

edpon

February 2023 | No. 65

the sun rises in the
east

edpon

EDPON IS A QUARTERLY MAGAZINE
Owned by EDP – Energias de Portugal, SA
Av. 24 de Julho, 12, Torre Poente, Piso 5
1249-300 Lisbon, Portugal
Tel.: 210 012 680 Fax: 210 012 910
Editor-in-chief: Rui Cabrita



EDP COORDINATOR Raquel Almeida Correia
EDITOR Eduardo Marino
WRITER Joana Peres
ARTWORK Maria Conceição
PHOTOGRAPHY Hugo Gamboa, João Reis, Paulo Coelho,
Nuno Cera, iStock, Unsplash, Scopia
PROOFREADER Ana Godinho

One company. One new global magazine.

This issue of edpON magazine marks a new stage in the life of this project, which has closely followed the growth of EDP since its launch in 2007. In addition to the new layout which combines more in-depth perspectives of our business and organization and a greater emphasis on visual representation, our new magazine is now a reflection of EDP's global presence.

As you explore the magazine four new sections – know, act, explore and inspire - you will discover what we are doing in the markets where we now operate including our key innovative projects and inspiring stories on how our people are positively shaping EDP around the globe.

One exciting example is the Group's expansion into the Asia-Pacific (APAC) region through the acquisition of Sunseap — a Singapore-based hub that is successfully bringing together EDP's global leadership in renewable energy in that region with local insight and expertise. This is the main story of this first edition, in which we present the key projects and growth plans for EDP in APAC as well as the teams behind this strategy.

This issue will also cover how EDP is changing the lives of thousands of people in Africa through solar energy projects under our Access to Energy program, how EDP Brasil has produced its first green hydrogen molecule, and how workplace ethics is seen under the eye of an international expert.

I am pleased to invite you to explore these and many other stories that inspire us every day in the next pages of our revamped magazine.

See you soon.

“Our new magazine is now a reflection of EDP's global presence”



by Miguel Stilwell d'Andrade
CEO, EDP Group

table of contents

// know



EDP is number 1 in the Dow Jones Sustainability World Index.

The company's best practices have again earned international recognition.

■ p.10



Grids Platform.

Over the last year and a half, the EDP Grids Platform has stepped up collaboration between the three countries: Brazil, Portugal, and Spain. The Gap Zero project is a huge success.

■ p.16

// act



EDP in the APAC region.

The Asia-Pacific region boasts the largest renewable energy growth opportunities.

■ p.18



Interview with Pedro Vasconcelos.

The COO for Asia-Pacific at EDPR explains the importance of being in the market that generates more than half of the world's electricity.

■ p.22



Emblematic APAC projects.

Learn more about some of the projects that EDP is developing on land, sea, and air.

■ p.30

// explore



Mind Your Mind.

Mental health matters at EDP. For the third year running, the company has set in motion the Mind Your Mind campaign.

■ p.46



The transformation of Sines on display at the MAAT museum.

The shots that appear in the "Distant Lights" exhibition were captured by Nuno Cera in 2022.

■ p.60

// inspire



Mozambique, the power of the sun.

EDP supports innovative and sustainable projects in developing countries through its Access to Energy (A2E) initiative.

■ p.68



First green hydrogen molecule.

EDP Brazil produced EDP's first H2V molecule at its new generation unit in São Gonçalo do Amarante, Ceará.

■ p.88



know.

EDPR NA builds wind farm in Indiana

With a capacity of 202 MW, the Indiana Crossroads II wind farm, located in White County, Indiana, is expected to be operational in 2023 and generate enough electricity to supply more than 54,000 homes. EDPR NA is the largest wind power generation operator in the state.

EDP REDES España: world leader in ESG

EDP REDES España ranked first in the electricity distribution sector, with a score of 99.6 points out of 100, in the latest Global Real Estate Sustainability Benchmark (GRESB). It achieved this position in the ranking by being the electricity distribution company that best integrates environmental, social and governance (ESG) criteria into its strategy.

New wind farm in Poland

EDP Renewables has inaugurated yet another wind farm in Poland. Located in Budzyń, in the west of Poland, it boasts a total capacity of 70 MW and will generate enough electricity to supply more than 85,000 households. This facility is EDPR's third investment in the Greater Poland Voivodeship, following the wind farms in Margonin (120 MW) and Pawłowo-Gołańcz (80 MW). Collectively, they deliver a total capacity of 270 MW.

EDP Renewables consolidates European presence

Kronos, a company in which EDP Renewables has acquired a 70% stake, is now part of the EDP Group's development strategy for solar photovoltaics. Founded in 2009, Kronos has a portfolio of 9.4 GW (7.5 GWac), with projects in different stages of development in Germany (4.5 GW), France (2.7 GW), the Netherlands (1.2 GW), and the UK (0.9 GW). Out of the combined 9.4 GW in development, 0.2 GW are ready to start construction.

Peixe Angical and Lajeado: the best in Brazil

Peixe Angical HPP and Lajeado HPP, both located in the state of Tocantins, are the best hydroelectric power plants in Brazil. That was the conclusion of the 2022 Inspection Campaign Report on Regulatory Self-Assessment and Operational Performance (DARDO) of Hydroelectric Power Plants (HPPs) with Centralized Dispatch by the National Electric System Operator (ONS). This report, published by the Brazilian National Electric Power Agency (ANEEL), assessed 148 power plants.

Largest distributed solar power contract in a single country

Verallia, a European leader in the production of glass containers for food and beverages, has chosen EDP Comercial to install five photovoltaic power plants to supply renewable electricity to its production units in Italy. The five plants will have a total installed capacity of 15 MWp, which makes this the largest contract announced by EDP in a single country for the installation of solar power plants.

Another wind farm in Italy

The Craco e Stigliano wind farm boasts 10 turbines, each with a capacity of 3.5 MW, for a total of 35 MW. It could potentially generate 79 GWh/year, preventing 37,250 metric tons of CO₂ emissions, and provide power to 26,280 households. In addition to the wind farm, EDP Renewables has also built the grid connection infrastructure. This new project brings EDPR's generation capacity in Italy to a total of 463 MW.



EDP is again
number one in
the world in the
**Dow Jones
Sustainability Index**

01

The best practices for sustainability have once again earned EDP recognition in the S&P Dow Jones Sustainability Index (DJSI). The company retained the top spot among the 180 integrated utilities from around the globe that were evaluated. With an overall score of 90 points (out of 100) — the second best since it joined this global benchmark index and well above the industry average of 50 points — EDP is also the only Portuguese company listed on the DJSI for 15 consecutive years. The ESG dimensions that contributed most to this performance included Governance & Economics, where the company received top scores in four of the nine criteria. The innovation management criteria was particularly remarkable, with innovative projects that drive the energy transition — like the floating solar power plant in the Alqueva — playing a decisive role. In the Environmental dimension, the transportation and

distribution segment saw the strongest improvement (a 23-point increase). In the Social dimension, it was prevention, safety, and health at work (with a 10-point increase, one of the most impressive positive changes year-on-year) and management of customer relations (with an 11-point increase) that stood out. Out of a total of 27 criteria, EDP achieved the maximum score of 100 points in eight: materiality, influence on public policies, innovation management, environmental reporting, social reporting, citizenship/philanthropy, water-related risks, and market opportunities. Since 2008, when it was first included in the DJSI World and DJSI Europe, EDP has made significant gains on that initial score of 75 points. In the last 15 years, the company placed in the top two positions in its segment all but twice. This recognition reflects the strength of a strategy focused on decarbonization, the development of renewable energy, and the promotion of a corporate culture model based on sustainability and positive social impact.

02

Best score ever at the WBCSD

The 2021 Sustainability Report earned the EDP Group the title of world's best utility. That's the conclusion of the World Business Council for Sustainable Development (WBCSD), an organization that assesses its members' sustainability reports each year, identifying strengths and areas for improvement in accordance with a 3-pillar, 18-criteria framework. EDP's most recent sustainability report managed to improve on the previous year's score by 7 percentage points, to 86%. This was the EDP Group's best score ever, ranking it as the best utility of the

154 companies surveyed worldwide. Two of the highlights were the pillar that assesses the principles of the report, where EDP went up from 79% to 89%; and the pillar that assesses the user experience, which rose from 69% to 75%.

.03

Yammer is here! EDP's new social network has arrived to bring together people from around the world. Globality and proximity are the

hallmarks of this new platform, which promises to be a leap forward in terms of communication. Now geared toward a global audience, Yammer bolsters its social networking potential with the launch of features like stories, questions, and topics. Users are invited to participate in communities, sharing ideas about the projects they follow, their company's achievements, and their country's tidbits.

.04

The largest wind turbines on the Iberian Peninsula

EDP Renewables has completed the installation of the two largest and most powerful onshore wind turbines on the Iberian Peninsula. The project was part of the Barão São João wind farm, in Lagos, Portugal, and involved two Vestas V162-6.2 MW EnVentus turbines. Their 80-meter blades will deliver an additional 34 GWh of renewable energy to the Portuguese grid each year — enough to meet the electricity needs of approximately 27,000 people. The transportation of the blades was the most complex operation of its kind ever carried out on the Iberian Peninsula. The blade lifter technology used — a first in Europe for blades of this size — leverages the inclination of the blades

themselves to adapt the transportation to the conditions of the road and the orography of the terrain.

.05

EDPR shortens I-REC issuance times

EDP Renewables is the first utility in Brazil to issue the new International Renewable Energy Certificates (I-RECs). This process reduces the lead time from 40–50 days to up to one week, and with the same level of security. The initiative is the result of a partnership between Way2, a leading company in the area of real-time metering and energy management solutions, and the Totum Institute, the agency responsible for issuing and managing these certificates in Brazil.

Instituto EDP brings sustainable lighting to favela

06

The Instituto EDP — in partnership with social organization Litro de Luz and with the support of NGO Gerando Falcões — has installed 30 solar powered street lights in Favela dos Sonhos, in Ferraz de Vasconcelos, Brazil. The goal is to improve the living conditions of local families, promoting well-being, safety and quality of life for the more than 500 residents.

These sustainable energy street lights are made of PVC piping and are equipped with a solar panel, battery, LED bulb and PET bottle. The streetlights were assembled by 50 volunteers and local residents. A total of 190 families are currently living in Favela dos Sonhos. The installation of sustainable public lighting is the third project developed by the EDP Institute in partnership with Litro de Luz. A total of 30 street lights have been installed in the city of São Sebastião, North Coast of São Paulo, serving the communities of Vila Sahy, Baleia Verde and Lobo Guará. In the state of Espírito Santo, the city of Vila Velha has received 60 street lights, serving the needs of the Jabaeté community.

.07

Photovoltaics for self-consumption in Spain EDP has installed and put into operation a

photovoltaic power plant at the AhorraMas supermarket chain central hub in Velilla de San Antonio, Spain. The installation consists of more than 3,300 solar panels with a combined capacity of 1,800 kWp. It will enable AhorraMas to save 25% of the total energy consumption of its logistics depots and central offices. With this installation, which will generate an estimated 2,760 MWh each year — enough to power almost 800 homes — Ahorramas will also achieve a significant reduction in CO₂ emissions, to the tune of 1,655 metric tons. The

impact is equivalent to that of 37,680 new trees. Cárnicas Frivall is a pork abattoir and pork products manufacturer in Villar de Olalla, Cuenca, where they will soon have their first photovoltaic installation for self-consumption. The solar power plant is being built and brought into operation by EDP, and will have a capacity of 4,584 kWp. It will enable Cárnicas Frivall to reduce its power consumption by more than 29% and save 23% on its electricity bill. This is EDP's largest self-consumption system for an industrial customer in Spain to date.



E-REDES awards scholarships to future engineers



.08

E-REDES has awarded 15 merit scholarships to young women graduating from master's programs in Electrical Engineering and Computer Engineering. The E-REDES Top Women Scholarship initiative was launched in May 2022 and aims to promote equal opportunities between men and women in the access to professional careers in engineering. At the same time, it seeks to attract more young women to join E-REDES, ensuring greater gender diversity in the company and a pool of talented employees to help drive the energy transition.

The winners were honored last December, at an event held in Lisbon. It was also an opportunity for the company to celebrate its commitment to promoting gender equality. The awardees will receive a scholarship of €2,000 each and the opportunity to participate in a mentoring program in the company, during which they will be accompanied by E-REDES mentors. Gender equality has become increasingly important as a way to promote equal opportunities in the workplace. E-REDES

is striving to reach a new level in terms of diversity & inclusion and achieve 16.3% of female representation in the workforce by the end of 2022.

.09

Ocean Winds launches project in California

Ocean Winds (OW) and Canada Pension Plan Investment Board (CPP Investments), through their

50:50 joint venture Golden State Wind, were awarded a 32,500-hectare (80,420-acre) lease area by the U.S. Bureau of Ocean Energy Management BOEM). Located in the Morro Bay area, off the central coast of California, this is where they will be developing an offshore wind project. Once fully operational, this lease area could accommodate approximately 2 GW of offshore wind energy, generating enough electricity to power the equivalent of 900,000 homes. This project will help bring the US and California closer to meeting their clean energy goals of 15 GW of floating offshore wind generation by 2035 in the US and 5 GW by 2030 in California.



.10

Solar power “made in Europe”

In early December 2022, the European Commission — together with industrial actors, research institutes, associations, and other relevant parties — launched the European Solar PV Industry Alliance. The Alliance will help mitigate energy supply and energy dependency risks by diversifying import supply channels and scaling up manufacturing of innovative and sustainable solar photovoltaic solutions in the European Union. The Commission and the signatories of the Alliance set out the

immediate priorities for 2023. Boosting domestic manufacturing capacity will be key for the EU to reach the REPowerEU objectives of over 320 GW of newly installed solar photovoltaic capacity by 2025 and nearly 600 GW by 2030. Another of the priorities set is reaching 30 GW of European manufacturing capacity by 2025 across the entire value chain. Reaching this objective would deliver €60 billion of new GDP per year in Europe and result in the creation of more than 400,000 new jobs.



.11

Simpler environmental licensing in Portugal

The Portuguese Council of Ministers has approved a decree-law that initiates the reform and simplification of environmental licensing by eliminating redundant licenses, authorizations, acts, and procedures. By reducing the administrative burden and framework costs, the aim is to simplify business activity and help encourage investment — subject, of course, to compliance

with environmental protection rules. The Public Administration will now focus primarily on enforcement, requiring a higher degree of co-responsibility and self-control on the part of the companies. At the same time, new transversal measures are being adopted, which apply

to administrative operations and to the actions of public entities in general — and which will also have significant impact on the environment. The new decree-law is part of the Simplex program and was the subject of a public consultation process that garnered more than 250 contributions. //

Gap Zero: united in the fight against energy fraud

Over the last year and a half, the EDP Grids Platform has stepped up collaboration between the three countries — Brazil, Portugal, and Spain — which has resulted in a wide range of initiatives. “We have more than 120 cross-pollinated initiatives — with nearly half of them now completed — that are a result of this very convergence, collaboration, exchange of experiences, and sharing of best practices and expertise between the three countries represented in the Grids Platform,” says Miguel Setas, a member of the Executive Board of Directors of the EDP Group.

Gap Zero is a prime example of the impact and success of this platform. “It’s a revenue assurance and fraud management project that has already involved 21 employees in the three countries. It has produced 18 initiatives, 78% of which have already been completed,” explains Miguel Setas. As a result of this exchange, the company has already recovered about 50 GWh of electricity, worth nearly €6 million.

This new way of working, based on synergies between teams in different countries, has made the operation of the grids more resilient and in line with EDP Group strategy. “We are focused on growth in service of the energy transition. The energy transition depends on the deep digitalization of our operations and infrastructure, as well as being a key component of distinctive talent,” says Miguel Setas.

All of this is happening against a backdrop of emerging, increasingly heightened risks, namely climate change and cybersecurity. But at the end of the day, it also results in the creation of value for everyone. “This is the framework of the strategy in which we are moving and which includes the 120 initiatives identified under the Grids Platform,” says the member of the Executive Board of Directors.

Inter-market benefits

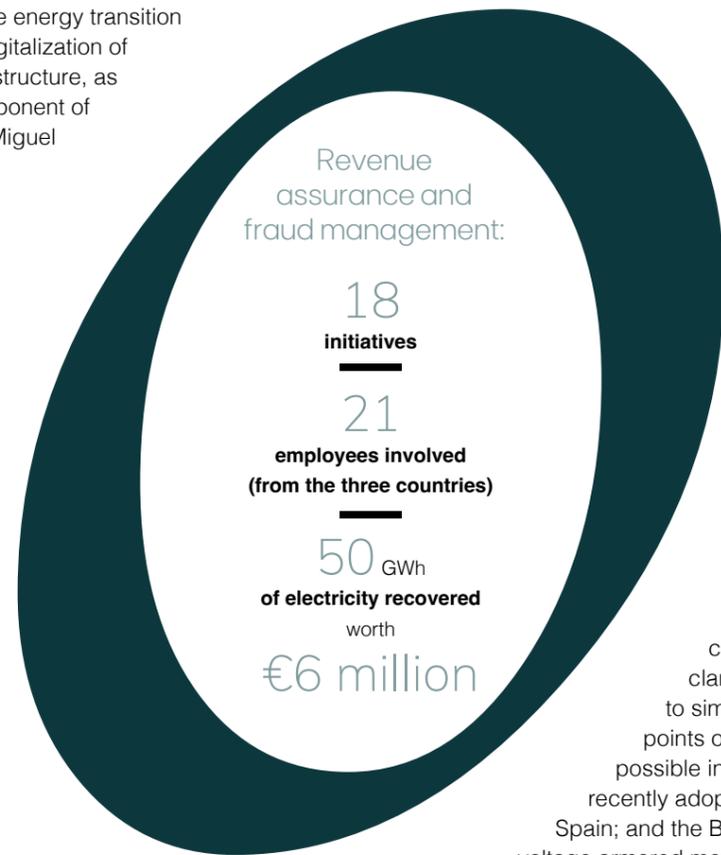
The benefits of this new approach to working on a platform are demonstrated by the success that has already been achieved and the projects currently under way. According to Amparo Queralt, from EDP Redes España, “at the various workshops, we shared already-implemented projects for the reduction of non-technical losses and discussed the possibility of transposing them to other countries. Our goal was always to draw on our employees’ full breadth of experience and expertise.” In Spain, there

were tests using amperometric clamps and a Bluetooth borescope camera, which are widely used in Portugal. The results were so impressive that those devices are already being used in all fraud inspection operations at EDP Redes España.

In Brazil, the platform has been equally successful. “We have been holding regular workshops, presentations, and meetings since 2021, during which we show the concrete results of the analytics applications we have developed here in Brazil,” says Evandro Scopel, from EDP Brasil. The Brazilian committee has already presented a number of improvements put into operation in the Espírito Santo business units.

There is no shortage of specific examples of knowledge transfer in the Grids Platform. Jorge Miguel Silva, from E-REDES, singled out three of them: the medium voltage metering unit, a piece of equipment used in Brazil, which was introduced in Portugal and has already helped confirm suspected fraud involving medium voltage customers; the wireless clamp meters used in Portugal to simultaneously test different points of an installation and identify possible inconsistencies, which was recently adopted by teams in Brazil and Spain; and the BT Zero solution for low-voltage armored metering, developed in Portugal based on a model that is widely used in Brazil, in areas of high operational complexity. In Portugal, the system has already been installed in two locations and has made it possible to shield the respective installations’ meters.

According to Jorge Miguel Silva, “the Grids Platform has already created synergies in several areas, from analytics to equipment. It has also enabled discussion of regulatory issues.” In short, when it comes to revenue assurance, “the Grids Platform has been very fruitful and yielded very positive results.” //



A nighttime photograph of the Esplanade - Theatres on the Bay in Singapore. The Esplanade's iconic white, petal-like structure is illuminated from within, casting a soft glow. In the foreground, a modern walkway with a glass railing and some greenery is visible. The background features a panoramic view of the city skyline across the water, with various skyscrapers and buildings lit up. The sky is dark with some light clouds. The word "act." is overlaid in white text on the right side of the image.

act.



The sun rises in the East

The Asia-Pacific (APAC) region boasts some of the largest renewable energy growth opportunities, with approximately 55% of global capacity additions this decade. Solar power accounts for 65% of the region's estimated growth. This unprecedented demand is driven by the region's growing population (currently at 4.4 billion, with a 4% population growth in 2019), robust economic growth prospects, and largely untapped potential.

In 2021, seeking to pursue a region-specific approach, EDPR acquired a 91% stake in Sunseap — one of the largest transactions in the solar power sector in Southeast Asia. Sunseap is a leading distributed solar power operator in the APAC region. The deal helped EDPR to effectively become a global player, holding 5.5 GW of renewable energy projects in the region: 540 MW of solar power projects already in operation and under construction; 127 MW of new guaranteed capacity; and a portfolio of 4.8 GW in various stages of development.

Sunseap is headquartered in Singapore and employs more than 600 people in nine markets: Singapore, Vietnam, Malaysia, Indonesia, Thailand, South Korea, China, Japan, and Taiwan.

Although the operating model is similar to EDPR's, in the APAC region the company operates across the entire solar energy value chain through a proprietary construction and operation model for rooftop, onshore, and floating solar PV projects. Its business model is centered on long-term, low-risk power purchase agreements with reliable partners and long-lasting customer relationships. There are also VPPAs, project power contracts that, unlike traditional PPAs, are not located on-site at the customer's property.



EDP was bound to move into the region that is expected to grow the most in the coming decade”

PEDRO VASCONCELOS

COO for Asia-Pacific at EDP



In this interview, the chief operating officer for the Asia-Pacific region at EDP Renewables explains the importance of being represented in the market that generates more than half of the world’s electricity. Now that Sunseap’s integration is complete, find out more about the expansion plans.

This expansion into the APAC region signals a new chapter in the history of EDP. Why there and why now?

To put it in simple terms, this is a sector where growth and scale are critical for success. Therefore, EDP was bound to move into the region that is set to grow the most in the coming decade. The APAC region is going to make up more than 50% of global demand and it’s where more than 40% of renewable capacity is projected to be installed by 2030*. The energy transition is a global challenge, and it will not succeed without the APAC region. At the same time, we have a “duty” to develop these understandably less mature markets and take a leading role, leveraging our expertise in the various technologies. This move adds considerable diversification to the EDP portfolio on multiple levels, since it represents an energy and economic development cycle that is quite different from that of Europe and the Americas.

How did the process unfold?

The acquisition of Sunseap was the result of a broad effort, coordinated with several investment banks, to find renewable energy assets that complemented EDP’s portfolio — at the geographical and/or technological level — and that made strategic sense and added value to the company. Sunseap was planning an IPO, but its largest shareholder moved first and was already in advanced negotiations with a number of buyers to sell its stake. We were late to that process, but still managed, in the end, to gain the support of the founders to buy the company and bring it into the Group. Our narrative of leadership of the energy transition, our track record, and our approach toward local culture and expertise were decisive factors. ▶

Source: <https://www.globaldata.com/media/thematic-research/56-worlds-energy-generated-apac-region-2030-says-globaldata/>

“From our very first meeting, Sunseap seemed to be a company with a DNA similar to EDP’s, with a strong business development and engineering team”



You mentioned that Sunseap was like “love at first sight.” What did this company have that others didn’t?

From our very first meeting, Sunseap seemed to be a company with a DNA similar to EDP’s, with a strong business development and engineering team. So much so that they were already providing these engineering services to third parties. They had a solid track record of delivery capacity in distributed solar, utility-scale onshore and floating solar projects, and electric mobility — as well as some retail, which we ended up phasing out. It was a company with the right technology and geographic distribution, already operating in nine different markets — all with local teams — and with enough critical mass in Singapore to be a regional hub for Asia.

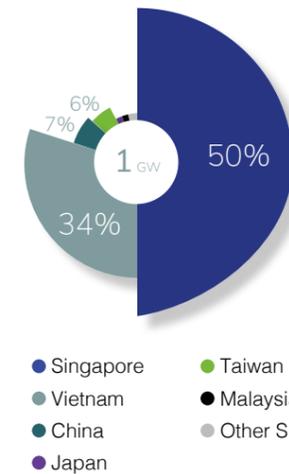
What is your assessment of the experience so far, and what are your growth expectations for the coming years?

We are just finishing the integration period. It has been almost one year, and the company is already well positioned, with a number of initiatives in place to improve the corporate maturity and depth of the teams. This is in line with the increased ambition of the new post-2022 business plan. There was an early effort in terms of back-office functions — such as P&O, IT, and finance — to ensure that we had the proper foundations in place before shifting our focus to the value chain as a whole, building on the solar distributed generation portfolio with a strong focus

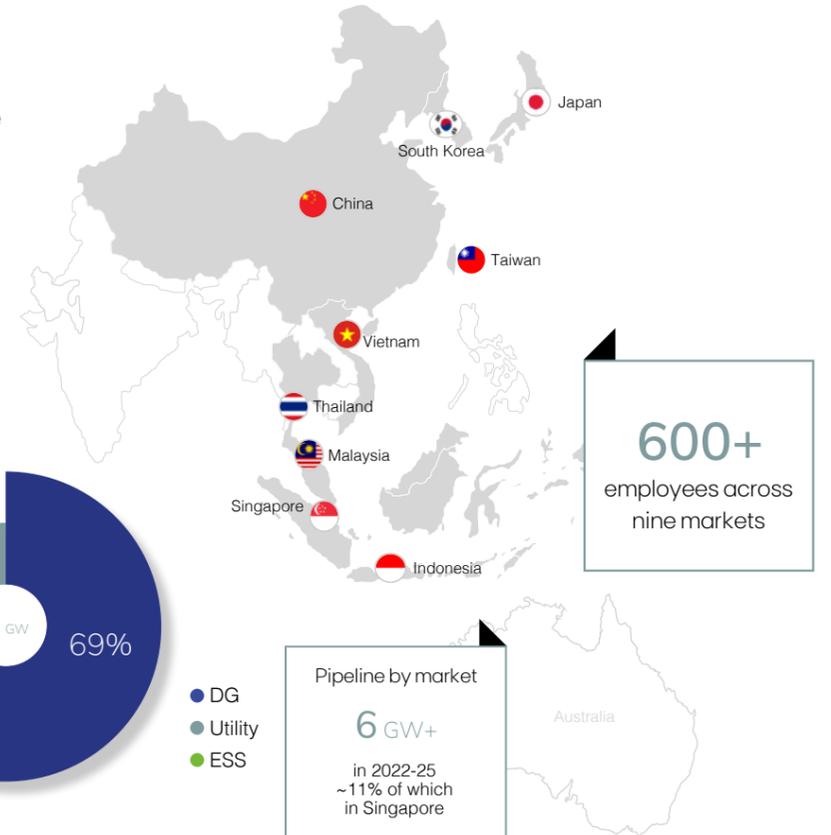
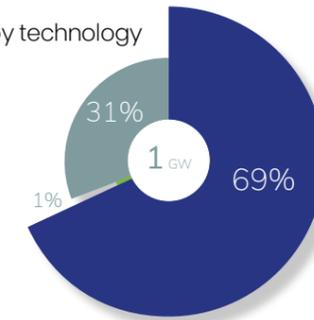
EDPR Sunseap footprint

EDPR Sunseap is headquartered in Singapore and present across nine markets. It currently has approximately 1GWp of operating and under construction capacity, with more than 6 GW in the pipeline.

Operating and U/C capacity by market



by technology



on larger scale projects and introducing wind power in the northernmost locations.

The draft growth forecast for 2023–27 is really exciting. It suggests bolstering the platform over the next five years to about 3 GW of capacity by 2027 and 7 GW by 2030, in 10 different markets with exposure to various technologies, all supported by more than 800 people with new, and improved digital processes, and systems that facilitate the scalability of the business model.

Have you been looking into other countries in the region? Could there be some news soon?

At the moment, EDPR Sunseap only has operational capacity or significant development in five out of the nine markets where we operate. In the rest of them, we are pursuing business development — with the expectation that the potential of those markets will enable us to deliver profitable projects in line with our investment policy. In addition to these countries, EDPR Sunseap is looking to tap into the Australian and possibly the Philippine markets. We also need to take into account the ASEAN Power Grid initiative to build a regional power interconnection. We want to join this effort through cross-border renewable generation projects in countries that aren’t limited by a lack of space, like Indonesia or Malaysia. Or even through offshore projects between countries, like

“The draft growth forecast for 2023–27 is really exciting: bolstering the platform to about 3 GW of capacity”



“The employees have been integrating very well ... we are taking a huge leap in terms of growth and evolving towards corporate maturity”

floating solar power around the Riau Islands, connected to a country with high-quality, reliable offtakers — a country like Singapore, where the energy demand will exceed the supply of clean energy.

What about the integration of Sunseap employees? Can we really speak with one voice?

The employees have been integrating very well, considering that Sunseap was a startup until very recently. Now, they are taking a huge leap in terms of growth, and evolving towards corporate maturity. Before we took

over, Sunseap’s structure was at the very limit of its growth capacity, with 498 MW installed in 10 years. After overhauling the organization, and its processes, EDPR Sunseap is now increasingly prepared to scale up the volume of projects it can analyze and develop. In just nine months, it has almost doubled its installed capacity to 892 MW. We now have an organization that is beginning to see the benefits of the structural overhauls we have been making. That in itself creates more openness to the continuous improvement of processes and greater alignment with the rest of the EDP Group. But we need to acknowledge that these are not linear growth pathways; they must be managed incrementally, especially in the context of an extremely heated and fractured post-COVID-19 labor market.

You have been involved in the development of EDP business plans for the past decade. What story do those plans tell?

The business plans — and delivery — of the past decade at EDP tell the story of a leader in the energy transition, with a growing preponderance of renewable energy in the company’s portfolio. We started by focusing more on electricity, sold the gas business, consolidated distribution in Spain, and expanded into several new markets in two main waves: first in 2018, and more recently in 2022. Along the way, we bolstered our presence in the markets where we were already operating. As a result, the company became increasingly oriented toward renewable generation and ever closer to the end customer. We have a very robust growth profile and an important distribution grid component that has served as a powerful risk mitigator and an important source of diversification.

The most recent business plan was the first to be based on a tangible purpose. Could the global instability that we have been witnessing end up compromising EDP’s objectives?

The recent instability has caused delays and uncertainty — hopefully short-lived — over the decommissioning of fossil fuel-based generation. It has also raised concerns about energy security and energy independence. On the other hand, this instability has made it very clear that we must maximize the penetration of renewable energy wherever possible. At the moment, bureaucracy and the licensing process are the biggest stumbling blocks. Despite the changed context, the challenge of climate change persists — or becomes even greater, as the world population continues to develop. Therefore, given our expertise and our unique position, EDP has a duty to lead the way in carbon neutrality by 2030 and offset the impact of those who won’t be so quick to do so. That is why Changing Tomorrow Now is so important and urgent.

As a group, EDP wants to take on a leading role in all areas of the energy sector value chain. How can we succeed in being leaders in such disparate areas as wind power, solar power, energy storage, floating and offshore projects, distribution grids, and smart solutions — all at the same time?

All areas of the energy transition have common elements that are very relevant and part of our DNA: they are all capital-intensive, require expertise in sophisticated technologies, require significant scale to be profitable and demand excellence in operation, and a permanent

search for greater efficiency and innovation. From hydroelectric to coal-fired power plants, smart grids, and renewable energy, EDP has grown both organizationally and operationally to manage these different portfolios, where complexity is welcome and a source of differentiation. In my view, the energy transition will continue to unfold, for the most part, along this competency matrix. That makes EDP very well positioned to indeed lead the energy transition. But the truth is that so are others, and talent and expertise are tradable commodities. Therefore, the retention and transfer of knowledge are now more important than ever. //

“The business plans of the past decade at EDP tell the story of a leader in the energy transition, with a growing preponderance of renewable energy in the portfolio”

“EDPR and Sunseap perfectly complement each other”

Lawrence Wu
Chief Financial Officer at Sunseap



Sunseap was created in 2011. More than a decade later, what has changed in this sector in the APAC region?

There have been several major changes:

- The cost of renewable energy is much more competitive, having declined more than tenfold to a point where renewable energy is now on “grid parity” and more attractive when compared to fossil fuels. Arguably, renewable generation — when coupled with energy storage and capable of delivering firm power — is often competitive against unsubsidized fossil fuel power generation.
- Climate change is now acknowledged as a real and undeniable threat to our entire civilization. The call for climate action and transition to renewable energy sources — like solar and wind — is now greater than ever before.
- The number and scale of energy projects in the region — namely in China and India — has increased significantly.

Earlier this year, EDP signed a global partnership to install up to 100 MWp of solar energy at Faurecia’s sites in Europe, Asia, and North America. This would not have been possible without the support and coordination of our teams in the three continents.

The two companies perfectly complement each other. EDPR’s financial firepower and expertise in utility scale, together with Sunseap’s entrepreneurial DNA, strong solar distributed generation track-record, and regional knowledge in Asian markets, will capture the growth potential in the Asia–Pacific.

EDP Sunseap has already celebrated and will continue to celebrate numerous successes: we acquired two solar PV projects in Vietnam, including the massive 250 MW Xuan Thien project; signed an MoU with Korea East-West Power to jointly develop clean energy projects, further strengthening our position in the Asia—Pacific; and are on course to launching SAP as the enterprise resource

“From a technology standpoint, we are anticipating more projects involving energy storage and wind”

According to BMI Research, China and India will be the chief drivers of renewable energy growth, adding 430 MW of new wind and solar capacity by 2027.

- The dialog and action on cross-border power system interconnectivity has also increased significantly.

How did this integration with EDP Renewables go?

Even before the acquisition was completed, in February 2022, Sunseap and EDPR had already been working together in terms of business and integration planning, and change management to ensure the successful integration and amalgamation of the two teams.

EDPR and Sunseap have a strong affinity in terms of culture and values. The two companies share core values such as innovation and sustainability. They also deeply value teamwork and encourage employees to take ownership in various projects.

planning tool in Singapore by the end of 2022.

From a human resources standpoint, EDPR Sunseap attracts diverse people through professional opportunities created within the company. For instance, 22 staff originally based in Portugal and Spain were given the opportunity to work in Singapore, while EDPR Sunseap has created a total of 292 jobs in Singapore in 2022.

What are your main goals for the future?

We will be focusing on bringing our integrated solutions to current markets in the Asia—Pacific, redoubling our efforts in utility scale development, particularly in Vietnam, China, Japan, and South Korea. From a technology standpoint, we are anticipating more projects involving energy storage and wind — which is new to Sunseap — while maintaining our stable base growth in distributed renewable energy generation.



APAC PROJECTS

On land, sea, and air, there are multiple projects being developed by EDP in this region. Here are the six most emblematic.



Vietnam
Ninh Thuan Solar Farm

Completed in 2019, the farm is located in the south-central coast of Vietnam and was commissioned as part of a 20-year solar power purchase agreement.

Time to implement:
About one year from June 8, 2018; COD: June 15, 2019

449,880
solar panels

42
inverters

Capacity:
168 MWp

Energy produced:
271,000,000
kWh per year

The annual amount of electricity generated from the project will be able to power up to **~100,000** households in the country.

2,000
People during peak period of construction phase. When put into operation, the plant will create regular jobs for **36-40** unskilled workers, in addition to specialized employees and operation engineers.



Xuan Thien Solar Project
Vietnam

In September 2022, EDPR Sunseap completed a US\$284 million deal with Xuan Thien Group to acquire two solar PV projects totaling 255 MWp under a 20-year power purchasing agreement priced at US\$93.5/MWh.

This acquisition paved the way for EDPR Sunseap's expansion in Vietnam. The latest acquisition is the company's largest utility-scale solar investment.

619,056 solar panels
160 inverters
 Capacity: **255 MWp**
 Energy produced: **944,000,000 kWh per year**

Time to implement:
 over 1 year from December 2018 to April 2020

Number of homes supplied:
150,000+ households

5,000 people during peak period of construction phase (estimated).



EDPR Sunseap is a leader in innovative solar solutions with the goal of managing over 2 GW of installed capacity by 2025.



Taiwan
Pingtung Canal

This is the first project developed by the EDPR Sunseap team in Taiwan. Spanning the entire length of a 3 km irrigation canal, this is also the largest canal-based solar project in Taiwan. The canal where the solar panels are installed is part of Pingtung county's largest irrigation network.

Due to the environmental conditions, the construction process was more challenging than conventional rooftop projects. The project was completed in several stages, starting in January 2019.

Time to implement:
 January 2019–April 2019

At least
15,000 solar panels

Capacity:
3,3 MWp

Energy produced:
3,974,850 kWh per year

Number of homes supplied:
977



Singapore
OFPV
 (offshore floating photovoltaic)

Time to implement:
 The project took close to a year to set up amid movement restrictions during the COVID-19 lockdown.

13,312
 solar panels

40
 inverters

30,000+
 floats

Capacity:
 5 MWp

Energy produced
 (estimated):

6,02 GWh
 per year

**Number of homes
 supplied:**

1,250
 4-room apartments

In March 2021, EDPR Sunseap completed the installation of one of the world's largest floating solar farms on sea water in the Straits of Johor. The solar farm is equipped with electrical panels, control system, and a 22 kV transformer. It is also a landing point for the subsea cable that transmits the generated power to the national grid. The floating PV system is designed with a robust constant tension mooring system that is able

to withstand changing weather conditions, keeping the platform and all of the operational equipment on board steady. There is also an air-conditioned second deck that doubles-up as a visitor centre and viewing gallery.

It is hoped that the successful building of the 5 MWp offshore floating photovoltaic (OFPV) system will lead to more OFPV projects in the region, as land-scarce countries

tap offshore solar as part of their renewables strategy.

The COVID-19 lockdown posed an additional challenge, as foreign workers hired by EDPR Sunseap's contractor were unable to leave their dormitories. Many members of the team volunteered to fill in the gap during this period. Their professionalism was key to the successful completion of the project in the face of the numerous challenges.

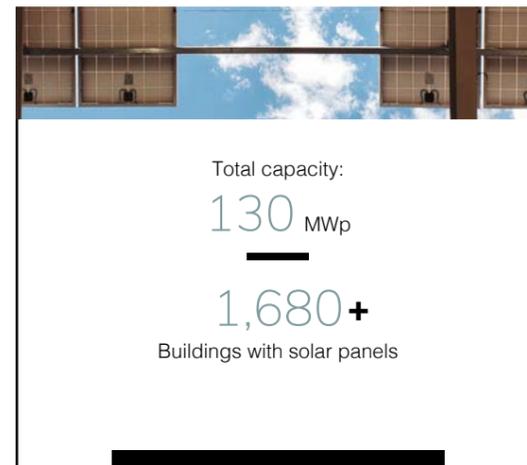


Singapore
Housing Development Board
(HDB)

The SolarNova program aggregates solar demand across government agencies to leverage economies of scale, allowing agencies with smaller energy demands to use clean energy at a lower cost.

EDPR Sunseap has won multiple tenders to install solar panels on residential high-rise buildings and government sites, including schools and Singapore Ministry of Defence sites. The projects are leasing tenders under the SolarNova joint program of the Singapore Housing & Development Board (HDB) and Singapore Economic Development Board.

The electricity generated by the solar panels will be used during the day to fully power shared services in residential buildings, such as the elevators, lights, and water pumps.



Taiwan
Ziqiang Elementary School Basketball Court



Located at Ziqiang Elementary School in New Taipei City, the project was completed in April 2022 and marks EDPR Sunseap Taiwan's first installation of a basketball rooftop solar energy system. It can provide approximately 200 kWp of renewable electricity and offset the equivalent to 171 metric tons of carbon emissions. The system will also be able to power an average of 60 Taiwanese households per year.

Time to implement: June—July 2022

588
panels

60
households
supplied

Capacity:
200 kWp

Energy produced:
240,900 kWh per year





testimonials



APAC employees

People are a fundamental part of our business. Meet some of our APAC employees who have joined the EDP world.

1.

How is it working in a company like EDP?

2.

What do you do in your work, and what are your professional goals?

3.

What do you consider your biggest challenges?

4.

Tell us something about yourself.

Phuong Nguyen Utility-Scale Operations

1. It's wonderful to work at EDP — and especially at EDPR. EDP is a global, well-established company with lots of people who have amazing skills and knowledge from various backgrounds and sectors. I learn something new with my colleagues from Vietnam, Singapore, Spain, and Portugal — and from my own work — every day. I believe I'm a better version of myself when leaving the office and I always look forward to a new day, even with all the stress of negotiation meetings with external parties.
2. At the moment, I'm in charge of business development and asset management for the Vietnam market. The business development side of things is about looking for the potential opportunities in the market based on our criteria (transition from the non-binding stage to due diligence, from the binding stage to the closing stage, and developing greenfield projects until the ready-to-build stage). Asset management focuses on optimizing and managing asset compliance with local requirements and EDPR's international standardized requirements.
3. The challenges of my job have changed over time, along with the prevailing conditions both internally and externally. If I'd been asked nine months ago, I would have said that the challenge was to balance local conditions — business environment, culture, and mindset among local partners, contractors, and authorities — with the standards and procedures of a "Western" company like EDPR. At the moment, my principal challenge is to manage and support the local team and liaise with regional and HQ teams to operate and maintain utility-scale operations and DG solar at over 500 MWp, to implement works for the solar pipeline for over 400 MWp, and to develop wind projects. After that, it's a matter of implementing, supporting, and managing the Sunseap integration process as smoothly as possible.
4. I was born in Nghe An province, in Central Vietnam. In 2005, I moved to Hanoi, the capital of Vietnam, for university and work. In my spare time, I like reading, running, swimming, and traveling.

Dong Wang Zhang Project Management

1. As EDP is a global energy leader, I believe that my experience can help the company grow, and that my career will be enriched through EDP's global perspective and working platform. Of course, every company has its own culture. EDP has a huge global presence and large number of employees. I believe that it offers a continuous learning journey.
2. My main role is to lead the project management team and assist with evaluating project opportunities, project construction, and asset operation management. We launched on the Chinese market not long ago. While we are expanding our presence in the market and growing the team, we are taking on more wide-ranging roles and responsibilities in addition to our technical and project management work. In the long term, I hope to grow with the company, broadening my skillset and developing more comprehensively as a business leader and a key person at EDP for the Chinese market.
3. The biggest challenges come from two key areas: the business itself, and project management. China's renewable energy market is the largest in the world already and provides many opportunities. However, those opportunities are scattered across different provinces, and every province has its own energy policy and local requirements. There is also intense competition (e.g., state-owned companies) and other local corporations, so we need to remain competitive if we are to pursue growth. In project management, another major challenge is managing the various stakeholders — the government, other parties in energy contracts, grid operators, EPCs, key equipment vendors, etc. All of these relationships need to be carefully tended to and maintained. The safety measures introduced in the current pandemic (COVID-19) add to the uncertainties and difficulties of project management.
4. I currently live in Kunshan, Jiangsu province, but I was born in Yancheng city, Jiangsu province, in 1981. I love playing basketball, usually on the weekend with my friends. My younger son shares my passion for basketball and has been accepted into our local basketball youth training team.

Jerry Gui Engineering

1. I enjoy working at EDP because it has a good working culture and very supportive and knowledgeable staff. My supervisors also give me all kind of opportunities that help me develop my skills.
2. In my work as a solar design engineer, my day-to-day activities involve design and cost preparation for solar power systems and attending tender clarification meetings to answer any technical questions that customers might have. My goal is to continue building my technical knowledge, with exposure to different types of solar system from different regions, each with their own geographic and regulatory constraints.
3. As a solar design engineer, in addition to the safety and maintenance considerations, the biggest challenges when designing a solar system involve the environmental impact, minimizing disruption to the lifestyle of residents in the area, and fulfilling local authority requirements.
4. I am from Malacca, Malaysia. I've been working in Singapore for the past eight years. In my free time, I like playing badminton, basketball, and sometimes cycling.



Jeff Ong
Project Management & Construction

- 1. It's amazing how Sunseap has transformed from a local SME into a global MNC after its integration into the EDP Group. I would say that it wasn't a particularly easy start — especially during the transition period, when new work processes, protocols, and ERP tools were being introduced. Of course, I welcome these challenges as I strongly believe that such change is necessary to prepare the team for the global stage. Being part of EDP also opens up new opportunities for me to explore beyond Singapore.
- 2. I am a senior manager in the Engineering department. I'm responsible for the project management and implementation of photovoltaic systems in Singapore. I hope to have an opportunity to work in other international markets on a utility-scale project.
- 3. People management, especially having to manage a big team. And I'm still struggling to pronounce our Portuguese and Spanish colleagues' names correctly.
- 4. I was born in Singapore and have 20 years of work experience in the power and energy industry. I've held various roles and functions ranging from engineering to sales and project management. I enjoy outdoor activities like jogging and badminton, as well as aquatic sports like sailing and scuba diving.

Naween Kaluarachchi
Energy Storage & Microgrids

- 1. It's been really exciting! I joined EDPR Sunseap APAC in 2019 and initially worked with the Building Solutions team, looking at energy efficiency projects. I'm currently with the Energy Storage & Microgrids team. I've always been passionate about working in the clean energy and sustainability sector, and I've thoroughly enjoyed working with and learning from everyone. I've been fortunate enough to be involved in some very exciting innovation projects as well!
- 2. I'm currently with the Energy Storage & Microgrids team at EDPR Sunseap APAC, overseeing the planning and construction of two islanded microgrids off the coast of Singapore. These islands are not connected to Singapore's main power grid and all their power is produced using diesel generators. By developing PV systems combined with energy storage systems, we'll be able to provide clean energy to residents and businesses around the clock, achieving the objective of decarbonization.
- 3. I think one of the biggest challenges has been adapting from projects that offer typical building solutions, like rooftop solar PV systems or energy improvement solutions, to operating a microgrid. We have to constantly push toward 100% reliability and availability of the system because this affects the daily lives and operations of consumers. However, this also brings out the best in the team, and we often have to think outside the box to find solutions.
- 4. I believe my name is one of the longest at EDPR Sunseap APAC. Although I've lived in Singapore for a better part of a decade, I'm from Sri Lanka, where it's very common for people to have extremely long names! I'm also the self-proclaimed best badminton player at EDPR Sunseap Singapore, and I welcome a challenge from my colleagues there. We play every Sunday!

Nhi Hoang
Marketing Communications

- 1. I feel very proud. What I've seen here at EDP is that we're not just focused on making a profit, but really care for our people, clients, partners, and communities. The local Vietnam team is like one big family. If I need some information, I always receive full support from everyone in the local team and from the APAC level.
- 2. I'm in charge of Marketing Communications & Sustainability at EDPR Sunseap Vietnam. Renewable energy is a very new industry in Vietnam. People often ask me what I will be doing to support the business, as EDP doesn't have any tangible products to sell. My main responsibility is to get people to understand the importance of the business. In the long term, I hope to create my own communications team with enough resources to further support the wider business.
- 3. There have been two big challenges in my career. Firstly, building a good relationship with new colleagues and working well together as the team and with other stakeholders. Secondly, as renewable energy is a very new industry in Vietnam, it means that I am also new with the industry and have to put a lot of effort into understanding the market and finding an appropriate way to convey or amplify our brand image to external stakeholders.
- 4. I'm 42 already, but everyone here has told me that I look younger than my age. I was born in Ho Chi Minh City, but my parents come from the north of Vietnam. I began my career as a services coordinator for Hewlett Packard and IBM for almost four years. During this time, I was aware of what the marketing communications team members were doing. I knew I would love that kind of job. I decided to quit my job and get an MBA in order to follow my passion. That opened up a whole new chapter in my life.

Erica Chang
Marketing Communications

- 1. It's a friendly and flexible workplace, where you get to work with an international team and learn about the different aspects of things.
- 2. I'm responsible for marketing activities in Taiwan and China. I work closely with the Singapore Communications and local team to execute communication plans, support brand awareness, and develop marketing communication initiatives for the region.
- 3. Adopting a multinational culture in a diverse working environment.
- 4. I just started hiking this year and loved it. I've went up one of Taiwan's highest mountains in June.



“We have felt very welcomed”

Teresa Teixeira Freitas
Planning & Control Department

Starting a new project in a completely new country, company, environment, culture, and team, with greater responsibility and autonomy. These were the main reasons why Teresa Teixeira Freitas accepted the position of Senior Manager in the Planning & Control Department at EDPR APAC. “I thought that being faced with a different context would be very interesting. It would not only allow me to learn more, but also to find different approaches to problems and ways to identify solutions and opportunities,” Teresa explains. At the time, she was Deputy Director of Planning in the Planning & Control Department at EDP Comercial, in Lisbon.

“Adjusting to this new professional life has been quite easy”

Adjusting to this new professional life has been “quite easy.” According to Teresa, the team formed outside of Singapore has the same values of hard work, persistence, and team spirit as the local Sunseap teams. “We have felt very welcomed by the local teams. There is a very good atmosphere and mutual support in the development of the project, which is an important starting point.” On top of that, living in highly developed country, in a city where everything is well-organized and functions smoothly, also adds to her motivation and makes her integration easier. What she is still getting used to is her new schedule: everything starts earlier, including lunch and dinner, which is quite different from what she was used to.

Otherwise, a typical working day in Singapore is pretty much the same as it was in Portugal. The main difference is that she spends more time commuting in Singapore, because she doesn't drive her car.

“On weekends, here in Singapore, I enjoy exploring the city, doing sports, and spending time with my family and friends. I have also been able to take advantage of some long weekends to visit a few nearby countries,” says Teresa Teixeira Freitas.

“What I miss most is definitely my family and friends who are in Portugal, but having video calls and social media does help to stay in touch.” But there is one aspect that came as a welcome surprise to her: “building a circle of friends that grew strong much faster and more naturally than I ever expected.”

The Asia-Pacific region has tremendous growth potential, and EDPR APAC is well positioned against other global players, with the advantage of having the bases in place — with a hub in Singapore and operations in nine markets — to seize present and future business opportunities. //



“Everything works efficiently and safely”

Manuel Hall
Business Performance Acceleration

Before arriving in Singapore — where he is Head of Business Performance Acceleration, a department focused on creating and accelerating the foundation for business scalability in the nine countries where EDPR APAC operates — Manuel Hall was a member of the electric mobility team at EDP Comercial.

His life got turned upside down, but it was an offer that he could not refuse: the opportunity to contribute to the energy transition in the market with the most growth potential in the world — not to mention the experience of living in a completely different culture and region. The adaptation turned out to be easier than expected: “For months, I've been raving to my family and friends about Singapore being a very easy country to live in,” Manuel admits. “The fact that there are a number of us expats at EDP also helped a lot. We ended up creating a group to help one another, and we also organize quite a lot of things outside of work.” A typical workday isn't much different from one in Portugal. The big difference comes after work: since Singapore gets warm weather year round, everything happens outdoors. “On weekends, we enjoy going for walks — Singapore has a lot of green areas — doing sports, and visiting some of the neighboring countries, whenever possible. There are a lot of interesting things to see on this side of the world,” he explains excitedly. Singapore has been a pleasant surprise. “Everything works efficiently and safely, and the country's level of digitization is outstanding. From public

“We ended up creating a group to help one another and organize things outside of work”

services to doing laundry, everything is planned with an app!” Still, there are always moments when he gets homesick and yearn for things like “eating a nice grilled fish by the beach.” If Manuel had to name the two biggest differences, they would be the Asian mode of social interaction and the food. For those who don't like spicy flavors, it can be quite the challenge! As the person responsible for accelerating business opportunities in the Asia-Pacific, Manuel is confident that the market's growth potential is there and has been well identified. “Our main focus now is to create the conditions and tools we need, in-house, to be able to deliver the growth and the targets we have set. If we can do it quickly, there is no question in my mind that our presence in the APAC will be a success!” //



explore.

mind your mind

The importance of mental health at EDP

In a study⁽¹⁾ that looked into the link between various daily activities and corresponding levels of happiness, work ranked low in contributing to our well-being, second only to something that no one really enjoys: being sick in bed. This finding is a cause for concern. After all, on average, we spend the equivalent of nine years of our lives in the workplace.

Another important mental health statistic is that one in five people have had or will at some point be diagnosed with a mental disorder⁽²⁾. Over the past decade, the use of antidepressants has doubled in Europe. Portugal, Iceland, and Canada now have the world's highest consumption of these drugs per capita. All in all, experts believe that only a third of those affected are currently receiving some kind of treatment. Whether because they fear stigmatization or lack access to health care, two-thirds continue to go untreated.

In a recent report on women's experiences in the workplace by consulting firm Deloitte, more than half of respondents (53%) said they were more stressed than they had been one year earlier, reporting poor or very poor mental health.

In a culture that is increasingly driven by productivity, where problems can be experienced behind closed doors, is our society becoming more unhappy?



For the third year running, EDP set in motion the Mind Your Mind campaign. The goal was to raise awareness among employees about mental health, emphasizing the importance of adopting preventive behaviors and providing support in the various markets where EDP operates. Part of the company's global wellness strategy, the campaign focused on the importance of psychological safety and included various global and local initiatives. The

global initiatives included "The future is mental," a clinic session with psychiatrist João Costa Ribeiro and the team responsible for the EDP support lines; "Ethical culture in business," a talk with Courageous Leadership CEO Brooke Deterline (read her interview on page 50); "Trust Space," a chat with EDP Brasil employee Gabriela Pesente (read her testimonial on page 48); and a series of sessions on mindfulness.

Psychological safety

Psychological safety is vital for us to feel included and free to learn, participate, or question without fear or embarrassment, thereby contributing to an organization that is innovative, diverse, and capable of adapting to future challenges.

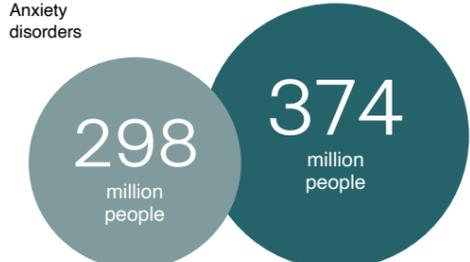
COVID-19 and mental health

According to the World Health Organization (WHO), the pandemic caused by COVID-19 quickly became one of the biggest global crises in generations. It produced severe and far-reaching consequences for health care systems, economies, and societies. Mental health was greatly affected, with mounting levels of anxiety and, in some cases, mental disorders.

Major depressive disorder



Anxiety disorders



- Before the COVID-19 pandemic
- During the COVID-19 pandemic

This represents an increase of **28%** and **26%** for **major depressive and anxiety disorders**, respectively, in just one year.

Source: Global Prevalence and Burden of Depressive and Anxiety Disorders, 2021

Notes:
1. "Are You Happy While You Work?" by Alex Bryson and George MacKerron, The Economic Journal (2017)
2. "Antidepressant Consumption in Selected Countries 2021" by Matej Mikulic, Statista (2022)

■ in the first person...

Mental Health



“I realized that I couldn’t carry on without help”

Gabriela Pesente da Silva



I’ve always taken good care of myself. For many years, I’ve been able to do whatever I needed to do to feel good. Knowing what’s good for me was and continues to be a perpetual process of self-discovery. I understood myself — and as I noted that I felt well adjusted, happy, and at ease, I tried to identify what made me that way. I did sports, attended Spiritist Center meetings, spent time with family and friends, read books, and watched GNT, my favorite TV channel.

Then, after I became a mother, the need to care for another being spoke louder. That’s when my life was thrown off balance. It’s difficult to even talk about this, because a child is the most wonderful thing in life, the greatest love — but also the greatest challenge. It’s a love that pulls you close and entwines with what was once freedom. The freedom to go out without a knapsack, without snacks, without extra diapers, the freedom to not have a child safety seat in the car or to leave furniture edges and corners unprotected.

The People Management Planning consultant at EDP Brasil shares with us a brave and revealing first-person testimony from someone who realized that seeking help can sometimes make all the difference.

For about a year, I was just Julia’s mom — and, clearly, I couldn’t handle that role. I was always covered in drool and felt overwhelmed. I just couldn’t handle what I thought being a mother meant. Everyone always told me, “Of course you’ll handle it, I had three and I did!” or “What about back in the day, when we didn’t even have disposable diapers?” or “Ah, but you have milk, you don’t have to go to work, why are you so nervous?” The truth is, things weren’t going well. I felt overwhelmed and, since I wasn’t working or contributing financially to the household, I really felt I had to do everything that needed to be done about Julia and the home. It was a burden imposed by the world and by myself.

When my daughter turned one year old, I went back to work. I arrived at EDP and made sure to spell out my prime concern: I needed flexibility because watching my daughter grow up and being there for her was — and continues to be — my top priority. Being able to set that condition during my very first interview with the business partner and the recruiter gave me a lot of confidence to move forward. I’ve also always had very compassionate managers, but knowing and setting those limits was crucial. Setting limits and delivering on the demands of the job, of course.

And then came the pandemic, and with it even more stress.

During a routine visit to my gynecologist, I mentioned that my premenstrual symptoms were just awful. That they made me a wreck. She suggested a prescription medication, which I bought but never took. I thought I could handle everything and stay healthy with nothing but homeopathy and exercise — which, to this day, I still haven’t been able to fit into my routine as much as I’d like.

One fine day I was at work when a request came in at very short notice. “I need this in two hours,” my coworker told me. I started seeing red. I was really upset. And I responded in a not-so-proper way. I think I was very rude that day, and I apologized to her. But it was then that I realized that I couldn’t carry on without help.

It was having an impact on my relationships. I treated my three-year-old daughter as if she were a 30-year-old adult. This nonsense of thinking that our family is ours, that they’ll love us forever... How many senseless things do we do thinking that their love is unconditional?

That’s when I decided to talk to the EDP doctor and figure out whether I should start taking the medication that my gynecologist had prescribed.

During a review meeting with my then-manager, I mentioned what was happening and that maybe I really needed the medication. On that day, everything changed. He told me that he also used medication and that he felt better for it. He offered me examples, told me what his doctor had told him, put me in touch with his own wife... And on that day, Christmas Eve 2021, I decided to start taking the medication.

Since then, there haven’t been any miracles. What changed was my relationship with myself. I don’t have breakdowns like I used to. My conversations are more balanced and deliberate.

I think this has helped me calm down and understand myself better — and to cope when plans fall through. I decided that I always have to be ready to take any opportunity to exercise. On days when I’m working from home, I get into my workout clothes right away and, if everything goes well, I hit the gym at lunchtime. If the first meeting of the day is canceled, I make the most of that time slot. And that’s how I’m doing things. I started to take piano lessons. The piano is a very emotional instrument for me — it belongs to my grandmother, who used to be a piano teacher. She’s very old now and has Alzheimer’s, so she can no longer play. That connection gives me a sense of belonging and of continuity in life. I also started going to therapy again.

I’m in a Starbucks right now, after working out for an hour at the gym, on a Saturday morning. My husband’s home with our daughter and I’m writing this. This was the moment of peace and quiet that I managed the find. As I reread this, I understand myself even more. It’s our vulnerabilities that make us human, isn’t it? And I also stop and think, wow, I’m getting so much done... In the end, I’m “handling it” a few things at a time, prioritizing what’s important — and I keep moving forward.” //

“For about a year, I was just Júlia’s mom — and I couldn’t handle that role ... And then came the pandemic, and with it even more stress”

EDP marked World Ethics Day with “Ethical culture in business: The importance of psychological safety,” a talk by Courageous Leadership CEO Brooke Deterline. Courageous Leadership is a consulting firm that helps organizations and their teams acquire the skills to overcome complex and ethically challenging social issues. edpON met her for a little chat.



Acting with ethical courage even when it's hard

BROOKE

Deterline
Courageous Leadership CEO

You say that it's easy for good people to do the wrong thing under pressure. Why is that?

History shows us exactly that. Under pressure, our behavior is affected by situational influences – the impact of environmental factors on behavior – that are often outside of our awareness. When we're stressed or afraid, our bodies can easily move into our threat system: we get ready to fight, flee, freeze, or appease. This is what Paul Gilbert, a psychologist and researcher, refers to as the Red Zone. There's no room for ethical considerations, or for a carefully constructed sense of oneself as a "good person." We're in survival mode.

What are the characteristics of that Red Zone?

In the Red Zone, we react to perceived threats, triggering our amygdala to flood our brains with cortisol and adrenaline hormones. Research shows that the physical sensations of fear, usually some type of contraction, are directly linked to a contraction of the heart muscle. As it turns out, those contractions correspond to a shrinking of the attributes we associate with "heart": our innate kindness, empathy and compassion. And, that contraction also cuts us off from our higher cognitive functioning such as discernment. Psychologically speaking, it's virtually impossible to have a closed heart and an open mind.

Why is that impossible?

Because in this state, our perspective and judgment are skewed by a cascade of negative thoughts that dramatically influence our reasoning, decision-making, and behavior while under pressure. It's our brain's way of telling us to act...now!
In the Red Zone, we are 100% focused on safety and control as a way to return to comfort, familiarity, and harmony (states that signal our brains and nervous systems that we are safe.) As social animals, we all need to belong to a group to survive. Social animals die in isolation. This makes it easy for any of us to obey unjust authority or conform to a group... even if we feel unsettled by what they're doing or asking us to do. We want desperately to have a sense of safety and belonging. These kind of things can unwittingly affect our behaviors, and cause us to act in ways that are not aligned with our own values. Unchecked fear sadly can render us callous, reckless... and stupid.

When we make a decision, are we often conditioned by situational influences?

Generally speaking, yes. Most times when we're among others and confronted with having to make a decision, we're subject to situational influences. However, the more we learn how to be aware of them, and the more we practice overriding those influences, the easier it becomes to make decisions that are unencumbered by our hardwired reactions and our negative automatic thoughts, and are better aligned with our values, good judgment, and best thinking. ▶



“Courage is the skill, learned and honed over time, which allows us to activate all our other values under pressure.”

“People in psychologically safe teams have a greater sense of inclusion and contribution to the organization, which increases employee retention and engagement”



How can we keep ethics from “fading” when we face a tough decision?

We can avoid using euphemisms such as, “It’s not personal, it’s just business.” These phrases allow us to disassociate ourselves from the responsibility of our actions and from the impact of decisions whose consequences are misaligned with our ethical reasoning and standards.

And in any situation, particularly when faced with a tough decision, we can simply ask ourselves, “What’s the right thing to do?” This simple “framing” helps us act from our values.

Why does psychological safety at work matter and how can we create it?

When people feel psychologically safe in the workplace, they’re freer to be creative – lending to solution-seeking and the development of technological advancements. There’s less pressure to conform, and more autonomy to identify and act in alignment with values without the threat of retaliation. People in psychologically safe teams have a greater sense of inclusion and contribution to the organization, which increases employee retention and engagement.

Psychological safety is vital to the foundation of ethical business practice, organizational growth, innovation, employee engagement, and the sustainability of a company over a long period of time. And even in the most psychologically safe environments, we still need ethical courage to help guide our actions.

How do you define “ethical courage”

We use the term “ethical courage,” by which we mean acting on our values in the face of fear in social situations. This includes learning to override our biology and social conditioning—both of which entail significant vulnerability. Acting with ethical courage even when it’s hard. Courage is the skill, learned and honed over time, which allows us to activate all our other values under pressure.

With so many negative things going on in the world, are we thinking enough about our core values?

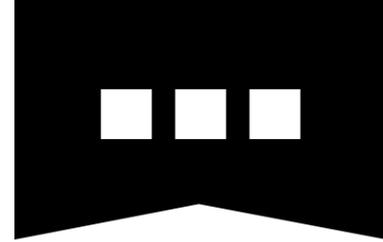
Most of us are disconnected from thinking about our core values regardless of what’s happening in the world. It may seem that all the tumult in the world may take us even further from thinking about our values. But perhaps counterintuitively, it’s the rhythm of constant, systematic, and predictable lives that can numb our awareness to conscious thought. Remember, our brains crave comfort, familiarity, and harmony--states that signal that we’re safe.

It takes intentional reflection to keep us connected to our core values. Great movement in the events and consciousness of our society often rattles us enough to break us away from the familiarity of our regular systems and patterns so we can see things anew, and re-balance our lives to realign more closely with our core values.

How important is it to connect with the right people as a source of moral strength?

We are all susceptible to doing the wrong thing in challenging situations. Having friends and colleagues who share our values and have the capacity to tell us the truth are invaluable when we’re in an ethically challenging situation. We may only need a quick bucking up, like, “I know this is challenging, and I know you’re committed to doing the right thing when it’s hard.” And sometimes we need someone outside the situation or system to help us see more clearly, because we’re so embedded that we can’t see the forest or the trees. //

“When people feel psychologically safe in the workplace, they’re freer to be creative”

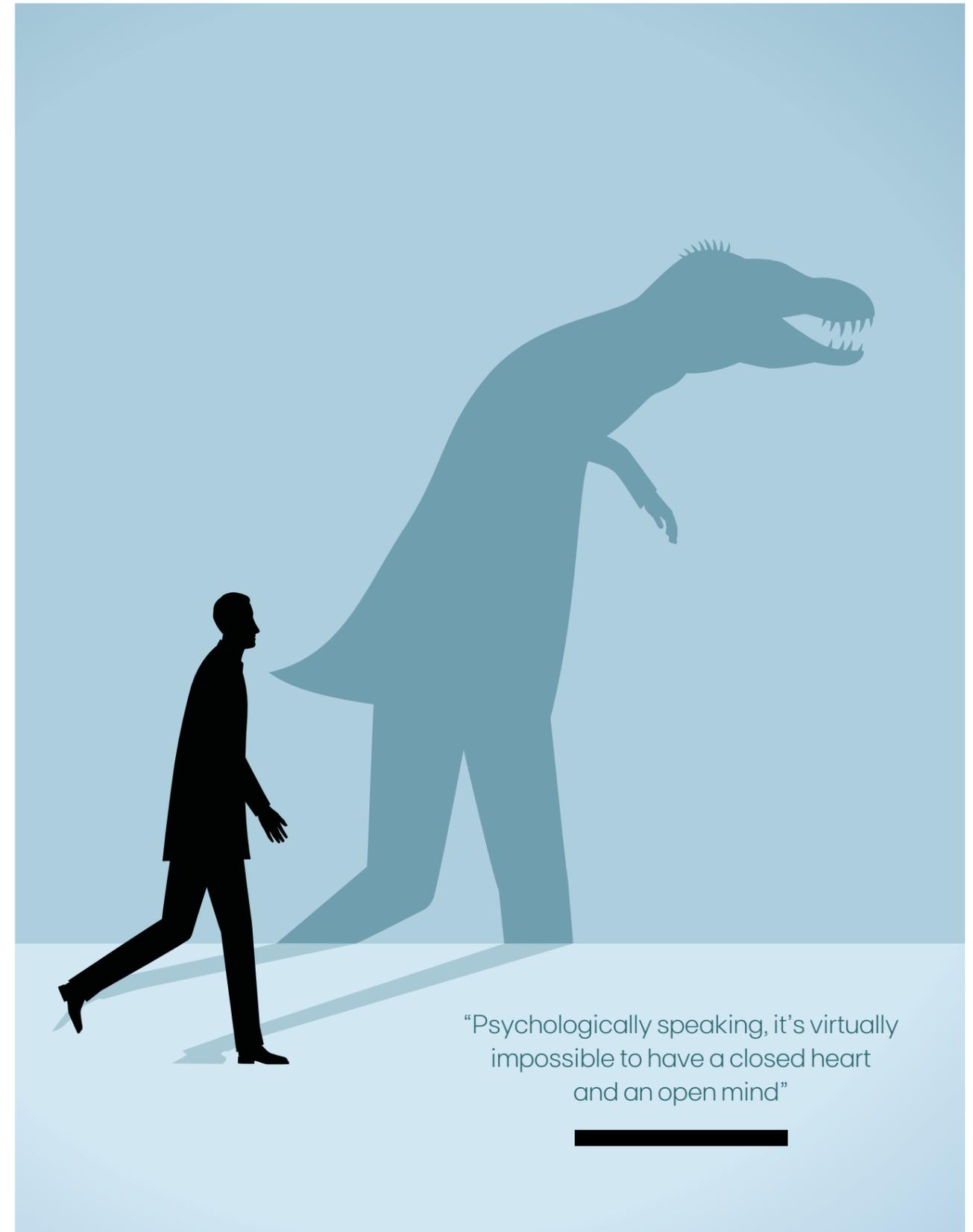


How do you tell the TRUTH when you are **pressured** to do the opposite?

Depending on the context, some of these suggestions may be more useful than others, but they all come down to supporting ourselves and building up our ethical courage.

- Get in touch with your motivating values. What are the values you care about and really drive you? What are the ones you really feel when you say them out loud? Can you honestly say, “I may be afraid of this conversation, but I stand for fairness, kindness, and our capacity to grow and learn”?
- In the Red Zone, we are flooded with with negative automatic thoughts (NATs) — fears or scary stories — that are often highly exaggerated. These NATs are designed to make us react and get out of harm’s way. NATs can push us to avoid tough conversations by dramatically overplaying the risks and obscuring the potential rewards — including the reward of following our own values.
- There are three key things we can do when we’re afraid to tell the truth:
 1. Write down our NATs. NATs sound like truths in our own heads. When we write them down, it’s much easier to realize their exaggerated nature.
 2. Challenge our NATs. For example, if your NAT is, “I’ll get fired if I tell the truth about this situation,” challenge it with, “What’s the likelihood that I’d get fired over this?” On reflection, maybe 10 percent — which takes the sting out of that NAT.
 3. The most important question we can ask ourselves in the face of fear is, “If the worst outcome happened, would it still be worth it for me — according to my values — to have this conversation?” This questions drags our value frame front and center of our awareness. Under pressure, we can experience “ethical fading,” where the ethical implications of our actions disappear from our minds. Simply reminding ourselves of our values helps us act according to them.

- Create and recite a values-aligned, supportive statement. For example, “I’m being courageous for the integrity of our team and organization”; “I’m honest with my colleagues to model the type of leadership I aspire to practice”; “We can’t grow without truth and candor”; “I am my father’s daughter.”
- Practice a conversation that scares you with a friend or colleague. Most of us know “what” to do, but not “how” to do the right thing in a challenging situation. It’s easy to imagine ourselves acting heroically, but far more difficult to actually do when the cortisol and adrenaline stress hormones are pumping through our veins. However, we can practice with some level of stress to create muscle memory.
- Share your conversational challenges with a friend. When we share our joys with a friend, it multiplies the joy. Similarly, when there’s something difficult we have to say, it lightens the load and multiplies our courage when we first share it with a friend.



“Psychologically speaking, it’s virtually impossible to have a closed heart and an open mind”

9 PRACTICAL ADVICE on ethical principles in business

...by Brooke Deterline

1 Explore and learn your patterns under stress. You can't change what you don't know. Start by taking notice of the situations in which you find it most challenging to act with ethical courage. Make a plan for how you want to act in those situations, and then practice, practice, practice. And then, review what happened, what worked, and what to improve next time.

2 Normalize the fact that we are all susceptible to acting outside of our values under pressure.

3 Don't confuse yourself (or others) for your (or their) Red Zone behavior. No one looks good in the Red Zone. We all need support and practice to be ethically courageous.

4 Connect with your "why." Remember why you're here, why you care, why your values matter to you. Plenty of research — and our own data — shows that simply connecting with our motivating values in challenging situations helps us act from them, instead of from the Red Zone.

5 Just as we connect with our own values to support ourselves, there's tremendous power in helping others connect with theirs.

6 When working with people exhibiting Red Zone behavior, aim to connect first. Listen to learn about their values and speak to them.

7 Many of us have been conditioned to think of courage as an individual act. But when we're dealing with group dynamics and complex systems, we need more leverage than just one person can generate. Studies on conformity dating back to the 1950s show that one person challenging the status quo is honorable but not very effective. A second person can help the challenger be courageous, but it still won't have much impact on the group. Three is the magic number. Three people, banding together, start to represent an organizational point of view.

8 Conduct social flight simulations. I can't emphasize this enough! Just like pilots practice emergency landings, practice the important conversations that carry some level of fear or stress, so that you can create muscle memory and act the way you practiced when you need to. Because when we're in the Red Zone, we can't access our deepest wisdom and values.

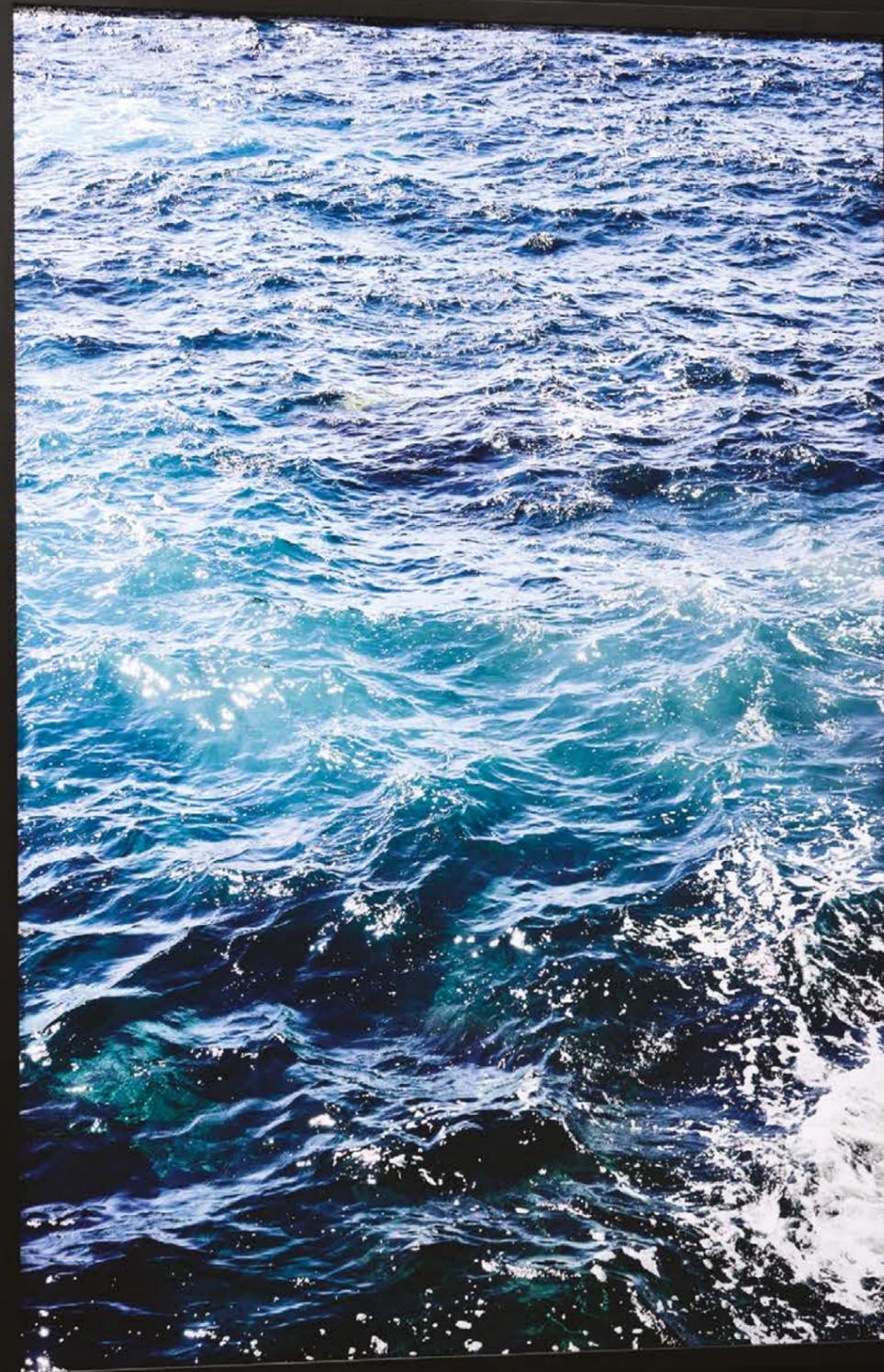
9 Research conducted by Carl Larson and many others shows that the primary — not "a" primary, but "the" primary — predictor of success in any work team is the ability to have courageous conversations.

“Having friends and colleagues who share our values and have the ability to tell us the truth are invaluable when we find ourselves in an ethically challenging situation”



Distant lights

The transformation of Sines through
the eye of photographer Nuno Cera





View of the exhibition "Nuno Cera. Distant Lights", maart 2022. © Nuno Cera

“Distant Lights” consists of a series of photographs and a video installation. Through them, Nuno Cera takes us on an exploration of the transformation of the landscape and the city of Sines, where he lived until the age of 21: the Sines Port Authority, Terminal XXI, the Galp Energia and Repsol refineries, the Quarry, the site of the future Data Center — already under construction — and EllaLink. And of course, the EDP Thermal Power Plant, which shut down in January 2021, after 35 years of operation.

The shots of the power plant that appear in “Distant Lights” were taken by Nuno Cera in August 2021. As he describes it, the feeling inside was already museum-like. “I was quite surprised by that feeling. Since it’s a very large and complex machine, it immediately gains the weight of time just by being still,” he says.

Nuno Cera documented his initial shots on his blog, in a post he titled “Inside a giant machine.”

“When I’m shooting, I’m interested in the interplay of scale, between the intricacy of the machines and the sheer size of the halls and groups.

“I was quite surprised by that feeling. Since it’s a very large and complex machine, it immediately gains the weight of time just by being still”

The power plant as a photographic object — much like other industries in Sines — is utterly fascinating for me. It’s incredible how a seemingly straightforward energy process can have so many variables and be so complex in its operation,” the artist says. He recalls visiting the power plant for the first time when he was still in school and again, in 2000, “this time with the intention of photographing and better understanding that space and type of industry. Ever since I was a teenager, I was curious to understand what was happening on the other side of the fence,” Cera adds.

“Distant Lights” is open to the public in room Cinzeiro 8 of Central Tejo, until March 13. //

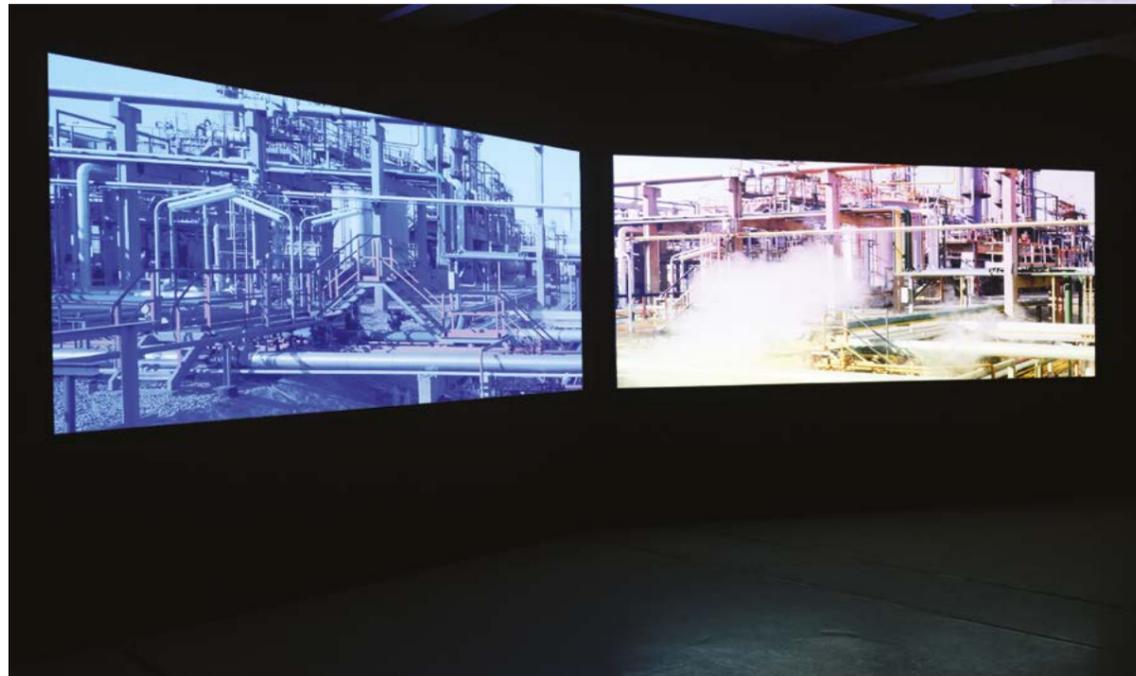


Views of Nuno Cera's
"Distant Lights" exhibition
(MAAT, 2022).





Views of Nuno Cera's "Distant Lights" exhibition (MAAT 2022).





inspire.



Mozambique

The power of the sun

for 733 million people around the world, access to electricity is still a distant dream. Among them are many of the 31 million Mozambican people — especially those in the most remote rural areas. For them, everyday tasks ranging from cooking to lighting their homes, schools, and health centers still rely heavily on firewood, charcoal, and other fossil fuels. Mozambique’s abundant solar resources can, however, represent a turning point for the country, contributing to its electrification and giving those populations access to the clean energy they need.

In recent years, EDP has been supporting innovative and sustainable projects in developing countries through its Access to Energy (A2E) initiative. Mozambique is, in fact, one of the seven countries with the most

projects financed by the A2E Fund and the only one to have received financing in all four editions of this EDP initiative. Additionally, since 2018, EDP has also maintained an investment in SolarWorks! — a Mozambique-based company that develops solar solutions tailored to homes and small businesses.

In late 2022, EDP was in Mozambique to visit some of the projects supported by the A2E Fund in different parts of the country, in the sectors of education, agriculture, health, clean energy, and community. This visit helped us learn more about their progress, their successes, and also their difficulties. Above all, it was an opportunity to discover inspiring stories and meet people whose lives were one day changed by the power of the sun.

The A2E Fund in figures

In 2018, EDP launched the A2E Fund to support sustainable, clean energy projects in developing countries.

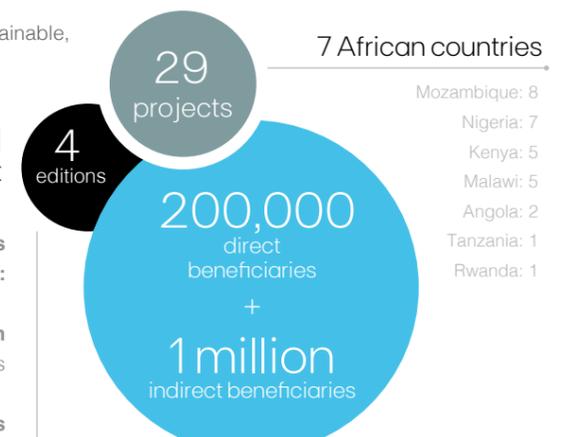
€2.5 MILLION investment

Strategic targets for the A2E area until 2025:

Investing up to €19 million in A2E companies

Connecting 200,000 customers

Preventing the emission of up to 1 million metric tons of CO₂



4 editions

Social impact (global)
A2E initiatives are part of a global social impact strategy in which EDP plans to invest more than €300 million by 2030.



Rita's new light

A simple solar panel on the zinc rooftop of their cinder block home, in a small village on the outskirts of Maputo, was enough to change the everyday lives of Rita Mujovo and her family. Even when the sun goes down early, she no longer needs candles to light up their home. Now that there are light bulbs hanging from the ceiling, she knows she can cook whenever she wants and entertain guests in the evening. Even her oldest daughter, the only one of her three children who is already going to school, can now study after it gets dark — as her younger siblings play safely in and around the house. “It has made all the difference,” says Rita, with a smile dancing across her face. The same system is also used to power a small radio and charge her phone, the only means of communication in the house. It’s how she stays in touch with her husband, Félix, whenever he is away in South Africa, working in the mines.



Jacinta's "all hours" store

"Now there's power at all hours!" she says with a vibrant laugh. Jacinta Nhagumbo works in a small grocery store, Milena's Bar, in a village near Matola. There, she sells eggs, fruit, meat, drinks, and other staples. The power grid has already made it to the area, as apparent from the utility poles in the street, but blackouts are still frequent. Since they installed the solar power system in the store, though, electricity has never failed — and so they are able to have fridges to keep their products fresh for longer, as well as being open until later. Longer hours also means more customers and higher revenue at the end of the day, so Jacinta couldn't be happier. "Before, power would come and go. Not anymore. Now, we have electricity all the time — and plenty of customers!" she says.

Moisés, the entrepreneur

Having reliable power and permanent lighting has also made all the difference for Moisés and his business, a small hardware and construction supplies store and brick factory near Matola. "Before, I had to close very early, almost mid-afternoon, because I didn't have any light. Now, I can stay open longer hours and the customers can come later," he says. "It's very good for me and for the business." The young entrepreneur — as he often describes himself — also points out that there has been a decrease in crime since he started having lighting around his store, which is located along a dirt road that many people use throughout the day. "It used to happen a lot, but not anymore. We are safer now," he acknowledges.





The Djabula artisans

To get to the site of the project conducted by Portuguese NGO VIDA in Djabula, you have to leave the capital city and travel for about two hours on a winding dirt road strewn with potholes, detours, and obstacles — and under a blazing sun for most of the way. Yet that very sun is also at the origin of a positive change in the lives of the people in this remote community south of Maputo. The solar panels installed there are now powering a vocational school, an agricultural nursery, a beekeeping facility, and even a workshop for artisans. All with the participation of the local population.

The focus on the production of handcrafted products has even led to the creation of their own brand: Djabula. In addition to being featured at handcraft fairs throughout the country, the brand's products are also available for sale at Nyala, a major store in downtown Maputo. This venture is a significant source of income for the group of artisans — 15 women and 1 man — who work in basketry, paper craft, and batik. It is even starting to attract a younger generation to the workshop. Sara Sangareau, the project manager at VIDA in Djabula, is proud of these small achievements — including the nursery, where they are testing different cultivars in the hope that they will become thriving crops in the area.





The market where charcoal and firewood are still sold as the predominant sources of energy in the country



SolarWorks! goes to the market

SolarWorks! workshop in Maputo attracts young workers

The SolarWorks! sales booth is like an island in the middle of a street market in Matola. And it's not just because of the garish red of the marquee and uniforms, the promotional jingle that one of the employees sings into the microphone, or even the impromptu dancing that prospective customers break into right there, to the tune of the music blasting from the sound system. It's also because the booth, showcasing solar panels and clean energy solutions, is surrounded by giant piles of firewood and charcoal for sale. Those are still the country's most prevalent sources of energy. It's a huge contrast, but the curiosity of passers-by is even greater. The company has been investing in this kind of street campaign, appearing in markets and other crowded areas, precisely for the opportunity to present its sustainability solutions to potential customers. SolarWorks! provides solar systems tailored to homes and small businesses. Such systems are often the only option available for rural communities to access electricity and use it for everyday tasks as simple as turning on a light bulb, charging a mobile phone, watching television, or running a refrigerator. The company — of which EDP has been a shareholder since 2018 — operates in Mozambique and Malawi, delivering a range of solar products that allow many people to have access to electricity



for the first time in their lives. Additionally, it continues to strive for innovation, developing other business-oriented kits for small entrepreneurs, including appliances like sewing machines, hair clippers, water pumps, freezers, and more.

Elias, one of the pioneers

Public grid electricity is yet to arrive in Bobole, on the outskirts of Maputo, but Elias Novunga did not wait to have power at home. A career soldier who now spends most of his time taking care of his small farm, where he grows produce and raises cattle, Elias was one of the first SolarWorks! customers in Mozambique. The reason, as he explains, was simply that he had to take care of his family and make sure that they had lighting both at home and around it. A simple solar panel was enough at first, but his family is growing. So, he decided to go back to SolarWorks! and bolster his rooftop solar system. This way, he can have more light and enough power for other appliances. "It's good electricity, and cheaper," he says, explaining why he didn't hesitate to go shopping again.



The strength of the mwarusis

Shielded from the merciless late morning sun by the shade of some leafier trees, a group of girls arranged themselves into small circles, sitting on the ground. On that day, they played a kind of "game of goose," adapted to their own reality, teaching them what to do if they want to lead a healthy life and safeguard their education and independence — and what they'd lose if they chose a different path. This is one of the game-based teaching methods used by the mentors trained by Girl MOVE. Their goal is to ensure that the *mwarusis* — a Makua term for girls in that transitional phase between the ages of 12 and 15 — do not drop out of school because of early marriages or pregnancies resulting from family or community pressure. This initiative is all the more pertinent in a country where only 10% of girls complete their secondary education and 40% have their first child before the age of 18. What is clear is that school dropout rates among girls have declined since the launch of Girl MOVE, in 2019. The organization recruited 840 *mwarusis* for a program targeting primary education students from vulnerable backgrounds, and the early marriage and pregnancy rate among that group dropped to less than 1%.

Their work with the *mwarusis* is just one of the many activities and projects developed by Girl MOVE. The academy is part of Lúrio University, located in Nampula, in northern Mozambique. It has been training and guiding young women to continue their studies, care for their own well-being, and pursue professional opportunities — and, later on, to inspire and guide other young women like themselves. The academy building itself is an example of sustainability, explains Joana Leite, the program director at Girl MOVE. Powered entirely by solar energy and batteries, the building is also notable for being made using exclusively local materials, including the burnt earth bricks that lend it a very special hue. "That's where our heart is," says Leite, and where they invest in the ripple effect of girls' education and leadership training.

Clean water, new life

The first time that clean water came out of the desalination system installed by Viva con Agua de Sankt Pauli in Matutuine, two hours outside of Maputo, it was cause for celebration. For the 160 or so children who attend elementary school there, it meant having access to clean drinking water. The entire community, which is home to about 650 families, no longer needs to find water from unsafe sources, like rivers and ponds. Alúzio Mbjaia, a teacher and school principal in Hindane, is now helping manage and maintain this project. As he shows us the solar panels on the roof of the facility where the water is filtered after being pumped from deep wells, he can't stop smiling. EDP's support for this initiative "was instrumental," he says, adding that with access to potable water, much can change in the life of



this community. That is still a common problem in Mozambique: 44% of the people have no access to basic water supply, and communities in rural areas are the most affected. And since it is traditionally women or children who are responsible for providing water for their families, they often have to travel long distances to do so. The result is that most of them end up missing out on the opportunity to study or engage in other activities. Now, thanks to German charity Viva con Agua, in partnership with Grino Water Solutions, there is a battery-free, solar-powered desalination system that provides free water to the children. For the rest of the community, it is available at a token price of MZN 10 (about €0.15) per 25-liter drum. //

Elementary school students in Hindane now have access to safe drinking water





New Downstream B2C Product Development at EDP Comercial

Where ideas take shape

In the third floor of the EDP building on Rua Camilo Castelo Branco, in Lisbon, there's a room where ideas burst into life. Many of them are transformed into emerging business models and innovative practices for customers of EDP Comercial, in Portugal, and EDP Solar, in Spain. It's in this "factory" that the New Downstream B2C Product Development team designs and develops energy products and services that change the way we use energy, contributing to a more sustainable world. The focus is on solar power, energy storage, and energy efficiency solutions.

There's no denying that modern energy systems are becoming increasingly decentralized and decarbonized. In this context, such processes have emerged as key to opening up new opportunities for value chain stakeholders, providing them with new solutions.

The New Downstream B2C Product Development Department was created in 2018, at a time when EDP Comercial sensed a growing momentum for innovation. "The idea, back then, was that it would be good to have a team dedicated exclusively to new products and services that would become available within one, three, or even five years," explained Gonçalo Saraiva, Head of the New Downstream B2C Product Development Department.

While the department is made up of people from EDP Comercial, it works with many partners — both internal (Smart Energy LAB, EDP Innovation, EDP NEW) and external (suppliers and various startups) — who bring in innovative solutions. "There's a whole innovation ecosystem feeding our pipeline," he says.

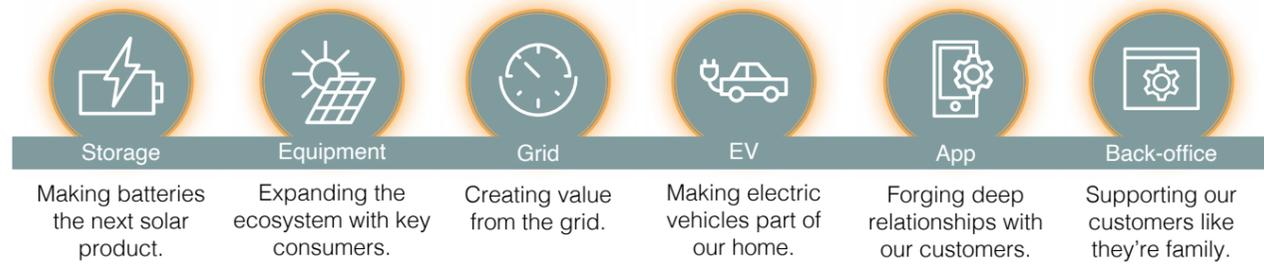
The blending of digital technologies and renewable energy solutions is already playing a key role in the sector in the Iberian Peninsula. "EDP has very different positions in Portugal and Spain: we're the incumbent in Portugal and the challenger in the Spanish solar power market. The customers' needs, however, are not fundamentally different," Gonçalo Saraiva explains. "We've been working to bring our team and the product team in Spain closer together, finding synergies within the Customer Solutions platform, and we've collaborated on a number of initiatives."

Solar batteries, the EDP Solar app, and the EDP solar tank (see inset) were the most recent products and services developed by the team. The EDP solar tank is currently in the commercial pilot phase. "[The EDP solar tank] is smart because it heats the water using surplus solar energy," Gonçalo Saraiva explained, "but also because it heats the water efficiently — it keeps hot and cold" ▶

Transforming ideas into products and services for customers in the Portuguese and Spanish markets — that's the mission of this "factory"

Product Factory vision

Smart, efficient, and simple home energy.



The team (from left): Gonçalo Saraiva, Carolina Coelho, Tomás Pestana, Cátia Gonçalves and Martim Braga.

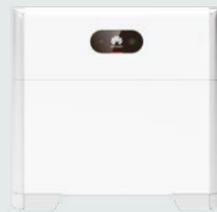
And where do the ideas come from? “Some arise from customer needs, but there is also an element of prognostication,” says Gonçalo. This team has a finger firmly on the pulse of technology, business models, and the way the industry is evolving. “It ends up being a mix of issues/needs that have already been identified and things that people probably don’t realize they want or need — or are even aware that they exist yet.”

As for the development of products and/or services, it’s a very organic process. According to the team, “our goal is to have a pipeline of products/services considered relevant within the organization, where we have an important angle to explore.”

One of the ideas currently in the pipeline, for example, will address an opportunity that’s still not being explored in Portugal: solar power in apartments, which could cover 50% of the country’s population. It’s a solar energy solution that consists of lightweight, flexible panels. Potentially a “do it yourself” system, these panels would be able to be installed on balconies without the need for building administration approval and could also be fitted with solar batteries.

The innovations won’t stop there, though. Portugal and Spain are already experiencing some emerging trends as a result of the work by this team. “The Solar Management dashboard, which was recently launched in Portugal, has now been rolled out in Spain. And we have other pan-Iberian projects planned for this year: the Energy Management System, enabling the intelligent management and optimization of customer assets; the heat pumps; and the PV+EV (photovoltaic panels + electric vehicle charging) solution,” which allows surplus solar power to be used to charge electric vehicles. //

Products already developed



EDP solar battery

With this battery, customers can not only use their solar energy during the day, but also store it and use it later. Combining solar panels with a solar battery allows customers to be more energy independent, reducing grid power consumption by up to 70% and contributing to a more sustainable future.

“EDP was first to market with this solution and positioned itself as a benchmark utility for these batteries. The project included and required cooperation between teams from different companies within the EDP Group (EDP Comercial, EDP Innovation), with different ways of working and different mindsets,” says Tomás Pestana, a member of the B2C Product Development Department.

EDP solar tank

This tank allows customers to not only use the electricity produced during the day, but also to use surplus solar energy to heat water when needed. Combining solar panels with a solar tank allows customers to be more energy independent, lowering water heating bills and contributing to a more sustainable future.

“We wanted a water heating solution that could be optimized for solar energy. We talked to many different manufacturers, but didn’t come across anything that we rated. And then, all of a sudden, a UK startup approached us with a highly distinctive solution that offers even better cost-effectiveness than the solar batteries themselves,” says Tomás Pestana. It is currently in the commercial pilot phase.



There is a “do it yourself” product in the pipeline: a kit of lightweight, flexible panels that can be installed on apartment balconies.



EDP Solar app

This pan-Iberian service allows customers to access their consumption data and monitor their production and use of solar power. Additionally, they can be warned of possible disruptions in the production of solar power.

“My greatest challenge so far has been the EDP Solar app. I realized that my decisions have an impact on tens of thousands of EDP customers. The app is already being used by 35,000 customers,” says Michael Silva of the Smart Energy Solutions division.



Green hydrogen at EDP

The first molecule

Green hydrogen is set to play an important role in the energy transition. Last December, EDP in Brazil produced this energy source's first molecule, paving the way for this technology to be rolled out across the entire EDP Group.

In December, EDP in Brazil produced the first molecule of green hydrogen at its new generation unit in São Gonçalo do Amarante, Ceará. The production of this molecule is the first strategic stage in the development at the Pecém Thermolectric Complex of a pilot hydrogen project that was officially launched in January 2023. This green hydrogen unit, representing an investment of €7.5 million, is the first in the state of Ceará — and the first in EDP Group.

"We are confident that green hydrogen will play an important role in the energy transition and in promoting a low-carbon economy. ... There are already scenarios where green hydrogen may have applications in certain sectors of industry and mobility, such as aviation," says João Marques da Cruz, CEO of EDP in Brazil. As he sees it, "the Northeast Region of Brazil has tremendous potential to become a supply hub, given the abundance of wind and solar energy resources, as well as the region's prime location and distribution structures like ports."

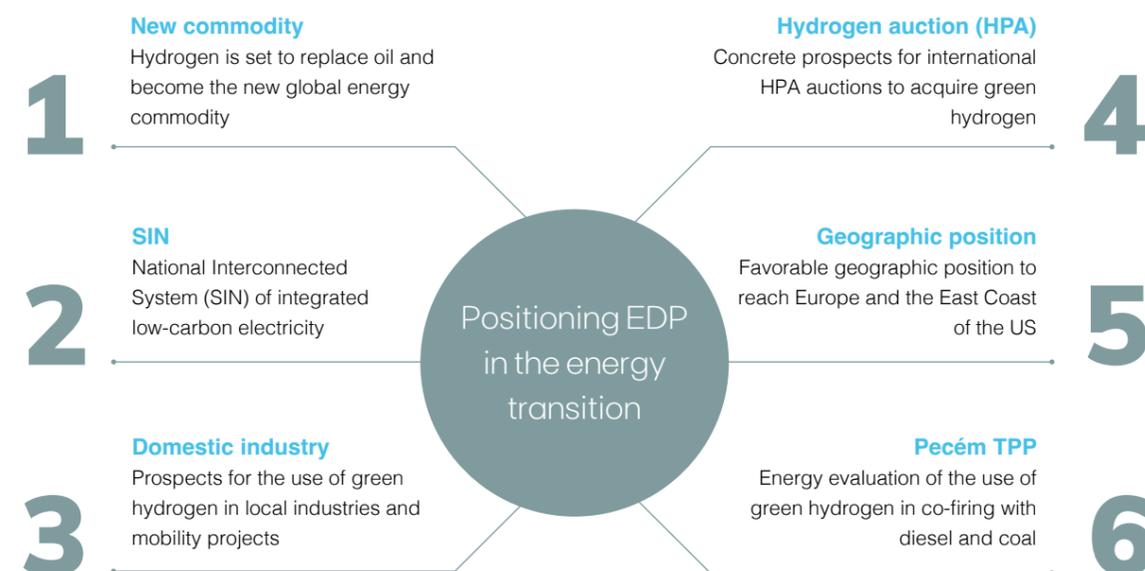
This EDP green hydrogen plant is a research & development project of the Pecém TPP. It is expected to produce clean fuel with renewable energy guarantee of origin. It will also help develop a roadmap with scalability scenario analyses, spanning the various phases between 1 MW and 1 GW, and taking into account all the links in the hydrogen production chain (see graph). The project also includes a solar farm with 3 MW capacity and a state-of-the-art electrolyzer module with the capacity to produce 250 Nm³/h of gas — also with renewable energy guarantee of origin.

Why green?

Depending on the production method, hydrogen can be classified as gray, blue, or green. Each color is associated with a different type of hydrogen technology. When you burn hydrogen, it emits only water. Its production, however, can be very carbon-intensive. Green hydrogen is the only type produced in a climate-neutral manner.

While gray hydrogen releases 10 kg of CO₂ for every kilo of hydrogen produced and blue hydrogen releases 1–3 kg of CO₂ for every kilo of hydrogen, green hydrogen reduces CO₂ emissions to near zero throughout the process. This happens because the electrolysis is fueled by electricity produced from renewable sources, like solar and wind.

Reasons to invest in green hydrogen



A pioneering project

With this project, EDP in Brasil is pioneering the generation of knowledge in the area of renewable hydrogen, carving out a position at the center of a vast production and application chain for this fuel. Indeed, the project also aims to analyze the hydrogen gas production chain, business models, strategic partnerships with industries, and adaptations to the mobility sector.

As noted by the project manager, Cayo Cid Moraes, this is “an end-to-end project that covers the entire upstream and downstream hydrogen production chain. All the electricity generated by the photovoltaic unit will be used in electrolysis. We are also developing a series of internal uses for the hydrogen, including co-firing with primary fuels and replacing the gray hydrogen used for alternator cooling at the Pecém power plant.” The Pecém Thermoelectric Complex has several other important projects under way related to sustainable thermoelectric generation. Among them are the application of coal ash in roads and in the production of cinder blocks for an administrative building, as well as Brazil’s first inter-municipal electric bus.

And EDP is not the only one in this region to recognize the potential of hydrogen; there are several other companies with an eye on this new technology. “EDP is one step ahead of them precisely because of our pioneering spirit and technological integration, with the first molecule produced in Brazil — and the first in Latin America — on a 1 MW scale,” says Cayo Cid Moraes.

More knowledge and experience

The people behind the project are mindful not only of the more “technical” production chain, but of all the challenges that arise along the way and the framework conditions required to implement a project of this size. “There are issues that include the environmental licensing

of the installation; the technical, regulatory, and financial sustainability criteria; the renewable energy guarantee of origin for the hydrogen; and the operation and maintenance of the asset. In other words, there are a lot of details surrounding this project that are of critical importance to EDP,” adds the project manager. “This is the first and most important step in EDP’s hydrogen strategy, because of what it will bring in terms of knowledge and experience.”

“Brazil is currently leading a working group of the International Council on Large Electric Systems, which has been tackling the certification of green hydrogen production. This committee is discussing the attributes that define hydrogen as renewable and the minimum criteria required for certification,” says João Marques da Cruz. “Participating in this discussion will certainly help establish the country as one of the leaders in this market. Armed with the experience and lessons learned from the Pecém unit, we at EDP will be able to contribute even more assertively to the expansion of green hydrogen production in the country.” //

Proof of concept (PoC) — 1W pilot plant



