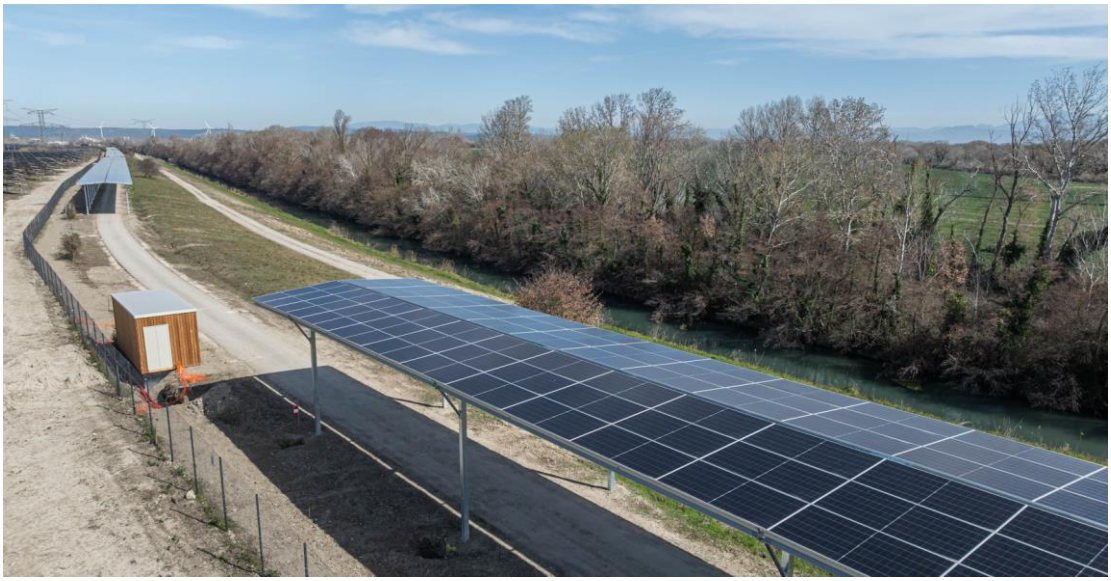
Press Release
June, 10, 2025

OPHELIA, a promising future for linear photovoltaic power plants to be discovered at CIRED 2025

On the occasion of CIRED 2025, which will take place from June 16 to 19 in Geneva, CNR, Nexans, Schneider Electric, SNCF, and SuperGrid Institute will present, for the first time, the project named OPHELIA. This experimental linear photovoltaic park, soon to be commissioned in France (Vaucluse), is located along a cycle route that runs alongside the Rhône River. It is based on an innovative medium-voltage direct current (MVDC[1]) electrical architecture. This promising solution could eventually transform existing linear infrastructures (dikes, roads, cycle paths, railway lines…) into powerful photovoltaic corridors. The OPHELIA project thus addresses two key challenges in the solar energy sector: the scarcity of available land and the integration of renewable energy production into the power system.



OPHELIA : Experimental linear photovoltaic park - Caderousse (France) – © Michel Bost

Supporting the Electrification of Uses

European power grids are under increasing pressure due to the electrification of end uses, aging infrastructure, and the challenges of integrating renewable energy sources.
Among these sources, the solar industry continues its momentum, with 338 GW of installed capacity in Europe, driven by the ambitious RePowerEU plan, which targets 750 GWp by 2030. Faced with the scarcity of suitable land, the sector sees linear photovoltaics as a promising future. In France, infrastructures such as waterways, riverbanks, roads, and cycle paths alone represent a potential of 35 GWp if equipped with solar power plants. SNCF is also studying the integration of photovoltaic modules along railway lines.

[1] MVDC : Medium Voltage Direct Current

Direct Current: An Opportunity to Collect and Distribute High Power

Linear photovoltaic installations will extend over several kilometers, sometimes in areas far from public distribution and transmission networks. Medium-voltage direct current (MVDC) is an excellent candidate for transporting the energy produced while minimizing electrical losses and ensuring grid stability. In the long term, microgrids could collect and distribute electricity in direct current, without conversion to alternating current, between solar parks, consumers (such as data centers or EV charging infrastructure), and storage systems (batteries). This would allow for a more balanced energy flow, reducing pressure on infrastructure and deferring costly upgrades required by grid operators.

OPHELIA's Innovations Ready for Real-World Testing

The OPHELIA project partners have developed a dedicated electrical architecture for linear photovoltaics with a ±5 kV DC voltage. The electricity generated by the solar canopies is transported to intermediate stations positioned along the route, where SuperGrid Institute's DC electronic transformers raise the panel voltage to the MVDC collection network. This network, made up of Nexans' medium-voltage DC cables, then carries the electricity to the DC-AC conversion substation connected to the delivery point. The MVDC network's protection and switching equipment is designed by Schneider Electric. These new technologies will be showcased at the **CIRED exhibition from June 12 to 19, 2025**, before being tested in real-world conditions at the photovoltaic park currently under construction in Caderousse (France), with commissioning scheduled for autumn 2025. In the future, the partners plan to increase the voltage to ±10 kV DC for photovoltaic parks with capacities of several tens of MWp.

Key Facts and Figures

June 16–19, 2025
CIRED 2025 in Geneva
www.cired2025.org

35 GWp and 38 TWh/year
Estimated potential of linear solar in France (excluding rail infrastructure)

250 kW and 99.2%
Power and efficiency of SuperGrid Institute's DC electronic transformer

±5 kV DC and ±10 kV DC
Voltages of the demonstrator (1 MWp) and future pilot projects (>20 MWp)

« France 2030 » Project

The OPHELIA project is funded by the French government as part of the "France 2030" program, operated by ADEME, which aims to develop the country's industrial competitiveness and future technologies.

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Contacts
CNR | cnr-presse@cnr.tm.fr – 06 74 79 10 00
Nexans | emmanuelle.guy@nexans.com - 01 78 15 04 68
Schneider Electric | andree.clar@se.com – 06 85 81 08 78
SNCF | patrick.chalumeau@sncf.fr - 06 22 68 17 84
SuperGrid Institute | amiel.kaplan@supergrid-institute.com - 07 71 32 28 98

About CNR
CNR (Compagnie Nationale du Rhône) is France's leading producer of 100% renewable electricity, with over 4,000 MW of installed capacity. CNR harnesses the energy of the Rhône River, for which it has held the concession since 1934, and develops wind and solar energy with 120 wind and photovoltaic farms across the country. This energy activity enables it to finance its two other historic missions – the management and development of river transport and the irrigation of agricultural land – as well as its public-interest missions (5Rhône Plans). CNR is the only public-interest limited company in France. Its capital is mostly public (183 local authorities and public institutions, Caisse des Dépôts Group), with ENGIE as the main industrial shareholder. The Rhône Development Act of February 28, 2022, extended CNR's concession until 2041.

About Nexans
For over a century, Nexans has played a crucial role in electrifying the planet and is committed to electrifying the future. With nearly 28,500 people in 41 countries, the Group is paving the way toward a new world of electrification: safer, more sustainable, renewable, decarbonized, and accessible to all. In 2024, Nexans generated €7.1 billion in standard revenue. The Group is a leader in the design and manufacturing of cable systems and services across four main business areas: PWR-Transmission, PWR-Grid, PWR-Connect, and Industry & Solutions. Nexans was the first in its industry to create a corporate foundation to support initiatives for access to energy for disadvantaged populations around the world. The Group is recognized as a global leader in climate action and has committed to achieving net-zero emissions by 2050, approved by the Science Based Targets initiative (SBTi).
Nexans. Electrify the Future.
Nexans is listed on Euronext Paris, compartment A.
For more information, visit www.nexans.com

About Schneider Electric
Schneider's purpose is to create Impact by empowering all to make the most of our energy and resources, bridging progress and sustainability for all. At Schneider, we call this Life Is On.
Our mission is to be the trusted partner in Sustainability and Efficiency.
We are a *global industrial technology leader* bringing world-leading expertise in electrification, automation and digitization to smart industries, resilient infrastructure, future-proof data centers, intelligent buildings, and intuitive homes. Anchored by our deep domain expertise, we provide integrated end-to-end lifecycle AI enabled Industrial IoT solutions with connected products, automation, software and services, delivering digital twins to enable profitable growth for our customers. We are a people company with an ecosystem of 150,000 colleagues and more than a million partners operating in over 100 countries to ensure proximity to our customers and stakeholders. We embrace diversity and inclusion in everything we do, guided by our meaningful purpose of a sustainable future for all.
www.se.com

About SNCF
SNCF Group is one of the world's leading players in passenger transport and freight logistics, managing the French rail network and generating €41.4 billion in revenue in 2022, nearly 40% of which came from international operations. Present in over 60 countries, covering a commercial network of 168 countries in total, the Group employs 276,000 people, nearly 210,000 of them in France, with more than half dedicated to its core rail business. It is managed by SNCF Holding, which owns five companies: SNCF Réseau (management, operation, and maintenance of the French rail network, rail engineering) and its subsidiary SNCF Gares & Connexions (design, operation, and commercial development of stations), SNCF Voyageurs (Transilien, TER and Intercités, TGV InOUI, OUIGO, Eurostar-Thalys, Alleo, Lyria, and ticketing via SNCF Connect), Keolis (urban, suburban, and regional public transport operator in France and worldwide), Rail Logistics Europe (rail freight transport), and Geodis (logistics and freight transport solutions). Alongside its customers (passengers, local authorities, shippers, and rail companies for SNCF Réseau) across all regions, the Group draws on its expertise in all aspects of rail and broader transport services to Act for a mobile, inclusive, and sustainable society.

About SuperGrid Institute
SuperGrid Institute is an independent private company specializing in systems and technologies for high- and medium-voltage direct current (HVDC & MVDC) — key components for future energy networks.Based in Villeurbanne (Lyon), its work actively contributes to the energy transition by removing technical barriers to the deployment of future power grids and the large-scale integration of renewable energy.The company is a member of the FIT (French Institutes of Technology) association, which brings together 15 French institutes (IRTs and ITEs) sharing the same foundations in public-private, multi-partner research.