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**#Saibamaisobre**  

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**INOVAÇÃO**

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## / Challenges and opportunities of an industry undergoing a profound innovative disruption

The electricity business model has not changed in a significant way in over a century. In fact, if it's forefathers were to pay us a visit today they would have very little trouble understanding the system and infrastructure. But the era of consistency and predictability is in the past, we have now entered an era where energy and information communication technologies intersect. This is accelerating innovation in the sector in a fashion not unlike telecommunications in the 90s and it is likely that over the coming years the business will be significantly transformed. New technologies will be adopted, new business models will be implemented and new players will enter the market. There will be winners and there will be losers.

A brave new energy world is emerging, where service comfort, mobility, sustainability and economy will be powered by a multitech approach supported by emerging IoT, machine learning and big data technologies. Renewable power has been growing significantly over the last decade and EDP has been a leader in the clean energy revolution. The integration of new technologies with the secular distribution grid has been key in allowing for increased penetration of renewable power and to maximize the potential for energy efficiency. Residential solar generation, combined with static storage, and integrated management of electrical devices is the future of retail. Electric cars are growing exponentially and will become the standard in mobility. This change will significantly contribute to reshaping the relationship between energy customers and utilities.

EDP is a strong proponent of Open Innovation. Work with universities, scientific institutions, startups, value chain suppliers and many other innovation sources is prized and encouraged as the way to continuously improve. EDP partners with entrepreneurs, business angels, venture capital funds and others to invest in promising smart energy solutions and it has developed a set of tools that include funding, management support and a business oriented test base with an international footprint. In doing so EDP is committed to remaining at the forefront of smart energy thereby insuring continuous and sustainable growth for all stakeholders.

## / Internal Innovation Vehicles

Innovation has been part of EDP's DNA since its inception and as such the activity is closely monitored and supported by the CEO and Board of Directors. Five workgroups aligned with the key challenges and opportunities facing the energy sector were established to monitor disruptive trends and spearhead the creation and adoption of disruptive solutions, these are: Cleaner Energy, Smarter Grids, Client-focused Solutions, Data Leap and Energy Storage.

The Cleaner Energy workgroup supports EDP's energy generation business units in the adoption and integration of competitive and cutting edge renewable power technologies, with the goal of reducing the group's CO2 emissions and fossil fuel dependency. The workgroup's focus is twofold: sourcing and validating alternative renewable energy technologies as well as optimizing conventional generation assets.

The WindFloat project, developed by EDP Innovation in conjunction with EDP Renewables, is a prime example of EDP's motivation to support transformative renewable energy technologies. The project consists in validating a floating offshore platform for wind turbines. Such a structure enables access to offshore locations where wind resources are superior. WindFloat successfully completed the pilot phase and is entering the pre-commercial phase.

The importance of a workgroup that works with EDP Distribution and centres its activities on smart grid technologies was indisputable given both the ongoing development of relevant advancements and the increased challenges that renewable generation pose to the grid. The stress caused by intermittency of renewable power generation, combined with increased penetration of electric vehicles and the expansion of prosumers requires increased transparency, predictability and control over the grid.

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Client-focused Solutions, a workgroup that engages with retail centred business units, looks to improve customer satisfaction and engagement. A new energy consumer that is increasingly sophisticated and values digital, effortless, highly customizable and personalized solutions is on the rise. The traditional energy retail business model is changing at a fast pace, therefore engaging with the customers with a view to constantly improving their experience is crucial to future success.

EDP Re:dy was developed by EDP Innovation in collaboration with EDP Comercial which consists of a home energy management solution that connects and controls household equipment providing users with a real-time holistic understanding of their consumption. Re:dy accompanies the wants and needs of the customer and as such is constantly evolving and improving. Most recently it integrated functionalities related to solar panels management and electric vehicle charging.

The Data Leap workgroup activities focus on internalizing and capitalizing on key technological enablers through digital transformation. It is a cross-functional group that follows trends, validates technologies and implements solutions in cutting edge areas such as big data, cloud computing, advanced analytics, machine learning, artificial intelligence and IoT.

A project that highlights not only Data Leap's pioneering efforts but also EDP's overall commitment to an Open Innovation philosophy is SINAPSE which results from a partnership between telecom operators and EDP. The project consists of a machine to machine communication platform

developed to receive and process actionable georeferenced outage alerts in real time. Power-related events occurring in electric assets are sent over the internet, EDP correlates these events in space and time to detect outages thereby significantly reducing response time and improving the customer experience.

Energy storage has been a key component of EDP's innovation road map for some time but imminent economic viability led to the creation of an autonomous work group that works with business units along the entire energy value chain. The workgroup monitors tendencies and tests technologies which may lead to new business models. The Vehicle to Grid (V2G) project, spearheaded by the Energy Storage workgroup, aims to leverage the energy stored in batteries of electric vehicles by integrating them with the grid in order to respond to potential needs. The project underway is a demonstrator test of the V2G solution, it aims to acquire technological knowledge and assess the challenges and opportunities.

#### **/ Tools to develop and integrate external innovation**

In order to insure the early adoption of new and potentially market leading technologies it is imperative that corporations innovate not only within but increasingly through external adoption and integration. Overcoming the "not-invented-here" mentality allows for a rapid introduction of valuable new technologies, models and capabilities.

EDP Innovation was established on the premise that this Open Innovation is crucial to forwarding its business and to this end an array of tools to support innovation sourcing and adoption have been devised and implemented. Today EDP supports smart energy startups from inception to investment. This ecosystem starts at the level of sourcing promising ideas and talent through initiatives such as hackathons and direct outreach, it evolves to prototyping support, via the Fab Lab in Lisbon, and moves on to structured incubation and acceleration programs. Key tools in this process are the proof of concept facilitation tracks and the investment vehicles.

Sourcing new and valuable ideas is the essential first step to innovation adoption and implementation. EDP hosts an annual Open Innovation

program designed to accelerate startups with an industry centric fit. In this program 15 startups, mainly from EDP's three key geographies, are selected to undergo an intensive program where through mentorship and training the companies are accelerated with a view of creating opportunities for partnership with EDP business units.

Sourcing of opportunities is a daily endeavour at EDP Innovation but at times it's front and centre. At WebSummit, a leading global innovation and entrepreneurship gathering, EDP searches for potential partners while showcasing its extensive ecosystem. Other initiatives such as the EDP Re:dy Challenge and EDP Hackathons are geared towards obtaining and maximizing traction with university graduates that typically possess raw talent and present comparatively less mature concepts.

According to a Boston Consulting Group study, corporate accelerator and incubator programs increased over the past ten years from 2% to 44% in the 30 largest companies of its CVC index. EDP has been ahead of this trend. In 2012, it kicked off its startup incubation program; an innovative equity free incubation/acceleration concept for startups operating in the energy sector. The program has since reviewed over 2000 applicants, it has incubated 31 startups and is responsible for the execution of 21 pilot projects with relevant EDP business units. Based on this successful track record in 2017 the Starter program expanded to Spain and Brazil, with a view to further increase its sourcing efforts. EDP has also made available a Fab lab where the community at large can prototype its solutions making use of cutting edge digital fabrication tools.

Proofs of concept, to validate technologies, are key to the EDP partnership and investment process. For this reason, one of EDP Innovation's critical tasks is bridging startups and EDP business units in order to insure an accelerated decision process. These pilot projects are critical to both parties; in the case of EDP they provide visibility on how technologies perform in real conditions thus validating next steps; for startups, they provide a unique stage to test, improve and if necessary pivot their solutions. The Free Electrons Accelerator, of which EDP is a founding member, was structured with this purpose in mind. Its aims to accelerate

A critical component in EDP's Open Innovation ecosystem is the capacity to invest in auspicious startups. To this end EDP Ventures was established in 2009. It takes equity positions in startups that have promising technologies with direct fit with EDPs business. This is an opportunity to support and engage with the community while leveraging key industry specific knowledge in a way that creates value. EDP has established two such funds, the Ventures SGPS which invests worldwide and has 40 million Euros under management and EDP Cleantech FCR, which is geocentric, investing it's 35 million Euros in Portugal.

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Change in the energy industry is indeed occurring at an increasingly fast pace. The developments related to digital technologies, the advent of distributed generation combined with the growth of asymmetric competition and an increasingly demanding customer base is leading utilities to reinvent themselves and their business. In order to face these challenges and capitalize on the opportunities that naturally arise EDP has developed one of the most robust corporate innovation ecosystems in the industry. It not only spearheads cutting edge innovation within its walls but supports external developments from inception to investment. In doing so EDP insures continuous and sustainable growth for all stakeholders.