

# edpon

October 2023 | No. 67

# Y.E.S.

You Empower Society



## Energy that changes the world

Grover Braden is grateful to EDP for the way it cares for the population. Supporting projects in order to promote proximity to local communities is one of the fundamental pillars of EDP YES.

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Octubre 2023 | N°67

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## La energía que cambia el mundo

El proyecto ENTAMA genera emprendedores locales en zonas rurales. La historia de Cristina Secades es una prueba del espíritu empresarial, uno de los pilares de EDP YES.

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changes  
the world

Gabriel Tan was one of the participants in the first global volunteering initiative involving employees from all over the world. A key area of EDP YES.

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## A energia que muda o mundo

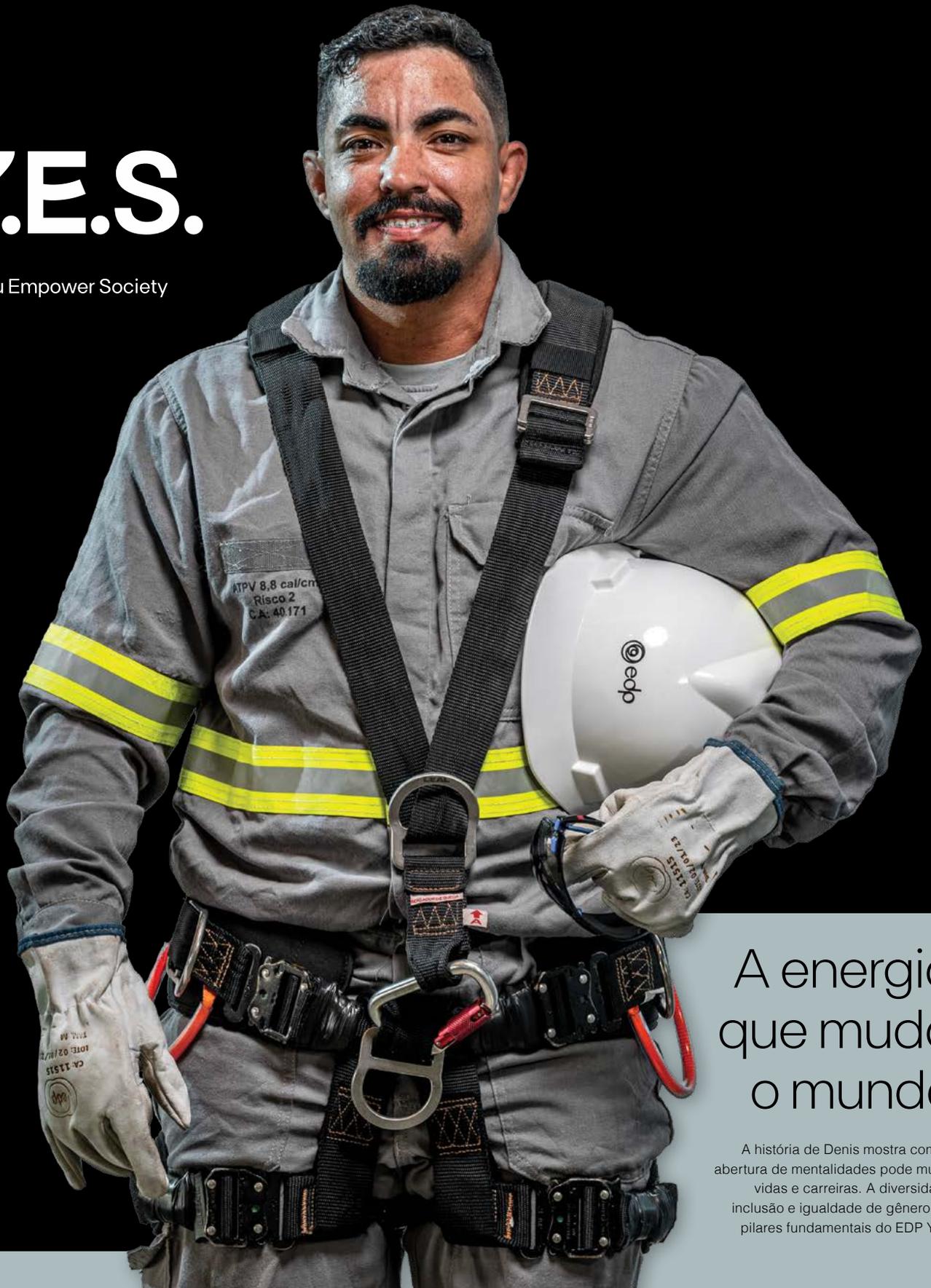
A EDP contratou Yuliia Prybytkova. A jovem ucraniana é uma das faces da resposta a situações de emergência humanitária, um dos pilares fundamentais do EDP YES.

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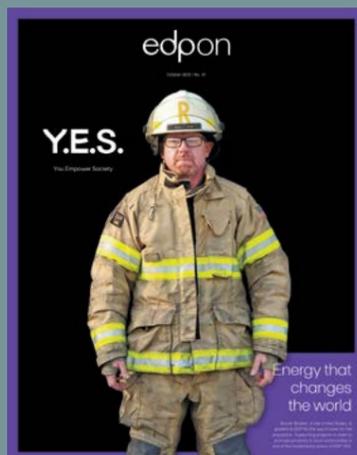


## A energia que muda o mundo

A história de Denis mostra como a abertura de mentalidades pode mudar vidas e carreiras. A diversidade, inclusão e igualdade de gênero são pilares fundamentais do EDP YES.

# edpon

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# Something greater

More than ever, investors, employees, consumers, suppliers, communities, and other stakeholders are challenging companies to have an active role when it comes to environmental and social responsibility.

At EDP, as we develop our clean energy projects across the world to boost the energy transition, we also aim at supporting local communities and protecting cultural and environmental heritage, putting our efforts to leaving no one behind along the way. This mission has a common denominator – people. On one hand, EDP's people. The importance of corporate social responsibility among employees has grown significantly in recent years thus enhancing cohesion. On the other hand, all those we cross paths with as we pursue our activity and all those we embrace within our more than 500 social projects around the world.

Throughout this issue we unfold some of these stories. Yullia, Gabriel, Grover, Vitalina, Carliane, Otilia, Bigirimana, Denis, among others, are all people in different geographies whose lives were touched by several social projects carried out by EDP and that we are truly proud of.

In this edition I also highlight the exclusive interview with Joana Vasconcelos, a Portuguese artist that is one of the most renowned names of the world's contemporary art scene. And we take a closer look into our global strategy for distributed solar generation. Last, but not least, we tell you more about how innovation and digitalisation in our networks business is fostering the energy transition, namely through projects such as SPOT, a robot that will help maintain our operations in Spain.

We hope you enjoy it!



by Miguel Stilwell d'Andrade  
CEO, EDP Group

“The importance of corporate social responsibility among employees has grown significantly in recent years thus enhancing cohesion.”



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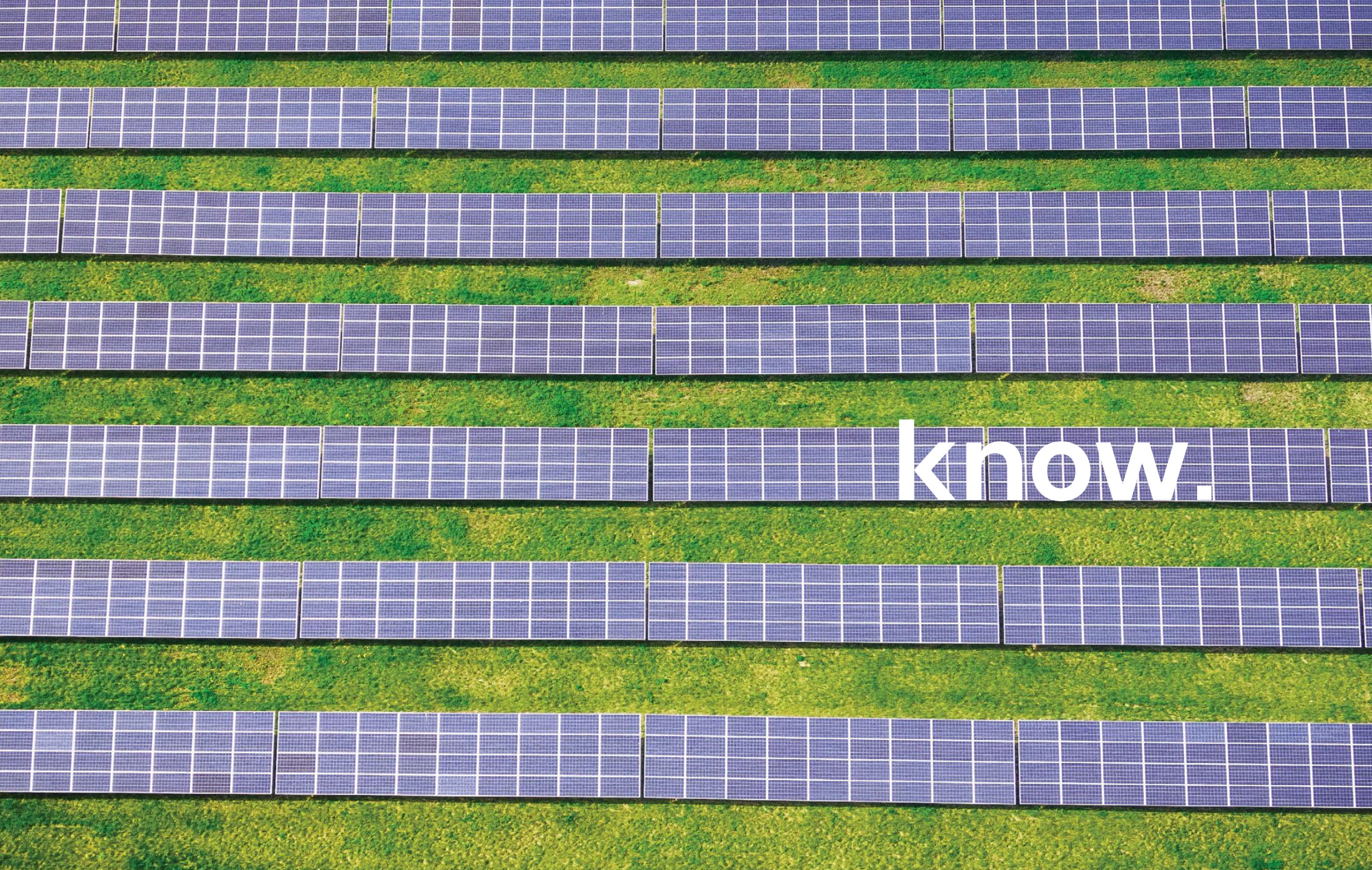
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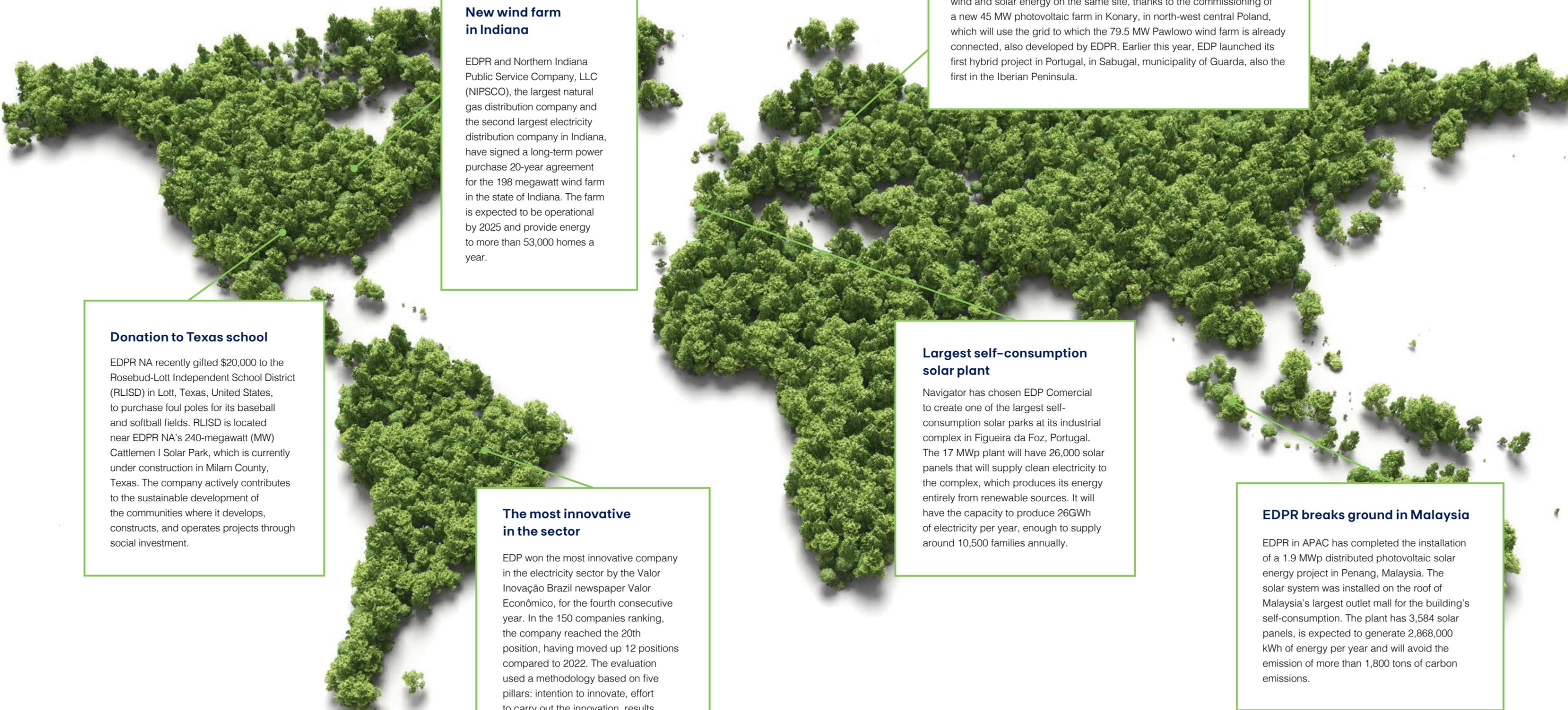


**SPOT in Spain**  
Meet the innovative robot, the new star of Spain's hydroelectric power plants in Spain.

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know.



### **New wind farm in Indiana**

EDPR and Northern Indiana Public Service Company, LLC (NIPSCO), the largest natural gas distribution company and the second largest electricity distribution company in Indiana, have signed a long-term power purchase 20-year agreement for the 198 megawatt wind farm in the state of Indiana. The farm is expected to be operational by 2025 and provide energy to more than 53,000 homes a year.

### **Hybrid project in Poland**

EDPR has launched its third hybrid project in Poland hybrid, combining wind and solar energy on the same site, thanks to the commissioning of a new 45 MW photovoltaic farm in Konary, in north-west central Poland, which will use the grid to which the 79.5 MW Pawlowo wind farm is already connected, also developed by EDPR. Earlier this year, EDP launched its first hybrid project in Portugal, in Sabugal, municipality of Guarda, also the first in the Iberian Peninsula.

### **Donation to Texas school**

EDPR NA recently gifted \$20,000 to the Rosebud-Lott Independent School District (RLISD) in Lott, Texas, United States, to purchase foul poles for its baseball and softball fields. RLISD is located near EDPR NA's 240-megawatt (MW) Cattlemen I Solar Park, which is currently under construction in Milam County, Texas. The company actively contributes to the sustainable development of the communities where it develops, constructs, and operates projects through social investment.

### **The most innovative in the sector**

EDP won the most innovative company in the electricity sector by the Valor Inovação Brazil newspaper Valor Econômico, for the fourth consecutive year. In the 150 companies ranking, the company reached the 20th position, having moved up 12 positions compared to 2022. The evaluation used a methodology based on five pillars: intention to innovate, effort to carry out the innovation, results obtained, market and knowledge generation.

### **Largest self-consumption solar plant**

Navigator has chosen EDP Comercial to create one of the largest self-consumption solar parks at its industrial complex in Figueira da Foz, Portugal. The 17 MWp plant will have 26,000 solar panels that will supply clean electricity to the complex, which produces its energy entirely from renewable sources. It will have the capacity to produce 26GWh of electricity per year, enough to supply around 10,500 families annually.

### **EDPR breaks ground in Malaysia**

EDPR in APAC has completed the installation of a 1.9 MWp distributed photovoltaic solar energy project in Penang, Malaysia. The solar system was installed on the roof of Malaysia's largest outlet mall for the building's self-consumption. The plant has 3,584 solar panels, is expected to generate 2,868,000 kWh of energy per year and will avoid the emission of more than 1,800 tons of carbon emissions.



EDPR's largest  
wind farm in  
**Portugal receives  
new power**

**01**

Six more state-of-the-art wind turbines are already in operation at the Alta da Coutada wind farm, which should increase by 12% the annual production of EDP Renováveis' wind farm complex in Serra da Padrela, in the municipalities of Vila Pouca de Aguiar and Valpaços, in the district of Vila Real. It is estimated that the park will produce more than 420 GWh of renewable energy per year, enough to supply around 130,000 homes with electricity produced without carbon emissions. The turbines now added will produce the equivalent of the needs of 15,000 average homes. Each year, the project is expected to avoid the emission of 170,000 tons of CO<sub>2</sub> into the atmosphere.

**.02**

**EDPR NA DG signs deal with Lufthansa**  
EDPR NA Distributed Generation LLC (EDPR NA DG) and Lufthansa Technik Puerto Rico (LTPR) have executed a 21-year power purchase agreement (PPA) that allows EDPR NA DG to install a 2-megawatt (MW) rooftop solar system on top of LTPR's Aguadilla Facility. This installment will provide between 95-100% of the site's annual energy needs and save the maintenance, operations, and repair facility more than \$10 million in operating costs. The system will also generate roughly 3 million kWh annually, reducing 2,126 metric tons of carbon emissions every year for the next two decades. This collaboration is EDPR NA DG's first partnership with an aviation company. The LHT branch, which belongs to the Lufthansa Group, is mobilizing efforts to reduce its carbon footprint and improve resource efficiency by 25 percent, increasing its use of renewable energy to 50 percent. The agreement with EDPR NA DG will help LTPR grow grid reliability in Puerto Rico.

# .03



## EDPR NA celebrates Global Wind Day

EDPR NA hosted an event to commemorate Indiana's renewable energy success and recognize its statewide partnerships with its critical stakeholders on May 15. Held at the Randolph County Fairgrounds, EDPR NA's Global Wind Day event celebrated local community stakeholders and welcomed landowners, elected officials, community groups, offtakers for the company's Randolph County renewable energy projects.

At the event, EDPR NA recognized local Indiana leaders and partners who have helped to secure a cleaner future through wind and solar energy partnerships and also honored the community partnerships. EDPR NA also presented the \$100,000 donation to the Randolph County 4-H Fairgrounds for their capital campaign to upgrade the dining room and kitchen. The Fairgrounds serve as

the heart of the community and are used for youth livestock programs, among many other community activities.

# .04

**Transformers Summit gathers customers and partners**  
Re-engineered from previous years' Customer

Events, the 2023 Transformers Summit gathered EDPR NA's valued customers and industry partners across the company's services and supply chain who have helped with its business and project pipeline. In the beautiful setting of Palm Springs, California, 124 of EDPR NA's customers and partners participated in the Transformers Summit from May 3 to 5, bringing together executives and industry stakeholders in the clean energy sector for a three-day event filled with cutting-edge market

intelligence briefings, insightful speaker panels, and high-level networking. Several members of the EDPR NA and EDPR NA DG leadership were in attendance. At the event, industry attendees engaged in presentations regarding renewables finance and policy outlooks, global supply trends, hydrogen growth, development trends, and inspiring customer stories.

# .05

**EDP Ventures invests in Terabase**  
EDP Ventures has announced an investment in Terabase Energy, a US-based leader in solutions for digitization and automated construction of solar power plants. By participating in the \$25 million (€23 million)



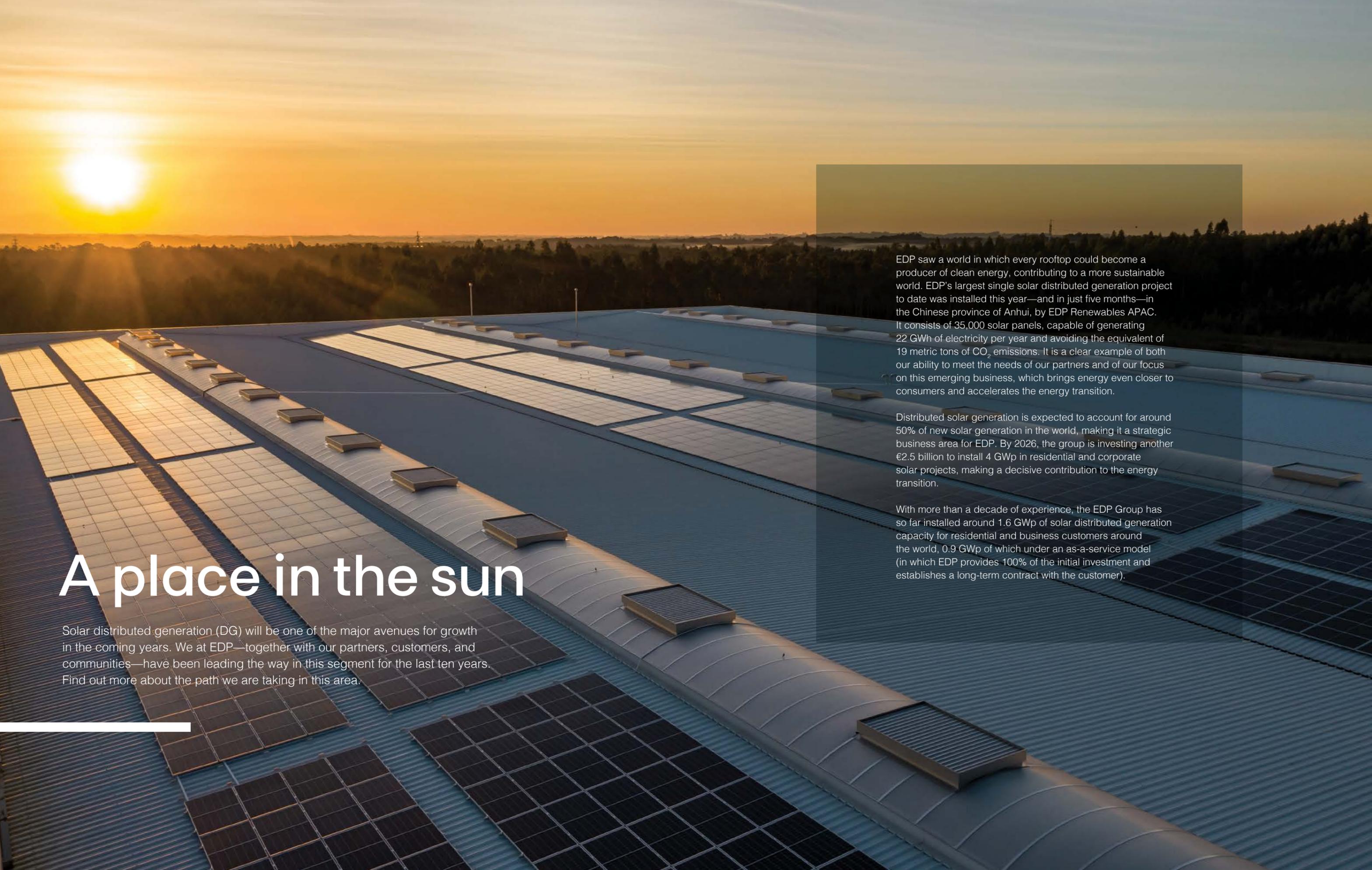
funding round led by Fifth Wall, EDP group's venture capital unit will drive the commercialization of the recently launched

automated building system for the construction of solar power plants. Based on its innovative systems, Terabase Energy aims to foster the rapid deployment of solar power plants at more competitive costs, supporting both grid-connected PV power generation and, in the future, the cost-effective production of green hydrogen with PV, consolidating its leadership in the sector. With a portfolio of 37 companies in Europe, the US, Latin America and Asia, EDP Ventures invests in startups and fast-growing technology companies to support the development of innovative solutions that actively contribute to the transformation of the energy sector.

# .06

**AI takes center stage at EDP stand**  
EDP used artificial intelligence to develop the layout of its pavilion at the 66<sup>th</sup> Asturias International Trade Fair (FIDMA). Through the "Journey to the Energy of the Future", visitors, led by a virtual guide, learned about the company's commitment to innovation, the project to transform EDP's power plants into strategic sites for renewable energies, storage, the system flexibility and renewable hydrogen. This was the first artistic activity with AI tools in the history of the fair. //





# A place in the sun

Solar distributed generation (DG) will be one of the major avenues for growth in the coming years. We at EDP—together with our partners, customers, and communities—have been leading the way in this segment for the last ten years. Find out more about the path we are taking in this area.

EDP saw a world in which every rooftop could become a producer of clean energy, contributing to a more sustainable world. EDP's largest single solar distributed generation project to date was installed this year—and in just five months—in the Chinese province of Anhui, by EDP Renewables APAC. It consists of 35,000 solar panels, capable of generating 22 GWh of electricity per year and avoiding the equivalent of 19 metric tons of CO<sub>2</sub> emissions. It is a clear example of both our ability to meet the needs of our partners and of our focus on this emerging business, which brings energy even closer to consumers and accelerates the energy transition.

Distributed solar generation is expected to account for around 50% of new solar generation in the world, making it a strategic business area for EDP. By 2026, the group is investing another €2.5 billion to install 4 GWp in residential and corporate solar projects, making a decisive contribution to the energy transition.

With more than a decade of experience, the EDP Group has so far installed around 1.6 GWp of solar distributed generation capacity for residential and business customers around the world, 0.9 GWp of which under an as-a-service model (in which EDP provides 100% of the initial investment and establishes a long-term contract with the customer).

### The advantages of solar distributed generation:

- promotes price stability and greater energy independence;
- enables services like energy storage and electric mobility;
- provides customers with 100% green energy;
- contributes to the company's or country's emissions targets;
- gives access to national or regional public incentives;
- reduced energy costs for the customer;
- installation time in 12 months giving immediate access to savings.



+ €2.5 billion  
by 2026

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+ 4.1 GWp  
installed between 2023 and 2026

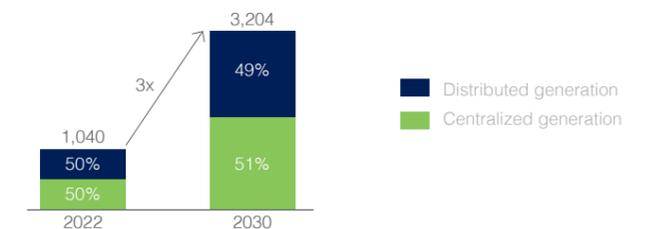
We demonstrated our vision when we decided to turn our entire production to renewable energy and commit to the energy transition. It was in 2012 that the company embarked on this journey, in Portugal, carving out a solid path that grew to Spain and Brazil and quickly expanded to several other markets with new projects and acquisitions. We are now at the forefront of solar distributed generation with 1.6 GWp of installed capacity worldwide—a staggering increase on the 53 MWp (less than 5% of current capacity) we had in our portfolio in 2019.

The group's solar distributed generation business is already present in 17 countries on four continents. And it is still growing, accounting for most new installations in the last two years—with 0.8 GWp in 2022 alone. Today, we are increasingly becoming a strategic partner for families and companies in their energy transition.

Over the next few years, solar distributed generation is expected to steadily increase in EDP's portfolio as a result of the growing interest from private customers and the development of the major projects the company has in the pipeline. This includes multiple installations for Google with a total of 650 MWp, which represents EDP Renewables' largest agreement with a single corporate customer (see interview on page 28).

There are numerous advantages to decentralized solar, whose potential continues to grow as the technology develops. In addition to the benefits in terms of consumption and energy efficiency for consumers, there is the versatility of the system, short payback periods for investors (9-11 years) and also the environmental component and contribution to the energy transition. ▶

### Growth potential of distributed solar energy in the world



# DG footprint

EDP is a global leader in the Distributed Generation ("DG") market with over 1,6 GWp of installed capacity. With a distinctive value proposition, EDP offers an extensive DG offering with a variety of products, customized business models and personalized value-added services.

## DG Overview

	
>1.600 MWp installed capacity	>1.800 MW contracted capacity
	
>7.000 active sites	17 territories

## Service Offerings

	
Rooftop Solar	Ground Mounted Solar
	
Carports	Community Solar
	
Rooftop Solar	Storage
	
Electric Mobility	Energy Efficiency
	
Micro-grids	



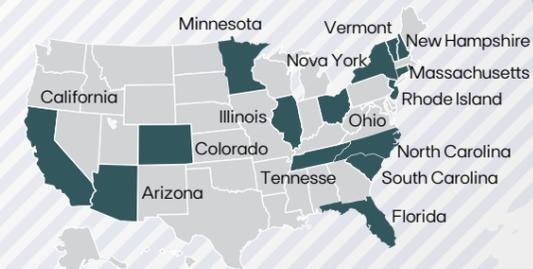
In Europe, EDP is one of the DG market leaders, with presence across both B2C and B2B and an unrivalled market share position in Iberia.



	>127.000 projects installed		>7.600 projects contracted
	>630 MWp installed capacity		>995 MWp contracted capacity
	>1.000 GWh solar generation		>230.000t CO <sub>2</sub> emissions avoided



In the USA, EDP has developed a leading DG platform with more than 400 projects and a total of ~290 MWp of installed capacity.



	>400 projects built to date		>500 active sites
	>290 MWp operating capacity		>150 MW near term pipeline
	>125 GWh solar generation		~81.000t CO <sub>2</sub> emissions avoided



In Asia, EDP concluded the acquisition of Sunseap Group, in February 2022 through EDPR and acquired a 91% stake in the company. It is also present in 10 markets and is expecting to contribute with >480 GWh in 2023 from all the projects installed.



	>2.700 projects installed		>2.200 buildings with solar panels
	>460 MWp installed capacity		>690 MWp contracted capacity
	>440 GWh solar generation		>312.343t CO <sub>2</sub> emissions avoided



In Brazil, EDP has already partnered with some of the biggest clients in the market and has positioned itself as a pioneer in distributed generation.



	>45 projects installed		>105 projects contracted
	>95 MWp installed capacity		>350 MWp contracted capacity
	>230 GWh solar generation		>29.000t CO <sub>2</sub> emissions avoided

# European leader in solar distributed

In Europe, EDP's solar distributed generation capacity is expected to grow fivefold between 2023 and 2026. The announced partnership with Navigator for a 17 MWp solar project demonstrates EDP's ability to be an important partner for companies facing the challenge of energy transition.

Solar energy has been gaining ground in European decarbonization plans. According to SolarPower Europe, this region has installed more than 40 GWp of capacity, 50% more than in 2021. This growth has been driven by rising energy prices, growing geopolitical tensions, which have brought Europe a new sense of urgency to accelerate its energy independence.

Compared to large-scale solar projects, distributed solar offers a more immediate contribution to this goal, since the installation time is significantly shorter.

This acceleration in Europe is also being experienced by EDP, which is currently active in distributed solar in eight countries in this market - Portugal, Spain, France, Italy, Belgium, Luxembourg, Germany and Poland. To date, EDP has contracted almost 1 GWp of capacity in the region, having already installed more than 65% of that capacity. EDP is also expected to install five times as many panels over the next three years than it has installed to date.

### The partner of companies in the energy transition

Today EDP stands out as the leader in distributed solar among European-based operators. This positioning is strongly sustained by solid growth in the Iberian market, where we have been present for almost a decade. Of the total contracted capacity at European level, around 800 MWp comes from Iberia - a contribution driven by the corporate segment, which represents more than 60% of the capacity contracted from EDP. The transition is accelerating not only in large companies, but also in small and medium-sized companies, where in the first half of the year alone more than 100 MWp was contracted.

### Across all European geographies, EDP has four main areas of competitive advantage::

- **As-a-service model:** Focus on offering a differentiated and innovative business model that makes investment more attractive and flexible for the customer.
- **Established, long-term partner:** In an increasingly dynamic market, EDP's solidity translates into a relationship of trust and security in the eyes of customers, in the eyes of customers, who can count on a long-term partner.
- **Comprehensive and diversified offer:** In addition to solar solutions, EDP is distinguished by a portfolio that is increasingly aligned with the energy transition, from green electricity to mobility and energy efficiency solutions.
- **Presence in key segments:** Strategic expansion into the various markets, with organic growth and through acquisitions, allows EDP to serve customers of various dimensions and with different needs.



Inauguration of the self-consumption plant at the CTT Production and Logistics Center in Maia

EDP's execution capacity in the corporate segment has been strengthened by large companies choosing us as their energy transition partners.

An example is Navigator, with whom EDP will install one of the largest solar plants for corporate self-consumption in Portugal, totaling 17 MWp.

### Bringing the sun's energy into families' homes

The residential segment has also been growing and allowing more and more families to increase their energy independence. EDP operates in this segment in Portugal and Spain, and today almost 130,000 families have solar panels on the roofs of their houses. This number is expected to increase by 40,000 panels by the end of the year.

The relationship between families and companies and energy does not begin and end with the production of solar energy. This is just a first step towards creating a wider ecosystem of energy solutions that will enable more efficient consumption.

In this context, EDP has been expanding its portfolio and has launched in Portugal the Mixergy intelligent water heater, which makes use of surplus solar energy to heat and store water intelligently and efficiently, with savings of up to 60% on water heating bills; solar panels in apartments are light and flexible, making them easy and safe to install on balconies.

In the area of batteries, the path has been one of strong consolidation, particularly in Spain, where in addition to the traditional battery, the EDP Solar Wallet is also available, a virtual battery that allows you not only to use the surpluses generated but also to share them with a second home with a photovoltaic installation, increasing the efficiency of the installation by around 20%.

As well as investing in products, EDP has also sought to develop innovative business models that accelerate the energy transition.

### The democratization of solar energy

The solar neighborhoods communities (Bairros Solares) are democratizing access to solar energy, particularly for families and companies facing investment or space limitations.

The installation is carried out at a customer with available space - the producer - and EDP installs more panels than are needed for self-consumption. At the same time, neighbors are recruited, receiving part of the energy produced by this installation.

The benefits are clear for EDP customers: they require no initial investment on the part of the participants; they allow the producer to reduce up to 60% of their energy consumption and up to 35% for their neighbors; and they promote self-sufficiency, local resilience and community involvement.

These communities can be formed in homes or businesses. This is the case with CTT, a client for whom EDP will be installing in more than 40 locations, with the capacity to supply 8,000 families and companies.

EDP has around 2,000 projects under development in Portugal, totaling more than 55 MWp. When all the projects are fully operational, there will be more than 40,000 families and companies producing solar energy locally in the country.

# A Testimonial

## “An important step forward”

José Luis Flores, head of the technical and purchasing area at Klépierre Iberia

“Klépierre’s partnership with EDP, which involved the installation of more than 5,411 PV modules in our malls, is an important step forward in terms of sustainability. This project will allow us to reduce energy consumption in our malls by 30%, making our portfolio even more efficient. In addition, self-consumption of solar power avoids the emission of more than 973 metric tons of CO<sub>2</sub> per year, something we are very proud of.

This year, in line with our Act4Good corporate social responsibility (CSR) and sustainability policy, we will tackle new challenges that will allow us to further minimize the impact of our assets and obtain a positive socio-environmental result. The installation of EV charging stations and even more solar PV modules (more than 30,000 m<sup>2</sup> in total) are just some of the actions that will help us consolidate our leadership in the sector. A leadership that has been acknowledged, among others, by the Spanish Ministry for the Ecological Transition and the Demographic Challenge when it certified the offsetting of our carbon footprint for the fourth year running.”



### Conquering Europe

Growth has also been notable in markets outside the Iberia: in 2021, EDP had only 24 MWp contracted outside Iberia, representing 7% of the total capacity contracted in Europe. In the first half of 2023, this figure had already risen to almost 200 MWp, representing 20% of capacity.

When EDP took the decision in 2018 to expand its presence to other European markets, it began its journey in Italy and Poland.

By the time it entered these markets, EDP was already a key player in solar energy. Not only because of the existing presence of EDP Renováveis, which operated solar plants in both countries, but also because of the experience it had acquired in launching operations in other markets.

The starting point was energy trading. However, the aim was never to be just another energy supplier in these geographies, but rather to compete for leadership in distributed solar. With this goal in mind, EDP entered these markets with differentiating value proposition: the option to join solar through an as-a-service model, in which it assumes 100% of the investment in the plant, as well as its management and monitoring, which has proved attractive to customers.

One of the ways to accelerate growth in these markets was through the acquisition of local companies specializing in this sector.

The first was in Italy in 2021, with an investment in the Enertel Group - a distributed solar company focused on the SME segment. With this acquisition, EDP gained access to a strong commercial network which, since 2018, had been



Verallia, Italy

responsible for the sale of more than 350 decentralized solar projects, allowing for early growth in the country, and which currently delivers around 500 installations a year,

Thanks to a successful acquisition strategy - which integrates an existing sales presence with EDP’s developed portfolio - it has become possible to offer photovoltaic solutions to a significant number of SMEs in a wide range of sectors that are investing in their energy transition. Between 2021 and 2022, this strategy led to a fourfold increase in EDP’s in the capacity contracted by EDP in the country. To date, there are already more than 100 MWp contracted in the region and more than 1,500 solar plants installed, active and connected to customers and the national grid. This rapid implementation confirms that distributed generation is one of the best ways to accelerate the sustainability goals of EDP, our customers and the world.

Among EDP’s biggest projects in Italy is the contract signed with Verallia - a manufacturer of glass containers for food and beverage containers. In total, the project comprises five solar photovoltaic plants in four Italian regions, with a capacity of 15 MWp. With 28,000 solar panels and production of up to 16 GWh of renewable energy per year, this installation allows the company to avoid emitting around 8,000 tons of CO<sub>2</sub> per year.

In Poland, too, EDP has made important acquisitions to support its growth in the country and consolidate its commitment to accelerate the energy transition in this market. In 2022, it acquired two local companies specialized in delivering photovoltaic solutions to various market segments. The first was Soon Energy, focused on large companies and public sector clients.

At the time of the acquisition, Soon Energy already had more than 25 Mwp installed in projects across Poland and a local sales force

of around 400 agents. Two months later, Zielona-Energia.com - which means “green energy” in Polish and specialized in SMEs - joined EDP Energia Polska.

The integration of these new companies into the portfolio not only drove financial growth, but also provided access to qualified installation teams and new suppliers for the purchase of panels and components at competitive prices.

In 2022, EDP exceeded 50 MWp contracted on the Polish market, a 10-fold increase on the previous year, to which a further 33 MWp have already been added in the first half of 2023.

Ferrero was one of the companies that chose EDP as its partner in the energy transition. The project includes the construction of two self-consumption plants with a capacity of 5.68 MWp, the equivalent of supplying 1,100 homes with renewable energy for a year.

Occupying the size of about six soccer pitches, the 10,300 solar panels guarantee the Belsk Duzy facility, from where Ferrero products are sold to customers in more than 100 countries. This investment, made under the as-a-service model, will save more than 4,600 tons of CO<sub>2</sub> annually.

### An expanding brand

This year, the EDP brand officially entered the Italian and Polish energy scene with its first solar-focused campaign, designed to increase brand awareness in these markets and position EDP as the right partner for companies looking for distributed solar energy solutions.

In the US, there is significant potential for developing distributed solar energy projects large commercial and industrial customers, as well as for developing energy communities. EDP is expected to grow 5x in the next 3 years through important corporate partnerships, such as the largest corporate partnership signed between EDP Renewables and Google or the recent partnership with Lufthansa to develop a project in Puerto Rico.

## Transforming the energy business in over 20 states

The distributed generation business unit of EDP Renewables North America (EDPR NA), EDPR NA Distributed Generation (EDPR NA DG) has an operating capacity of 290 MWp across 442 projects spanning more than 20 states. Growth is on the horizon for the unit, which has a development pipeline of more than 250 MW. EDPR NA DG has defined itself in the market, providing cutting-edge ground-mounted solar and storage, canopy/carport solar, rooftop solar, and community solar products, with projects ranging from 800 KW to 20 MW in size. Comprised of more than 60 employees with more than 160 years of combined experience, the team prides itself in its commitment to using safe, proven, best-in-class technology for all its projects and proactively monitoring its systems to ensure maximized power and revenue generation.

EDPR NA DG serves a diverse range of customers, ranging from commercial and industrial entities to public schools, universities, hospitals, municipalities, and local governments, as well as religious institutions and small utilities and power generators. Its notable customers include Walmart –with a portfolio of 50+ sites across seven states, Scripps Health Systems – one of the largest healthcare providers in California, and Faurecia – a global leader in automotive technology. In addition, EDPR NA DG has a partnership with the City of Philadelphia through the city’s Solarize Philly Program.

One of EDPR NA DG’s most recent significant partnership announcements was with Google, announcing the largest corporate sponsorship of distributed solar development in the United States, according to data from S&P Global and BloombergNEF. The signing of this framework agreement aligns with an environmental justice program benefiting more than 25,000 families in low-to-moderate income (LMI) communities. In addition, EDPR NA DG and Google will partner on a \$12 million Community Impact Fund, which will help alleviate energy burden in these communities.

EDP and Google signed the largest corporate sponsorship of distributed solar development in the United States

EDPR NA DG owns and operates 98 MWp of ground-mount solar nationwide.



Community solar ground mounted Penn Yan, NY

# 3

questions for...  
**Michelle Davis**  
Wood Mackenzie Power  
& Renewables



**Michelle Davis is the Head of Global Solar at Wood Mackenzie Power & Renewables and leads research coverage of the commercial solar market and tracks the competitive landscape of installers, financiers, and technology providers.**

### 1. What benefits can distributed solar offer that other kinds of energy may not?

Distributed generation requires less transmission and distribution infrastructure to deliver power directly to the customer, which can result in cost savings. Another benefit of distributed generation, which is relevant for solar and also for battery storage, is its modularity and scalability. Unlike traditional power plants – such as natural gas plants, nuclear plants, or coal plants – solar projects can be scaled down to just a few panels, generating less than a kilowatt, or scaled up to multi-megawatt or even gigawatt projects.

### 2. What role can distributed solar play in reducing greenhouse gas emissions and combating climate change?

As mentioned, distributed solar can be scaled, so scaling up distributed solar installations increases the climate change reduction benefits accordingly. For example, installing 20 panels instead of 10 can help reduce greenhouse gas emissions by twice as much. In addition, distributed solar can help customers manage their load and maximize their use of renewable energy. By integrating distributed generation with storage and sophisticated management tools to store midday solar and distribute the energy for the evening ramp, the system will help even out customers' load and ultimately minimize greenhouse gas emissions effectively.

### 3. What is your outlook on the solar energy industry in the U.S. over the next five to 10 years?

It's very positive! My company Wood Mackenzie established the public Solar Market Insight Report 2022 Year in Review, and we predict that the total installed U.S. solar fleet is expected to grow five times larger than it is today, from 141 GWdc at the end of 2022 to more than 700 GWdc by 2033. Growth is faster in the near term, averaging 19% until 2027 before slowing to an average annual growth rate of 7% from 2028-2033.



North America



EDPR NA DG owns and operates 12 MWp of canopy-mount solar projects nationwide.

EDPR NA DG's community solar projects include 22 MWp of operational projects across seven projects, with an additional 15 projects currently under construction, and 55 MWp under development.



EDPR NA DG owns and operates 110 MWp of roof-mount solar projects nationwide.

EDPR NA DG has also gained recognition and trust from landowners who choose to work with the company due to its tailored customer-centric approach. As a heavyweight of clean energy development for decades through EDPR NA, EDPR NA DG offers experience and financial stability to landowners that few others in the North American market can. The team regularly engages with community leaders, prioritizing community impact, and building on its established goodwill.



## Sana Ouji

Energy Lead at Google

The Clean Energy Financial Benefit Sharing Program has as one of its one of the main partners EDPR NA Distributed Generation. Energy Lead at Google, Sana Ouji, explains what the program is about and how the two companies have been working together.

### What factors led Google to choose EDPR NA Distributed Generation (EDPR NA DG) as its partner in the Clean Energy Financial Benefit Sharing Program?

Achieving the required grid decarbonization to combat climate change will require more than just Google. EDPR NA DG is an extremely collaborative partner that shares our mission for extending the clean energy benefits to communities. We are grateful for their expertise and steady focus on our shared mission.

## “EDPR NA DG shares our mission for extending the clean energy benefits to communities”

### What were the driving reasons behind Google’s decision to initiate the Clean Energy Financial Benefit Sharing Program?

More than three years ago, we started a journey to better understand how we can help lower barriers to an equitable clean energy transition. We interviewed community leaders, non-governmental organizations (NGOs), and policy advocates about challenges to an equitable energy transition in their communities. We heard over and over again that high energy burden remains a primary barrier to an equitable energy transition. In fact, in the U.S. alone, 25 million households face high or severe energy burden, which the U.S. Department of Energy defines as spending 10% or more of gross household income on utility bills.

What we learned through this exercise was the foundation of our Clean Energy Financial Benefit Sharing Program. It takes aim at reducing energy burden and is a small step toward a cleaner, more equitable future.

### How does the partnership between Google and EDPR NA DG aim to address environmental justice concerns and benefit low-to-moderate income (LMI) households?

We hope that the addition of these projects would help provide local communities with clean energy resources in a historically fossil-heavy grid.

Additionally, at least 35% of the portfolio will be built in LMI

communities and will extend property tax and wage benefits to those communities. Through the Clean Energy Financial Benefit Sharing Program, approximately 25,000 households will receive utility bill credits each year – directly and immediately reducing energy burden.

### How will the success of the program be measured and evaluated?

With any new program there will be lessons learned and improvements that we could apply to future initiatives. As we focus with EDPR NA DG and our other partners on execution of the projects and deployment of funds, we will seek to communicate and publicize this model far and wide and streamline adoption for other like-minded buyers. Success will be measured by the positive impact for communities the projects will serve and how scalable the model can be by other clean energy buyers.

### What specific advantages and expertise does Google look forward to learning from the partnership with EDPR NA DG?

This deal became possible because of an unprecedented level of transparency between our teams. It was our first “open-book” transaction, and we are excited to apply what we learned to our future deals.

### Given the ambitious nature of the agreement supporting more than 80 distributed solar PV totaling 500 MWac, what potential

### challenges do you anticipate in implementing the Clean Energy Financial Benefit Sharing Program, and what strategies are in place to overcome them?

We built in a lot of flexibility in the structure of the deal to allow EDPR NA DG to optimize portfolio revenues and ensure delivery of this benefit in real time. I’m sure there will be new challenges that will come up that we didn’t think about when putting the deal together, but we have built a strong relationship with EDPR NA DG throughout this process and feel confident in our combined capacity to solve those issues as they come up.

### How does the partnership with EDPR NA DG align with Google’s broader sustainability commitments and energy strategies?

In 2020, Google set an ambitious goal to match all our operations with carbon-free energy (CFE) on an hourly basis by 2030. This goal is motivated by the belief that to successfully combat climate change, we must rapidly decarbonize the world’s energy systems – for everyone. By working collectively to advance toward 24/7 carbon-free energy, we want to transform whole electricity systems, accelerate entirely new industries, and ensure that all communities benefit in the clean energy transition. Our partnership with EDPR NA DG highlights this commitment to transitioning to renewable energy and low or zero-carbon solutions at both a local and global level.

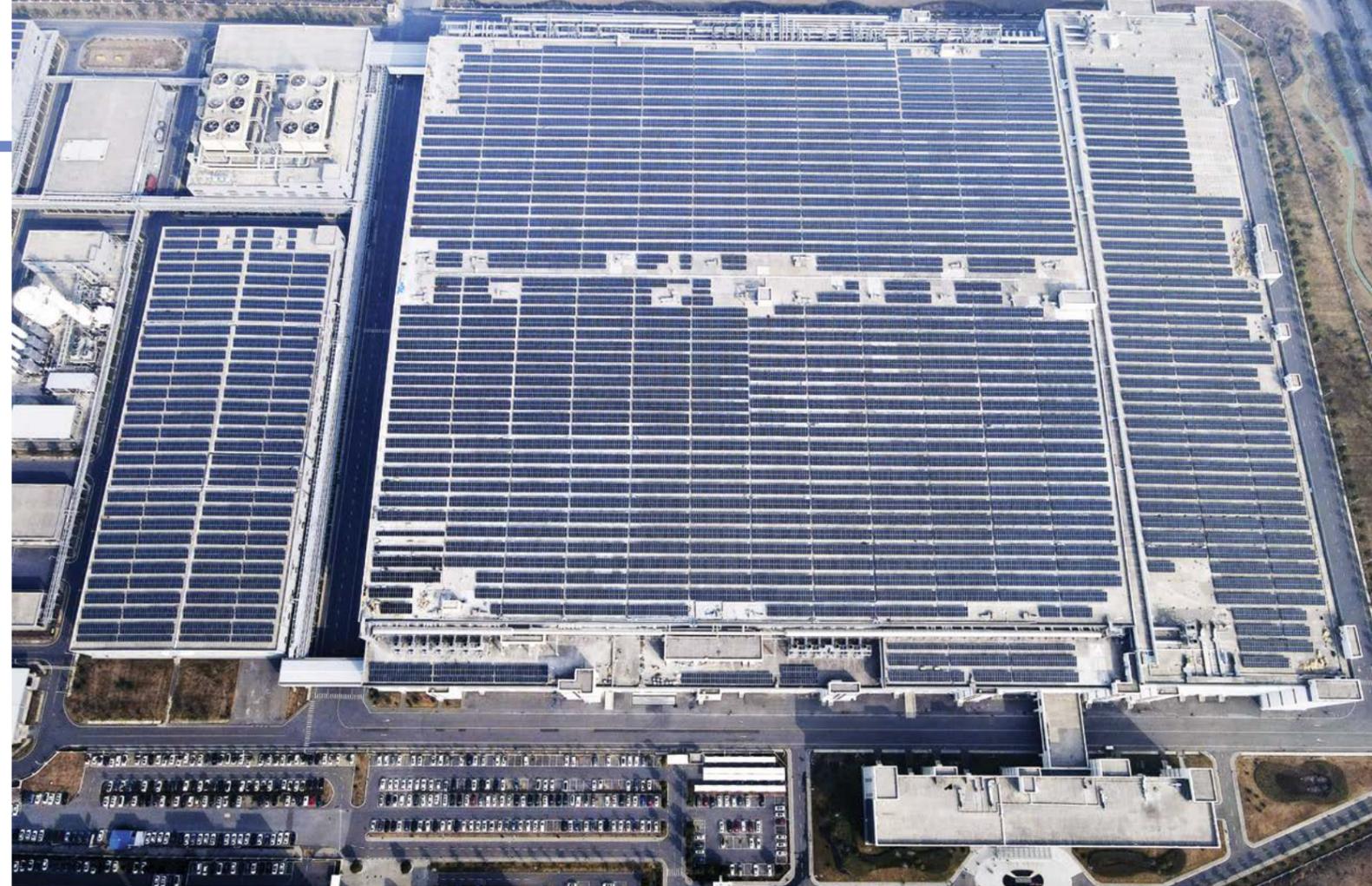
## EDPR's distributed generation solar in Asia Pacific

In APAC, EDP plans to triple its presence in distributed solar energy by 2026, supported by increasing decarbonization objectives and industrial presence in the region. The company already has more than 1.1 GWp in its portfolio and more than 150 MWp secured or under construction. Recently, in China, EDP developed its largest distributed solar energy worldwide, with a capacity of 19 MWp.

According to the International Energy Agency, Asia's renewable energy additions and electricity consumption will outpace the rest of the world. By 2030, 40% of global capacity additions will come from Asia, with solar playing a central role. There is also structural opportunity in the Asia-Pacific (APAC) region, with more countries committing to net-zero targets by 2050.

To maximise this opportunity and achieve the climate targets, EDP Renewables (EDPR) is making significant strides in the development and expansion of Solar Distributed Generation (DG) projects, playing a vital role in advancing the adoption of solar energy across the region.

In the recently presented Business Plan 23-26, EDPR aims to add 1.5 GWp and reach 2.4 GWp installed capacity by 2026, ramping up annual capacity additions with an average of 375 MW, accelerating renewables across a handful of markets. This includes behind the meter DG projects that provide renewable energy to businesses and governments to greenify the grid.



Yet, while the region presents immense potential for solar energy deployment, several challenges hinder the widespread adoption of solar across APAC:

- **Land Constraints:** Many countries in APAC, particularly densely populated urban centres such as Singapore, face limited land availability for large-scale solar installations.
- **Policy and Regulatory Barriers:** Inconsistent or ambiguous policy frameworks and regulations related to solar energy deployment can create uncertainties for investors and developers. Policy support and long-term incentives are essential to promote confidence and attract investment in the solar sector.
- **Infrastructure and Market Access:** In underdeveloped regions, lack of infrastructure, such as reliable roads and transmission lines, can impede the expansion of solar energy. Ensuring market access and reliable transportation of solar equipment are essential for project viability.

EDPR in APAC aims to add 1.5 GWp and reach 2.4 GWp installed capacity by 2026.

# “What our clients say?”

“Reliable, eco-friendly, and cost-effective energy alternative”

T&K Worldwide

As a firm advocate for sustainable living, I wanted to highlight the remarkable benefits and positive impact solar power has had on my life and the environment. Before embracing solar power, our company was reliant on traditional grid electricity. However, the rising energy costs, coupled with growing concern for the environment, prompted us to explore alternative energy sources. This led us to discover EDP Renewables APAC's exceptional solar power systems and their commitment to promoting clean and renewable energy. Upon reaching out to EDP Renewables APAC, I was immediately impressed by their knowledgeable and dedicated team. Their experts guided me through the entire process, from assessing our energy requirements to designing and installing a customized solar panel system for our workshop. The professionalism, expertise, and attention to detail displayed by the EDP Renewables APAC team were truly commendable. I wholeheartedly recommend EDP Renewables APAC's solar power solutions to anyone seeking a reliable, eco-friendly, and cost-effective energy alternative.



“Thank you for making the process seamless and enjoyable”

Education in Motion

I am thrilled to share my positive experience with your company and express my appreciation for the outstanding service and expertise provided by Gabriel and team. They have been professional from the very beginning of the process and to execution of installation. Where I was seeing it through all the way. Sharing similar goals on sustainability assisted the college to achieve the Zero Energy certification for our building. Your commitment to sustainability and renewable energy was evident in every step of this journey. I would thank and recommend EDP Renewables APAC to any companies who are keen to embark on their sustainability journey. Thank you for making the process seamless and enjoyable, and for providing exceptional service from start to finish.



To overcome these challenges, innovation in solar technology is driving further efficiency improvements and cost reductions. These also envision placing solar in different environments to meet the varied conditions of each region. Some examples of solar innovations include:

- **Modular Containerised Solar Solutions:** In Singapore, we have developed a unique modular containerised solar photovoltaic (PV) solution, which allows for extremely quick deployment and dismantling of the solar panels. The panels are linked up within the container and are rolled out via a roller system at site for deployment. This greatly reduces the resources needed as compared to conventional ground-mounted solar PV systems. This solution is especially useful for areas that require temporary solar energy generation or where quick deployment and dismantling are paramount.
- **Offshore Floating Solar:** In March 2021, we have also developed one of the world's largest offshore floating solar farms along the straits of Johor, between Singapore and Malaysia. The project has a capacity size of 5 MWp, generates about 6 GWh of renewable energy annually, and is deployed in open seawater. This project was more challenging to construct as compared to ground-mounted solar installations due to the unpredictable nature of open sea, the need to avoid shipping routes and the presence of barnacles. Marine expertise was also required for the robust mooring installation and system design that was required to keep the platform steady amidst waves and currents.

Other noteworthy solar DG projects we have developed in APAC include:

- **Solar across Singapore's public housing flats:** Through the program SolarNova and in partnership with Singapore's Housing Development Board (Singapore's public housing authority), we now have solar across more than 2,300 public housing buildings and more than 200 MWp of installed capacity. This is in line with the government's movement in solarising the nation.
- **19MWp rooftop solar DG project in China's Anhui province:** The project is located on the rooftop of a major consumer electronic manufacturing facility for self-consumption. It is the largest single DG solar PV project undertaken by EDP. The system is structured with 35,000 solar panels and it will generate over 22 million kWh of energy annually, equivalent to offsetting approximately 18,949 metric tonnes of carbon emissions.
- **Dual usage facilities in Taiwan:** In Taiwan, we currently have 47 MWp total installed capacity. Due to land constraints in Taiwan, these solar DG PV systems are innovatively built and are placed across facilities with a secondary usage to maximise underutilised areas. Some examples include:
  - A 3.3 MWp canal-based solar system in Pingtung, Taiwan, where solar is placed above Taiwan's irrigation network.
  - A 200 kWp rooftop solar PV system placed above a basketball court at Ziqian Elementary School in New Taipei City.
  - A 2.5 MWp solar PV project combined with a livestock farm.

## Performance maximization and asset overhaul

The Business Performance Acceleration (BPA) and Assets and Operations (AO) teams work together to achieve performance maximization and asset overhaul. Together they identify areas for improvement, implement changes that increase efficiency and reduce costs, and ensure that assets are operating at peak performance.

By Tan Yong Beng, Asset Operations, EDP Renewables APAC

The BPA team identifies areas of improvement and works with the AO team to implement changes that increase efficiency and reduce costs. While the AO team is responsible for managing assets and ensuring that they are operating at peak performance.

After analyzing the detailed asset data, the team concluded that the main root-causes for underperformance include: i) faulty equipment, ii) poor design of the communications solutions and iii) aging equipment with outdated technology (namely panels and inverters).

Older assets with an average age of 8 years, present some expected signs of degradation; however, there are also more recent sites that present signs of underperformance.

In order to close the gap between actual and target Performance Ratio (PR), the team launched 3 different projects to repair and

overhaul the underperforming assets, prioritizing sites according to financial upside, exposure to liquidated damages for not meeting Guaranteed Energy Output (GEO), and cost saving via comms replacement for public housing sites:

**1. Project Hyper I 24.1 MWp** (currently at 46% completion, targeted for Dec-24): aims at replacing outdated and underperforming SolarEdge inverters on public housing sites. Encouraging results in repaired sites (3.7 MWp), PR increased by an average of 60% (13% to 73%) equivalent to estimated S\$ 640k in yearly incremental revenues.

**2. Project Sprint I 28.6 MWp** (currently at 26% completion, targeted for July-23): focused on C&I sites where non-compliance with GEO can lead to liquidation damages. These sites include complex issues to be solved, mostly related to soiling.

Contractual actions are in place, in order to mitigate impacts (tariff renegotiation in order to justify remedial works).

**3. Project Lah I 1,800 Sites:** Replacement of communications hardware and monitoring systems in ~1,800 sites, eliminating vendor lock-in. This project allows the team to become hardware agnostic, creating the conditions for an optimal decision on a future monitoring system.

By launching these initiatives, the team hopes to streamline processes, improve efficiency and performance of our assets to achieve the desired outcome. And in the long run, to have positive spill-over in future projects and other geographies (i.e., benefits of setting up scalable foundations for overseas expansion).

## Implementation of Save2Compete

EDP Renewables APAC have just finalized the deployment of Effizency platform to help accelerate the Solar distributed generation (DG) solar business in Small and Medium Enterprises. The software was successfully deployed in other EDP geographies, namely, Portugal, Spain, Italy, Poland and more and is now deployed in Singapore.

By Jaafar AK, Business Development SMB, EDP Renewables APAC

Effizency, an EDP spin-off, provides a software as service solution (Save2compete) used by internal and external sales teams to efficiently create Solar PV proposals. The feature of this tool aids in the technical sizing and system design aspect as well as financial modelling and customising business models.

### Technical sizing and system design

- Set up solar system by inserting panel groups and defining exclusions
- Define structure, panel type, panel slope, roof material and roof orientation
- Benefit from radiation depiction and exclude shaded panels
- Benefit from the best-automated storage solution for the designed system
- Explore the onsite virtual visualization with augmented reality

### Financial modelling and customized business models

- Use different business models (upfront instalments, our PPAs)
- Apply risk rules to specific business modes
- Decision based on accessing the client's credit risk profile
- Define the target margins for the project
- Set up the financial metrics and verify the sensitivity analysis

Prior to implementing this tool, the process of creating proposals involved utilising several different tools and cross-referencing across various teams which resulted in lengthy process.

With the Effizency platform, the commercial process is streamlined with digitalizing and automating the technical sizing, financial modelling and proposal generation, thereby substantially reducing the client acquisition cost. Results have shown that a proposal can be generated in just 5 minutes which saved a lot of time for the sales team.

### A success case from an energy services seller:



Performance results after one year with Effizency solution

## Distributed generation: a strategic priority in Brazil

Distributed generation is becoming a priority in EDP's strategy for Brazil. The company is expected to double its installed capacity in this sector to more than 200 MW by the end of the year, with an investment of about R\$2.3 billion by 2026.

With the latest updates to the EDP Group's strategic plan, including a R\$30 billion investment in Brazil over the next five years, solar power is viewed as a priority for the company in the country. The goal is to reach more than 500 MW of installed capacity by 2026.

The share of distributed generation electricity sold by the company grew by 50% last year. The company also closed 2022 with a 252% increase in the number of distributed generation customers compared to the previous year. In terms of installed capacity, 2022 closed with 86 MW. Another 130 MW are currently under construction and are expected to come on stream later this year, more than doubling the installed capacity to 200 MW.

"By 2026, we should have invested around R\$2.3 billion in distributed generation. In the last year, we have dedicated ourselves to developing solutions that have pushed us forward in this segment and the goal is to continue to grow and drive the energy transition. Brazil is a world leader in solar distributed generation—and that is unprecedented. There is no country in the world where solar distributed generation is bigger than utility-scale wind and solar generation. This is a unique opportunity and one of our priorities," says the CEO of EDP Brasil, João Marques da Cruz.

The data he is referring to was released in March by the Brazilian Ministry of Mines and Energy, showing that in just two months the installed capacity of solar distributed generation in the country grew by 1 GW to 18 GW.



As a result, solar power—with 26 GW—became one of Brazil's largest energy sources, second only to hydroelectric generation.

"Our focus has been on offering a modern, accessible, and inclusive product that provides access to solar energy, especially for small businesses. By doing this, we are helping many businesses to become more sustainable—both from a decarbonization point of view, by boosting their use of renewable energy sources, and from a financial point of view, since distributed generation can result in savings of between 10% and 30% on the energy bill," explains Marques da Cruz.

Solar distributed generation is the term used to describe electricity generated by PV power plants at or near the point of consumption. In Brazil, however, regulators defined a broader concept—expanding the location of the installation to the entire concession area of the distributor—and capped the size of DG power plants (at 3 MW as of 2023), with benefits for regulated customers via energy compensation in the Net Metering system.

EDP offers its customers two types of distributed generation: remote self-consumption, in which the power plant is leased exclusively to a single company; and shared generation, in which several companies have shares in the same power plant through a consortium or association.

One of EDP Brasil's distributed generation solutions is Solar Digital. It offers differentiated conditions and simple, uncomplicated access for small businesses that have energy costs starting at R\$300 and that use low voltage, under the shared generation model.

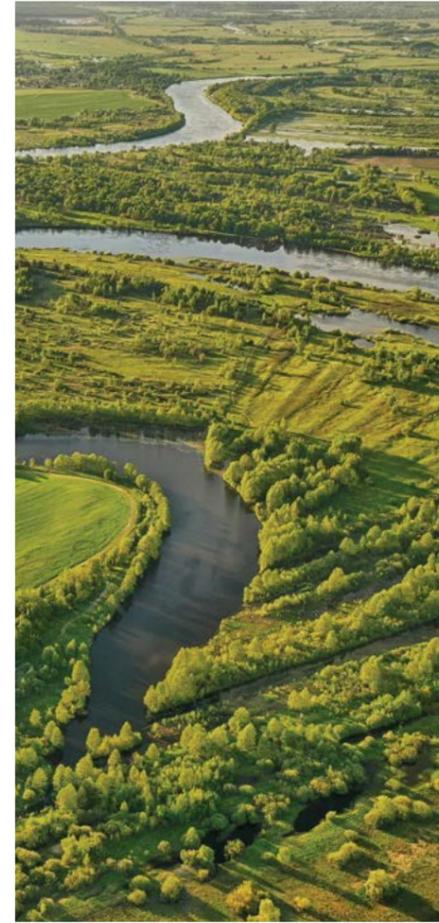
In addition to the savings on the energy bill, another advantage is that customers don't have to pay for the installation and infrastructure of the solar power plants, since they operate remotely and EDP takes on the construction, operation, and maintenance.

Aside from distributed generation, EDP is also offering differentiated conditions for medium-sized and large companies that want to make the switch to the wholesale and retail open market. EDP also offers the purchase of renewable energy certificates (I-RECs), which confirm the renewable source origin of the electricity. //





act.

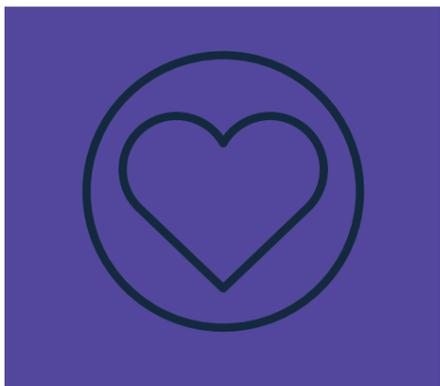


# You Empower Society

At EDP, our ambition is to lead the energy transition, contributing to a future based on a low-carbon economy, capable of meeting the challenges of climate change. We always take into account our impact on local communities so that the benefits of decarbonizing the economy are distributed fairly—and so that no one is left behind. Every year, we invest more than €30 million in over 500 social responsibility projects around the world under one of the main areas of EDP Y.E.S. (You Empower Society): Community, Culture, Energy, Planet, and Skills. Discover the stories of some of the people who benefited from these projects and learn how we made a difference in their lives.

## Y.E.S.

To Community



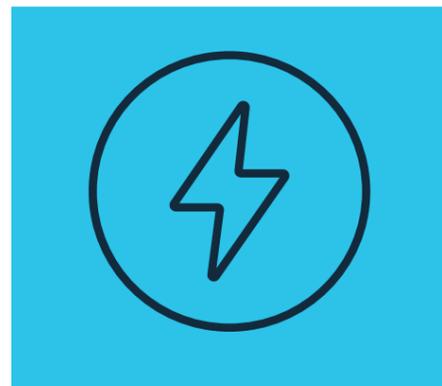
## Y.E.S.

To Culture



## Y.E.S.

To Energy



## Y.E.S.

To Planet



## Y.E.S.

To Skills



# Energy that changes the world

The energy transition offers a unique opportunity to build a more equitable society, providing universal access to clean and renewable energies. EDP recognizes that incorporating the needs of the people and the planet into its business strategy creates sustainable value for the company itself and for its stakeholders.

**S**ocial investment is one of the EDP Group's strategic pillars, enabling to build trusting relationships with local communities. That is why EDP works to promote the sustainable development of these communities through social responsibility programs—based on its own initiatives, donations, and volunteering—changing the lives of more than three million people every year.

The main objective is to develop or support projects that contribute to the just energy transition, namely providing access to energy, combating energy poverty, helping communities affected by the decommissioning of thermoelectric power plants, protecting natural heritage and biodiversity, promoting energy efficiency and renewable energies, and contributing to the decarbonization and fight against climate change.

One example is the Access to Energy in Africa program, under which we provide a fund that supports clean energy projects in the areas of education, health, water and agriculture, business, and community development—as well as make direct investments in companies that promote sustainable solutions for access to clean energy in those markets. Another example is the installation of street lights with solar panels and readily available materials, bringing more security to communities in Brazil.



EDP also runs programs in several countries, such as Energy Inclusion and Solidarity Solar, to tackle the problem of energy poverty with the aim of bringing more comfort to low-income families or communities. Solutions include installing thermal insulation, replacing roofs, repairing electrical connections, replacing equipment, and installing self-consumption solar panels.

In 2021, EDP completed the decommissioning of the coal-fired power plant in Sines, Portugal, in line with the commitments to decarbonize the company and the Portuguese economy, and developed a series of initiatives to promote the conversion of the local economy and employment. EDP also develops training programs for young people and adults in various locations so as to promote access to quality employment, as well as support for entrepreneurs.

Culture is another of EDP's areas of intervention, as it can be a powerful tool for social inclusion and community development.

EDP also supports projects that respond to other social needs in the local communities, namely through volunteering (in 2022, around 30% of employees worldwide took part in these initiatives) and responding to global humanitarian emergencies. One example of this was the military conflict in Ukraine, which mobilized resources and teams in several countries, implementing various initiatives to support victims and refugees.



# From the theatre of war to EDP

Helping others is part of the company's DNA. As part of its effort to support refugees from the war in Ukraine, EDP hired **Yuliia Prybytkova**. Responding to humanitarian crises is one of the key pillars of EDP Y.E.S. (You Empower Society).

Yuliia was on vacation at the beach when she received the news: Russia had invaded Ukraine! Her parents, who were on vacation in Portugal—unaware at the time that this was to be their daughter's destination to escape the war—returned immediately.

It wasn't the first time that this family (which also includes two non-identical twin brothers, aged 21, one of whom is in the army) had found themselves in this situation: in 2014, when the eastern Ukrainian city of Donetsk, where they are from, was occupied by Russian forces, they had to give up a stable life to move to Kyiv.

Yuliia Prybytkova, who holds a law degree, already had her own apartment and was working as a business trainer and coach for a large company, when fate played another trick on her.

She still recalls the fear she experienced in the shelter during the early days of the invasion, and what her parents told her—with a touch of the dark humor that is so characteristic of the Ukrainian people: "At least you will have to escape so that you can carry on the family line."

The escape felt like a World War II movie. Trains jam-packed with people trying to get out no matter what, with the 32-year-old girl, claustrophobic to boot, trying to squeeze in. She managed to get on a train carrying children with special needs and arrived in Poland without knowing anyone. From there, she got in touch with two journalists from CNN Portugal, for whom she had previously done some translation work. One of them readily offered to host her in Lisbon. She spent three months at his house and then moved to Cascais, to a room in the house of the other journalist she knew, spending time with his five young children.

Right from the start, Yuliia took advantage of all the time she had to get her documents in order and send CVs to various companies. Her desperation was such that as soon as she met anyone, she would immediately ask if they had any job opportunities.

EDP was one of the first to respond. Yuliia went through the recruitment process and, one month later, in May 2022, she joined the company. "I was very fortunate to end up here," she says. "They were very open from the very first interview. And when I was hired, at the end of the final interview, we were all kissing and hugging—which for me, coming from a culture like Ukraine, was very sweet and strange at the same time. Now I know that's how Portuguese people are," she says, laughing.

"Although I am a foreigner who does not speak Portuguese, I feel that my ideas are valued, that my eight years of experience in business training and coaching mean something to the company," says Yuliia. "EDP is a multinational company that tries to be as open as possible, diverse, and inclusive—and it values people with different perspectives."

At the moment, she is part of the EDP University team, an area she considers to be a good match for her and where she feels she can make a real contribution.

"I'm adapting to Portugal very well. I like the life I have here and I have even started to learn Portuguese," she says. But, she confesses: "The hard part is that I love my country. Being away has brought me to the point where I'm losing that strong connection. It's still a struggle being away from my family, but I started creating bonds here and I feel really comfortable and connected now. But I honestly don't know what will happen when the war is over."

# Always ready to help

This year, for the first time, the EDP Volunteering Program organized a global initiative that involved employees from all over the world.

**Gabriel Tan** was one of the participants in Singapore.

Last May, EDP held its first global volunteering initiative, bringing together volunteers from Brazil, Portugal, Spain, Greece, Italy, Poland, Romania, Hungary, the United Kingdom, the United States, and—for the first time—Singapore. The proceeds went to international organizations Plant for the Planet (which promotes reforestation and various climate actions) and Make-A-Wish (which fulfills the dreams of children with critical illnesses).

Gabriel Tan, Global Key Account Manager at EDP Renewables APAC, was one of the 728 employees who responded to the call and took part in this campaign celebrating energy month.

"It is rewarding for me to be able to participate in initiatives that benefit the community," he says. "We have a vibrant volunteering culture that fits perfectly with the corporate social responsibility (CSR) work we do with the communities. I am proud to be part of these initiatives and I believe that this will also be part of our value proposition in recruiting new talent in this competitive job market."

This initiative was part of the Energy Campaign and took place in the various locations in different ways, from charity runs/walks to beach clean-ups. For Gabriel, it was a unique opportunity to get to know his team and colleagues better, in a relaxed atmosphere away from work. "It was important and fun to be able to do this as a company," he says.

The EDP APAC employee had already volunteered at the Special Olympics for a while, and the lessons he learned then gave him a lot of inspiration.

"One time, I was running with an athlete and one of her shoes came off, making her trip and fall," he recalls. "Despite the discomfort, she held on and kept running until the end of her training session. That has made a profound impression on me about perseverance in difficult situations. Being able to give is a blessing, but the lessons learned from volunteering are the best return for me."



Gabriel Tan

# A vehicle to save lives

Initially, he wasn't keen on the idea of having a wind farm in his community. Now, **Grover Braden**, in the United States, is grateful to EDP for the way it cares for the population and for donating the vehicle that the town's fire department had long dreamed of.

"Everyone in the department was stunned when they learned the amount donated by EDP Renewables," says Grover Braden (in the photo, the third from the right). He serves as chief of the volunteer fire department of Honey Creek, a town near the company's 801 MW Meadow Lake Wind Farm—the largest in Indiana and one of the largest in the United States.

Grover is talking about the donation that EDP made to help the local fire department buy a new truck, enabling the firefighters to serve the community more safely and efficiently. The firefighters have a very small annual budget and had been saving since 1998 for the new truck.

The vehicle features, for example, a stainless steel body instead of aluminum—as well as breathing apparatus mounted under the seats, a significant improvement on what was previously available and which will make life much easier for those who put their lives on the line to save others. "As fire chief, I am very grateful and excited by the donation we received. It allowed us to build the truck we really needed," says Grover.

This relationship between the company and the community had a rocky start. When the wind farm was being built, Grover wasn't exactly a fan of the idea. "I didn't know anything about them," he explains. Since then, he has attended several meetings and his opinion has changed completely. "EDP has done a very good job taking care of the community and its wind farms. When there's a problem, they're always available and deal with it quickly. I know that lots of the farmers in the area have really good things to say about the site."

And that is not all: "The dirt road in front of my workshop" (Grover owns a truck repair business) "is now a wide asphalt road because of the wind farm," he says. The company has also recently donated \$50,000 to build a barn for trade shows.

The new vehicle will help Grover's fire department respond not only to home and forest fires, but also to other serious situations such as tornadoes or traffic accidents. It will also be of great help to the fire departments of neighboring towns.

The local fire department is made up of dedicated volunteers who put in an admirable amount of time and effort to ensure that their community is safe and secure. That was what led Grover Braden to join the organization: "When things are bad, we get up, push forward, and do our best to help people in their time of need."



Grover Braden



# Changing the world with art

Ever since they met at university, **Claudia, Marta, and Diego** dreamed of finishing their degree and starting their own firm. The EDP Public Art Spain competition was their golden ticket.

When they decided to take part in the EDP Public Art project promoted with the support of Ribera de Arriba Town Council, Diego Catena Nieto, Claudia Gadea Milián, and Marta Molins Laín had no idea that their lifelong dream would come true so quickly. The project takes place in Portugal and Spain with the aim of bringing art and social transformation to local communities.

Since their freshman year of university, when they first met, the three had imagined one day having their own firm and working together. That plan could have taken many years to come to fruition, all things being equal, but victory in the EDP competition made it possible instantly.

A total of 33 proposals were submitted by 59 students from 20 universities for three different projects: the extension of the La Viesca Social Center, an urban intervention in Barrio de la Llosa, and the construction of a cultural center in Bueño. The three young architects submitted a project to create the Bueño Art Center and won. The project was selected by the jury and won a prize of €14,000.

"The first thing we did was visit the place to see what we could understand about the environment," says Marta. "One of the things that caught our eye was the traditional granaries of Asturias—the so-called *hórreos*, which were used to store wheat and are raised from the ground up on a series of pillars. We liked the idea of having two different visual levels and that's what we tried to recreate."

"The community was involved from the very start of the project," says Diego. "It's important for it to be embraced by everyone so that it can meet their needs."

"People are very curious to see what the project will look like once the construction is finished," adds Cláudia. "It's possible that by the end of the year everything will have been completed—not only the development and the street furniture, but also the surrounding area."

For the young architects, working on this project was "like two years of self-taught training," says Cláudia Gadea Milián. "These were two very intense but very enriching years, which also served to teach us how a firm works and how to collaborate with other entities."

Marta Molins Laín agrees. "It was a little stressful, but in a good way, because it taught us many things that you can only learn on an actual project. It was a perfect way to finish our degree."

Diogo Catena Nieto has one piece of advice for anyone thinking about participating: "Don't hesitate to participate! There aren't a lot of initiatives for young people in this sector these days, so make the most of it. You will learn so much!"

For the three young architects, it was like "being thrown into the deep end," which forced them to take the risk of creating their own firm and undertaking a major project. As Diogo sums up, "It changed our life!"



Luís Silveirinha

# Put communities back on the map

The Public Art project has left an indelible mark wherever it has been implemented. **Luís Silveirinha** was one of the artists invited to change the face of his community.

Through beauty and artistic expression, Campo Maior, a town in the Alto Alentejo, has gained prominence in the Public Art scene in Portugal, emerging from anonymity to become a reference point on the national art scene.

Luís Silveirinha was one of the artists invited to take part in this project. "Being part of this project and putting Alto Alentejo on the Public Art map in Portugal was a very important experience," he says. Luís returned to his hometown - where he hadn't shown his work for over 20 years - with the support of Fundação EDP and a dedicated team, seeking to raise standards and highlight Campo Maior on the art scene.

The importance of urban art in transforming and revitalizing public spaces, especially in Alto Alentejo, cannot be underestimated. By giving new purposes to abandoned places, urban art brings life and a new perspective. For the mayor of Campo Maior, Luís Rosinha, "Urban Art, when produced with the consideration and participation of the community, has the potential to become a positive energy that drives the valorization of cultural identity and the development of authentic and vibrant urban spaces".

For Luís Silveirinha, each intervention had its own meaning and importance. However, one of the most interesting was the intervention on the water tank in which the artist André Nada also took part.

"The festivities had a unique moment there, also reminiscent of the tale of the beanstalk, where a flora climbed a tower in a space of magic and ethereal moments." As Pedro Reis, a teacher at Campo Maior Secondary School, says: "It's a work that transmits movement, color and joy. It's a 'shot across the bow' against sadness and monotony",

The message conveyed by his art is one of cooperation, involvement and appreciation of the people. As he emphasizes, "art is a way of uniting communities, promoting thought and emotion, and enhancing freedom of expression".

In Portugal, this project is curated by Fundação EDP, and the artists are invited to develop a process of collaboration with local populations, motivating them to take part in community assemblies to discuss the artistic intervention proposals to be carried out in public spaces (building façades, walls, network transformer stations, etc.).

Started in 2015, the project is already present in 31 locations in Portugal, in various regions such as the Algarve, Alentejo, Ribatejo, Médio-Tejo and Trás-os-Montes, Alto Douro, Minho and Beira Baixa. Xana, Alexandre Farto aka Vhils, Manuel João Vieira, Mariana A Miserável and Menau are some of the of the 50 or so artists and collectives who signed the 139 interventions.



Vitalina Varela

## More sunshine in Vitalina's life

The Solidarity Solar program has recently kicked off with the installation of more than 300 solar panels in Alto da Cova da Moura, one of the poorest neighborhoods in Portugal. **Vitalina Varela**, the unforgettable star of a film named after herself, was one of the beneficiaries.

She was part of the cleaning crew working on the set of Pedro Costa's "Cavalo Dinheiro" when the Portuguese director realized she was a diamond in the rough. Vitalina Varela became the protagonist of his next film, titled after her own name and inspired by the life of this Cape Verdean woman who, in 2013, took a plane to Portugal after the death of her husband. Without the means to return, Vitalina ended up living in Alto da Cova da Moura, one of the poorest neighborhoods in Lisbon. The same neighborhood where EDP has recently brought solar power to 300 homes by installing self-consumption solar panels—and even threw in an energy-efficient refrigerators.

Vitalina says she saw a paper on the floor when she got home and went to her neighbor to find out what it was. To his surprise, it was an EDP leaflet offering the installation of solar panels to people in the community who met certain conditions. Vitalina submitted the necessary papers and the rest happened very quickly.

Proud of the new solar panels on her roof—the same roof that, just a few years ago, leaked whenever it rained—she now feels closer to her family, who live in a very remote area of Cape Verde and only have access to energy through solar panels. When the time comes to pose for the photo, you can sense her gratitude for the difference in quality of life that the new solar panels will bring.

The star of "Vitalina Varela" has lived a very difficult life since arriving in Portugal, facing all kinds of hardships. She waited for almost forty years for her husband to return for her on the island of Santiago, in Cape Verde, and ended up coming to Portugal in the worst of circumstances, three days after her husband's funeral. "I went through a lot of hardships," she says, remembering the time she woke up to find the house flooded and the bed soaked through.

Pedro Costa thought her life would make a good movie and hired her to tell the world her story. "Vitalina Varela" is a film about the women who stay behind when their husbands leave because of poverty. It premiered in 2019 at the Locarno Film Festival in Switzerland and earned its director the Golden Leopard—and Vitalina Varela the Silver Leopard for her performance. Since then, it has continued to collect international awards, becoming the most acclaimed Portuguese film of all time.

Vitalina, who has since joined a stage production in Lisbon, is waiting for the opportunity to return to the big screen. "It was an incredible experience. I worked a lot, but everything I did was done with strength, courage, and love," she says in her blend of Cape Verdean Creole and Portuguese.

The Alto da Cova da Moura project is just one example of what Solidarity Solar aims to achieve. Created with the ambition of actively contributing to a just energy transition and improving the quality of life in the communities—especially those most in need—this program is already considering new initiatives in other areas of Portugal, Spain, and Brazil.

# A revolution in the favela

Before the joint project between EDP and NGO Litro de Luz, entering Favela dos Sonhos at night was a real nightmare. **Carliane** and **Pauliana** tell how the lives of hundreds of families have become much brighter.

Imagine what it is like living in a dark, dingy place, where people are afraid to go back to their homes at night, where you don't see children playing, where dogs can attack you at any moment, and you can easily fall into a hole or slip in the mud—a place where not even cab, Uber, or food delivery drivers dare to go. That's Favela dos Sonhos, in Ferraz de Vasconcellos, São Paulo. Or rather, it that's what it *was*—until EDP joined forces with NGO Litro de Luz to change the lives of hundreds of families.

This project is based on creative solutions and low-cost technology involving inexpensive materials to create solar-powered street lights. The lampposts are made of PVC tubes fitted with solar panels, batteries, LED lamps, and plastic bottles—which makes them affordable and easy to replicate in other regions.

"I helped assemble and install the lampposts, which brought dignity, security, and quality of life to the favela," 33-year-old Carliane says with a sense of pride. She has been sharing a home with four other people for the past five years, since the favela was still called Boca do Sapó. "We even helped install the lampposts," confirms 26-year-old Pauliana, who has lived there for four years, in a home with six other people. "It was very rewarding to see people happy because the streets are brighter. Street lights bring a greater sense of security! It is much safer today for my children when they come back from school and can see the lights in the favela. I am so grateful!"

As we mentioned, things weren't always like this. "When I moved in, I had no contact with the neighbors. I would come home from work and go inside the house and only leave the next day to go to work. When I went out at night, I would sometimes prefer to return only the next morning. It was always very dark," says Carliane. "In addition to the darkness, there was the issue of the dogs. One neighbor even had to go to hospital because a dog ripped his leg open."

Until electricity was installed in the favela, everyone had a so-called *gato*, an unauthorized connection where it only had to rain to leave people without power, with mud everywhere, not knowing where they were stepping or what dangers lurked in the dark.

"EDP has brought a lot of security to the favela, especially when it comes to fires," says Carliane. Today, the installations are done properly and we can sleep at ease... Before, the way the *gatos* were done, we were always afraid the whole place would burst into flames."

"Now we have the Litro de Luz ambassadors here, and the challenge is keeping the street lights working and reaching the alleyways that are still dark. And EDP brought street lights and electrical installations that also helped a lot in terms of relationships between neighbors," says Pauliana. "It was a huge fire hazard. Sometimes the wrong wiring would burn down a house. Not anymore! Moving around withing the community has also improved a lot. There are even people making deliveries here now."

In addition to the partnership with Litro de Luz, EDP carries out other activities directly with the community—improving the electrical infrastructure of homes in the favela to combat energy poverty, strengthening public education, and generating work and income—with a view to ensuring the dignity and improved quality of life of its residents.





# A happier, more efficient home

**Vicência Silvério**, 86, is one of the beneficiaries of EDP's energy inclusion project in Portugal, which transforms the lives of those who live in old houses that lack security and energy efficiency. This type of project is also under way in Spain and Brazil.

Associação Mais Proximidade (AMP) applied for EDP's Energy Inclusion project in Portugal with the aim of improving the quality of life in the homes of some of the people it supports. The project has succeeded in transforming lives by offering energy-saving and efficiency solutions to low-income families and individuals.

Mrs. Silvério, an 86-year-old woman whom AMP has been helping for nine years, has seen the success of this partnership first hand. "In two days, my house became much safer," she says. Replacing an old water heater and gas cylinder—which were in an interior bathroom without ventilation—with a new water heater and electric stove may seem simple, but it is a crucial step towards safety.

According to Patrícia Silva, AMP's gerontologist and manager of this initiative, the scheme guarantees greater comfort and quality of life for the elderly in their own home, and "we even managed to replace Mrs. Silvério's old refrigerator with a more efficient one—and the electrical wiring was completely overhauled to fit her needs." Mrs. Silvério, who has lived in the heart of Mouraria, Lisbon, for more than six decades, could not have been happier with the upgrades: "There aren't wires all over the house anymore. Now, I have light switches at my height and several sockets that I didn't have before."

This is the testimonial of just one of the beneficiaries to whom Associação Mais Proximidade brought this EDP project. "We still have four more houses to upgrade," says Patrícia Silva.

For Beatriz Roque, a psychologist who accompanies Mrs. Silvério, it has been a real privilege to get in touch with the beneficiaries of this project: "Each moment is unique and I believe that AMP makes the world a little better every day, one smile at a time. Sitting down with each person, getting to know a little of their history and identity, makes me truly happy."



Vicência Silvério



Otilia Nhatumbo

# From cleaning assistant to customer manager

The inspiring story of **Otilia Nhatumbo**, in Mozambique, is a powerful reminder that with determination, dedication, and a company that believes in its employees' potential, the sky is the limit.

It was as a cleaning assistant at SolarWorks!—a company that sells decentralized solar energy solutions for homes and businesses in Mozambique and Malawi and one of EDP's investments in Africa—that Otilia Nhatumbo took the first steps in her career. She was 21 years old and had never worked in her life. But even without any experience, this young woman seized an opportunity that came her way and began to build the rest of her life story.

With a fighting spirit, Otilia took advantage of what SolarWorks! had to offer her. "I got the opportunity to be a store assistant, and after a while I applied for a job in the customer line," she recalls. It was at this moment that her ambition began to build and after a short time, she found herself leading a team. "It was a small team, but it has grown since. We now have roughly 30 people," she says. Currently, Otilia plays a role far beyond that of a customer service line supervisor; she manages the line that covers three key areas: customer service, collections, and helpdesk. It's been six years since she started at SolarWorks! and her journey is a real source of inspiration.

SolarWorks! is headquartered in Matola, Mozambique, and has several stores throughout the country. When she visits these stores, her co-workers ask for advice on how to achieve their goals. Otilia shares the message that believing in yourself, in what you do and your desired future trajectory, are the most important things in building a path to success: "The important thing is to focus on what we want to be and where we want to be in the future."

On the customer service line, Otilia has employees with stories similar to hers. "They also started out as cleaning assistants and thanks to the opportunities provided by SolarWorks! have become the best agents and employees in my department."

SolarWorks! plays a fundamental role in the professional development of many people in Mozambique. "Unlike a lot of companies, SolarWorks! is not based solely on previous experience. It provides opportunities for all people, regardless of their gender, age, or background." It's a company that believes in the potential and capacity for growth in each individual," she says.

# The guard who reinvented himself as a shoemaker

Thanks to a project supported by EDP's A2E Fund, **Bigirimana Emmanuel** was able to reinvent himself in Rwanda by making new, more affordable shoes for refugees.

This is a story about overcoming obstacles, in which energy played a crucial role. In 2016, a security guard by the name of Bigirimana Emmanuel fled political conflict in the world's poorest country, Burundi. His aim was to seek better living conditions but, he ended up in the Mahama refugee camp in eastern Rwanda. When he got there, he couldn't find a job or any other occupation. But he didn't give up. "One of my neighbors was a shoemaker and was moving to Kigali because of a job opportunity. I realized that I could learn to do his job. I started learning in 2018 and after three months, I was repairing shoes to a good standard," he recalls.

Despite all the setbacks, like not having enough capital to buy raw materials to make new shoes and the lack of electricity in the camp, Bigirimana persevered. He started to travel to communities where there was electricity, but the truth was that spending time traveling from his workshop to the other community to do small repair jobs that needed electricity wasn't going to be feasible.

The solution came through OffGridBox, a project supported by EDP's Access to Energy (A2E) Fund that provides electricity to refugee camps. "I realized it was a good opportunity. I approached them and they immediately allowed me to start working in the 'Box,' which is close to the biggest market in the refugee camp. It was an opportunity that brought me closer to my customers and I didn't have to waste time traveling to other communities for electricity."

The OffGridBox is a mobile and modular unit that supplies energy (through solar panels that are installed on the roof) and potable water (when integrated with a water purification system). It is also directly connected to nearby businesses to supply energy and serves as a station for regular mobile phone charging and rental of solar kits (consisting of light bulbs and a battery).

In Rwanda, six OffGridBoxes were installed in four refugee camps and a host community, allowing 12 local businesses to be connected to energy; distributing 900 solar kits and charging around 10,000 mobile phones each month.

Now, about two years after starting to work with OffGridBox, Bigirimana Emmanuel makes new shoes that are much more affordable for refugees, since the cost of doing business has decreased. "Before I started working with this system, I had a capital of RWF 180,000 (approximately €160). Now, I have RWF 450,000 [€400]. Making new shoes is very profitable."

The Burundian guard who reinvented himself as a shoemaker in Mahama now just wants electricity to transform more lives.

Saiba mais aqui: <http://www.offgridbox.com/>



Bigirimana Emmanuel



Foto Wayuu

# Respect the people of the forest

Engaging local communities and compensating for natural ecosystems, are key priorities whenever EDP launches a new project. The native **Wayuu People** of Colombia praise the way they were included in the process.

"It's the first time they've visited us and explained a project of this size," says Celestino García Uriana, a retired teacher who now works in agriculture and shepherding. Community leader, Celestino, is a Wayuu who has lived for more than three decades with the Paüsayuu of the Isijo'u territory, through marriage. A community that lives in one of the areas within the Macuira National Natural Park where EDPR will carry out the necessary environmental compensations for the construction of the Alpha (212 MW) and Beta (280 MW) wind farms.

Ancestrally inhabited by communities of the Wayuu ethnic group with traces of dry tropical forest, this area is a strategic ecosystem of great importance to Colombia due to the ecosystem services it provides. During the construction of these projects, in an area of 2,230 hectares, there will be certain impacts on the natural ecosystems, which have to be compensated with areas of equivalent environmental benefit.

EDP carried out a special action plan to involve local families and explain, especially to the children, the environmental compensation plan for the area. "I am very happy with this project," says Celestino. "I'm very grateful for the opportunity to be part of this initiative that makes children and parents happy."

Through various recreational activities and the delivery of biodegradable personal hygiene kits, the company encouraged the community to take part in the plan, which consists of positive initiatives for the conservation of natural ecosystems, ecological restoration of degraded ecosystems, and sustainable use of biodiversity, in accordance with the policies of the National Natural Parks of Colombia and with the participation of the Wayuu community.

This will allow for the preservation and embedding over time of six fundamental ecosystems in La Guajira, namely habitats for flora, fauna, microbiota, and communities; capture of greenhouse gases; supply of goods and natural resources; heat regulation; nutrient cycling; and water sources.

# Achieve big things, with the little things

The ENTAMA project empowers local entrepreneurs in rural areas.

The story of **Cristina Secades** reveals her love of the land, which resulted in a sustainable business and awards in Asturias, Spain—and where mini kiwis are the real stars.

Cristina Secades, a lover of nature with a degree in forestry, always had in mind that, sooner or later, the countryside would end up being her office. She always had the conviction that this would need to be done in the most respectful way possible for the environment. The words her parents uttered to her as a child many years ago as they picked apples in the orchard resonated with her as she grew up: “You know, Cris, if you take care of the earth, it will take care of you...”

While still working for others, she decided in 2016, to take the difficult step of restoring two small family farms in Gijón. She did this by starting from scratch, with no financial support; using only traditional methods and with just the help of her parents. “I started by introducing animals, growing table apples, and organic mini kiwi. Throughout this process, I also studied fruit growing, organic farming, and visited plantations—both here and abroad—while keeping in touch with producers and researchers in Portugal, Belgium, Poland, the United Kingdom, and the United States,” says the founder and owner of Kiwin Bio.

Today, Kiwin Bio is a successful farm of mini organic kiwi fruit that has already collected several national and international awards for its innovation. “We are really looking for and promoting sustainability. I always say that biological, ecological, green, whatever we want to call it, is more than a certification or a label. The concept goes beyond that. It has to do with agroecology; a way of working that encompasses an entire system and takes into account the entire life cycle of a product, including social and environmental aspects.”

The plantation is supported by its own resources, using the sun as a source of energy. A whole system that, together with the animals, completes the circle of life to make it as sustainable as possible. “A work philosophy that proves that another type of agriculture is viable, dignified, respectful of nature, ‘by and for the people.’ With the enthusiasm of those who believe, now more than ever, in the importance of healthy eating.”

The land that her great-grandmother worked so many times, where her father planted apple trees more than 40 years ago and where Cristina spent so many summers with her grandparents is now this project full of strength and enthusiasm, “a grain of sand to contribute to the reactivation of the Asturian countryside and with which I aspire to be part of the network of people who are committed to offering the best food from the heart.”

Despite their small size, mini kiwis contain five times more vitamin C than oranges. Just 100 grams cover almost 90% of a person’s daily requirements. With the scientific name *Actinidia arguta*, they contain over 20 essential nutrients and are also one of the highest sources of lutein. They have anti-tumor, anti-inflammatory, anti-diabetic, anti-dermatitis properties, low glycemic index, and contribute to protection against digestive diseases.

Entama was created in 2019 to boost the energy transition and promote the development and reindustrialization of local communities by supporting projects in territories where EDP has energy production centers or which are at risk of depopulation.





Denis

# Electrician and trans — with great pride

**Denis** has lived with prejudice in the job market all his life. EDP Brazil opened the door to a career that seemed forbidden to him. Now, society needs to do the rest.

Before entering the program at the School of Electricians for Trans People (Denis worked at a telemarketing company) the only place that really provides jobs for trans people and medical insurance. But this Brazilian professional, who was born in Bahia and came to São Paulo when he was only two years old, is now a happier person, doing what he really enjoys.

"This course made me realize how important energy is in people's lives. Our instructor said that with each service we would learn and observe people's happiness when we solved the problem, and that in the end, that would be priceless. Now, I see it every day," says Denis. And as that same instructor said, "you don't choose this area; it chooses you."

"In my personal life, it was a great gift because I had lost my mother and I was a little lost," says Denis. "On top of that, it's hard to get a job as a trans person. I had no prospects in the job market but EDP gave me a way to continue chasing my dreams."

One of the immediate changes brought about by this program was the fact that he was now able to help his sisters, and undergo medical treatment to continue his transition.

But there is still a lot of work to be done with regard to how society—and Brazilian society in particular—treats underrepresented groups, especially transgender people. "There are a lot of lies spread in the media and it confuses people. But with my experience within a cisgender space, I see that we also have to understand that not everyone will respect us or want to work with us. But that's ok, we're here to learn and evolve," he concedes.

Denis continues to face prejudice every day, but dismisses the attacks. "What matters is that you go after your dreams without needing to victimize yourself or attack other people, even though bad people are just like that because they have nothing else to offer."

As the electrician states, this opportunity is a way "to show that it doesn't matter if you are trans, gay, or an alien. We just need an opportunity to show that we can work and be great professionals in any area."

"EDP was a company that faced the world to help people like me and that inspires other companies. EDP gave me the opportunity and I am growing and improving every day," says Denis. "I'm a professional and that's what matters. It makes me get up and go to work every day with joy, and strive to do what is right."

# A new future for Sines

Following its commitment to decarbonization, EDP has decided to close the Sines power plant, in Portugal, after 35 years of operation. but we didn't leave anyone behind. **Vanessa Lima** tells us how Futuro Ativo Sines was born.

The Local Office for Social Referral (GLES) is one of the outreaches of the Futuro Ativo Sines (FAS) project, promoted by EDP. Through psychosocial support and employment, and professional training, it aims to have a direct impact on the lives of former workers at the Sines Power Plant and their families.

Since February 2021 "GLES has provided support to more than 100 people, offering different forms of assistance, from office consultancy to psychological support and through the social fund," explains Vanessa Lima, a former worker at the plant and GLES employee. "It is important to point out that the impact goes beyond the direct beneficiaries, extending to institutions in the municipalities of Sines and Santiago do Cacém and benefiting a significant number of people," she adds.

Among the life stories she witnessed, the social aspect was the one that impacted her the most. A particularly striking case was that of a mother who was a victim of domestic violence and whose financial independence was essential to ensure a secure future for her children. "Through professional guidance and determination, she was able to find a job in the area of health and safety, opening up new horizons for her family."

Another challenging case involved an Angolan man, who was struggling to find housing for his family, including his pregnant wife and young child. The struggle to find a home reflects the ongoing housing crisis in the region, where the shortage of affordable housing is a significant challenge. GLES's persistence and dedication resulted in the acquisition of more affordable housing, providing some light relief until better opportunities arose.

Participating in GLES and in the FAS Project "is not an easy task," according to Vanessa Lima. Dealing with the emotions and difficulties of former colleagues at the Power Station, as well as the anguish of people seeking help, often imposed emotional and practical challenges on her. "Many times I would finish my work at the office and go home to think about ways in which I could improve and help more. I was often 'vilified,' as I was the person taking the lead at GLES, because they did not realize that some of the support they requested went beyond our office's capabilities. However, the number of times we were able to support those who came to us was far greater, and that is very rewarding."

For Vanessa Lima, being part of GLES represents an opportunity to continue her involvement with the community after previously working for eight years at the Sines Thermoelectric Power Plant. "It was a mix of emotions. I was sad because of the decommissioning of the power plant and for leaving the family that we had there, but happy to have the opportunity to remain connected to the plant and to the people." I'm grateful to be a part of GLES. "I cannot thank EDP enough for the opportunity it gave me to be part of FAS. Despite all the difficulties, and being the first project of this type, it is now recognized worldwide."





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A unique  
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JOANA  
VASCONCELOS

Her career began with the EDP Foundation's New Artists Award, in 2000. Today, she is known for her monumental sculptures and one of the most respected figures on the international contemporary art scene. In this exclusive interview, Joana Vasconcelos explains the secret of her success and what we can expect from her new exhibition at the MAAT.

Vasconcelos

© Artindo Camacho for Atelier Joana Vasconcelos





**What can we expect from this “Plug-In” exhibition at the MAAT?**

“Plug-In” brings together pieces from different periods. It’s not a chronological or anthological exhibition. Instead, as the name suggests, it relates to the idea of electricity, with several pieces that have never been shown in Portugal before. These pieces are a coming together of craft and technology and show how these components can dialogue and create works of art. I often mix artisanal, handmade stuff with technological elements, such as electricity. All these pieces include electricity in some way. They just need to be plugged in.

**You are famous for the size of your sculptures and installations. What is the design process behind such large-scale projects?**

I work both in monumental sculpture and on more conventionally sized pieces. With monumental sculpture, it is always about space, whether indoors or outdoors. Outdoors, it is considered public art. Indoors, it is called monumental sculpture because it relates to the large spaces left by architecture. Architects often design buildings and leave huge spaces that are then difficult to fill with furniture. That is where monumental sculpture steps in, opening up a dialogue with the architecture to create a new identity for that space.

On the other hand, my pieces are often purposefully made for places and site-specific. And that dialogue is what is really interesting: instead of the piece being imposed on the space or filling the void, there is a relationship that is formed between the piece and the space.

**Do you get a lot of requests for site-specific pieces from around the world?**

Yes. For example, the *Tree of Life* (which is being shown in Portugal for the first time) is a site-specific design for the Sainte-Chapelle, a 13th-century

“I like it when people take one look and go, ‘Wow!’ It is magical. At that moment, it is as if the doors have opened to a new dimension.”

building that has undergone a number of transformations and whose ceiling vaults are 20 meters high. These are places with a very strong identity, so it’s important to ask: what am I going to create here? You have to create dialogue. You have to understand the site and its history, what it represented in the past, working in the present and creating a different perspective for the future.

**What is the message you want to convey with your work?**

There is always a message of hope and peace. I think it’s possible to find a balance between the space and the sculpture and create an idea of bliss. I like it when people take one look and go, “Wow!” It is magical. At that moment, it is as if the doors have opened to a new dimension, to a future that we hope will be one of beauty, of harmony, where things are connected to one another. Art can create that harmony.

**What does a normal day at your studio look like?**

I usually get to the studio at 8–8:30 a.m. Some days I do yoga, others meditation. After that, I check my schedule, I work with my team on the various projects, I work with the architecture, communications, engineering, or production teams, I have a few more meetings in between... And I doodle a lot to get through all the meetings (laughs).

**Not exactly what people imagine when they think about the life of an artist...**

Yeah, that stereotype of the despondent artist, working alone in an attic. I used to be that artist, early on, when I had my studio in Bairro da Boavista. There is that romantic idea of the troubled, psychologically tortured artist doing things all alone. Here, we are the opposite of that. We actually have a wellness program for everyone and we do our work as a team.

**What does that wellness program consist of?**

We have three dimensions. One is physical, which is the company: Unidade Infinita. One is intellectual, which is the Joana Vasconcelos Foundation. And then there is the spiritual dimension, which is Corpo Infinito, the area of our studio that deals with wellness and includes activities like yoga classes, guided meditation, psychotherapy, coaching sessions, astrology, radiesthesia...

At the Foundation, our program is more focused on social issues, supporting the arts, and creating opportunities for young artists, as well as supporting various institutions that help children, refugees, and people with intellectual disabilities. And Unidade Infinita, of course, is the company that works to produce the art pieces.

Basically, those are the three components: the body, the mind, and the spirit.

**What role does art play in society today?**

Art has always been part of the human need for expression and reflection on the times in which we live. Artists play a role that is to reflect on the times in which we live and, from our vantage point, create a new dimension for everyone else to imagine, “So how are we going to build the future?”

**Does technology play an important role in art?**

Of course. Technology is an integral part of our society, very important in the development and creation of that future. As part of that fabric that reflects what is happening around us, we use technology to create our dimension. Many of our pieces are handcrafted, but there is a lot of technology behind them. And that is the paradox. Some people can see the technology, while others who can only see the craft. In reality, however, we have as much technology as craft. ▶



“Having different opinions is invaluable for continuing to generate dialogue. I may not agree sometimes, but people are entitled to their opinion — just as I am entitled to mine.”

Our society is like that too. It is very technological, but there are still handcrafted and handmade things.

**Beyond art, what are your interests and passions?**

I love practicing karate and I love doing yoga and the other activities we have here. I don't have any hobbies, because in a way my life and my work are one and the same... It is a unique take on life, a little different from that of people who have a framework that is given to them by society and who live on that framework. In my case, I have been building that framework every day, starting from scratch. In that sense, every day is a death and every day is a rebirth. Every day is an opportunity to do things differently, to try to do things better—or at least not to make the same mistakes as the day before.

**How do you handle criticism and opinions about your work?**

I handle it well, in the sense that it is normal to have different opinions. Not all people are on the same wavelength. I often say that some people are on AM, others are on FM. Having different opinions is invaluable for continuing to generate dialogue. I may not agree sometimes, but people are entitled to their opinion — just as I am entitled to mine. They just don't have a right to be mean. Having a well-founded opinion is one thing, but malice, idiocy, or ignorance is quite another. That really bothers me.

**You were the very first winner of the EDP Foundation's New Artists Award in 2000. How did this award boost your career?**

It made a huge difference. To this day, I still remember receiving the news from João Pinharanda, the current director of the MAAT and creator of the award. I burst out laughing and thought he was messing with me. I don't remember how much was the prize, but I do know that I bought a Sony HandyCam and that I used it on the project where I went to Fátima ([www.fatimashop](http://www.fatimashop), 2002). And there you have it: I spent the money on technology. It was good for a few other things, but mostly for the recognition I got from a community I admire, the artistic community.

It was also very important, because I was able to have my first exhibition, at the old Marcenaria, as well as my first catalog, *Medley*. It enabled me to sort myself out and create the start of a proper career. It was very important for me to show who I was.

**What are your tips for young artists who are looking to launch their careers?**

The only tip I could offer a young artist is the one I used myself. First, I have always worked hard. Second, I never got caught up in the trappings of life, like alcohol, drugs, parties, the dazzle of materialism. I have managed to stay focused and on track throughout my life. There is no story for you to draw on, because you cannot emulate someone else's path. Because no matter who you try to emulate, they are not you. Every artist has to build his or her own identity. ▶

© Afíndio Cernachio for Atelier Joana Vasconcelos

“I started to make friends abroad and meet people who were more attuned to my wavelength, and that’s how I survived. It was my lifeline.”

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The artistic world has different wavelengths, and I wasn’t tuned into the wavelength that existed in Portugal. When I started to go elsewhere, I realized that there were other wavelengths that I was more attuned to. I started to make friends abroad and meet people who were more attuned to my wavelength, and that’s how I survived. It was my lifeline.

**Basically, your tip is to “find your own wavelength”?**

Yes. There is always someone in another part of the world who is attuned to you. That was a major breakthrough for me. I was so happy when I found people out there who were on the same wavelength as me! From that point on, it was a gradual process. I created a network that is now quite established and important and that, when it is activated, can bring a lot of visibility, clout, recognition, and financial resources.

**Have you always had that ambition to become an internationally recognized artist?**

No, not at all. What you are saying implies a project, a manipulation of reality in order to achieve certain goals — and it is something that is part of the local wavelength, which is “you do this to achieve that.” Well, there is no such thing. You can’t force things. Museums also have a wavelength and choose people who are on the same wavelength. When you are on the wavelength of places like Versailles, the Guggenheim, or Venice, this is a very distinct wavelength. Now we are showing at the Uffizi Galleries in Florence, which is like nothing else in the world. How did that happen? I have no idea! What I do know is that I am on the same wavelength as them. It is a very special place. //





Drag Race, 2023 © Atelier Joana Vasconcelos

## What you can see at the MAAT

The new season at the MAAT kicks off with the opening of Joana Vasconcelos' solo exhibition. It spans two different locations and two events designed to celebrate the seventh anniversary of the Museum of Art, Architecture and Technology in Lisbon. September 29 saw the official opening of the exhibition that brings together some of the iconic pieces produced by the artist since 2000 with a direct connection to the world of electricity. On October 5, was time for official unveiling of the Tree of Life (2023), originally created as part of the France-Portugal 2022 Season and now adapted to the Generator Room at Central Tejo. "Plug-In" brings together different pieces and presents to the world the never before seen *Drag Race* (2023), here in dialogue with *War Games* (2011) —

two conventional vehicles transformed into works of art: the first, exuberantly decorated with gilded carvings and feathers; the second, covered with toy rifles and packed with stuffed toys. Two pieces that were exhibited at the Guggenheim Bilbao will be presented in Lisbon for the first time: the mirror mask named *I'm Your Mirror* (2019) and the gigantic engagement ring *Solitaire* (2018). From Asia comes the tentacular textile sculpture *Valkyrie Octopus*, created in 2015 for the MGM Macau. In Europe for the first time, it now hangs above the Oval Room at the MAAT. These recent works by Joana Vasconcelos are joined by several others, including *Strangers in the Night* (2000). After a two-year lockdown imposed on the art world by the pandemic, 2023 is

proving to be a magical year for Joana Vasconcelos; in February, she caught the world's attention with *Valkyrie Miss Dior* created in partnership with Dior's creative director Maria Grazia Chiuri for her Fall 2023 runway show; in April, she unveiled a 13-meter *Tree of Life* at the Sainte-Chapelle de Vincennes in Paris; in June, her *Wedding Cake* at Waddesdon Manor was acknowledged as a "masterpiece" by The Guardian and she was part of the group of 200 artists from around the world received by Pope Francis at the Vatican; in July, she cemented her reputation in China with a 35-piece solo show at Tang Contemporary Art, in Beijing; and October will see her exhibit at one of the most prestigious venues in fine arts — the Uffizi Galleries — alongside Caravaggio, Botticelli, da Vinci, and other giants of the art world.

Arbre de Vie, 2023 © Didier Plovy | Cortesia Centre des Monuments Nationaux



Valkyrie Octopus, 2015 © Luis Vasconcelos



inspire.

Electrical grid digitalization

# The silent revolution

The electricity sector is undergoing a massive transformation, one that is happening at breakneck speed and is barely visible. At EDP, we are at the forefront of this revolution. By 2026, we will have invested €3.2 billion to strengthen the digitalization, intelligence, resilience, and efficiency of our infrastructure.

# h

ave you ever wondered how electricity gets to your home when you flip a switch, charge an electric vehicle, or use water from your water heater? Simple things like this, and so many others, are almost taken for granted. But getting everything to work perfectly is a long and complex process.

The magic happens in a hydroelectric power plant, wind farm, or solar installation, where water, wind, and sun are transformed into electricity. Once generated, the electricity sets off on a long journey along transmission lines, over mountains and valleys, flowing through towers to reach all the places where it is needed. But when electricity arrives in the city, it is not the end of the line: it is channeled into substations where it is transformed, reducing its intensity and making it safer to use in our homes. It then makes its way through power lines, past electricity meters that record how much power we use, and finally on to consumers.

Now imagine all this multiplied by millions of people. The process seems endless! Just to give you an idea, the EDP Group's low-, medium- and high-voltage power lines in Portugal, Spain, and Brazil stretch for 381,000 km, almost long enough to reach the moon!

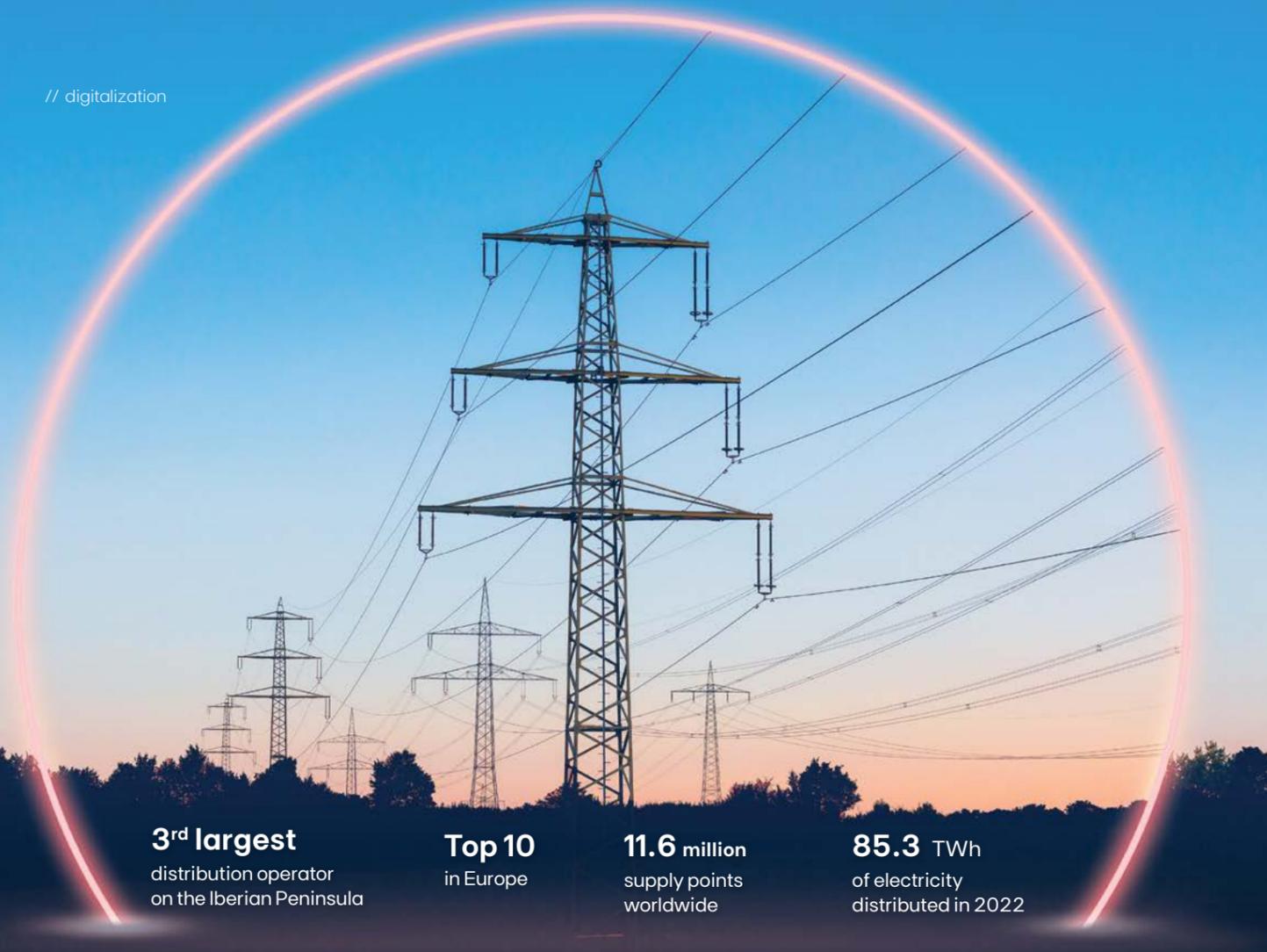


The challenges facing electricity transmission and distribution grids—especially with a view to increasing their efficiency and preparing them for a more electrified world with increasingly distributed resources—are to strengthen and modernize their infrastructure. “Digitalization plays a key role in supporting this transition by automating countless processes and increasing network intelligence,” says José Ferrari Careto, head of the Grids Platform.

To understand the significance of the digitalization of power grids, it is important to take a quick trip down memory lane. Traditionally, electricity was generated centrally and distributed unidirectionally. The system worked, but it was limited in terms of efficiency and adaptability. The digitalization of power grids represents the transition to a smarter and more adaptable system. With increasingly smart power grids, companies such as E-REDES Portugal, E-REDES España, and EDP Brasil take on a central role in today's energy transition, connecting traditional consumers, self-consumers, producers, aggregators, energy storage systems, flexibility services' supply and demand, and electric vehicles. A complex and dynamic ecosystem with different factors and needs for electricity and information. The ▶

“The EDP Group’s grid operators have been making significant investments in their digitalization, so as to improve the quality of the service they provide to their customers.”

**José Ferrari Careto,**  
head of the Grids Platform



**3<sup>rd</sup> largest**  
distribution operator  
on the Iberian Peninsula

**Top 10**  
in Europe

**11.6 million**  
supply points  
worldwide

**85.3 TWh**  
of electricity  
distributed in 2022

distribution system operator (DSO) therefore breaks with the classic model of managing power grids to also become a manager of information networks.

This is a path that the EDP Group has been on for the last few years. “The EDP Group’s grid operators have been making significant investments in their digitalization, so as to improve the quality of the service we provide to our customers. “Having an increasingly smart power grid, complete with better information, allows us to make the best business decisions, whether in the more operational aspects of managing distributed energy or optimizing investment in the grid, or in aspects more closely related to responding to the requests and requirements of our stakeholders,” says José Ferrari Careto. “Having the ability to manage all this digital data—and distribute it throughout the sector’s value chain (and beyond)—will allow companies to adopt new business models, such as energy communities or potential flexibility providers,” he adds.

**80% of electricity from renewable sources**

Portugal, for example, is expected to produce 80% of its electricity from renewable sources by 2026, a profound transformation that will result in a highly decarbonized, decentralized, and digitalized electricity system, supported by smart grids and a new electricity distribution paradigm. That is why digitalization is so important. The proliferation of smart grids, capable of ensuring bidirectional power and data flows, gives the DSO the role of a data hub.

It is this data that allows for the real-time monitoring, control, and dynamic management of energy—with a view to optimizing energy flows, increasing integration of decentralized, variable renewable production, and active consumer participation. All without ever compromising the quality and reliability of the electricity supply. To achieve this, “we continue to invest in intelligence, resilience, automation and sensorization, new planning and management tools, and data sharing with multiple

**Power grids**

~232,000 km	~53,000 km	~96,000 km
<b>Portugal</b>	<b>Spain</b>	<b>Brazil</b>

stakeholders,” says José Ferrari Careto. “The grids of the future are going to be an ongoing challenge until we achieve a full and just energy transition.”

**Distributed generation**

Digitalization encourages distributed generation, and that energy can be shared and managed intelligently, reducing dependence on centralized sources. According to José Ferrari Careto, one of the main challenges facing the EDP Group is the issue of distributed generation of renewable power. In Portugal, for example, 75% to 80% of distributed renewables are connected to the distribution grids. “This means that we have to keep up with the growth of distributed generation and accommodate it in our grids, because wind farms and solar power plants feed the electricity they produce directly into the distribution system. This is a major challenge from a technical and capacity point of view, especially compared to the model that has always been in place.”

**Smart meters**

One of the most visible elements of digitalization is the rollout of smart meters. They enable the leveraging of two improvement factors: give customers more information so they can better manage their consumption, take energy efficiency measures, or consider the best investment in renewable energies; and increase the efficiency of the management and service provided by the distribution system, as they make it possible to collect more and better information on consumption and production, automate processes, and improve grid planning and management.

For José Ferrari Careto, this is the most structural transformation of distribution systems. In Spain, 100% of the EDP Group’s electricity meters are smart meters. In Portugal, there are more than 5 million—with the goal of reaching 100% of delivery points by the end of 2024. In Brazil, around 500,000 smart meters have already been installed. “It is a very significant change, where the customer knows every 15 minutes if they are consuming more or less and can manage their activity based on it.”

**Digital transformation**

- **Modernization of the grid’s metering assets.** In Portugal, this focuses on the replacement of 6 million electricity meters. The operation has already resulted in the installation of more than 5 million smart meters, accounting for approximately 81% of customers.
- **Digitalization of the grid’s assets.** This allows more than 65% of operations to be carried out remotely, eliminating the need to be physically present for meter readings, disconnections, reconnections, change of power level, etc. It makes the process more convenient for customers and significantly reduces the carbon footprint, since the crews don’t need to visit the site. This process also makes it possible to provide granular data on consumption—without which it is not possible to provide new services like self-consumption, electric mobility, and energy efficiency.
- **Use of process mining technologies as the basis for continuous improvement.** It detects constraints and inefficiencies in the company’s main operational processes. Standardized processes in support systems with continuous, bi-directional flows throughout the ecosystem have achieved a digitalization rate of around 93%.
- **End-to-end digitalization of the entire on-site experience of internal and external technicians.** This included planning the work, optimizing routes, ordering personal protective equipment, and carrying out the operation on site using mobile equipment with AR/VR services and remote specialist assistance. The Field Remote Support project won Best Energy & Utilities Project at the 2020 Portugal Digital Awards and the Exceed route optimization project won the Excellence in Field Services award at the 2022 Iberian Salesforce Summit.
- **Use of drones.** This equipment (GridDrone) enables us to inspect power lines and grid infrastructures and automatically process videos to detect problems and alert technicians.

From the point of view of grid operation, smart meters also make it possible for service order operations to be carried out remotely. “In Portugal, 65% of work orders are already carried out remotely. In Spain, all work orders are done remotely,” he says. “From an environmental point of view, the impact of our activity, in terms of carbon footprint, has been significantly reduced, since the crews don’t need to visit the site.”

### Electric mobility

Electric vehicles are transforming the way we travel and live. But this too comes with its own set of challenges, especially when it comes to charging stations, which are connected to the grid and end up being very demanding points of consumption. From a development and planning perspective, when there is a charging station connected to the grid—especially a high-speed one—it is the equivalent of powering a 10 or 12-story building. On the other hand, as technology evolves, vehicles could themselves deliver energy to buildings and the grid, further increasing their benefits and potential uses.

### Communication networks

The digitalization of the grid relies heavily on robust communication networks. This includes the use of technologies such as the internet of things (IoT) to connect meters and devices throughout the grid, enabling instant, two-way communication. This is where the Grids Platform, along with the Digital Global Unit (DGU), has been doing a great deal of work. In terms of the high- and medium-voltage grids, the entire operation is carried out using digital information acquired in real time. Work is also currently underway to upgrade grid operation systems to an advanced distribution management system (ADMS), boosting visibility over low voltage and maximizing the benefits of smart grids.

ADMS is a grids platform project that is already in use in Spain, is currently being implemented in Portugal, and will also be operational in Brazil by the end of the year. It provides an integrated view of the state of the grid and the ability to act on the grid remotely. This platform integration has already brought savings of about €4.5 million.

### New developments in low voltage

When it comes to low voltage (LV), the EDP Group has tens of thousands of (slightly less) smart substations in place. “In Portugal alone, we have around 70,000 substations,” he says. Still, the group wants to delve deeper into the LV grid. “We have an interesting initiative underway, called Info Assets. It allows us to use artificial intelligence to gain more knowledge based on images collected from Google Street View,” explains José Ferrari Careto. In other words, by combining Street View images with satellite information and data gathered on the ground, the company is able to obtain more information about the status of the grid. This means that when an intervention is required, there is no need to start by sending a team out.

Another area where the EDP Group is seeking to establish coordination between Portugal and Spain concerns another project: LVControl. It is an advanced system with the potential to revolutionize LV grid management and monitoring. “It is an initiative that started in Spain. But following this Grids Platform model, where we try to have cross-pollination of initiatives, it has also been adopted in Portugal.”

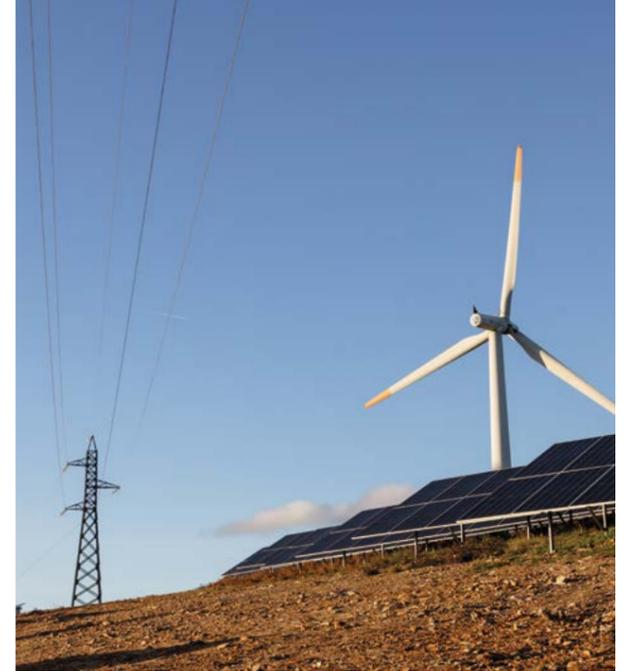
### Energy storage

The ability to store energy is also becoming a crucial aspect of digital electricity grids. Large-scale home storage batteries strike a balance between supply and demand, making the grid more resilient. This is the reality that is beginning to take shape on the side of the distribution system operators—and one which the EDP Group is following very closely, particularly in Portugal, with regard to flexibility.

Grids have traditionally been dimensioned for peak conditions, with investments directed toward assets such as transformer stations and an electrical substations. But with grid flexibility, those investments are no longer vital.

It was in this context that, at the end of 2022, E-REDES Portugal launched FIRMe. The project aims to adapt to flexibility requirements and test the market by raising awareness among stakeholders (flexibility service providers), encouraging them to participate in this new local flexibility market model. “This allows someone to offer storage services where energy is released when it is needed, without having to build a substation,” explains José Ferrari Careto.

Flexibility will play a key role in this process, highlighting the importance of the e-platforms provided by E-REDES—a



In Portugal, 75% to 80% of distributed renewables are connected to the distribution grids

kind of marketplace “where we share our needs and the market responds. We have eight opportunities at the moment. The auction is underway and will end around the middle of the month.”

It may take some time, but we are heading toward an internet of energy, where everything will be connected and just one click away. There is no shortage of projects at E-REDES Portugal, E-REDES España, and EDP Brasil—many of which have earned national and international recognition.

The digitalization of power grids is a silent transformation that will shape our energy future. It is a step toward a smarter, more efficient, and more environmentally sustainable grid. As this revolution progresses, we can look forward to a more connected, efficient, and energy-conscious world, where electricity continues to light up the world—but in a way that is smarter than ever before. //



EV charging station

# SPOT

## Robot arrives at power plants in Spain

EDP Spain goes one step further in its commitment to innovation and successfully performs the first autonomous navigation test with a dynamic robot in a power generation plant. It is the first time this technology has been tested in a Spanish electricity generation plant.

It weighs barely 32 kilograms. Driven by its four legs, it can achieve speeds of up to 1,6 meters per second while dodging unforeseen obstacles and overcoming gaps of up to 30 cm of height and slopes of up to 30 degrees. It is called SPOT and it could be the perfect 'colleague' for EDP workers in hydroelectric power plants such as Tanes (Asturias), where the dynamic robot from Boston Dynamics has already successfully overcome the autonomous navigation test along with the Asturian company Alisys.

The robot has been able to navigate the different plants of the underground plant, going up and down the stairs and stopping at certain points to carry out an inspection or take a reading and even avoiding obstacles. This is only the first step in the Hidro project, financed by the government of the Principado de Asturias through the Sekuens agency. This project aims to investigate potential of dynamic robots, which are inspired by the biomechanics of quadrupedal animals, for maintenance operations in power plants.

"At EDP we are certain that robotics will play a key role in the future operation and maintenance of our plants", says Enrique Menéndez, Innovation Projects Manager at EDP Spain. These robots can work in hard-to-reach places and can move in harsh, rough, complex and variable environments, such as stairs, ramps or rocky terrain. They are also designed to return to their original state after a fall or incident.

For this reason, Menéndez adds, these robots are set to become "a work tool which will make easier our colleagues' life and work, as they will help improve efficiency and operation, even carrying out tasks that involve a certain amount of risk". The robots will also "allow us to have eyes on each of the plants".

These devices will be able to facilitate and help people to carry out monotonous and dangerous operations

Eyes, yes, because SPOT has a 360° range of vision and performance thanks to its five stereo cameras that provide audio and video. As well as two actuators on both sides of the hip and one actuator for each knee that provide 12 degrees of freedom of movement. It is powered by interchangeable 90-minute batteries and has a charging station where it can be recharged autonomously. ▶



// robots

In the words of Emilio Fernández, Director of Hydroelectric Power Plants and Energy Dispatch at EDP Spain, “this new partner will represent a further step in the digitalisation and automation of the operation and maintenance tasks of hydroelectric power plants, helping workers to carry out these tasks both at the plants themselves and at the dams”. Work is currently underway to enable SPOT to make daily operating rounds at the power plant, taking readings and performing routine checks, either accompanying the manager or autonomously, while the responsible worker undertakes other, more value-added tasks. Since there are different types of meters, providing the robot with the necessary intelligence to read each of them is a highly complex task.



### A modular robot to monitor the Tanos substation

This project is another step forward in EDP's commitment to innovation in its quest to improve the operation, availability and efficiency of any type of installation. In fact, says Enrique Menéndez, “from the Innovation department we are working on aerial, terrestrial and underwater robotics projects for all the company's business units: hydroelectric generation, thermal generation, distribution and even for EDP Renewables colleagues”. A good example of this is the use of a modular robot developed by the Valencian company Robotnik to carry out supervision work at the Tanos substation in Torrelavega (Cantabria).

In addition, it will be assessed whether the robot would be able to advance tasks that are to be carried out by the guard or even avoid the deployment of the on-call team. For example, whether the robot itself would be able to restart the plant in the event that one of the groups is triggered and the on-call team is on duty at another plant. If it were possible to provide the robot with this functionality, according to the Innovation department, “delays in restarting the centre would be avoided and the efficiency of the service would be improved”.

Eduardo Gómez de Tostón, CEO of Alisys, is confident that these devices “will be able to facilitate and help people to carry out monotonous and dangerous operations”. “We are positive that energy companies like EDP will use them to improve plant operations, monitoring and operation.

“EDP is a company renowned for its innovation, and we will continue to research and test technologies that can add value”, emphasises Pablo Fernández, director of the Aboño power plant. Both there and at the Tanes plant itself, they have already experimented with another machine, in this case the GHOST model, known for its use in military operations. These new companions, says Enrique Menéndez, are destined to be like the watchdog and the shepherd: “They do different jobs and when they are together, they complement each other to perform them even better”. //

