

# THE AGILITY EFFECT

MAGAZINE

SOLAR ON  
COMMERCIAL  
ROOF SPACES

INNOVATION  
IN NUCLEAR  
WASTE

ACCELERATING  
TOWARD CARBON  
REDUCTION



"THE PURPOSE  
OF MY WORK"

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## EDITORIAL

Certain ideas, such as "Values", "Talent" and "Individual development", or being "People-centric" in general, can often appear devoid of meaning because it is extremely difficult to transform them into something tangible for each individual.

What links the employees in a business is the way they live together and interact – their shared values. Ours – confidence, autonomy and solidarity – nourish our service-oriented culture and management approach. Each of our 90,000 employees brings them to life on a daily basis. In this way, they help to develop our organisation and truly embody the identity of VINCI Energies.

This edition of The Agility Effect launches a new section – "Agility People" – that gives our employees an opportunity to talk about their roles and day-to-day work. These are highly personal accounts of what makes a career with VINCI Energies so special. They describe how they felt in their first post, a defining moment in their career, the changes experienced and the directions taken. Discover the meaning that each person brings to their mission.

It may even inspire new vocations!

We hope you enjoy reading it!

Véronique Matignon  
VP of Human Resources of VINCI Energies



## AGILITY **PICTURE**

# FROM FACTORY TO POST-COVID COMMERCIAL BUILDING

In March 2022, BNP Paribas Real Estate moved into its next-generation headquarters in Boulogne-Billancourt, to the west of Paris. Designed to be a precursor of the post-Covid commercial building, in other words mixed-use, energy efficient and integrated into its environment, this brand new head office had to meet an additional challenge, since the site is a conversion of "57 Métal", the iconic Renault workshop. In order to meet climate-related requirements, architect Dominique Perrault opted for passive solutions and used architectural and organisational techniques that will ultimately enable the building to be energy efficient. Commissioned to carry out the HVAC packages (heating, ventilation and air conditioning), VINCI Energies is providing technical maintenance services for the building.

# SOLAR PV ON COMMERCIAL ROOFTOPS

**VINCI Energies has embarked on a strategy aimed at installing solar photovoltaics on the rooftops of its buildings, a market abandoned by investors in solar PV, through a special purpose vehicle named ELIOVE.**

The climate emergency is forcing all stakeholders in the energy sector (suppliers, operators and businesses) to step up energy efficiency initiatives across their operations. One option that has been insufficiently explored is to install solar panels on the rooftops of commercial buildings.

So far, only retail and logistics firms have started deploying solar PV panels on the rooftops of their hypermarkets and warehouses because they are obliged to do so by law.

As far as office buildings are concerned, there is much still to do. "The market has been

totally overlooked by solar developers for economic reasons. The age or even dilapidation of a significant proportion of assets can put a heavy strain on the investments that need to be made before being able to adopt solar systems. What's more, the relatively narrow area available on rooftops compromises the profitability of operations", explains Houda Matta, business unit manager of ELIOVE a VINCI Energies business unit set up at the end of 2021 to bring solar PV to its buildings.

## 80 feasibility studies

"We are our own best solar power producers" could therefore be the slogan of the new entity which was initiated by VINCI Energies senior management to accelerate a strategy to deliver sustainable consumption across the Group's property assets by installing solar PV panels on all technically eligible buildings.





BUILDINGS

ACCELERATION

# RETAIL ON THE PATH TOWARDS “ENERGY SOBRIETY”

ELIOVE’s roadmap involves listing and auditing the roofspace of the 160 buildings owned by VINCI Energies in France, then going on to target the 400 buildings it rents.

Some 80 feasibility studies have already been conducted. It appears that more than half of the buildings do not lend themselves easily to panel installation. That might be because the retrofit costs are too high, the structure of the framework is unable to support the load of a solar installation over time, the rooftop suffers from shading, a lease is about to expire, or due to the supposed resale of the property.

## Contractually capped electricity prices

ELIOVE’s aim is to enable VINCI Energies business units to install panels on their buildings without any upfront financial or human investment and without risk.

It manages all of the phases of the project for its clients, including stability calculations for sections of existing framework, consumption profile, layout and shading studies, production simulation, administrative steps

(prior declaration of works, ENEDIS application for connection to the public electricity distribution network) and negotiations with metal workers, roofers and waterproofing experts regarding the completion of re-roofing or structural reinforcement works.

*“The approach VINCI Energies has adopted with ELIOVE is unique.”*

It also handles the coordination with technical inspection services to verify that the project is sound, the project management of the re-roofing or structural reinforcement, the implementation of systems integration, and regulatory follow-up. All of this forms part of a 20-year operation and maintenance arrangement.

The fact that the price of the electricity produced is contractually capped offers the client company considerable security at a time when electricity prices are soaring and when each contract

renegotiation leads to a sharp rise in rates.

## Self-consumption model

“The approach VINCI Energies has adopted with ELIOVE is unique”, stresses Aymeric Tissandier, director at VINCI Facilities. “Firstly, because we’re the only ones making inroads into the office building rooftop market. Secondly, because we’re employing our own business units to work on our own buildings. And lastly, and most importantly, because we’re committed to a self-consumption model in which players in the solar industry install panels and pay rent to client companies with the aim of selling on generated electricity”.

Return on investment in solar PV is not achieved before a 15 or 20-year period. But ELIOVE was primarily set up in order to improve environmental performance. As an investor, VINCI Energies, has therefore chosen to limit the risk to its own business units. ELIOVE’s first client, the company IEP, based in Limoges in west-central France, should see its 810m<sup>2</sup>-roofspace fitted with solar panels. Some 15 other operational projects are currently being launched.



Measures in the plan include turning off illuminated signs as soon as stores close – rather than one hour after closing time as required by law since 2018; systematically reducing lighting (by 50% on the shop floor before the public arrives and by 30% during “critical consumption periods”); switching off air exchange at night; and delaying ice production times.

For Perifem, the federation that brings together all the stakeholders from the food sector and specialised stores, plus their suppliers, to work on environmental issues, it’s a question of accelerating the timetable for France’s “tertiary decree” which aims to reduce retailers’ energy consumption by 40% by 2030.

Indeed, retailers don’t really have a choice. Their electricity bill, which accounted for 30% of their net profit before the recent surge in energy costs, is expected to double in 2023. The retail sector is particularly energy intensive. A supermarket consumes electricity all the time, even when it is closed.

## In France, most retail federations, covering major supermarket chains, specialised stores and independent shops, have committed themselves to reducing electricity consumption in retail outlets.

On 18 July 2022, France’s retail sector agreed on an “energy sobriety” or efficiency plan, applicable to large food

and specialised retail stores from 15 October 2022. It will subsequently be extended to the industry as a whole.



“Energy sobriety in retail stores is linked to several sources of consumption”, says Nicolas Hoffer, director within the building solutions business line at VINCI Energies. “Most outlets are focusing on lighting, and replacing fluorescent tubes – which are actually being phased out in France (specifically T8 and T5 tubes) – by LEDs or compact fluorescent lamps”.

### Refrigeration is first in line

In food retail, the main project to be tackled remains refrigeration equipment, the biggest consumer of energy before lighting. In fact, refrigerants are ten thousand times more polluting in terms of global warming potential than carbon dioxide. What’s more, they are governed by the European F-Gas regulation, which is currently being reviewed.

*“This is more of a refurbishment than a construction market.”*

In order to reduce the consumption of their refrigeration systems, stores can do several things: install night blinds on assets, use refrigeration performance optimisation devices (electronic expansion valves that ensure evaporator superheat control), and adjust defrost and deep-freeze settings.

More broadly, “greening” rooftops and shade canopies, equipping car-parks with solar PV panels, implementing rainwater harvesting systems and installing electric vehicle charge points are further strategic priorities that retailers can pursue as part of their commitment to the energy transition.

### Supporting retailers with all their needs

In order to provide a comprehensive response to retailers’ needs, the VINCI Energies building solutions business line set up a “retail space” club several years ago. The club brings together and links all VINCI Energies business units that have developed areas of expertise and solutions specific to the sector, for example in solar PV, HVAC, commercial cooling, lighting, electric vehicle charging infrastructure and so on.

“We are in the process of putting together a package of services that will enable us to offer both small and large retailers a cross-cutting approach”, states Nicolas Hoffer, joint coordinator for the club. VINCI Energies considers that rehabilitation and refurbishment projects are key here.

“France focused heavily on developing retail space in the 2010s. Zero land take requirement and a reassessment by society of the hypermarket model have considerably changed the equation since then. So, this is more of a refurbishment than a construction market”, explains Lydie Marchand, also joint coordinator of the retail space club.

The aim now is to expand the skills needed to run stores that are not only energy efficient, by minimising their ecological impact and taking into account the life cycle of all materials, but that are also integrated into their area.

# LCPC: A NEW TOOL FOR ENERGY TRANSITION

**France's 2020 environmental legislation requires tertiary-sector real estate to take all its externalities into account. The low-carbon performance contract (LCPC) is part of this systemic evaluation approach, and an assessment method that VINCI Facilities is initially applying to itself.**

France's 2019 energy/climate law commits the country to reducing its greenhouse gas emissions (GHG) and achieve carbon neutrality by 2050. In the arsenal of provisions designed to help achieve this goal, some legislation is targeting specific business segments. For instance, The new so-called "RE2020" environmental regulations apply specifically to the construction sector.

Since 1 January 2022, new buildings must be designed to guarantee a target of reducing direct and indirect emissions by 40% by 2030 and 75% by 2050. Most affected among these new buildings are tertiary-sector premises, which are highly energy intensive.

According to the Sustainable Real Estate Observatory, the carbon

footprint of an office building amounts to 9 tonnes CO<sub>2</sub> equivalent per square metre over its entire life cycle. The lighting, heating, climate control and water consumption required for buildings to function are naturally at the centre of the debate.

Four major criteria can be taken into account in this wider analysis of a building's carbon footprint: responsible development, operational control, storage and circular economy (see box).

## Going further than energy performance contracts

Dans cette logique d'évaluation In this approach focused on comprehensive, systemic evaluation, owners, builders and operators have a new tool at their disposal:

The low-carbon performance contract (LCPC), a contractual agreement between the project owner and operators specialising in energy services. Unlike an energy performance contract (EPC), the LCPC is not simply concerned with reducing energy consumption, but aims to reduce the carbon footprint of a given activity.

"Various tools can be used with a low-carbon performance contract", says Emmanuel Nunes, Business Development Manager at VINCI Facilities.

He continues, "The P2C (contract carbon profile) tool allows us to calculate the carbon footprint of the facility management contracts we fulfil for our customers, based on data and emissions factors from the ADEME and INIES databases.



Environmental QuickScan is a quick method for measuring the emissions specific to our customers and prospects We then suggest a carbon reduction plan with commitments in line with their CO<sub>2</sub> emissions reduction trajectories.

CMS (Carbon Monitoring System) is a low-carbon performance contract tool for managing reduction commitments and highlighting the low-carbon performance actions implemented for the contract.

The greenhouse gas emissions reporting tool BEGES is more specifically aimed at business units subject to regulation and wishing to pursue an ambitious carbon reduction plan".

## Label-based approach

Though not yet widely used, these new performance contracts should quickly become embedded in the real estate sector's partnership practices. They will provide a further advantage

in the process of obtaining various labels: Positive Energy & Reduced Carbon Building (E+C-), NF HQE™, BREEAM, LEED and BBCA).

To accelerate the adoption of low-carbon performance contracts and emphasise their undeniable legitimacy in the energy conservation efforts being made in the real estate

market, VINCI Facilities decided to apply this approach to its own business activities. As Emmanuel Nunes concludes, "Before acting and committing to reduce our customers' emissions, for over a year now, our strategy has been to use this new unit of measurement – carbon – to evaluate our own facility management business, source by source, across our entire operation".

## The four criteria of extended carbon reporting

- The responsible construction criterion includes greenhouse gas emissions connected with every phase of building construction, right through to demolition: the production, transformation and transportation of construction materials; construction logistics; and materials used.
- The operational control criterion concerns the building's operational phase and more specifically, its heating, cooling, domestic hot water production and ventilation, along with the use of renewable energies.
- The storage criterion covers the use of recycled and biosourced materials to insulate buildings.
- The circular economy criterion concerns the deconstruction, reuse and recycling of materials during the construction or alteration of the building.

# HOW ITS CAN ACCELERATE THE DEVELOPMENT OF AUTONOMOUS CARS

**Over the last 10 years, a number of pilot schemes in Europe have been seeking to maximise feedback on intelligent transport systems (ITS) with the aim of building a harmonised approach to the expansion of autonomous cars in the EU. How far has this come?**

The European Commission has been going all out in recent years to expand intelligent transport systems (ITS), whether by working on standardisation, funding research projects or building a regulatory framework. In doing so, it hopes to speed up the development of a harmonised industrial offering throughout Europe. Indeed, several projects – either initiated, coordinated or funded by the EU – have emerged in France over the past decade. These support a number of objectives, such as enhancing road safety, improving the safety of road operating staff, making traffic management more effective and contributing to a reduction in emissions, and finally optimising infrastructure management costs. The first cooperative ITS or C-ITS pilot project, named SCOOP (for “Système COOpératif Pilote”), was launched in 2014. Coordinated by the French Ministry

for the Ecological Transition, the project, for which 50% of the funding was provided by the European Commission, focused on communication between connected vehicles on the one hand and between vehicles and road infrastructure on the other. It involved fitting sensors in vehicles in order to transmit data (on slippery road conditions, sudden braking or accidents for example) to other vehicles and the road operator by means of roadside units. Numerous public and private partners played a part in the project, including local authorities, road operators, car manufacturers, telecoms operators, universities and research centres. Equipment was installed throughout 2,000km of roads in 5 pilot areas (Greater Paris, the A4 motorway, the Isère department, the Bordeaux ring road and the Brittany ring road), with a target of 3,000 connected vehicles.

## Foundations of an ITS strategy

The initiative came to an end in 2019, having produced mixed results. By definition, any ITS project requires a significant number of connected vehicles. “The SCOOP tests were probably hindered by a too modest deployment of connected cars,” says Emmanuel Jolly, head of Actemium Paris Transport. But SCOOP laid the foundations for a real ITS strategy. Other projects are under way, namely C-Roads, EasyWay, Datex II, EU EIP, InterCor and InDiD. Each new initiative seeks to introduce new communication techniques, diversify the relays involved in the connection loop or adapt the scope. “All of these projects are part

of a process aimed at developing autonomous vehicles. The idea is to conduct further tests and observations, and to encourage collaboration between players in the sector. This will help anticipate the technical and functional developments and trends in the systems that will be deployed across Europe in the future,” stresses Jeremy Deville, director at VINCI Energies, who is involved in C-Roads France, which is France’s contribution to the European C-Roads Platform.

## The interoperability challenge

However, there are quite a few barriers still to be overcome in this concerted drive to develop

intelligent transport. From a regulatory point of view, Europe must define the specifications required for ITS compatibility, interoperability and continuity in the EU. As for France, the national strategy for the development of autonomous vehicles involves preparing a deployment plan for infrastructure connectivity that has yet to be implemented. Choices will also have to be made regarding which communication technology to select at a time when car manufacturers are fighting to impose their own standards – without necessarily opting for the same technologies – and when competition from often innovative mobile applications is not insignificant.



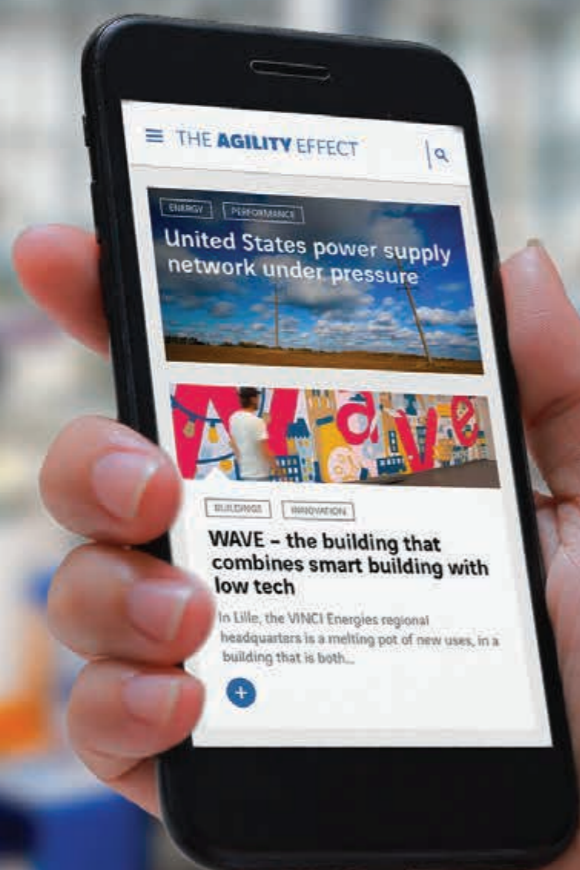
*“The idea is to conduct further tests and increase collaboration so as to anticipate the systems that will be deployed across Europe in the future.”*

The associated business models must also be defined. The deployment of roadside units, whose unit cost is estimated at €3,000 (for 2km of range), is raising a number of questions. Finally, the fact that the reliability of communications is not consistent across a large proportion of road networks represents a further obstacle.



# VINCI ENERGIES ACCELERATOR OF ENVIRONMENTAL TRANSITION

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## AGILITY PEOPLE

# “THE PURPOSE OF MY WORK”

“Agility People” is a series of portraits of VINCI Energies employees. These “talents” come from a whole range of backgrounds and personal career paths, and work around the world in one of the multiple business activities that allow VINCI Energies to prosper.

They all demonstrate, through their different roles and in their own unique way, the values held by VINCI Energies, and a collective commitment to environmental transition.

Meet them in the following pages.

**Adrian Matthys** (Actemium Switzerland) is fully invested in designing a POC for developing a new automation system.

**Lennart Reepschläger** (Omexom Germany) pioneers innovative projects for offshore wind turbine maintenance.

**João Guarda** (Axians Portugal) is a data scientist and AI coach. They exemplify the importance of innovation at VINCI Energies.

Operational expertise is another VINCI Energies strength, as embodied by **Laurence Vaux** (Actemium Cadarache), who supports major nuclear operators;

5G expert **Hendrik Kahmann** (Axians Germany); and **Sidonie Moundi Elimbi** (Actemium Cameroon), who leads her country’s largest maintenance contract.

INDUSTRY

INNOVATION

# IN SEARCH OF EXCELLENCE

**Adrian Matthys, aged 22, is an automation engineer at Actemium Switzerland. Having won the bronze medal in the international WorldSkills competition, he is pursuing his career with the full support of his managers and is becoming a coach himself.**

Adrian Matthys is a young Swiss engineer aged 22. While working as an automation engineer at Actemium Schweiz AG in Arlesheim, the suburb of Basel where he spends 60% of his time, he is also studying for his Bachelor of Science in Electrical Engineering and Information Technology at FHNW (University of Applied Sciences Northwestern Switzerland).

This is the continuation of a remarkable career that already includes a gold medal at SwissSkills 2020, the national competition for apprentices, and the bronze medal in the mechatronics category at WorldSkills in October 2022.

This is a demanding competition that Adrian prepared for methodically. Throughout the preparation phase, he benefited from material and psychological support from Actemium. "I really appreciate the way the managers at VINCI Energies, and at the highest level, take an interest

in young people's training", says Adrian Matthys, who sees in that the VINCI Energies values of confidence and responsibility.

*"I really appreciate the way the managers take an interest in young people's training."*

As for his future, the young automation engineer sees himself abroad. "VINCI Energies' international network offers a lot of possibilities. I would also like to devote part of my time to teaching. I'm already coaching an Actemium apprentice who is preparing for the WorldSkills Competition in September 2023". The loop is complete.





## AGILITY PEOPLE

ENERGY

PERFORMANCE

# “I’VE LEARNED A LOT ABOUT MYSELF AND MY ABILITY TO MANAGE”

**Sidonie Moundi Elimbi is a project manager for Actemium Cameroon's largest maintenance contract. We look at the unusual track record of a determined woman who has seized opportunities as they have presented themselves.**

Project manager at Actemium Cameroon, Sidonie Moundi Elimbi, 42, manages the maintenance contract for oil company Perenco, VINCI Energies' biggest client in the country. Specialising in HSEQ (health, safety, environment and quality), her career at Actemium began with the Limbe refinery extension project in south-west Cameroon.

“In 2019, management offered me the role of junior project manager for the Perenco contract. I must say that I was a little concerned about

taking on such responsibility! But I was fortunate to have had as my mentor the incumbent project manager Alain Zeh Messi (known as father Alain), someone with a great deal of experience and highly respected.”

The Covid 19 pandemic proved to be a trial by fire. “It wasn't easy, but I learned a lot about my new role and about myself, my ability to be a manager.”

Alone at the helm since 2021, Sidonie Moundi Elimbi now heads up 253 people, including 251 men. “I'm supervising teams and making sure that services are being delivered properly, completion times are being met and of course that safety instructions are being complied with and the environment protected.” Her goal is to “become a business unit manager, still in the maintenance sector.”

ICT CUSTOMIZATION

# COLLABORATIVE WORKING AS A GUIDING PRINCIPLE

**Hendrik Kahmann is a business development manager at Axians Germany. He develops innovative business models and partnerships built around ICT. His method involves curiosity, listening and collaboration.**

As Business Development Manager at Axians (the VINCI Energies ICT brand) in Germany, Hendrik Kahmann is currently devoting much of his time to the development of private 5G networks for the logistics and industrial sectors.

“In conjunction with other VINCI Energies business units, including Actemium and Omexom, we have established a private 5G network demonstrator in the form of an initial proof of concept for co-creation purposes”, explains the 38-year-old manager, who is passionate about the numerous possibilities that 5G offers in the industrial sector, both in terms of autonomous robots and remote inspection and maintenance.

This is an opportunity to apply a working method that he cultivates with great conviction: collaborative working. “Being able to talk things over with other professionals is very important to me”, he says.

“It opens up so many opportunities”. He feels that this way of operating is perfectly aligned with an important VINCI Energies value:

*“Being able to talk things over with other professionals in different verticals is very important to me. It opens up so many opportunities.”*

“the spirit of entrepreneurship that enables us to develop new products and new business models with agility”.

At the forefront of the digital revolution, this technology fan is also proud to be “contributing to the environmental transition by developing connected industry that is more efficient, less energy-intensive and more sustainable”.



# “THINKING AND ACTING LIKE AN ENTREPRENEUR”

**Project manager at Omexom Renewable Energies Offshore in Germany, Lennart Reepschläger manages innovative programmes aimed at optimising offshore wind turbine inspection and operation of windfarms in general. The organisational system at VINCI Energies, which encourages autonomy, enables him to have a tangible and rapid impact.**

Lennart Reepschläger has no shortage of projects in his pipeline, “OBSERVAERO”, “Mini-ROV” and “Sound Scanning” to name just a few. Project manager at Omexom Renewable Energies Offshore in Oldenburg near Bremen in northern Germany, this 28-year-old engineer is working on four projects designed to optimise the inspection and operation of offshore wind turbines.

OBSERVAERO is a service for inspecting rotor blades via drone and assessing the results with AI support; a “Mini-ROV” is an underwater robot that checks the condition of wind turbine foundations; and Sound Scanning is an acoustic inspection method for localization and assessment of acoustic phenomena. He also manages a fourth programme that focuses on rotor blade repair. All should be operational in 2023.

“Apart from these projects, I’m also involved in the strategic development of our new business unit and the sales activities of our solutions and services,” stresses Lennart Reepschläger.

*“I manage my projects independently. That means I can be flexible and adapt quickly, which is really motivating.”*

What the young project manager likes above all in his work is the opportunity to contribute towards the energy transition and the autonomy he enjoys

in carrying out his projects. “The support from Omexom Brand Team, Axians, VINCI Energies and its ENERGIZE programme, which helps business units with their innovation projects, and from Digitalschmiede, a centre for innovation in Frankfurt, from other VINCI Group entities like LEONARD, and VIA IMC (VINCI Construction), is a huge asset.”

The organisational system and operating method at VINCI Energies facilitate the process. “VINCI Energies business units are highly autonomous,” he notes. “Our unit can implement its own strategy with a great deal of freedom and in full confidence with VINCI Energies. Even at my level of project manager, I’m encouraged to think and act as an entrepreneur. I manage my projects independently. That means I can be flexible and adapt quickly depending on needs. That’s really motivating.”





## AGILITY PEOPLE

ENERGY

TRANSFORMATION

# “DON'T PUT LIMITS ON YOURSELF, ALWAYS BE BOLD”

**After spending the first part of her career in the oil and gas industry, Laurence Vaux joined the nuclear division at VINCI Energies as manager of the Actemium Cadarache business unit – a new challenge for this accomplished triathlete.**

Having completed engineering studies in Toulouse and a Master's degree in oil and gas at the IFP School, Laurence Vaux started her career in 1998 at BP before moving on to GE Power & Water. After 20 years in oil and gas, she completed an Executive MBA in 2018 and joined VINCI Energies as VP of business development for Sub-Saharan Africa, still in the same sector.

She added a new operational dimension to her career in October 2021 when she was appointed manager of the Actemium Cadarache business unit (in the Bouches-du-Rhône department in southern France) within the VINCI Energies nuclear division. As the head of a team of 35, Laurence Vaux enjoys the autonomy and responsibility that her new role offers.

“Being business unit manager is quite a challenge. I am being supported by VINCI Energies through the nuclear division's AVENIR operational excellence plan.” She says she is someone who “never puts limits on herself”, who has “always been bold.”

She is also proud to play a part in the great energy transition adventure alongside clients like the CEA (French Alternative Energies and Atomic Energy Commission) and the ITER project (International Thermonuclear Experimental Reactor). This skilled triathlete is not fazed by long-term projects of this kind. “Nuclear is a marathon not a sprint,” she says, adding that on 9 July she plans to take part in the Tour de France stage in the Alps, wearing a bib from Mécénat Chirurgie Cardiaque, the charity supported by VINCI Energies.

INDUSTRY

INNOVATION

# PROFESSION: AI COACH

**Lead data scientist at Axians Portugal and AI coach at Leonard, João Guarda strives to carry out his work responsibly while seeking to have a positive impact on people's lives and the planet.**

"When you work in artificial intelligence (AI), you constantly need to consider the ethics and implications of what you're doing." This responsible approach to AI and the necessary awareness-raising work involved is something that João Guarda, 27, lead data scientist at Axians Portugal, has been putting into practice since October 2022 as part of his new role as AI coach at Leonard, VINCI's innovation platform. The role involves training employees from the Group's various business units and contributing to an AI research project based on observation of the planet.

At Leonard, João Guarda can draw

on all the very diverse skills required in his job as data scientist. "First, you have to be able to identify artificial intelligence use cases," explains the young Portuguese engineer. "You then have to move onto the project implementation phase. And finally, it's crucial to be able to form and lead a team internally and with the client so as to complete the project." All of these capabilities serve his goal to have a positive impact on people's daily lives, which remains the main motivation in his work. "AI can help achieve small things, like automating tedious tasks, as well as big things by optimising energy consumption for example."



# MAKE A DIFFERENCE WITH VINCI ENERGIES!

Go to Solidarity Effect to learn more about what VINCI Energies and its employees are doing to bring about a more considerate and benevolent world.

[solidarity-effect.vinci-energies.com](https://solidarity-effect.vinci-energies.com)



INDUSTRY INNOVATION

## DIFFERENTIATED MANAGEMENT SOLUTIONS FOR NUCLEAR WASTE



**In recent months, nuclear energy has been back at the centre of debate. And the main focus is on what to do with radioactive waste. Solutions are being rolled out, driven by the innovative capacity of players in the industry. One such solution is Cigéo, a long-lived high-level waste disposal project in eastern France.**

With world energy markets disrupted by the war in Ukraine, the nuclear industry is finding renewed credence as the centrepiece of strategies that address the major energy and climate-related challenges of tomorrow. This is due to its ability to continuously generate low-carbon electricity at competitive prices. "Nuclear power still tends to suffer

from a negative image, perpetuated by the memory of the Chernobyl and Fukushima accidents. However, people have a very poor understanding of it, whether the physical process, industrial treatment procedures, associated safety ecosystem or major innovations being researched in the field", says Pascal Champ, director of non-destructive testing

operations in the VINCI Energies nuclear division. The division implements its electrical, mechanical, ventilation and non-destructive testing competencies from the engineering through to the works stage, backed by the VINCI Group's civil engineering know-how.

"Our positioning is rather unique since we're neither waste operators nor managers. We act as an integrator across an extended spectrum of expertise, mobilising various Group business units to respond to public or private tenders", explains Pascal.

Examples of business units include Omexom Cherbourg, which was involved in works to increase capacity at the Orano la Hague facility; Cegelec CEM, which installed radioactive waste encapsulation and storage systems at EDF's Bugey facility; and Actemium Projets Nucléaires France and Actemium Tricastin, which installed and tested power and data systems and perimeter security systems at the CEA (French Alternative Energies and Atomic Energy Commission) and Orano facilities among others.



## The varying hazard levels of waste

One of the major sources of tension immediately associated with nuclear energy is radioactive waste. While all types of waste are radioactive, they do not all present the same degree of hazard. This hazard is calculated on the basis of two variables.

The first is the level of radioactivity. This is expressed in Becquerels to specify how many atoms disintegrate per second. Using this unit of measurement, waste is classified as very low-level waste (VLLW), low-level waste (LLW),

intermediate-level waste (ILW) and high-level waste (HLW).

*“A final disposal route is already in place for 90% of radioactive waste produced in France (by volume).”*

The second metric used to assess the hazard level of waste is lifetime or half-life, the time it takes for half of the quantity of a single

radionuclide to decay. Half-lives can vary in length from a few days to several thousands of years. Short-lived waste is defined as a period of less than 31 years, while long-lived waste is anything above that threshold.

Combining these two variables produces five categories of nuclear waste (see box). Regardless of the category, all waste must be treated in order to ensure safe final disposal. The treatment process includes collecting and segregating waste, reducing its volume and adjusting its chemical composition and physical appearance (for example by concentrating liquid waste), and lastly conditioning

it into a form that immobilises it in packages prior to storage and/or final disposal.

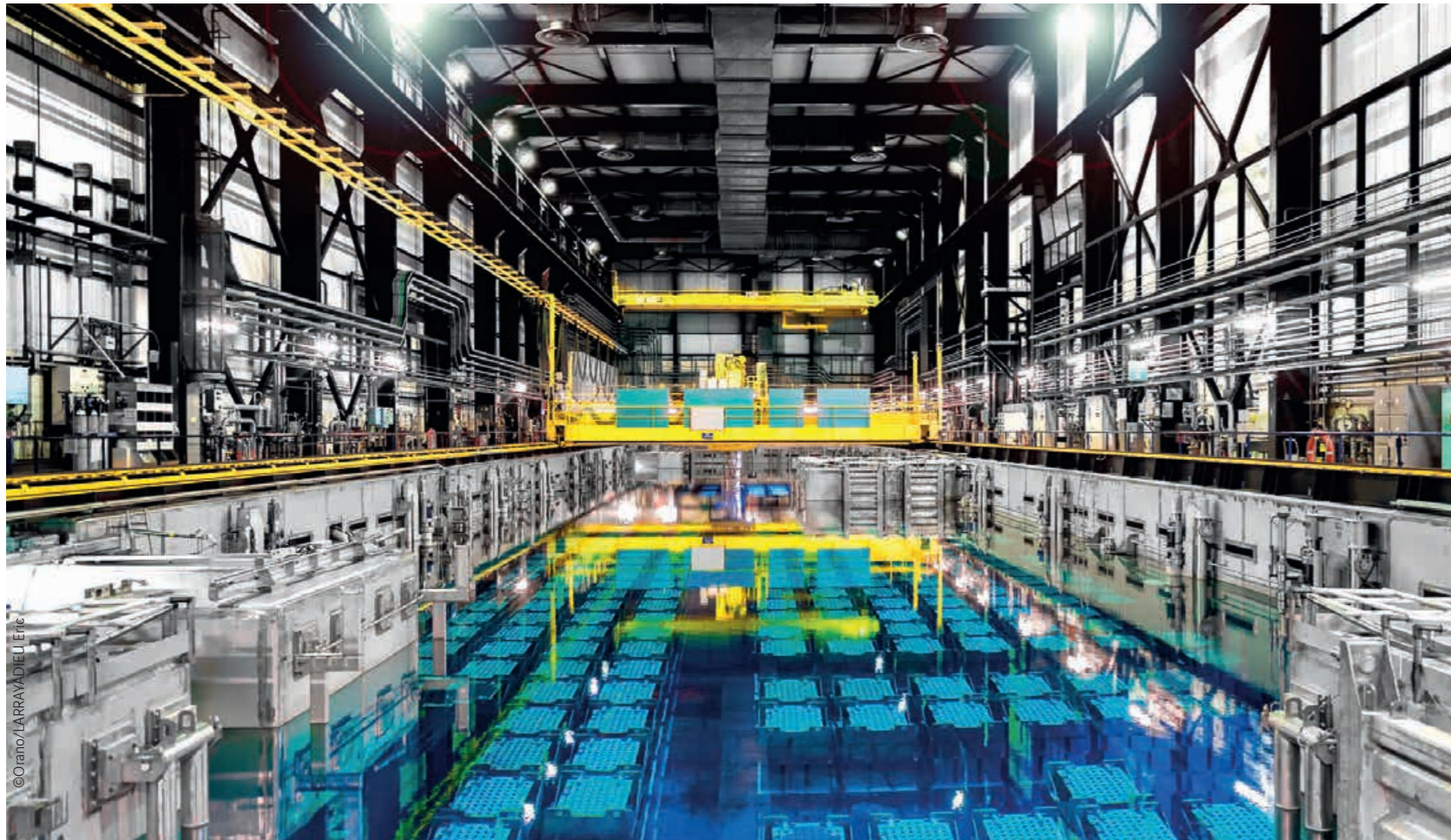
## Cigéo project

“A final disposal management route is already in place for 90% of nuclear waste produced in France (by volume). The waste is handled as part of an industrial approach by the French National Agency for Radioactive Waste Management (Andra) and sent to dedicated disposal facilities”, points out Pascal Champ. At end-2020, the amount of waste managed or due to be managed by Andra stood at 1,600,000m<sup>3</sup>, the equivalent in size

to 445 Olympic swimming pools (see 2022 Andra waste inventory).

However, there is as yet no definitive disposal route for long-lived HLW and ILW. It is currently conditioned and stored by waste producers pending the availability of an underground final disposal site (at a depth of 500m). This is where Andra’s deep geological disposal facility Cigéo (Centre industriel de stockage géologique pour les déchets) project comes into play. Located on the border of the Meuse and Haute Marne departments in eastern France, the site was chosen for its specific geological properties, namely low permeability and self-sealing capacity.

Cigéo is a large-scale, long-term project, spanning around 100 years. Whatever the nature of the services already provided by the various businesses appointed by Andra, the technical and societal challenges involved in these activities have led to substantial contracts in terms of resources and timing. Between 2016 and 2019, Cegelec CEM undertook engineering studies for the handling and storage subsystem for packages of long-lived HLW and ILW. “The job, worth more than €20 million, represented 200,000 hours of studies and involved 60 people and the production of a thousand deliverables”, says Pascal Champ.



## 5 categories of waste

By combining radioactivity and half-life criteria, 5 categories of radioactive waste can be identified.

- Very low-level waste (VLLW): rubble, concrete and scrap arising mainly from the decommissioning of nuclear facilities. Accounts for 27% of the volume of waste in France, with radioactivity levels significantly decreasing within around 10 years.
- Short-lived low-level and intermediate-level waste (LLW and ILW): gloves, filters and resins often related to the maintenance of nuclear facilities, particularly hospitals and research centres. Accounts for 63% of the volume of waste, with radioactivity levels significantly decreasing within around 300 years.
- Long-lived low-level waste: covers radium-bearing waste which comes from the minerals used in some industries, and graphite waste resulting from the decommissioning of first-generation nuclear reactors. Accounts for 7% of the volume of radioactive waste.
- Long-lived intermediate-level waste (ILW) arising from the reprocessing of spent fuel from nuclear power plants. Accounts for 3% of the volume of radioactive waste.
- Long-lived high-level waste (HLW) resulting from the reprocessing of spent nuclear fuel: contains fission products and minor actinides formed by nuclear reactions in the fuel while in the reactor. Half-lives can span several thousands, if not millions, of years. Accounts for just 0.2% of the volume of radioactive waste, but 96% of the total radioactivity of radioactive waste in France.

# THE WORLD'S LARGEST TELESCOPE IS UNDER PREPARATION WITH SUPPORT FROM ACTEMIUM

**The European project the Extremely Large Telescope will be operational in Chile from 2027. The operation to polish its oversized mirror is now under way, primarily in France. Actemium Maintenance Ouest Centre is working on this specialised task on behalf of Safran.**

This will be the largest telescope in the world. With a volume around eight times that of the Arc de Triomphe, it will above all boast unprecedented resolution. Because the ELT (Extremely Large Telescope) needs to see very far indeed, to observe clusters of stars far beyond our galaxy, to probe the birth of planetary systems and help us understand how the universe was formed.

This technological feat will be accomplished from northern Chile, and specifically the Cerro Amazones, a mountain rising 3,000 metres above the Atacama Desert. The environment there offers extraordinary conditions for observation: almost 330 clear nights a year, high air stability



and a perfectly dry atmosphere transparent to infrared radiation.

The ELT's power is equivalent to that of the world's 16 largest currently operating telescopes combined. Its secret – the primary mirror. The larger the light-collecting surface of this mirror, the greater its resolving power. The main mirror of the ELT is a never-before-seen 39 metres in diameter. By way of illustration, the fault tolerance for each hexagonal segment is not to exceed 10 nanometres, which is equivalent to the presence of a single ladybird on the entire land area of France.

## A race for power – and against time

Behind this project is the European Southern Observatory (ESO), an intergovernmental organisation of 16 leading countries in the field of astronomy. For Europe, the issue is at least as much political as scientific. Several other projects to install ultra massive telescopes began simultaneously around the world, including the Thirty Meter Telescope (30 m in diameter) and the Giant Magellan Telescope (25.4 m), both American undertakings.

A race for power, then. But also a race against time. While the Thirty Meter Telescope is not scheduled for delivery in Hawaii until 2030, the ELT should be operational from 2027. For the companies involved in this European project worth €1.3 billion, the ability to meet deadlines presumably features prominently in the technical brief.

As a specialist in optronics, avionics and electronic guidance systems, Safran Electronics & Defense has been tasked with polishing and installing the mirrors. The telescope's main mirror is actually composed of 798 hexagonal mirrors, each measuring 1.40 m, plus 133 spare mirrors. Safran will therefore need to polish 931 mirrors. The operation began in 2020 in a specially constructed building in Sain Benoît, near Poitiers.

## 20 machines in use

The telescope's accuracy depends on the crucial and painstaking polishing operation. The process involves a series of extremely technologically advanced stages, from pre-polishing to cleaning, via lapping, smoothing and ion milling. These are performed by a total of 20 machines, operating either through robotics or digital control.

Actemium Maintenance Ouest Centre, a VINCI Energies business unit specialised in industrial maintenance, is tasked with the preventive and corrective maintenance of the polishing equipment across the entire production chain. "Each part manipulated by these machines costs several hundred thousand euros", says Maël Lafaurie, a project manager at Actemium Maintenance Ouest Centre, "Meaning that even the slightest fault is completely unacceptable".

*The telescope's main mirror is composed of 798 hexagonal mirrors, each measuring 1.40 m.*

To convince Safran, the business unit created a turnkey solution that combines process digitalisation, a maintenance plan, a range of service packages, a defined spare parts inventory and operational maintenance. All this is to be done while dealing with the constraints that production rates place on equipment installation, commissioning and availability. "We also perform numerous weather checks and ourselves maintain the inspection equipment", adds Baptiste Champalou, who supervises the three Actemium technicians assigned full-time to the Saint Benoît site. The contract started in September 2019 and is due to conclude in 2024.

# VAFOS PULP AS IS REDUCING ITS CARBON FOOTPRINT WITH ACTEMIUM

**The electrification of manufacturing is a key issue for the planet. In a first for Europe, the Norwegian paper pulp manufacturer Vafos Pulp AS is equipping its factory with an electric heating system that will minimise its carbon footprint, using a solution developed by Actemium.**

The Norwegian firm Vafos Pulp AS manufactures unbleached paper pulp used mainly in the production of cardboard. The company wanted to equip its Kragerø factory with a new heating system allowing it to move from fuel oil to electric power and thus drastically reduce its carbon footprint. This will be Europe's first factory of this type.

As part of this contract, Actemium, the VINCI Energies brand specialising in industrial performance, designed and supplied two electrical cabinets built into containers. "This was the simplest and cheapest solution, as it saved having to construct a new building", explains Jon Ottar Ellefsen, BU manager of Actemium Electro AS.

"Another considerable advantage was being able to build the entire electrical distribution room in our workshop, with all the installations and the distribution cabinet. That all takes around seven weeks. We then



transport the completely finished containers to the site". Actemium Electro AS has completed the installation, but the customer has postponed the project because of supply problems due to the current situation.

## Excellent prospects

The electrical switchboards are fitted with DCT880 thyristors from ABB and a Siemens S7 controller to regulate the heating elements. "We chose ABB's DCT technology because it offers the best performance against the customer's criteria", says Jon Ottar Ellefsen. "And we chose the Siemens S7 controller because

it's a tried and tested automation system that we are already very familiar with."

This installation, a first of its kind, offers great prospects in what promises to be a huge market, given the 2050 zero emissions target announced by the European Union.

"The electrification of manufacturing is an enormous opportunity", concludes Jon Ottar Ellefsen. "With the container-based solution developed by Actemium, we could electrify industry everywhere, not just because of its price but also the practicality, with the possibility to quickly source one or two containers ready for connection to the network and the factory."

# USING HYPERVISION TO MANAGE RENEWABLE ENERGY

**Omexom RE Solar has designed OkiO, a tool that can monitor and optimise the management of renewable energy sources. This energy hypervision platform has been deployed across all of the assets managed by the company.**

Omexom RE Solar is a VINCI Energies business unit that specialises in the construction of solar PV plants and high voltage substations for renewable energy sources. It also provides operation and maintenance services for these facilities.

"As our business has grown, we have ended up with a lot of assets to manage that are very different in terms of size, architecture and technology", says BU Manager Yves Daguin. "As the operator of more than 500MW of renewable assets, we needed to optimise our processes and make them more efficient". In 2020, the company decided to build its own hypervision

tool with the aim of standardising its processes. Its name, OkiO, comes from "occhio", the Italian word for "eye", and its purpose is to enable the Omexom RE Solar control hub near Montpellier, which monitors all company assets, to access the key data of all these facilities in real time and thus optimise power generation. "As turnkey contractor for power producers, we manage equipment and systems that are often proprietary, in other words closed, and that can cause scalability problems at the operation phase for example when they come to be updated", points out Yves Daguin. "So, it's vital that we have a tool that

centralises and secures the data from these facilities so that we can utilise it as we see fit".

## Beyond solar PV

After 6 months of work defining the technical specifications to be incorporated into the tool and its software architecture, Omexom RE Solar started developing a beta version of OkiO in 2021. This was tested on two assets with different needs: a solar PV plant and a switchyard. The company has been deploying the tool since the summer of 2022 across all of its assets. The ambition is "to extend the scope of the hypervision platform to cover facilities that generate other types of renewable energy like hydroelectric power, wind power and hydrogen". "We've already noticed that it saves a lot of time in data analysis and as a result that it significantly improves performance indicators and plant up-time. This improvement is driven, among other things, by a weather monitoring system which enables us to establish performance scenarios introducing the idea of prediction", says Yves Daguin. "It provides our clients with the assurance that they can feed more power into the grid and thereby boost performance", he concludes.



# UNITED STATES POWER SUPPLY NETWORK UNDER PRESSURE

**Faced with increasingly frequent violent weather events, the ageing US power supply network is in a race against time. But solutions do exist.**

On 28 September 2022, Hurricane Ian, one of the most powerful in US history, struck Florida and South Carolina. This Category 4 storm caused the deaths of more than 60 people and plunged 2.7 million into darkness.

This type of catastrophe, likely to occur more frequently in future due to global warming, again highlighted the weaknesses of the ageing US power supply network. A study has shown certain parts of the network are more than 100 years old, and 70% of transmission and distribution lines are in the latter half of their useful life. According to a report by the American Society of Civil Engineers, the distribution network alone accounts for 92% of all power outages.

Jim Turley is President of Booth & Associates, an electrical and gas utility engineering company within the PrimeLine Utility Services group, specialising in transmission, distribution, substation and

telecommunications infrastructure (VINCI Energies). He explains that “The main cause of outages during hurricanes, and it is also the case during ice/snowstorms, is the falling of trees onto distribution lines.

*“While the equipment has been reinforced in coastal regions, inland, the distribution network remains more of traditional design and construction standards.”*

So, the challenge on the utility side is ensuring the regular maintenance of the right-of-way and cutting trees away from the lines”.

He adds, “The other way to reduce power outages is to raise the level

of design and strength requirements for new installations.” This is addressed by the NESC standard <sup>(1)</sup>, especially since the 2002 edition following the series of hurricanes that struck the country in the 1990s. Since then, high-voltage lines must be able to withstand winds of up to 140 mph (225 kph), increased from the previous 110 mph (177 kph).

“The requirements are increasingly demanding for transmission lines and in coastal areas such as Florida or the East Coast and many utilities in these regions have begun strengthening their distribution infrastructure.”, says Jim Turley. “The latest 2023 NESC update was just released in August 2022.”

## Reinforcing equipment and burying power lines

To meet these new technical requirements and improve its network, Florida’s largest public electricity provider Florida Power and Light (FPL) is constantly reinforcing its electrical poles. In 2018, it also launched a pilot programme known as Storm Secure Underground. Its aim is to replace overhead power lines with underground lines to improve resilience during

hurricanes and other extreme weather events.

“Overall, Florida Power and Light has done great work in strengthening its network”, says Nick Smith, Director of Estimating and Project Management at Chain Electric Company, a Prime Line Utility Services company that specialises in the construction and maintenance of electrical distribution systems, and was involved in urgent repair work following the hurricane. “Even though we had more than

2.5 million faults after Hurricane Ian, we were able to get almost everything operational in around two weeks”.

However, according to Jim Turley, there are still regional variations: “While the equipment has been reinforced in coastal regions, inland, the distribution network remains more of traditional design and construction standards. While Hurricane Ian did not penetrate the heart of North Carolina, some hurricanes do sometimes and can cause

enormous damage by bringing down large trees. It is necessary that the work of reinforcement, maintenance of rights-of-ways and the burial of lines must continue to reduce outages and improve restoration times”.

(1) The National Electrical Safety Code (NESC) is an American standard relating to the safe installation, operation and maintenance of electrical supply and communications systems.



# A SOLAR MEGA-PLANT

**The Labarde plant in south-western France is designed to supply electricity to around 30% of Bordeaux residents. The main technical challenge involved in this supersize project relates to the ground conditions since the site was formerly a landfill.**

The Labarde plant near Bordeaux is Europe's largest urban solar PV facility. Inaugurated on 12 May 2022, it includes around 140,000 solar panels across a 60-hectare area, with an installed capacity of 59MW.

The aim is to generate 75GWh per year of renewable electricity, enough to meet the needs (excluding heating) of some 70,000 people – 28% of Bordeaux's population – or more than 34,000 people including heating. Most importantly, the facility's generation capacity will help save over 2,940 tonnes of CO<sub>2</sub> per year.

The €60 million project stems from a partnership concluded in 2018 between the Banque

des Territoires bank and JP Energie Environnement, an independent French business which specialises in the development, financing, construction and operation of wind and solar farms throughout France.

It took two years of works to complete this large-scale project in two segments. The first segment involved installing units 1 and 2, generating 33MW or 55% of the facility's total capacity. Units 3 and 4 were delivered as part of the second segment in 2021.

A total of around 15 companies contributed, including Omexom ENR Sud-Ouest, the VINCI Energies business unit responsible for connecting the solar PV panels

and electrical substations. "We first got involved in May 2020 when we dug the 20,000V medium-voltage trench, then we came back in July to connect the panels, supply and install the electrical systems (alternating and direct current), and install and connect the inverters and transformer substation (enabling the electricity to be fed back to the EDF power grid)", explains Florian Baudoin, now project manager at Omexom ENR Antilles, who worked on the Bordeaux project.

## Scaling up

RTE, the French electricity transmission system operator, is very clear in its assessment: if France wants to achieve carbon neutrality by 2050, its overall solar capacity must increase by a factor of 7 to 20. This explains the recent trend in launching big projects.

"So far, most projects involved 5 to 20MW-capacity plants. Now, projects targeting 30, 50 and 60MW of capacity are becoming the norm", says Alexandre Baudelin, head of Omexom ENR Sud-Ouest.

However, in Labarde the main technical challenge lay less in the scale of the project than in the ground conditions. The plant was built on the site of a former Bordeaux Métropole landfill that had been closed for over 35 years. The land had become unsuitable for agricultural activities and was not authorised for construction due to the 2 to 3 million cubic metres of waste buried underground.

The concrete bases, on which the panels' metal frames are secured, are installed on a geotechnical membrane (in other words a waterproof sheet)

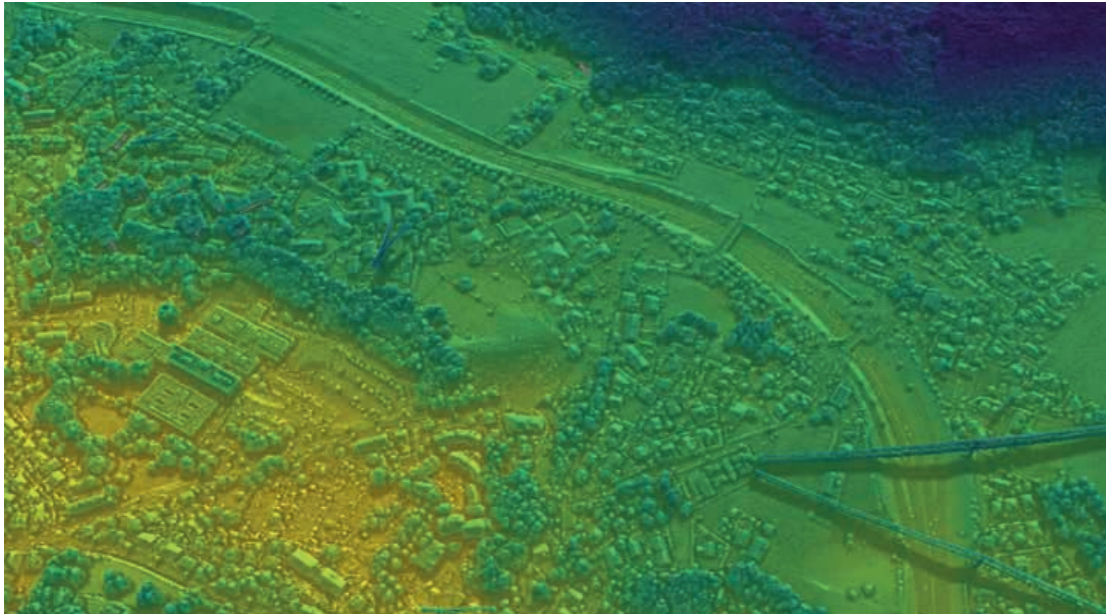
which is spread out on a layer of clay then ballasted with 30cm of topsoil.

This system of superimposed layers, while it aims to prevent gas or liquid leakage that could pollute the Garonne estuary's water table, rules out the possibility of any earthworks being performed or of construction plant operating. As a result, artificial tracks had to be created using engineering fabric covered with gravel-sand mix so as to enable vehicles and equipment to access the live site.

An annual technical inspection will be performed to review land survey changes, the thickness of the layer of soil, and the absence of erosion or ruts in the vegetation cover. As for landscape maintenance, well that aspect has been entrusted to... a flock of 150 sheep and 5 goats.



# DATA IS KEY TO PLANNING TRANSFORMATION



**Data can be very powerful in helping to develop and implement public policies in a variety of areas, such as risk prevention, water management and sea freight. Companies in the private sector are at the forefront in this matter, including Axians in the Netherlands.**

Data can be used to benefit the population as information can be combined from a great many sensors collecting a considerable amount of data in real time. Such smart data can power new services able to facilitate and improve people's lives, in particular by helping to implement public policies.

One such example in France is the initiative developed by the French National Institute of Geographic and Forest Information (IGN), which involved developing a high-definition Lidar <sup>(1)</sup> map of the country. By generating accurate and detailed geographic data, the project, the initial modules from which will be available in late 2022/early 2023,

will support public authorities to put in place their policies related to agriculture, forestry, the environment, urban development and energy.

The tool will enable the French National Forest Office (ONF) and private management companies to better understand what state the forests are in and how they are changing as a result of climate change. These models could also serve to simulate natural disasters and predict the risk of flooding and rock slides. The Netherlands is one of the countries driving Lidar mapping, having already conducted four such exercises, and Switzerland is mapping its territory for the second time.

## Managing a watershed

The private sector clearly has a part to play in driving this approach of using data to optimise public policies. Waterschap Hollandse Delta (WSHD), the authority that manages 758 kilometres of dykes and dunes between Rotterdam and Dordrecht, 1,600 kilometres of road and cycle path, and 20 wastewater treatment plants, contracted Axians Netherlands to help design the architecture for a New Water System Control data platform, which ultimately will enable WSHD to improve the way it manages the water system in the region. It will serve to calculate the impact of the various meteorological scenarios and therefore control the locks to ensure the water stays at an optimal level.

"These checks will initially be suggested by the system, but in time it will become automated", explained Alexander van Helm, Technical Director at Axians in Laren. "We were able to add value to this project by developing a comprehensive and detailed conceptual architecture based

on a standard approach and methodology that takes account of the complexity of data in managing water".

*Powering new services to improve people's lives by helping to implement public policies.*

## Digitising the largest port in Europe

Axians boasts considerable expertise in digitisation. The expert ICT brand has been working for several years on another large-scale project to digitise processes at the port of Rotterdam, the largest port in Europe.

"In partnership with IBM and Cisco, we built an IoT platform that measures several parameters (including currents, tides, pressure, temperature, turbidity, wind and visibility) so as to optimise the movement of vessels in the port", says Alexander van Helm.

Using the Internet of Things, the port authority can collect myriad data that it then processes and makes available to those concerned

through different filters. The data platform of the port of Rotterdam makes it possible to monitor the movement of vessels, the state of the infrastructure, as well as meteorological, geographic and hydrological data.

The use of data and digitisation means the container terminal at the industrial park of Maasvlakte is already operated without human intervention, with autonomous cranes and remote-controlled trucks. The idea is that vessels will be able to enter and exit the port completely autonomously by 2030.

Undeniably, data represents a major opportunity for local authorities and public institutions in general. The potential scope of application is enormous. Nevertheless, using data to steer public policies means a specific method must be followed to ensure the quality of data and the decisions that are made, without overlooking the ethical considerations of such an approach.

<sup>(1)</sup> LiDAR : A method of remote detection that creates a three-dimensional array of points from which various digital models can be generated, for example a model of the topography (land, above ground and ground elevation)

# DPCM: THE SOFTWARE THAT REDUCES YOUR IT BILL

**Axians has developed software called Dynamic Power Cloud Manager (DPCM) that enables its customers to gauge their real needs in terms of IT systems usage, and thus generates significant savings.**

Axians has developed software called Dynamic Power Cloud Manager (DPCM) that enables its customers to gauge their real needs in terms of IT systems usage, and thus generates significant savings.

Computing systems continue to increase in efficiency. But the need for IT performance has grown more strongly still, creating considerable energy expenditure. To manage this often business-critical infrastructure, Axians, the VINCI Energies ICT brand, has designed a turnkey solution to reduce costs and optimise processes, known as Dynamic Power Cloud Manager (DPCM).

This tool has been constantly refined over more than 10 years and presents two major advantages: it automates most of the work managed by the IT department and offers extremely powerful

monitoring. "Effective monitoring allows us to know what the real needs are. Customers using this software gain the ability to run productive systems only without slowing down the rest. This allows energy and operational cost savings of up to 30%", says Armin Heigl, BU manager of Axians Infrastructure Software, who stresses that the initial cost of the software is generally recouped within a year thanks to the energy savings made.

## Maximising savings

The monitoring provided by DPCM optimises system resources and thus maximises energy savings. "Let's take the example of an IBM Power 9 (E950) system with all processors active but peak load never exceeding 25% over 365 days. Using IBM Elastic Capacity on Demand,<sup>(1)</sup> 50% of processor cores and memory can be

deactivated, for a saving of 192 Watts per system. In a datacentre with at least eight servers, that adds up to 1,536 Watts. Not to mention that at least the same amount is saved in cooling power", explains Christian Heitkamp, Software Product Manager at Axians. "These savings can be even greater where infrastructure is more significantly underused".

*"Customers using DPCM gain the ability to run productive systems only without slowing down the rest."*

In addition to the energy savings, DPCM also reduces running costs: "Deactivating processor cores automatically reduces your IT bill. You only pay for what you use.

And that applies to numerous applications, from firmware updates to system recovery or verifying backups", says Christian Heitkamp.

He continues, "This Software even allows savings in training. Personnel who don't know IBM Power can quickly use and integrate DPCM X, our most recent version of the software. This is particularly

beneficial now that IBM Power specialists are quite rare".

Axians has already deployed this solution with some sixty clients in sectors like aviation, automotive, telecoms and banking/insurance. From the last of these for example, The German insurer Huk-Coburg appreciated the simple and intuitive management via the Linux/Unix

platform, which freed up IT staff to concentrate on other, more urgent tasks.

(1) IBM Elastic Capacity on Demand is a solution that allows you to create temporary capacity by activating and deactivating processor cores and memory units to help meet the demands of your business peaks.



# HOW DO WE ACCELERATE THE REDUCTION OF OUR CARBON FOOTPRINT?



François Gemenne,  
Co-author of the IPCC report

Corinne Lanièce,  
General Secretary  
of VINCI Energies

**How are we doing on decarbonising the economy? What role should businesses play? Specifically, what ambitions and solutions does VINCI Energies have? François Gemenne, a professor at Sciences Po Paris and the University of Liège, and co-author of the IPCC report, and Corinne Lanièce, General Secretary of VINCI Energies, answer these questions.**

**You contributed to the most recent IPCC report last April. What are its key points?**

**François Gemenne.** There are three main ideas to consider. The first is the irreversibility of climate change. The second is the absolute urgency for our cities, our regions and our territories to implement public policies to adapt to these effects. And the third idea is the need to link climate policies with social policies. We know that the most vulnerable populations will be the worst affected.

**What can economic operators do, and businesses in particular?**

**F.G.** The good news is that we can still act on the extent of global warming. We face a progressive problem in which every incremental temperature increase matters. Every tonne of CO<sub>2</sub> not emitted can make a difference. This is where businesses and individuals have a huge role to play. Multinationals like VINCI can go beyond national constraints and take steps that have a significant impact on CO<sub>2</sub> reduction.



**Corinne Lanièce.** At VINCI Energies, as an accelerator of energy transition, we have a special role to play in energy management and reducing greenhouse gases. We consider two types of carbon footprint. First, our own carbon emissions. This is the energy we consume with our assets and in relation to our business activities. The second type of carbon footprint relates to our indirect emissions. This includes the CO<sub>2</sub> emitted by machinery and equipment that we purchase, by our suppliers' and subcontractors' services, and the emissions that our customers create when they use the facilities, products and services that we sell them.



*"As an accelerator of environmental transition, we have a special role to play."*

Corinne Lanièce

**What targets has VINCI Energies set for reducing its own carbon emissions?**

**C.L.** We are committed to reducing our direct carbon emissions by 40% by 2030. These amount to 310,000 tonnes of CO<sub>2</sub> equivalent per year, or 13% of the VINCI Group's Scope 1 and 2 emissions. The fuel used in our vehicle fleet accounts for 90% of our direct emissions. Our main levers for action

therefore affect this fleet. There are various solutions: increasing the proportion of electric vehicles, biofuel, journey optimisation, etc. But we can also look at energy efficiency in our buildings, precise monitoring of their energy consumption, and greater use of green energy. In fact, 10% of our indirect emissions come from the energy we use to heat and light our buildings and facilities. We are still below our trajectory. There is work to do, business unit by business unit.

**F.G.** This is a very important point. It is essential that we emphasise not only the final objective, but also the trajectory for reaching it. This is key, because many businesses talk about their targets for 2030 but forget to say where they are today and what they intend to do tomorrow, next week or for the next six months. The trajectory is easily as important as the final objective.

**What about VINCI Energies' indirect carbon emissions?**

**C.L.** We aim to reduce our indirect carbon emissions by 20% by 2030. These represent the majority of our total carbon footprint, at around eight million tonnes of CO<sub>2</sub> in 2021. Of these, 40% are from upstream, i.e. our suppliers and subcontractors, and 60% from downstream, i.e. our customers. The 1,900 VINCI Energies business units are central to their customers' choices in energy, infrastructure and processes. We provide numerous customised solutions to help them reduce their carbon footprints.

**Why do the different VINCI Energies business lines all have their own carbon calculator?**

**C.L.** Tools for measuring carbon emissions are crucial for accelerating assessment of our own projects and being able to advise our customers. We have developed tools to assess the impact of our projects for all our business lines. These tools are important, but it is even more important that our operations managers become familiar with the concept of "carbon accounting" and are able to raise the subject with their customers. Carbon accounting tools help us to make our customers more aware of the impacts their choices have in terms of CO<sub>2</sub> and encourage them to choose solutions with lower CO<sub>2</sub> emissions.

**F.G.** It is essential to be able to quantify and monitor CO<sub>2</sub> emissions. This is not simply a methodological issue but also a political one. Who should shoulder the responsibility for CO<sub>2</sub> measurements? What are the implications of choosing this or that counting method? Currently, the main challenge facing

most companies lies in going beyond good intentions and understanding that a business activity that is unsustainable today will not be profitable tomorrow. Take the example of Toyota: they invested a lot of money in hybrid and electric vehicles when no one really thought it was worth doing. But that strategy enabled them to take the lead in the American automotive market. It is essential that large companies like VINCI Energies understand that it is in their interest to decarbonise their business activities, even though the costs may seem higher in the short term. An organisation like VINCI Energies is present in energy, transport, infrastructure, manufacturing, building, ICT and other sectors. In all these areas, it is essential to reduce our energy consumption and improve energy efficiency. That is what will make the difference.

**Does VINCI Energies proactively suggest environmental solutions to its customers, even if customers are not requesting them?**

**C.L.** VINCI Energies is resolutely playing its role as a facilitator of environmental transition. Where low-carbon technologies exist, it is our responsibility to offer them to our customers. The aim is to find the simplest solutions with the maximum effects.

**F.G.** To achieve the goals of the Paris Agreements, we must not consume any more coal. But we also need to reduce oil use by 60% and gas use by 70%. We are currently nowhere near that! We therefore need to use less energy for the same tasks.

**So, does that make energy saving an imperative?**

**F.G.** Since the war in Ukraine began, the concept of energy conservation has become something of a civic duty, to avoid financing Russia by purchasing its oil and gas. But the problem is actually much wider. If we continue to consume energy at current levels, renewable energies, and even nuclear, will never be able to replace fossil fuels. At this moment, fossil fuels still represent 84% of the total worldwide energy mix. It was 86% twenty years ago! In twenty years, despite all the warnings and efforts, we have only reduced the proportion of fossil fuels by two per cent! At the same time, renewable energies have soared spectacularly, becoming cheaper and more efficient. But the problem is that they have not replaced fossil fuels. They have instead supplemented fossil fuels to meet consumption that has constantly increased over the last 20 years.

**C.L.** Things are moving fast, but we need to keep accelerating our efforts. We must create solutions with low environmental impact for our customers. Each of the four VINCI Energies business lines is involved and has its role to play in many different fields: renewable energies, hydrogen, storage, smart grids, process digitalisation, smart technologies, energy efficiency, building monitoring, etc. We still have plenty of work to do.



*"The trajectory is easily as important as the final objective."*

François Gemenne

# INDUSTRIAL SHIFT IN NUCLEAR SECTOR IS KEY TO ENERGY TRANSITION



France's announcement of its intention to build new EPR2 reactors is more than a major political development, it's a tipping point.

When I took over the management of the VINCI Energies nuclear division in 2019, the general trend was still towards rendering the sector invisible.

In the space of two years, due to the effect of both the climate crisis and energy market pressures, exacerbated by the war in Ukraine, a paradigm shift has occurred. The critical nature of environmental

issues and the extreme volatility of the energy market have put nuclear power back at the centre of the energy debate and indeed the energy mix. Nuclear power is no longer taboo. Three years ago, only half of French were in favour of it. Today, 75% of them are.

### A new vision

This new energy vision will be implemented along several lines.

In the 1970s, it was agreed that, for safety reasons, power stations

could not operate for longer than 40 years. It was this rule that led, among other things, to the decision to shut Fessenheim.

Today, the legislator is looking into extending plant lifetime to 60 years or beyond, as is the case in the US. Furthermore, the French government in 2022 approved the construction of 6 new next-generation (EPR2) reactors – the first of which could be commissioned in 2035 – and 8 additional reactors are under consideration. So we are at a crossroads.

### Large-scale programme

France is now embarking on a large-scale industrial programme which is set to mobilise significant resources over several decades. The challenge is all the greater since political decisions taken in recent decades have ended up slowing the momentum and performance of a sector which ultimately represents €50 billion in revenue and employs 220,000 people.

In order to make a success of this shift towards nuclear expansion, we – and I mean all stakeholders – must meet two major challenges, key to the smooth running of such a vast project.

### The skills factor

The first of these challenges relates to skills. The sector will need to recruit 10,000 to 15,000 full-time equivalent employees per year over the next 10 years. To do this, further partnerships will need to be set up with engineering schools and institutions that train young people in operational trades (delivering vocational diplomas, advanced technician's diplomas, etc.).

EDF recently opened nuclear academies. At VINCI Energies, we are not ruling out the possibility of establishing our own training programmes and of widening the scope to more diverse audiences and to more women.

But recruiting people is not enough. You have to retain them over the long term. It takes 10 years,

at best, to build a reactor. So it's important to offer attractive career prospects and to innovate from a management perspective.

*Our goal is to strengthen our role as leading player in the sector.*

### The operational excellence requirement

The other main challenge lies in operational excellence and safety. The sector as a whole is committed to a quality approach.

The French Nuclear Industry Association (GIFEN or Groupement des industriels français de l'industrie nucléaire) has launched a programme called Match which aims to consolidate and share workloads, matching deployment needs and resources across France. In 2020, EDF initiated the Excell plan to transform the sector.

We ourselves in 2021 launched the AVENIR (future) plan to incorporate our processes and those of our stakeholders into a systematic continuous improvement drive. The objective is to deliver what we call "getting it right first time".

### VINCI Energies' goal

The VINCI Energies nuclear division is still in its infancy, since it was set up in 2012. It currently employs 2,000 people and generates €300 million in sales. It is likely that this figure will rise in the years ahead. And we expect to recruit a lot of new staff in the coming years.

Our goal is to strengthen our role as leading player in the sector by supporting EDF with our expertise in design, engineering, works and maintenance. The industrial shift in the nuclear sector is necessary for the transition to low-carbon energy. And as such it's an area of common interest.



**Christophe Caizergues**  
Managing Director of the VINCI Energies Nuclear Pole

## AGILITY **PICTURE**

# WHEN NATURE INSPIRES INDUSTRY

Nature is the world's greatest laboratory. Industry has long drawn inspiration from it through an innovation strategy that is constantly being perfected: biomimicry. The humpback whale, for example, has triggered ideas among American researchers. Despite its size, this marine mammal is very agile thanks to its pectoral flippers whose tubercles (or bumps) create a swirling effect that enhances lift and enables it to quickly change direction. Researchers at West Chester University in the US have applied this to wind turbine blades for Canadian company Whale Power. More stable and capable of functioning in light or strong winds, these bio-inspired blades generate 20% more electricity.



## AGILITY **PROFILE**

# VINCI ENERGIES ACCELERATOR OF ENVIRONMENTAL TRANSITION

In a world undergoing constant change, VINCI Energies contributes to the environmental transition by helping bring about major trends in the digital landscape and energy sector. VINCI Energies' teams roll out technologies and integrate customised multi-technical solutions, from design to implementation, operation and maintenance. With their strong local roots and agile and innovative structure, VINCI Energies' 1,900 business units have positioned themselves at the heart of the energy choices of their customers, boosting the reliability, efficiency and sustainability of their infrastructure and processes. VINCI Energies strives for global performance, caring for the planet, useful to people and committed to local communities.

### Contact us

VINCI Energies  
2169, boulevard de la Défense  
CS 90274  
92741 Nanterre Cedex  
FRANCE  
Tel. : +33 (0) 1 57 98 61 02  
communication@vinci-energies.com

### Find us on the web

vinci-energies.com  
theagilityeffect.com  
solidarity-effect.vinci-energies.com



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Sabrina Thibault

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Roseline Mouillefarine

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