PRESS RELEASE
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With the OPHELIA project, CNR and its partners Nexans, Schneider Electric, SNCF, and SuperGrid Institute drive innovation and launch a solar canopy demonstrator along the ViaRhôna

The OPHELIA research project aims to promote the development of linear photovoltaic power plants by installing solar panels on long, narrow land surfaces (running alongside dikes, roads, railways, etc.). Selected in 2023 as the winner of the "DEMO TASE" call for proposals launched by the French Agency for Ecological Transition (ADEME), and developed by five partners (CNR, Nexans, Schneider Electric, SNCF, and SuperGrid Institute), OPHELIA is a research project focused on the electrical architecture of linear photovoltaic power plants and their integration into the built environment.
A solar canopy demonstrator will be deployed over a near-900-meter section of the ViaRhôna—a cycling route following the Rhône River—in the Vaucluse department by 2028.
Set to showcase a truly disruptive technology, the OPHELIA project will help accelerate regional photovoltaic development without creating any land-use conflicts, as it will make use of linear land that has already been developed.
Representing an investment of over €20 million, the OPHELIA project is funded by the French State as part of the France 2030 investment plan—executed by ADEME—and holds labels awarded by the Tenerrdis and i-Trans industrial clusters.

A promising future for linear photovoltaic power plants

Though faced with a scarcity of land available for new projects, the photovoltaic industry remains key to hitting the energy transition targets set by the French State. Long linear photovoltaic power plants provide a response to land scarcity, as they help optimize the use of long, narrow land surfaces and structures that have already been designated for other uses (dikes, spaces alongside railways, roads, cycle paths, etc.), leaving natural spaces as they are. The wedges of land in question retain their original use while electricity production becomes a complementary activity. France's gross development potential is estimated at more than 60,000 kilometers, corresponding to an installed capacity of nearly 60 GWp.
With the OPHELIA project, CNR and its partners will be testing a medium-voltage direct current electrical architecture and paving the way for the development of projects on long linear land, spanning at least 20 kilometers.

Disruptive technology developed for long-distance power transmission

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In line with two of the photovoltaic industry's goals, the OPHELIA project aims to exploit linear land running alongside existing infrastructure and reduce long cable-related electrical losses by developing technological building blocks that make it possible to replace alternating current with medium-voltage direct current (MVDC).

OPHELIA is an innovative R&D project comprising electrical architecture design, prototype production, and on-site testing, and involving five partners—CNR (the project coordinator), Nexans, Schneider Electric, SNCF, and SuperGrid Institute.

Demonstrator characteristics

The demonstrator will consist of a series of three solar canopies, installed over around 900 meters of the ViaRhôna cycling route—which follows the Rhône River—in Caderousse in the Vaucluse department. Expected to have an installed capacity of around 900 kWp (generating enough electricity to meet the annual needs of approximately 700 people), the demonstrator will comprise 30 solar canopy structures. The panels will be angled toward the east and the west, forming a roof.
The partners involved in the project will be given the opportunity to design and conduct on-site testing of an electrical architecture and all the equipment required to transmit MVDC electricity from the point of production to the point of delivery.
The construction and testing phases are scheduled to take place between 2025 and 2028, following three years of engineering design studies, R&D, and prototype development.

An innovation-focused project supported by the French State and executed by ADEME

The OPHELIA project was selected as the winner of the "Technologies Avancées pour les Systèmes Énergétiques : DEMO TASE" call for proposals launched by ADEME in 2022.
Representing a total investment of over €20 million, the project is co-funded by the French State (contributing around 40% of funding) as part of the France 2030 investment plan, which is being executed by ADEME in a bid to enhance the country's industrial competitiveness and future technology development.
This funding is key to supporting the partners involved in developing this large-scale R&D project.
OPHELIA has also been awarded labels by the Tenerrdis and i-Trans industrial clusters.

"The Rhône Valley offers the perfect natural conditions to explore new innovative and promising technologies capable of meeting regions' renewable energy needs and local stakeholders' expectations. This demonstrator, developed with our partners, forms part of CNR's "Photovoltaïque Grand Linéaire" innovation program, designed to demonstrate the technical and economic viability of long photovoltaic power plants, stretching several kilometers. It provides a response to the need to integrate new solutions into a restrictive built environment and paves the way for the development of projects on long linear land, spanning at least 20 kilometers."
Frédéric Storck, Head of Energy Transition and Innovation at CNR

"Nexans is proud to be involved in the OPHELIA project to develop a new, optimized electrical architecture for linear photovoltaic power plants. The replacement of alternating current by medium-voltage direct current for power transmission purposes marks a technological breakthrough that reduces power losses. Innovation capable of facilitating the energy transition and sustainable electrification is a key focus for us as well as a means of developing new solutions like this demonstrator, helping to reduce our impact on the environment."
Max-André Delannoy, Technical and Innovation Vice President at Nexans

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“Direct current represents a new technological horizon in the field of medium-voltage power transmission after more than 100 years of development focusing on alternating current. It should facilitate better grid integration of certain applications like long linear photovoltaic power plants, promoting significant development of renewables while avoiding land take. Schneider Electric’s purpose is to empower everyone to make the most of its energy and resources, bridging the gap between progress and sustainability for all. That’s why we’re particularly proud to be involved in this project to provide the technical building blocks for more efficient interconnections between production and distribution facilities.”
Christophe Prévé, Chief Technical Officer of Medium Voltage Offers at Schneider Electric

“Photovoltaic energy generation is a key priority for SNCF, as it enables us to cover some of our energy needs while contributing to the collective effort to strengthen France’s energy sovereignty. By testing the operation of solar panels on a long stretch of land, OPHELIA is paving the way for the use of railside land. This project therefore fully aligns with the strategy adopted by the Group, which has just launched “SNCF Renouvelables”, our new photovoltaic development subsidiary, to generate carbon-free energy on our land.”
Carole Desnost, Director of Technology, Innovation and Projects for the SNCF Group

“The OPHELIA project is fully aligned with SuperGrid Institute’s mission of providing technological innovations to accelerate the development of future power grids and the massive integration of renewable energy. We are very proud to be contributing to this project with our expertise on innovative power conversion systems and our testing facilities. By improving efficiency, limiting the consumption of raw materials and reducing the overall footprint of the conversion solution, new converter technologies are at the heart of unlocking the full potential of linear land electricity production.”
Dr. Piotr Dworakowski, Power Convertors Team Leader at SuperGrid Institute

ABOUT

CNR

CNR (Compagnie Nationale du Rhône) is France’s leading producer of 100% renewable power, with an installed capacity of 4,000 MW. It converts energy from water in the Rhône River—for which it has held the concession since 1934—and harnesses energy from the wind and sun, operating 115 wind and photovoltaic power plants throughout France. Its business as an energy company is what enables it to fund the development of its two other historic activities—river transportation development and navigation management, agricultural land irrigation—and its public-interest work (5Rhône Plans). CNR is France’s only public-interest limited company. Its shares are held primarily by public investors (183 local authorities and public institutions, the Caisse des Dépôts group). ENGIE is its leading industrial shareholder. France’s Rhône Development law of February 28, 2022 extended the CNR’s concession until 2041.

Nexans

For over a century, Nexans has played a crucial role in the electrification of the planet and is committed to electrifying the future. With approximately 28,000 people in 42 countries, the Group is paving the way to a new world of safe, sustainable and decarbonized electricity that is accessible to everyone. In 2022, Nexans generated 6.7 billion euros in standard sales. The Group is a leader in the design and manufacturing of cable systems and services across four main business areas: Power Generation & Transmission, Distribution, Usage and Industry & Solutions. Nexans was the first company in its industry to create a Foundation supporting sustainable initiatives, bringing access to energy to disadvantaged communities worldwide. The Group pledged to contribute to carbon neutrality by 2030.

Nexans. Electrify the future.

Nexans is listed on Euronext Paris, compartment A.
For more information, please visit www.nexans.com

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Schneider Electric

Schneider Electric's purpose is to empower everyone to make the most of its energy and resources, bridging the gap between progress and sustainability for all. We call this Life Is On.
Our mission is to be your digital partner for sustainability and efficiency.
We drive digital transformation by integrating world-leading process and energy technologies. We connect products, controls, software, and services to the cloud throughout the entire lifecycle of your business for integrated company management of residential housing, commercial buildings, data centers, infrastructure, and industry.
We are the most local of global companies. We are advocates of open standards and partnership ecosystems that are passionate about our shared meaningful purpose, and inclusive and empowered values. www.se.com

SNCF Group

The SNCF Group is a global leader in passenger and freight transportation services, including management of the French rail network, generating almost €41.4 billion in revenue in 2022, with almost 40% coming from outside France. With a direct presence in over 60 countries and a network connecting 168, the Group has 276,000 employees—almost 210,000 in France and more than half in its core rail business. The Group is controlled by SNCF Holding, which owns five companies: SNCF Réseau (management, operation and maintenance of the French rail network, plus railway engineering) and its own subsidiary SNCF Gares & Connexions (station design, operation and development); SNCF Voyageurs (Transilien, TER, Intercités, TGV InOUI, OUIGO, Eurostar-Thalys, Alleo, and Lyria train services, as well as distribution with SNCF Connect); Keolis (operator of urban, suburban and regional public transportation networks in France and worldwide); Rail Logistics Europe (rail freight); and Geodis (logistics solutions and freight transportation). Working closely with customers and clients (passengers, local authorities, shippers, and railway operators using SNCF Réseau services) at the heart of local communities, the Group leverages its expertise in all aspects of the railway industry and transportation services in general to help bring about a more dynamic, caring, and sustainable society.

SuperGrid Institute

SuperGrid Institute is a privately owned company with expertise in high- and medium-voltage direct current (HVDC & MVDC) systems and technologies—key components of future energy networks. Based in the Greater Lyon town of Villeurbanne, the company actively contributes to the energy transition by removing the technical barriers associated with the deployment of future power grids and the mass integration of renewables.

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