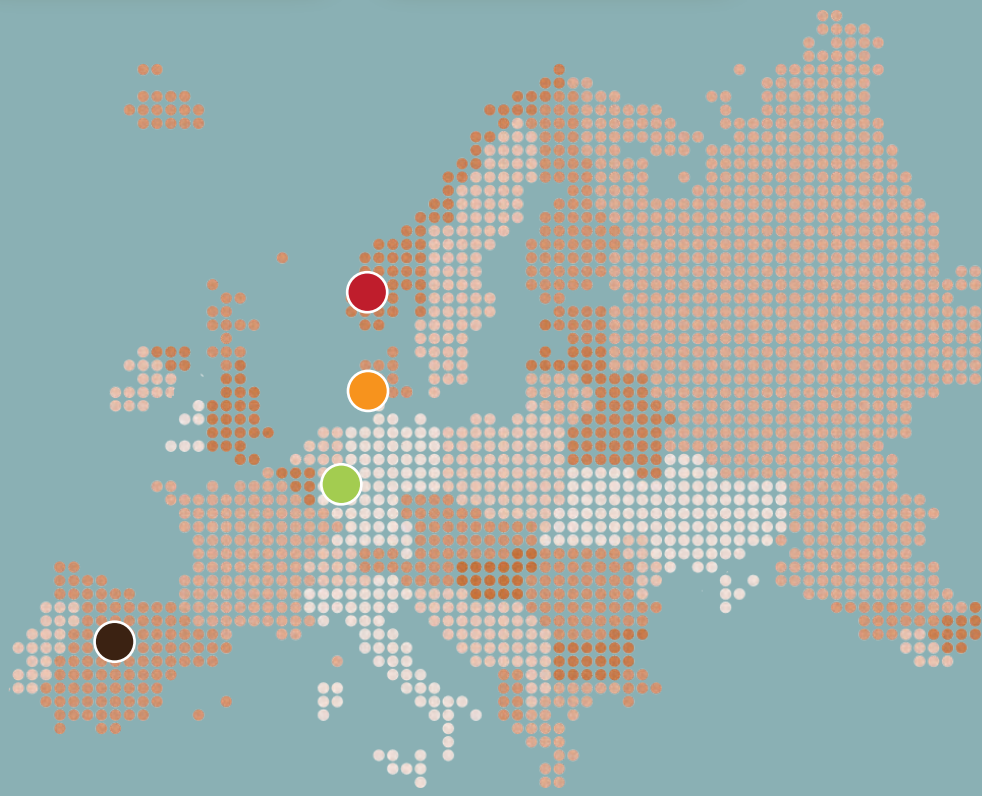

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This project has received funding from the European Union's Horizon Europe research and innovation programme under Grant Agreement 101172806