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In a world undergoing constant change, VINCI Energies focuses on connections, performance, energy efficiency and data to fast-track the rollout of new technologies and support two major changes: the digital transformation and the energy transition.

Keeping pace with market change, VINCI Energies supports its customers by offering increasingly innovative solutions and services, from design to implementation, operation and maintenance.

With their strong regional roots and agile organisational structure, VINCI Energies' 1,600 business units boost the reliability, safety and efficiency of energy, transport and communication infrastructure, factories and buildings.



• A year of projects around the world

In 53 countries on five continents, VINCI Energies' 1,600 business units put our commitments into practice, helping their customers address the major challenges of the digital transformation and the energy transition.

SHARED WORLD

With the acquisition of Infratek, VINCI Energies consolidates its operations in Scandinavia.

34 acquisitions

accounting for combined revenue of €1.6 billion

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Acquisitions: ongoing momentum

For more than 15 years, VINCI Energies has implemented an international expansion strategy designed to enlarge its expertise networks and provide its customers with local service around the world. In 2017, the main acquisition was PrimeLine Utility Services. The move is part of the strategy of deploying VINCI Energies' activities in North America and expanding the energy infrastructure segment supported by its Omexom brand. In Europe, VINCI Energies acquired Infratek and Horlemann, two companies specialising in power grids in Scandinavia and Germany, as well as Eitech, a Swedish company offering electrical works and engineering services.



04 - 05

At the Viva Technology trade fair, sharing the solutions of the future

For the second year running, VINCI Energies was a partner of Viva Technology, the global innovation event. From 15 to 17 June 2017, its teams ran the Digital Industry lab, where visitors were offered immersion in the world of smart industries, infrastructure and buildings, including augmented reality tools, big data solutions, cloud computing and Internet of Things.



06 - 07

6 start-ups

Inerbiz, the VINCI Energies managerial and financial investment fund focused on innovation, has supported six start-ups since its inception in 2016.

• A hackathon

A hackathon opens up prospects in IoT and Big Data

The first VINCI Energies hackathon took place from 12 to 14 May 2017. Nearly 200 people (start-ups and employee teams) competed to complete one of the seven challenges on offer: image processing, data transmission, geo-location, clean city, healthy city, digitisation and chatbot. The winning start-ups received a three-month incubation programme at La Factory to develop their products and services. In-house projects will also be developed, with the goal of including new services in the VINCI Energies range.





Lydia Babaci-Victor,

VINCI Energies Director of Business Development and Innovation

"At La Factory, we receive 1,200 partners, customers and employees every month, give them a hands-on overview of our innovations, and invite them to gain familiarity with an ecosystem that may be new to them. For start-up managers, La Factory is both an incubator and a place where they can meet people with whom they wish to conduct experiments and do business... the point being to move forward together. In short, La Factory is where everything comes together – the physical and the digital worlds, the digital transformation, the energy transition, the various business activities and our brands, VINCI Energies and its partners."

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•••• Setting sail to save lives

The Initiatives-Cœur sailboat, designed to take part in high-profile races, brings media coverage to the Mécénat Chirurgie Cardiaque charitable association to help it to save children with heart defects. In September 2017, VINCI Energies signed a sports and charity partnership with the sailboat to help fund improved performance and draw more attention to the cause. Meanwhile, VINCI Energies signed a four-year sponsorship agreement with Mécénat Chirurgie Cardiaque.

"Saving children and raising physician awareness of paediatric cardiology"

Francine Leca, professor of thoracic surgery and founder of Mécénat Chirurgie Cardiaque

"The purpose of Mécénat Chirurgie Cardiaque is to enable children with heart defects to be operated on in France when they cannot be treated in their own countries. In 2017, seven children were operated on thanks to VINCI Energies as part of the partnership with the Initiatives-Cœur sailboat and its skipper Sam Davies. In 2018, we will be engaging in impressive projects with VINCI Energies that should enable us to continue to support the Mécénat Chirurgie Cardiaque goal of saving children, notably by raising physician awareness of paediatric cardiology."



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* Meeting the intercultural challenge

An offshoot of the INSA Strasbourg engineering school, DeutschINSA offers a bilingual and bicultural course of study in which French and German speaking high-school graduates can earn an engineering or architecture degree. As part of the programme, VINCI Energies signed a partnership agreement with the Alsatian school. Its commitment notably involves hosting French and German interns at business units located in the two countries.





• An inclusive and innovative method for recruiting interns

Young Talents Day for senior-year students at engineering, business, management and IT schools was held on 18 November 2017 to award nearly 400 internships. In the run-up to the event, VINCI Energies used an innovative recruitment system in which the student was asked to submit an application with a video in which he or she answered a question put by the future manager, instead of the usual essay; the student was given an opportunity to propose his or her "ideal internship" (which was then submitted to business experts for analysis); and the recruitment process was shortened and simplified to make it more efficient, using communication via the LinkedIn, Facebook and Twitter social media.



submitted applications via the www.youngtalentsday.com platform to take part in the day-long recruitment event.





Smart lighting in Australia

Australian Capital Territory (ACT) Government awarded the contract to manage public lighting in Canberra to Electrix. In coming years, Electrix, supported by Omexom and Citeos, will equip 79,000 streetlights with LEDs and connect them to smart control systems. The project will save energy as well as improve network maintenance, safety and reliability.



Supporting the energy transition in Senegal

In Senegal, after building the Bokhol solar power plant (photo) in 2017, Omexom rose to the challenge of building and handing over eight photovoltaic solar power plants with a combined capacity of 17 MW in just 10 months. The plants, spread across four large regions in the eastern and western parts of the country, will generate power equivalent to the annual consumption of 140,000 people and avoid discharging nearly 19,000 tonnes of CO₂ to the atmosphere every year. The solar panels are supplemented by generator sets and batteries that offset intermittent solar generation and thus ensure continuous power supply. Financed by the German KFW bank and Senelec (Société d'électricité du Sénégal), the project investment came to €26.8 million.



••• Maintenance of Brazilian offshore oil platforms

Actemium O&G Offshore won the contract to provide major maintenance of the P55 (fixed) and P62 (floating production, storage and offloading unit – FPSO) platforms operated in Brazil by Petrobras. Services include detailed engineering and global maintenance. The contract value is €52 million. ••

Restructuring and managing four schools in Cologne

The City of Cologne awarded a contract to VINCI Facilities SKE to restructure and expand four schools and manage them for a period of 29 years. The German VINCI Energies subsidiary will renovate a number of landmark buildings, construct new ones and provide facility management services, which include upkeep of the premises and the outdoor spaces, security, maintenance and energy consumption management. The €163.6 million contract is covered by a PPP (public private partnership).







Meal trays assembled using image recognition

A robot fitted with a 3D camera can collect food products and assemble them on meal trays on a production line, based on image recognition technology. Actemium used its expertise in image processing to develop this type of robotised production line, set for completion in 2018, for the Servair company in Roissy.



• A futuristic campus focused on the smart city

What will the city of the future look like? Thecamp, the new-generation campus focused on the digital transformation, of which VINCI Energies is a founding partner, proposes to answer that question. To implement the digital works package of the project taking shape in Aix-en-Provence, Axians implemented innovative, secure solutions. The watchwords were connectivity, mobility, collaboration and interactivity.

A 100-metre high-rise soon to be handed over in Casablanca

Casablanca Finance City (CFC) is an initiative aimed at making Casablanca a financial hub. Its headquarters are soon to be set up in a 100 metre high, 21,000 sq. metre high-rise that will also accommodate the offices of the Bank Al Maghrib Banking Supervision Division and a conference centre, for which the Cegelec Maroc teams are carrying out the full range of technical works. The work is to be completed in 2018.



* Agility to boost performance

The VINCI Energies business model combines local service delivered by business units in the field and global expertise provided by leading brands. The two dimensions come together on projects of all sizes at all stages of their development.

VISION AND ORGANISATION

VINCI Energies' multi-local, decentralised organisational structure fosters entrepreneurship and networking of its full range of expertise.

18 - 19

A TALK WITH THE CHAIRMAN



Yves MEIGNIÉ Chairman and Chief Executive Officer of VINCI Energies

How would you rate VINCI Energies' overall performance in 2017?

It was a very good year, with strong growth in order intake and an upturn in organic growth across all business lines and all countries. This resulted in record operating income. Meanwhile, we took our international expansion to a new level, notably in the Scandinavian countries, with the acquisition of Eitech and Infratek, and in the U.S. with PrimeLine, our first major acquisition in that country. In 2000, our revenue came in at €3 billion. In 2018, factoring in the 34 acquisitions we carried out in 2017, we expect to exceed €12 billion - with more than half of that revenue generated outside France. We are moving forward steadily and surely, and what we are seeing is that our business model based on networked autonomous business units is just as effective in the rest of the world as it has proven itself to be in Europe.



How has VINCI Energies' business environment changed?

Three years ago, we initiated a coordinated innovation programme designed to enable us to help our customers tackle the energy transition and the digital transformation. In 2017, organisations began to experience these two challenges as a hands-on reality. As an integrator, our job is to deliver solutions and services in all the technologies relevant to our four business lines – infrastructure, industry, building solutions and ICT. In a rapidly electrifying and digitising world, we are well positioned to do that, since we cover the full range of expertise required. Facilities are also working together to develop solutions such as collective self-consumption.

Safety and recruitment are a crucial focus at VINCI Energies. What were the main events in 2017?

We strive to achieve Zero Accidents and believe that accident prevention must become a shared culture for all our employees. We took advantage of our Safety Week to issue a call for vigilance and transparency and made tools available to managers that they can use to energise their teams. With respect to recruitment, there was a sharp upturn

"Symbolising its innovation policy open to the ecosystem, VINCI Energies' first hackathon challenged our business units and start-ups across all four business lines. The event generated several solutions and services that are now being brought to market."

How do synergies between the brands boost innovation?

The energy transition and the digital transformation are generating an increasing number of opportunities to cross-fertilise the expertise offered by our brands. To step up this process and to help devise solutions and services going forward, we set up La Factory in Paris-La Défense. A second Factory will open in Frankfurt in the first half of 2018. Our brands are already joining forces to broaden their playing field. Axians is working with Citeos to develop IoT solutions for the city and with VINCI Facilities to do the same for buildings. It brings its expertise in cybersecurity to Actemium's move to apply its industrial supervision solutions and services to urban buildings and infrastructure. Omexom and VINCI

in our workforce in 2017. Now that global growth has resumed, VINCI Energies' attractiveness as an employer will be a key factor in its expansion. For us, the challenge will be to attract talent and retain employees, since human resources are the key to our success. We have therefore stepped up our training efforts, extending the VINCI Energies Academy network outside France (to Morocco, Germany, etc.) and forging or renewing a wide variety of partnerships with academic institutions such as the ENSEEIHT and INSA Strasbourg engineering schools in France, the Universities of Coventry in the UK and Queensland in Australia, and the Polytechnique and Ecole Centrale engineering schools in Dakar and Casablanca respectively.



2017 REVENUE



REVENUE BY GEOGRAPHICAL AREA

REVENUE BY BUSINESS LINE

NET ICOME



EUROPE BELGIUM BULGARIA CZECH REPUBLIC DENMARK FINLAND GERMANY IRELAND ITALY LUXEMBOURG NORWAY POLAND PORTUGAL ROMANIA SLOVAKIA SPAIN SWEDEN SWITZERLAND THE NETHERLANDS UNITED KINGDOM **OUTSIDE EUROPE** ALGERIA ANGOLA AUSTRALIA BAHRAIN BRAZIL **BURKINA FASO** CAMEROON CANADA CHINA CÔTE D'IVOIRE DEMOCRATIC REPUBLIC OF CONGO EAST TIMOR INDIA INDONESIA KAZAKHSTAN MALAYSIA MAURITANIA MOROCCO MOZAMBIQUE NEW ZEALAND NIGERIA QATAR REPUBLIC OF CONGO RUSSIA SAUDI ARABIA SENEGAL SINGAPORE SOUTH KOREA VIETNAM

1

Bernard LATOUR Deputy Managing Director and Director General of VINCI Energies Europe

Lars NORDIN

2

Deputy Managing Director and Chief Financial Officer of VINCI Energies

3

Yves MEIGNIÉ Chairman and Chief **Executive Officer** of VINCI Energies



4

Hervé ADAM Deputy Managing Director and General Manager of VINCI Energies France

5

Arnaud GRISON Deputy Managing Director and General Manager of VINCI Energies International & Systems

Patrick LEBRUN Deputy Managing Director and General Secretary of VINCI Energies

YEARBOOK 2017

VINCI Energies operates according to a multi-local, decentralised

business model that fosters entrepreneurship and networks all its expertise to create value in day-to-day work for its customers. Operating in infrastructure, industry, building solutions and information and communication technologies,

the 1,600 business units are organised around five global brands – Omexom, Citeos, Actemium, VINCI Facilities and Axians – and brands with a regional identity. These brands act and interact to develop common solutions and services.

The goals of our business lines

INFRASTRUCTURE

Supporting the promise of the energy transition in energy and transport infrastructure

VINCI Energies offers solutions for those who generate, transform and transmit electricity and for those who use it. VINCI Energies thus helps electricity producers, transmission system operators and local authorities carry out their work and supports their upgrades. VINCI Energies applies its expertise in transmission grids to cope with the impact of renewable energies, develop energy storage solutions, make infrastructure smarter and support new consumption modes. We address the issues of smart public lighting, lower energy consumption, electric mobility and self-consumption and offer solutions that sustainably and efficiently meet our customers' needs. The Infrastructure business line accounts for 25% of VINCI Energies' revenue. Most of these activities are covered by the Citeos and the Omexom brands



INDUSTRY

Helping to continuously boost industrial performance

VINCI Energies designs and rolls out customised, integrated solutions and services for the factories of its industrial customers, including 3D design, augmented reality, collaborative robots, smart sensors, and predictive maintenance. As a major player in the transition to smart industry, we make industrial processes more productive and efficient and reduce their energy consumption. The Industry business line accounts for 28% of VINCI Energies' revenue. Actemium is the brand dedicated to industrial processes.



BUILDING SOLUTIONS

Making buildings smarter and more sustainable

VINCI Energies solutions deliver air, water, heating, refrigeration, energy and information. They combine energy efficiency and smart building technologies ranging from multi-technical maintenance to operation and end-user services. The Building solutions business line accounts for 29% of VINCI Energies' revenue. Facility management is provided under the VINCI Facilities brand. The work is performed under local brands.



ICT

Operating at the heart of the digital transformation

VINCI Energies leverages its broad range of expertise in data collection, sharing, processing, storage and protection to build a customised approach to IT infrastructure and services for companies, operators and service providers and to boost their performance. The ICT activity accounts for 18% of VINCI Energies' revenue. The Axians brand is dedicated to information and communication technologies.



SHARED VALUES

Practicing what we preach

Grounded in the values of responsibility and solidarity, our teams promote health and safety, ethics, knowledge transmission and community support in the field. These initiatives reflect the range and diversity of VINCI Energies' human resources.

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In 2017, the VINCI Energies - Initiatives-Cœur partnership enabled seven children with heart defects to be operated on.

Ethics

VINCI Energies has long addressed the issues of corporate social responsibility, respect for human rights and compliance, with a special focus on combating corruption. Following the guidelines rolled out by the VINCI Group, VINCI Energies strives to be in the forefront of the endeavour to tighten national and international standards.

At VINCI Energies, ethics and corporate social responsibility are core values. They form the cornerstone of the Group's business model and entrepreneurial approach and underpin the exacting trust and fairness standards that its business units apply in their relations with customers, partners, suppliers

VINCI Energies employees in turn apply these principles in their conduct. To guide their activities, they notably use two tools developed by VINCI.

Two Group-wide guidelines

and employees.

The VINCI Code of Ethics and Conduct. adopted in 2010, sets out the rules applying to all Group companies and employees. It is supplemented by an Anti-Corruption Code of Conduct, which is used to carry out training in these areas. In addition, the Manifesto adopted in 2012 presents VINCI's main sustainable development guidelines. The document lists eight major principles that describe the Group's commitments to all its stakeholders. One, entitled "Together! Comply with ethical principles", reiterates that ethical behaviour is key to the Group's contracts and customer relations and that Group companies must apply the Code of Ethics

and Conduct throughout the world. It reiterates the Group's commitment to total transparency in its own practices and in those of its subcontractors.

Continuous improvement

Given increasing stakeholder requirements and tighter legal obligations applying to companies, it is vital for VINCI Energies and the entire Group to steer an unwavering course in business ethics and compliance. VINCI Energies will continue the endeavour in which it has been engaged for a long time now, and will make it part of a continuous improvement process. This programme is now coordinated at VINCI Group level by a dedicated department reporting to top management.



"THE HUMAN RIGHTS GUIDE IS AN INVALUABLE PART OF THE CONTINUOUS IMPROVEMENT PROGRAMME APPLYING TO OUR MANAGERIAL PRACTICES IN ALL THE COUNTRIES WHERE WE OPERATE."

Patrick Lebrun, Executive Vice-President and Company Secretary of VINCI Energies





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The Code of Ethics and Conduct

Issued by the Group in 2010, the Code of Ethics and Conduct was updated in 2017, notably to bring it into line with the French transparency, anti-corruption and economic modernisation law (the "Sapin 2" law) of December 2016.



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The Human Rights Guide

The purpose of the Human Rights Guide, which was circulated in 2017 and posted on the VINCI website, is to identify the main areas in which VINCI's activities may have a significant impact on human rights and to define a core set of quidelines to be followed by all entities across all business activities and locations. The guide has been broadly disseminated throughout VINCI Energies business units and serves as input to their corporate social responsibility programmes.

Health and safety

VINCI Energies is developing the Safety Excellence culture and implementing an ambitious safety policy focused on the Zero Accidents objective. In addition to closely tracking the safety indicators, the company is working to collectively identify dangerous behaviour and situations and devise ways to put a stop to them. The ultimate goal is to make health and safety second nature for everyone.

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MY COMMITMENT TO YOU





In New Zealand, Electrix expects its employees to stop work when they observe a dangerous situation. To consolidate this vigilance culture, directors distribute business cards to employees. The card shows their photo and telephone number as well as their safety expectations and commitments. These are handed to worksite teams to encourage them to report any safety issues and remind them of the importance of everyone being actively involved in safety.



Dedôme

VINCI Energies

in France

"An Excellence goal for everyone"

"The Safety Excellence goal was set in January 2017 to promote exemplary accident prevention, health and safety behaviour. The Director of Business quest for perfection must Development and be shared by all teams at all Human Resources, times, across the board.

To achieve this objective, VINCI Energies has rolled out a substantial specific training programme in France and the rest of the world. Members of top management, division directors, business unit

managers, project managers and foremen have all received the training."

SAFETY **EXCELLENCE**









Accident prevention as a culture

Look, warn, share: attentiveness and transparency are central to the appeal VINCI Energies made to its employees during the annual Safety Week event that has taken place every year since 2015. The goal is for them to report dangerous situations before an accident occurs and also to encourage everyone to become involved in improving safety. To enlist the teams in this pro-active endeavour, a large number of presentations and workshops were held throughout the week across all VINCI Energies business units around the world.







Human resources

VINCI Energies is committed to an ambitious managerial and human resources policy aimed at transmitting and sharing knowledge and focused on helping employees pursue their careers in the company and develop their skills, investing in training, forging ties with the academic world and supporting students.



Familiarising students with innovation methods

In partnership with VINCI Energies, the INP-ENSE³ engineering school in Grenoble held its first innovation challenge in 2017. Students were offered an opportunity to work in groups on engineering, industrial or research projects, eight of which were supported by VINCI Energies. The finals were held on 24 May, when the student groups made their pitch to the jury and the public. Yves Meignié, Chairman and Chief Executive Officer of VINCI Energies and sponsor of the Class of 2018, presented the prizes to the winners.



"Committed to training engineers"

Hervé Adam Managing Director, VINCI Energies France

"For a major economic player such as VINCI Energies, recruitment, support and promotion of tomorrow's talent are crucial goals. We therefore decided to join forces with the ENSEEIHT digital

and energy engineering school a to develop a relationship aimed t at creating ties between a students and our business p units. For VINCI Energies this is a great opportunity to expand and transmit its knowledge

and skills by contributing to the training, orientation and induction of the young people at ENSEEIHT."











Human resources





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"Training employees across the African continent"

Rida Lyahyaoui Manager, HR, Communication & VINCI Energies Academy in Africa

"On 9 January 2017, the VINCI Energies Academy, located in Casablanca, launched its very first session. The entity's mission is to meet the training needs of the Group's business units operating in Africa. During the first year, three training courses were on offer: business unit manager, project manager and design manager. Since these courses were introduced, 80 trainees have taken them. A total of 1,600 people have been trained by the VINCI Energies Academy in Africa."



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Working closely with the academic community

On 17 October 2017, VINCI Energies and the ESIGELEC engineering school signed a partnership agreement. Its purpose is to encourage new skills relating to the digital transformation, establish consistency between training and the needs of business units and interest students in VINCI Energies business lines. To seal the partnership, VINCI Energies is sponsoring the 430 students in the class of 2020.



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Rapidly assembling the right skills

To be able to set up teams on short notice and guarantee the qualifications and skills of the people recruited, Actemium Oil & Gas Maintenance developed an on-line skills assessment platform. Called the E-brain Assessment Solutions, it is based on technical questionnaires for each position that are drawn up using a database of more than 2,200 questions. It was used to recruit 146 people with different profiles from 11 different countries for an oil project in Angola within three months.



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A stimulating environment for interns

In 2017, 21 young people joined the VINCI Energies teams in Brazil as interns during one of their last two years of study. They were notably supported by a challenge competition in which prizes were awarded to those submitting the best internship projects.





YEARBOOK 2017



VINCI Energies is committed to serving as a long-term community partner.

This commitment is reflected in the many projects supported by the Fondation VINCI pour la Cité (VINCI foundation for the community) and by Group business units. Access to employment, mobility, housing and stronger social ties are just some of the issues it addresses.





"Music initiation" Michèle Geoffroy

HR & Communication Manager at VINCI Facilities in Belgium, association sponsor

"ReMuA is a music school of a very special kind. It enables more than a thousand underprivileged children in Brussels to learn to play an instrument, sing and read sheet music, either at school, in their neighbourhoods or during extracurricular training programmes. Supported by an orchestra, they regularly perform for large audiences in high-profile cultural settings. The musical activity opens up new horizons for them and helps them develop self-confidence and appreciate the benefits of hard work and mutual respect. The VINCI Fund (a sister fund of the Fondation VINCI pour la Cité in Belgium) will help ReMuA buy instruments and equipment to extend the project to two Dutch-speaking schools."



Helping people living with disability

The Angus Riding for the Disabled charity offers children and adults with disabilities physical and mental stimulation by teaching them to ride and to learn basic horse-care. In 2017, the VINCI UK Foundation provided funding to buy a pony. An Omexom employee will act as the project Sponsor and use his expertise to offer commercial and financial support.



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Supporting the fight against cancer

The CanTeen association helps fund treatment and support programmes for young people living with cancer. Every year it organises a national bandana day to raise funds. In 2017, a large number of Electrix Australia employees took part in the fundraising effort.

Renovation and maintenance of a public housing residence



In Lyon, the Aslim association fosters access to housing for people in financial difficulty. The Fondation d'entreprise VINCI pour la Cité is funding renovation work for one of the public housing residences. In addition its sponsorship programme will enable an employee to support the personnel maintaining these housing units.

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SMART

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OCT 17 ANGERS

DAY

CITY

VINCI Energies took part in the World Electronics Forum (WEF) in Angers from 24 to 28 October 2017 and held an Innovation Day for its customers and employees.

XIIX

Co-construction to go farther, faster

25 OCT 17 ANGERS

DAY

NNG

Identifying opportunities on the ground, enlisting qualified partners and introducing a collaborative approach, our business units breathe life into innovation to roll out innovative solutions and services for our customers.



The SmartMagne project is France's first experiment with collective power generation and self-consumption in a rural setting. To conduct it, we are working with Omexom. As an elected official I am highly committed to addressing energy transition issues and am looking for partners that can give our département

a head start. VINCI Energies business units are well placed to do that, and have been for a long time. We worked with them to roll out the

network of electric vehicle charging stations in the Cher and we were the first rural département to install a public lighting system with presence detectors. In both those cases I was impressed by the group's innovative drive. We decided to work with Omexom as a direct result of those years of testing and rolling out pioneering solutions. Together, we will be adding another piece to the local energy puzzle of the future.





Adopting a co-development approach

I started working with Actemium in 2012, focusing more particularly on a revamp of our factory at Utrecht in the Netherlands. Actemium's main quality is its openness to innovation. The minute you put forward an idea, the Actemium people start looking into how to implement it and how to work with you to develop it. Their approach is resolutely focused on co-development. The goal is not to keep an idea to oneself but to build on cooperation to go further, faster. This mutual trust is the key to a successful partnership. Internationally, Actemium's support is invaluable. In late

March 2018, we began a joint project with their teams in Belgium and

CHRIS MERCIER

Chief Operating Officer

at Nuscience Group Spain, the goal being to re-design the software systems at our plant in Toledo (a rollout similar to our project in Belgium). They work together easily within their own network. The software and energy divisions thus work closely together. Lastly, their project management method is very efficient. They are very good at time and project management and they let you know when the slightest problem crops up. This is a major advantage when you are managing a large project such as designing and building a plant. 🎵

"Actemium's main quality is its openness to innovation."

YEARBOOK 2017

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42 - 43

"The strategic committee meetings with VINCI Facilities are very useful since they give us insight on how the market is changing."

A common

experimentation culture

GreenMe delivers services that enhance the quality of the work environment by using connected objects to measure such parameters as temperature, humidity, lighting quality, noise and ventilation. We first got in touch with VINCI Facilities in early 2016. We spoke with people there who were very open to innovation and shared our determination to carry out continuous, fast-paced experiments. At their request we worked to make changes in a product for which a prototype had already been

ALEXANDRE DUGARRY Co-founder and CIO of Green/Me Kaling Streen Co-founder and CIO of Green/Me

> subsequently heard about Inerbiz, the VINCI Energies managerial and financial investment fund dedicated to innovation. The fact that it focuses on project development rather than financing encouraged us to submit an application. Since joining the fund, we regularly hold strategic committee meetings with a VINCI Facilities representative. These meetings give us invaluable insight on how the market is developing, which is useful input to our discussions about developing our products and our business model.

Developing smart

connected buildings

The Smart Building Alliance for Smart Cities was founded to re-think the building in light of the new uses to which it is put and the new technologies that are used in it. We believe that digital technologies are blurring the boundaries between the building's stakeholders and that the latter must be supported so that they can learn to work together and reposition themselves along the value chain. In line with this goal, VINCI Energies – an honorary member of the

alliance – is working with us to promote the quidelines we have

drawn up to foster inclusion of the "smart" approach in construction projects. If we are to expand the smart building segment and enhance the value of the building for its owners, end users and municipality, we must be able to offer a wide variety of adaptable services that can keep pace with changing uses to which the building is put. VINCI Energies has a well-thought-out innovation policy, which builds on start-ups without taking them over so as to avoid stifling them, and is particularly well-placed to support this momentum.

become a service platform in which data will be the fourth utility alongside water, gas and electricity."

"The building will

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Fast track development of disruptive ideas

Shortly after joining

Axians, I was given the opportunity to participate in VINCI Energies' first hackathon, held in May 2017. The event brought together teams from seven countries to compete in a number of different challenges. Our team focused on the image processing challenge, proposed and coordinated by Omexom, with a project to teach a system to identify corrosion patches on a set of images of metal structures. Our goal was to facilitate and

DAVID JARDIM

Machine learning specialist,

Axians Portugal

optimise maintenance of electricity pylons. Our efforts during the event's 48 hour work

window payed off, with our project winning the challenge in our chosen category. For me, the hackathon was a fantastic introduction into VINCI Energies' innovation environment. Having participated in a number of similar events in previous work experiences. I was particularly impressed with the business focus. Indeed, all challenges were supported by mentors, helping us to fully realise how our propositions could address real life issues for the company. Shortly after the event, our team got the green light to take our project forward and we now have a proof-of-concept well underway with a customer in Portugal.

"The hackathon truly demonstrated VINCI Energies' approach to innovation: competitive, focused and business driven."

> "We share the same mindset of shaping the manufacturing industry regarding digitalization."

Designing high value-added solutions and services

DR CHRISTIAN SCHLÖGEL

Chief Digital Officer (CDO) – KUKA AG

VINCI Energies is a well-known, wellestablished player in the manufacturing and automation sectors. We share its approach to digitisation. VINCI Energies is an ideal partner for us. Not only do we

> have a common goal – supporting the digital transformation of the sector –

but our market positions also form an excellent fit. Meanwhile, KUKA enables VINCI Energies to include robotics in its areas of expertise. One of the expected benefits of our Industrial Internet of Things (IIoT) partnership will be to build a new ecosystem, with KUKA providing the platform. components and IIoT experts for target markets and VINCI Energies providing its own IIoT experts. Axians will be part of this ecosystem, developing customised IIoT solutions for specific market segments and supporting Connyun* with broad-based expertise. Actemium will strengthen its position as a systems integrator by adding robotic technology to its range of expertise. Our goal is to make joint use of our existing customer portfolio and to win new customers by offering high-value-added solutions and services.

* Connyun is a start-up in which KUKA is a shareholder.

• Supporting our customers' transformation

If companies are to get the full benefit of current trends such as energy efficiency, connected buildings and the factory of the future, they must boost their performance and agility. To help them do that, VINCI Energies applies the latest technologies and an approach focused on operational innovation.

SHARED EXPERTISE

46 - 47

Cegelec Nord Grands Projets and Santerne Fluides worked on the Nausicaa extension in Boulogne sur Mer, France.

INFRASTRUCTURE

Adapting infrastructure to support the energy transition

Ensuring a secure, affordable and environmentally friendly energy supply is a triple challenge and a national economic and social development priority. The nuclear phase-out in Germany and the shift to electric vehicles under consideration in the 2030 timeframe in France are two cases in point. But the energy transition is also a goal at local level, where LEDs are coming into widespread use in public lighting systems and electric mobility is being rapidly introduced.

Against this broad backdrop, emerging energy storage, selfconsumption, active demand management and energy management technologies are changing the way transmission grids operate. All these trends offer expansion opportunities for VINCI Energies business units. For example, Omexom facilitates the growing use of load management, another energy management tool, and leads the way in microorid and self-consumption systems.

Smart grids, which enable production units, transmission infrastructure and consumers to interact with each other, are a key energy system control solution. These new ways of transmitting and sharing energy also require the creation of interconnected digital systems. Because the latter are potentially exposed to cyberattack, grid security is also a major issue. To address all these challenges, VINCI Energies, with its Citeos and Omexom brands and its integrated digital technology solutions and services, is positioned as a benchmark energy transition provider.



3

chips.

The LED tubes

contain Li-Fi

The data is

transmitted to the LEDs via the

electricity grid.

[VIEWPOINT] "Extremely precise topographic surveys"

"Omexom provides the universal, rapid Nomad Mapping System technology to perform highly operational topographic surveys for companies. The system, contained in a backpack, comprises a GPS, an inertial unit (a navigation tool with a variety of precision sensors), two laser scanners and five video cameras. Interfaced with a powerful computer, the tool can collect an impressive amount of data. By overlaying the point cloud and the corresponding photographs, the NMS and the computer can reconstruct the path taken by the apparatus and deliver an extremely precise 3D survey that is far more comprehensive than a conventional survey and completed far faster."

> Sylvain Pejean Project Manager at Omexom Atlantique Ingénierie

48 - 49

IS THE NUMBER OF ENERGY PERFORMANCE CONTRACTS HELD BY VINCI ENERGIES IN FRANCE IN 2017. These contracts, with

an average duration of 9 years, include consumption performance targets.

YEARBOOK 2017

A server establishes the Internet connection

[TRENDS]

Li-Fi, part of Smart Lighting

Li-Fi (which stands for Light and Fidelity) is a wireless Internet technology that uses the visible part of the electromagnetic spectrum. With Li-Fi, LED lighting can transmit digital content (video, sound, etc.) to a device such as a computer, tablet or smartphone. The data can only be captured in the lighted area.

The terminals receiving the data must be fitted with a system containing, among other things, a photosensor (camera, luminosity sensor, USB/Bluetooth micro receiver, etc.). New generations of tablets and smartphones will be Li-Fi compatible.

Building an electricity transmission grid in Scotland

Omexom, as part of a joint venture with Britain's Morgan Sindall, has won a major Scottish and Southern Electricity Networks (SSEN) contract covering, among other things, 160 kilometres of power lines, 73 towers in isolated areas and a new transformer station. The project, located in the North of Scotland, will take two years to design and build. The infrastructure will strengthen the high voltage grid and support connection of wind turbines.





Radio communication system for the De Lijn public transport company

50 - 51

TranzCom, a VINCI Energies business unit in Belgium, is to equip the 4,000 trams and buses operated in northern Belgium by the Flemish public transport company De Lijn with a Digital Mobile Radio (DMR) network and a new on-board communication system that will boost regional dispatch centre efficiency by giving operators a way to rapidly and directly contact drivers (two-way calls, bus position information to facilitate control) and passengers (public address announcements).



Focus on solar in Burkina Faso

West Africa's largest photovoltaic solar generation facility (with 33.7 MW installed capacity), the Zagtouli power plant on the outskirts of Ouagadougou, began operating at the end of November 2017. To build it, the national electricity company of Burkina Faso called on a joint venture led by Omexom, which provided its expertise. The project is the first instalment of an expansion programme designed to ensure that about 30% of the country's electricity will be generated from solar energy by 2020.



solar panels over 55 hectares



INDUSTRY

Stepping up the pace of industrial transformation

••••

Digital technologies are extending their reach and making industry more human, connected, responsible and efficient. In connected factories, tools, products and workstations are constantly interacting to optimise production systems.

In 2017, the transition to this new model was in full swing and the full range of participants in the ecosystem were closely involved.

Building on its local expertise, strong network and international reputation as a benchmark integrator, Actemium helped accelerate operational innovation at customer sites – for example, by robotising processes to speed production while reducing costs, and by implementing new maintenance algorithms in conjunction with increasingly miniaturised, precise and rapid sensors to detect ever smaller faults.

Energy efficiency is a key factor in boosting industrial companies' competitiveness. To help them increase it, VINCI Energies carried out several projects designed to re-use thermal energy that is otherwise lost (so-called unavoidable energy).

At Group level, Actemium and other brands such as Axians (digital infrastructure and solutions), Omexom (smart grids) and VINCI Facilities (smart buildings) can form partnerships to address the issues faced by the factory of the future.



VINCI ENERGIES TEAMS SPECIALISING IN THE OIL AND GAS SECTOR ARE MAINTAINING nearly 150 offshore sites around the world, including some 30 FPSOs (floating production, storage and offloading units).

[TRENDS]

Smart Coaching

The smart coaching solution developed by Actemium enables maintenance technicians in the field to receive virtual technical support in real time via augmented reality. Mini-programmes also overlay a solution devised ahead of time over the physical reality of a problem.



[Focus] Expanding the use of additive manufacturing

In additive manufacturing, a 3D file is transformed into a physical object through the successive addition of layers of material. The ALAFU (Atelier laser du future - laser workshop of the future) project is designed to demonstrate the use of the technology in mass production under controlled conditions. To this end, five Actemium business units are pooling their complementary expertise in centralised and remote supervision, dry powder process equipment, transfer automation and robotisation, post-treatment operations and non-destructive testing. These synergies are expected to deliver turnkey solutions as well as customised solutions adapted to the needs of users.

"LIVE" SUPPORT

The smart coaching solution supports "live" meetings between field technicians and experts.

PRECISE INSTRUCTIONS

The image captured by the technician is recognised by artificial intelligence and re-worked if need be to show the necessary instructions full-scale.

Boosting adaptability, flexibility and speed

A major aircraft engine manufacturer has introduced a robotised engine part inspection solution developed by Actemium NDT Products & Systems and Actemium Toulouse Robotique et Automation. The new solution automates the non-destructive x-ray testing process. Once the part reference has been scanned, an automatic cycle is initiated in which the entire part is inspected. The robot positions itself in accordance with the programme specific to the part to ensure precise orientation and monitoring. Images are then transmitted to the operator for approval. The system makes the process more reliable while at the same time speeding it up. The tool improves performance to boost competitiveness in a market that is growing by leaps and bounds.





54 - 55

Charting a course to the factory of the future

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Helping to orbit the Ariane 6



In French Guiana, Cegelec Projet Espace is providing support for the French National Centre for Space Studies (CNES) on the construction of the new Ariane 6 launch complex. The business unit notably leads the joint venture responsible for implementing the conventional and cryogenic fluid systems at the Ariane launch complex No. 4, which will be used to launch the Ariane 6. It is also responsible for overall management of 14 ELV and safety systems.



YEARBOOK 2017

ACTEMIUM

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BUILDING SOLUTIONS

Improving building performance



One of VINCI Facilities' missions is to provide services for building end users. The company is currently testing a conversational robot that it developed jointly with Aeon X, a start-up that won the 2017 VINCI Energies Hackathon. The chatbot can be used to reserve meeting rooms and event spaces, send an alert to the site Hospitality Manager and order services. A wide variety of semantic tests are continuously expanding its degree of intelligence.



In the past, the main criterion used to assess the value of a property was its technical performance. But innovations relating to consumption metering, accommodation of user needs and the fast-paced energy transition have now changed that.

The building is now connected to its environment. Its technical components operate in an open circuit and its energy consumption is geared to the needs of end users as well as to buildings and services in its immediate vicinity (neighbouring buildings, public transport, smart grids, etc.). This change has transformed the building into an integrated service platform ("the Building as a Service").

These underlying trends have given a key role to the combined expertise of VINCI Energies works business units and VINCI Facilities, which roll out new technologies to do such things as track installations in real time or introduce a predictive approach to equipment maintenance.

Digital technologies, a crucial part of efficient facility management, are an essential way to fine-tune strategic management of customer sites. BIM, which provides a 3D model of buildings, is used to validate projects prior to the start of construction and to support new uses.

VINCI Facilities' Building Operating System epitomises this vision. This technical architecture and IT will make the building of the future more connected, economical, efficient, secure and comfortable.

WHAT IS THE BOS (BUILDING OPERATING SYSTEM)?

The building's Operating System (OS) connects all building management, monitoring and control systems to provide platforms and Web/ Cloud tools with the full range of data needed to develop innovative services. The BOS has become the cornerstone of all works, tools and services made available in smart buildings.

[TRENDS]

The five benefits of a smart building

The use of sensors distributed throughout the infrastructure and data collected in smart buildings substantially improves building management.



BUILDING SOLUTIONS



58 - 59

Behind the scenes of a major property project

Near Rennes, Legendre Immobilier selected Cegelec Rennes Projets and Cegelec Clim to handle the technical works packages at the campus being built for the Avril (Lesieur, Puget, Matines, Diester®, Sanders...) industrial group. They will focus on power supply and ELV electrical systems and HVAC works. The 13,000 sq. metre building will accommodate 700 people.





Innovation and emphasis on service

In response to a call for tender issued by Société Générale for its sites in Paris (landmark buildings) and Fontenay sous Bois, VINCI Facilities devised innovative digital, CSR and end-user multi-service solutions. The bid's strong emphasis on service and inclusion of hospitality management were compelling. The three-year contract covers a 143,000 sq. metre floor area and will employ about 40 people.



New maintenance contract with the Antwerp railway station

Antwerpen Centraal, an architectural gem and Belgium's fifth-busiest railway station, is a major regional and international hub. The SNCB (the national railway company of Belgium) awarded a contract to VINCI Facilities Belgium covering preventive maintenance, repairs and regular servicing of fire safety systems at the site. Meanwhile, Cegelec Fire Solutions is in charge of the sprinkler system.



YEARBOOK 2017



Supporting customers' digital transformation



Not long ago, companies primarily used digital technologies to display information and transmit requests. Today, digital technologies have expanded their reach. Increasingly efficient information and communication technologies are helping to improve quality of service, creating new services and sometimes prompting organisations to re-think their business models.

This underlying trend is driven by changes in infrastructure. "Hybrid" solutions are currently being developed to support the best combination of dedicated and public cloud resources.

"Software defined" - i.e. dynamically configured and coordinated - architectures are key to "as a service" solutions in which software

is installed on remote servers and customers pay a subscription fee - priced according to use - to access functionalities.

The widespread use of IoT, progress in artificial intelligence and exponential growth of big data are the other aspect of the change now under way. Companies seek ways to make the most of this potential and to defend themselves from attack - a growing concern in an increasingly connected world.

Building on this vision of changes to come, Axians works with its customers alongside other VINCI Energies business units to devise innovative solutions that meet the specific needs of customers and their sectors.



axians

DIGITAL SECURITY EVENTS

were reported by the Agence nationale de la sécurité des systèmes d'information (ÁNSSI – French national cybersecurity agency). These included 79 "major events" and 159 events that were addressed, including three classified as "critical"

The data cycle

[TRENDS]

axians

-Data is central to the digital transformation. It is collected, stored and then disseminated. If users are to collaborate, they must have access to data everywhere, at all times. Data is a raw material that must be analysed to generate actual value and support forecasting and decision-making. Because every action taken during this cycle may represent a risk for the company, all data must be secured.

[VIEWPOINT]

"We help customers get the most value from big data"

"Everyone knows big data will sooner or later play a major role within companies. But devising ways to use it is not always easy. That is where we come in. When we are presented with a problem, our datalab researchers tackle it by working with the customer to assess the work needed and the data available. In addition to their expertise in analytics and IT, our researchers are resourceful and intellectually curious and can rapidly gain a clear picture of the possibilities and then produce a functional prototype."

Arno Hordiik Chief Technology Officer, analytics expert at Axians Netherlands

DATA CREATION Collect/Transmit



axians



Transforming the Port of Rotterdam into a smart harbour

In partnership with Cisco and IBM, Axians Netherlands has won a contract to design, roll out and operate an IoT platform for the port of Rotterdam. The project includes connected weather stations, sensors and communication tools to facilitate ship movements, software using operator data to reduce berthing times and 3D printers to facilitate production of parts on demand in shipyards.





Managing Wi-Fi

in Spanish airports

Axians rolled out the public Wi-Fi network and upgraded the backbone at half the sites operated by airport concessionaire AENA, i.e. 24 airports and two heliports. It will also operate the Wi-Fi solution across all sites, i.e. 48 airports, for a period of four years. The system includes an access and authentication portal and user location analysis.



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Stepping up regional broadband rollout

As a major player in the French Very High-Speed Broadband plan, Axians will be rolling out optical fibre to the home (FTTH) in nine French *départements* – Aube, Ardèche, Drôme, Essonne, Seine-Maritime, Pyrénées-Orientales, Jura, Saône-et-Loire and Haute-Saône – over the next few years. It also works on mobile telephone "dead zone" coverage. For example, in the Mayenne department it is commissioning and will maintain towers covering the frequencies of all four operators.



will receive broadband coverage





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