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02

STRATEGIC APROACH

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02

Strategic approach

2.1. Business environment

2.1.1. Renewables are the backbone of decarbonization

2.1.1.1. Green recovery

COVID-19 is not only a global pandemic and public health crisis; it has also severely damaged the global economy and financial markets. However, it has also boosted the climate movement and the sense of urgency in climate action, leading to bolder commitments from countries all around the world.

We are now at a pivotal moment, as national governments are designing stimulus packages to revive their economies. The recovery from COVID-19 is showing a new willingness to set ambitious mitigation targets, which can strengthen the case for accelerating the transition to a climate-neutral society. Low carbon policies can not only mitigate climate and health risks, but also reactivate the world economy. In this context, renewables must be at the heart of rebuilding policies as they are the cheapest generating alternative in most countries, while they can also stimulate the economy by creating “green” jobs, ensuring energy security and saving money from fossil fuel imports.

Demand for “Green recovery” is materializing in different ways, including more ambitious emission and renewable targets.

In December 2020, the world celebrated the 5th anniversary of the Paris Agreement and the United Nations hosted an important summit in which 75 countries announced new commitments, with 24 pledging to reach carbon neutrality.

In Europe, the Green Deal announced in December 2019 is at the heart of the EU's strategy to drive the economic recovery from the COVID-19 pandemic, in particular through the so-called "Next Generation EU", a €750 billion recovery instrument announced in May 2020. Around 30% of the €750 billion fund will be used to support decarbonization, in addition to the €1 trillion previously announced by the Green Deal. Additionally, several EU Member countries are announcing national recovery plans, some of which have substantial green components. In parallel, EU leaders agreed in December 2020 to cut the bloc's net emissions by at least 55% by 2030, compared to 1990 levels, increasing considerably from its previous level of 40%. To achieve this target, the European Commission (EC) is preparing its "Fit for 55 Package" of proposals, an umbrella term for all the revisions and initiatives linked to the 55% emission reduction target. The Renewable Energy Directive will need to be reviewed, to align the current "at least 32% renewable target by 2030" with the new 55% emission reduction target.

Global Warming in 2020

According to the Global Carbon Project (GCP), global carbon dioxide (CO_2) emissions from fossil fuel and industry are expected to drop by 7% in 2020, the largest absolute drop ever recorded, as economies around the world feel the effects of COVID-19 lockdowns. However, 2020 reduction will not slow the pace of global warming as emissions continue to accumulate in the atmosphere propelling the world closer to crossing the 1.5°C warming threshold. Indeed, the NASA reported in January 2021 that 2020 had been the hottest year ever on record. The climate crisis materialized in soaring temperatures, enormous storms, unprecedented wildfires and climate-related floods that killed at least 8.200 people and cost the world USD 210 billion in insured losses, according to a report published by Munich Re. According to this study, natural catastrophe losses in 2020 were significantly higher than the previous year.

In the US, president Joe Biden signed on its first day of mandate an executive order to reinstate the US to the Paris Climate agreement, which highlights the urgency of tackling climate change.

In 2020, many countries have also adopted net zero emission targets by 2050. As of today, at least 8 countries have already put the commitment into law (Norway, Denmark, New Zealand, the UK, Hungary, Germany, Sweden and France), while others, like the EU have proposed the legislation (under the EU Green Deal) and are awaiting ratification. Together, net zero commitments so far represent nearly 50% of global CO_2 emissions and 50% of global GDP, which could increase importantly if the US were to join as well, in line with current President Biden recent announcement. Other large economies are also considering to becoming carbon neutral, like Japan and South Africa (in 2050) or China (in 2060).

Companies have also shown a growing environmental awareness in 2020, despite the severe turmoil caused by the COVID-19 pandemic. According to the analysis conducted by the non-profit global Climate-Disclosure Project platform (CDP), the number of major companies who've disclosed their environmental impact and importantly committed to reducing it increased 14% in 2020.

2.1.1.2. The future is green

Despite the slowdown witnessed by the power sector during the COVID-19 pandemic, renewable energy grew in 2020. According to the International Energy Agency (IEA), around 90% of the power capacity added worldwide was renewable. All analysts have also highlighted that the renewable energy sector, and in particular, the renewable electricity sector, have showed a strong resilience to the crisis. While global energy demand has declined by around 5% (according to IEA estimates), electricity from renewable sources has grown by almost 7%. In total, around 200 GW of additional renewable capacity has been connected in 2020. A rise of 15% in the auctioned capacity[1] hints at this growing interest in renewable capacity.

For the medium and long-term, prospects are also excellent. Wind and solar PV capacity is on track to overtake natural gas in 2023, and coal in 2024, becoming the largest source of electricity generation worldwide in 2025.

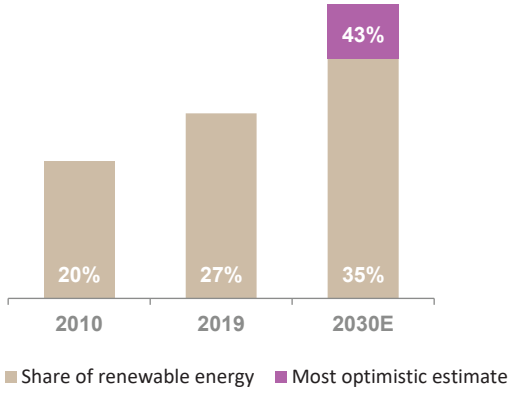
Most of the energy analysts foresee a rapid grow of wind and solar PV, thanks to a continued sharp cost reduction, driven by improving technologies, economies of scale, increasingly competitive supply chains and growing developer experience.

[1] From January to October 2020. Source: IEA

According to the International Renewable Energy Agency (IRENA), the Levelised Cost of Electricity (LCOE) of solar PV has fallen 82% since 2010, followed by onshore wind at 39% and offshore wind at 29%. With these technologies becoming the least-cost option for new capacity in an increasingly number of countries, their contribution in the energy mix is expected to take a leading role.

In the next decade, renewables are expected to be the backbone of energy transition. According to consulted experts[2], renewables will generate in 2030 between 35-43% of the electricity generation[3], from around 27% in 2019. However, in the wake of the COVID-19 recovery, strengthen policies are expected, and therefore, the share of renewables could increase accordingly.

Share of renewables in power generation



2.1.2. The evolution of renewables around the world in 2020

Wind

Global wind additions are likely to witness considerable growth in 2020[4], with analysts[5] forecasting around 60-72 GW of new capacity, vs 60.4 GW in 2019. For example, according to the latest market outlook published by the Global Wind Energy Council (GWEC), wind could increase as much as 71.3 GW in 2020, despite the impact of the COVID-19 pandemic.

However, as China announced in January 2021 the staggering figure of nearly 72 GW of wind additions in 2020 (nearly tripling the amount of capacity in 2019), wordwide wind additions are now expected to be much higher, probably around 100-112 GW.[6]

All forecasts highlight wind industry resilience during the pandemic crisis. Despite that national lockdowns led to a slowdown of construction activity (essentially caused by supply chain disruptions and logistical challenges) in the first half of the year, deployment accelerated in the second half.

The offshore wind sector has also proved to be resilient. According to preliminary data, around 6.9 GW could have been connected, around 4 GW in China, and 2.9 GW in Europe.

In Europe, the wind industry experienced disruptions in the first semester but total additions were nevertheless comparable to previous years. According to Wind Europe, 3.9 GW of onshore wind facilities were connected in the first six months of the year, slightly over the average of the previous three years (3.7 GW) while offshore installations were slightly below the three-year average (1.2 GW in 2020 vs 1.5 GW in 2017-2019). Overall, preliminary results are particularly encouraging

[2] Consulted experts and analysts include: IRENA, IEA, IHS, Wood MacKenzie and BNEF, among others.
[3] Central scenarios (or scenarios taking into account existing policies and enacted targets) have been used to elaborate this range.
[4] At the time of preparation of this report, data from the global wind energy council (GWEC), the american wind energy association (AWEA) or wind europe, have not been released
[5] Experts consulted include: GWEC, IHS markit, bloomberg new energy finance, international energy agency, wood mackenzie, IEA, wind europe and US energy information administration, among others.
[6] Most of the experts consulted had forecast that China would install around 30 GW of wind in 2020, therefore, 40 GW below the final figure.

considering that wind installations are typically higher in the second half of the year, mainly due to the strongest activity in summer months, suggesting that total 2020 additions could easily surpass the 10 GW threshold (probably around 12 GW). In 2020, wind power contributed to 15% of Europe's total electricity generation, its highest-ever share, according to a report released by Enappsys Ltd.

In the United States, developpers commissioned 16.9 GW of new onshore wind capacity, far more than the previous record of 13.2 GW achieved in 2012, according to the American Clean Power Association. These impressive results are partly explained by the rush of wind developers to connect their projects before the phase-out of the full value of the US production tax credit (PTC) at the end of 2020.

China remained the undisputed world's wind power leader, adding 71.6 GW of wind energy, more than doble the previous record (29.4 GW in 2015) according to the National Energy Administration (NEA). Despite challenges posed by COVID-19 pandemic, developers in China were rushing to complete projects before the phase-out of the current remuneration scheme. It has been a particularly good year for offshore wind installations as it is estimated that around 3.5-4 GW of offshore wind facilities have been added. However, given astonishing total figure of 71.6 GW (that includes both onshore and offshore facilities), offshore additions could be much higher. After this surge of new installations, China may become the largest offshore wind operator worldwide in 2020 or 2021 the latest.

Solar PV

Solar PV grew robustly around the world in 2020 despite the turmoil caused by the COVID-19 crisis. Although final data are still being collected, experts points out that around 106-132 GW of new facilities could have been connected in 2020[7] . Therefore, 2020 final figure is expected to be in line with 2019 data (108 GW) or, more likely, above.

In Europe, 18.2 GW of solar PV capacity was added, up 11% from the 16.2 GW installed in 2019, according to Solar Power Europe. With this surge in new installations, the European solar PV industry proved its resilience during the coronavirus pandemic as 2020 was the second-best year for installations, only behind 2011 when 21.4 GW were installed. Over the past 12 months, Germany led the way with 4.8 GW of new installations, followed by 2.8 GW in the Netherlands and 2.6 GW in Spain. Poland more than doubled its additions to 2.2 GW, and France installed 0.9 GW.

In the US, utility-scale solar additions more than doubled from 2019 levels, as 11.158 MW were connected in 2020, according to the Energy Information Administration (EIA). With those additions, there are now more than 47 GW of solar PV operating in the US, enough to power 11 million American homes.

China remains the largest market. According to the National Energy Administration, the country added 48 GW of solar PV additions, exceeding all expectations. This figure largely surpasses the 30.1 GW added in 2019, although it remains below the 2017 record of 52.8 GW.

[7] Experts consulted included: BNEF, IHS, Wood Mackenzie, IEA, The Solar Energy Industries associations (SEIA) among others

2.1.3. Regulatory Framework

SPAIN

- Under RD 413/2014, wind energy receives pool price and a premium per MW in order to achieve a target return defined by regulation.
- RDL 17/2019 has set the target return (TRF) @7.398% for WF's prior to 2013 (provided that any arbitration cases are withdrawn) for the next two regulatory periods (until 2031) and @7.09% for new installations for the current regulatory period (until 2026).
- Premium calculation is based on standard assets (standard load factor, production and costs).
- Since 2016, all the new renewable capacity is allocated through competitive auctions.
- In 2020, RD 960/2020 defined the framework for a new auction mechanism.
- In January 2021 the first auction under the new scheme will be held:
  - Wind and onshore PV projects will compete for 12-year fixed-price PPAs with certain exposure to market prices (5% for non-dispatchable and 25% for dispatchable RES).
  - Participants are awarded unidentified MWs but will need to comply with stringent deadline and submit a strategic plan.
- The Royal Decree on access and connection to the energy and transmission networks (RD 1183/2020) was approved in December 2020, establishing the principles and criteria in relation to the application, processing and granting of permits for access and connection to the electricity transmission and distribution networks.

PORTUGAL

- WF's commissioned before 2006 are subject to a FIT whose value is correlated with production and indexed with CPI. Initial tenure was the soonest of 15 years (or until 2020) or 33GWh/MW but in was increased 7 years (tariff extension) with a cap and floor scheme in exchange of annual payments between 2013 and 2020.
- WF's under the new regime (COD after 2006) are subject to a FIT for the soonest of 20 years from COD of 44 GWh/MW. Tariff value is also indexed wit CPI.
- Since 2019, solar projects are awarded following a new auction system.
- Solar PV projects awarded in the 2019 and 2020 auctions achieved record low prices.
- Participants, in their bids, have the choice between different remuneration schemes:
  - A fixed guaranteed tariff structure (that was transformed into a CfD in 2020 auction).
  - A market scheme where players bid for a contribution made to the National Electric System.
  - Since 2020, a new system consisting of a market scheme for power plants incorporating a storage system, in which participants bid the value of the capacity payment what they would like to receive.

FRANCE

- Old wind farms receive Feed-in tariffs for 15 years, with values depending on the COD and load factors achieved.
- A transitory Contract-for-difference scheme was released in December 2016 in which wind farms having requested a PPA in 2016 would receive a 15-year CfD, being the strike price very similar to the previous FIT. This scheme was closed in December 2019.
- From 2017 onwards:
  - Wind farms with less or equal than 6 wind turbines (and with 3MW/WTG maximum) can request a 20-year CfD which strike price ranges from 72€/MWh to 74€/MWh depending on turbine's diameter and may include a FIT reduction when a yearly generation cap is reached.
  - Wind farms of more than 6 wind turbines need to participate in competitive tenders in order to obtain a 20-year CfD.

BELGIUM

- Green certificate scheme.
- WF's receive market price plus GC per MWh produced.
- Number of GC/MWh for new plants' contracts is revised every three years.
- The minimum price for GCs is set 65€/GC in Wallonia.

ITALY

- WF's in operation prior to 2012YE are under a feed-in-premium scheme applicable for the first 15 years of operation.
- WF's commissioned from 2013 onwards awarded in competitive auctions until 2017 are subject to a 20-years floor CfD scheme.
- WF's winning the auctions will benefit from a 20-years two-side CfD scheme.
- In 2020, three renewable auctions were held.

POLAND

- Electricity price can be stablished through bilateral contracts.
- WF's before 2018 are subject to a GC scheme. Wind receive 1 GC/MWh during 15 years that can be traded in the market. Electricity suppliers have a substitution fee for non-compliance with GC obligations.
- WF's awarded since 2018 in auctions are subject to a two-side CfD with a tenure of 15 years.

ROMANIA

- Wind assets (installed until 2013) received 2 GW/MWh until 2017 and 1 GC/MWh after 2017 completing 15 years.
  - 1 out of the 2 GC earned until March 2017 is postponed and can only be recovered gradually from January 2018.
- Solar assets received 6 GC/MWh for 15 years.
  - 2 out of the 6 GC earned until December 2020 are postponed and may only be recovered gradually from 2025.
- GC are traded in the market under a cap and floor system (cap €35 and floor 29,4€).
- Wind assets (installed after 2013) receive 1,5 GC/MWh until 2017 and 0,75 GC/MWh afterwards until completing 15 years.
- Solar PV facilities (installed after 2014) only receive 3 GC.
- The GCs issued after April 2017 and the CGs postponed to trading from July 2013 will remain valid and may be traded until March 2032.

GREECE

- Renewable projects in Greece are supported by a 20-year feed-in premiums (Contracts-for-Difference) awarded through auctions.

BRAZIL

- Old installed capacity under a feed-in program ("PROINFA").
- Since 2008, competitive auctions awarding 20-years PPAs.
- Electricity may also be sold under private PPAs.

COLOMBIA

- Colombian WFs have been awarded 15-years long-term contracts though competitive pay-as-bid auction. Contracts are signed with several Colombian distribution counties.
- Additionally, Colombian WF's secured reliability charge contract, a monthly payment in exchange of having part of its capacity available when the system is under tight supply conditions.

USA

- Sales can be fixed under PPAs (typically 15-25 years), Hedges, or subject to spot market prices.
- Green Certificates (Renewable Energy Credits, or RECs) subject to each state regulation
- Tax Incentives
  - PTC collected for 10-years post COD
  - ITC collected at COD
  - PTC and ITC levels depend on phase down schedule
- Key changes: Shift in US Presidency and Senate likely reduce support for fossil interests and improve support for renewables

CANADA

- Most existing supply in Canada is either contracted or rate regulated
- New supply motivated by PPAs from Provincial solicitations and bilateral contracts.
- Ontario and Alberta increasingly looking to spot markets to compensate
- Key changes: Federal Gov't is raising carbon tax to $170/ton by 2030

MEXICO

- Cancellation of new supply auctions
- New supply is backed by bilateral contracts
- Key changes: New administration slowing or reversing the recent market liberalizations

EDPR NA Regulatory and Market Environment:

EDPR operates in most of the electricity markets in the US, Canada, and Mexico. The nature of regulations and market rules vary from market to market with different degrees of influence from Federal and State/Provincial regulators in each market. The opportunities and constraints for EDPR assets and prospects are significantly defined by these regulations and market rules.

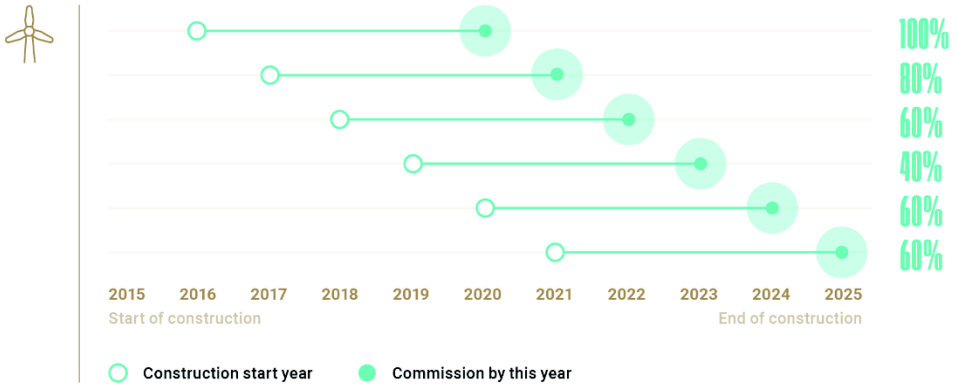
Regional Transmission Organizations ("RTO"), Independent System Operators ("ISO") exist throughout much of North America to operate a region's electricity grid, administer the region's wholesale electricity markets, and provide reliability planning for the region's bulk electricity system. RTOs carry additional responsibility for the region's transmission network. US markets with RTOs and ISOs fall under greater Federal influence through the Federal Energy Regulatory Commission ("FERC") which results in more transparent tariff and market rules. Regulation and market rules for regions not in RTO/ISO footprints tend to be influenced by various combinations of entities including State regulators, vertically integrated utilities, municipal governments, and Federal Agencies.

In general, EDPR seeks to build assets in North American markets where long-term contracts are available for the bulk of the output of its generation facilities. In addition to electrical power, EDPR's facilities can produce capacity and ancillary services in regions with demand for these products. Many states have enacted Renewable Portfolio Standards ("RPS") require obligated entities to provide a certain percentage of their energy supply from qualifying renewable sources, similar to the Renewable Energy Directive in the EU. Over the last few years, North American states have expanded these targets such that renewable portfolio standards in over ten states require 50% or more of their energy supply to be delivered via renewable resources in the next ten to twenty years. Certain facilities within the EDPR wind and solar portfolio, given their location, produce renewable energy credits ("REC"), certificates of clean energy ("CEL") and other environmental attributes which are typically sold, along with the energy, capacity, and ancillary services, from the plants under long-term contracts. These RECs generated via renewable production may also be sold separately from the wind and solar generation, if not already included in the long-term contracts. The party owning the RECs is solely entitled to the benefits of the environmental attributes.

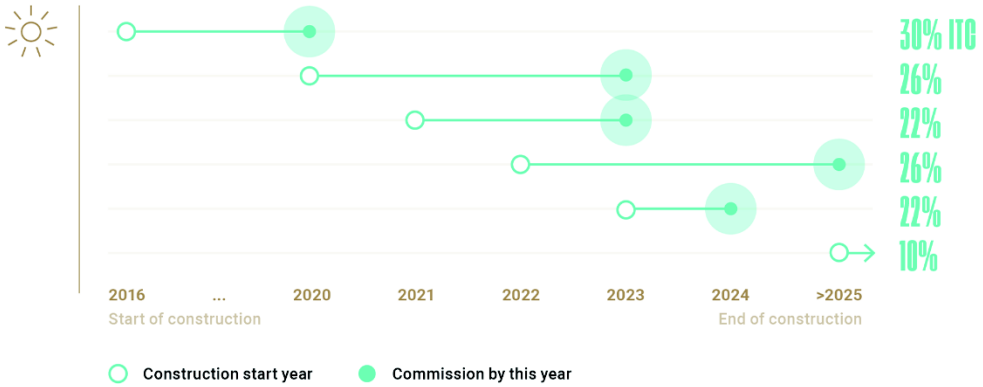
US federal, state and local governments have established various incentives to support the development of renewable energy projects. Included in these incentives are the Investment Tax Credit ("ITC"), Production Tax Credit ("PTC"), cash grants, and tax equity financing. Pursuant to the US federal Modified Accelerated Cost Recovery System, wind and solar projects are fully depreciated for tax purposes over a five-year period even though the useful life of such projects is generally much longer than five years.

Owners of utility-scale wind facilities are eligible to claim the ITC upon initially achieving commercial operation or PTCs for generation from qualifying facilities. The PTC is awarded based on the volume of electricity produced by the wind facility during the first ten years of commercial operation. This incentive was established by the US Congress as part of the 1992 Energy Policy Act and has been extended several times through the American Recovery and Reinvestment Act of 2009, the American Taxpayer Relief Act of 2013, the Tax Increase Prevention Act of 2014, the Consolidated Appropriation Act of 2016, and most recently as part of the $1.4 trillion omnibus and COVID-19 relief package. The ITC and PTC levels for a given facility depend on that facility's start of construction date and commissioning date and remain fixed at this level for the first ten years of operation.

PTC Schedule for wind



ITC Schedule for solar PV

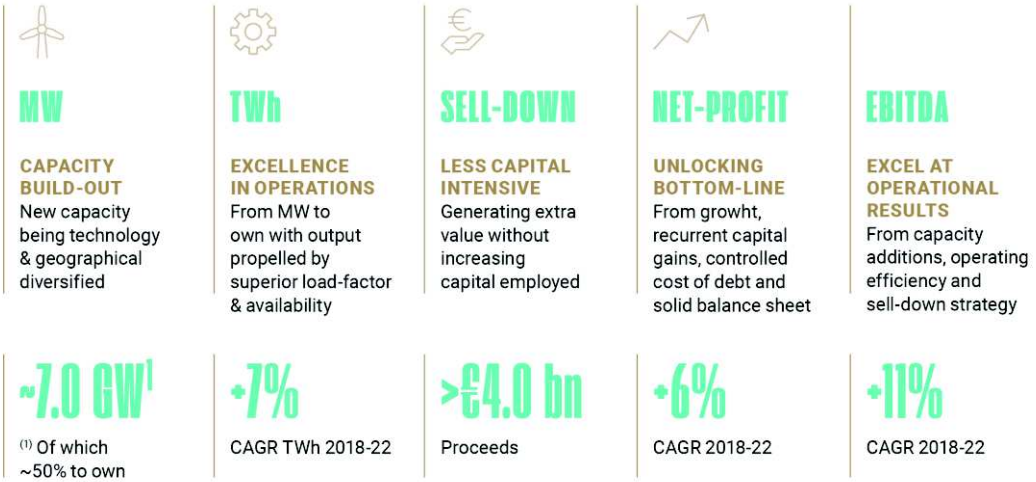


2.2. Strategy

Since its inception, EDPR has been performing a strategy focused on selective growth, by investing in quality projects with predictable future cash-flows and seamless execution, supported by core competences that yield superior profitability, all embedded within a distinctive and self-funding model designed to accelerate value creation. As a result of undertaking such strategy, at the same time flexible enough to accommodate changing business and economic environments, EDPR remains today a leading company in the renewable energy industry.

EDPR's strategy is supported by its three main pillars:

EDPR Business model to deliver solid and ambitious growth targets through 2022 positioning to successfully lead a sector with increased worldwide relevance.



2.2.1. Selective Growth

Selective growth is the key principle behind EDPR's investment selection process, with new projects having long-term PPAs secured or being awarded long-term contracts under stable regulatory frameworks, as well as exhibiting above portfolio average load factor. As presented in March 2019, EDPR plans to add c.7.0 GW for the 2019-2022 period, of which 87% is already secured. EDPR will diversify geographically and technologically growing on wind onshore, offshore and solar along with the entrance in new markets.

EDPR MAIN GROWTH MARKET DRIVEN BY PPAS SECURED

North America is EDPR's main growth market, with 6.8 GW installed capacity, representing around half of EDPR total portfolio.

The US, Canada and Mexico will account for 60% of the total 7.0 GW targeted capacity additions.

EDPR has secured a total of 3.3 GW for the period. 2.1 GW related to wind onshore projects, with 0.4 GW for 2021, along with 1.2 GW related to solar projects, some of them with storage batteries, of which 0.2 GW for 2020, 0.2 GW for 2021 and 0.7 GW for 2022.

In 2020, EDPR built 0.6 GW of wind onshore and 0.2 GW of Solar PV in North America.

FOCUS ON LOW RISK REGULATORY FRAMEWORKS

EDPR growth in Europe is supported by identified short-term opportunities along with medium-term pipeline options and PPA appetite.

In 2019-2022**, EDPR plans to add 1.4 GW in Europe, representing 20%** of the total capacity to be added in the period 2019-2022.

From the 1.4 GW, **EDPR already secured 1.2 GW related to wind onshore** projects of which 0.7 GW for 2021 and 0.1 GW for 2022, **along with 0.1 GW of solar** projects for 2022.

In 2020, EDPR added 0.6 GW of wind onshore in Europe.

PROJECTS WITH LONG-TERM PPAS

Brazil represents a 10% of the 7.0 GW total capacity to be added in the 2019-2022 period.

EDPR has been active in upcoming Brazilian opportunities, namely auction opportunities, given the strong fundamentals of the country, with high growth of electricity demand, robust renewable resources and availability of long-term energy supply agreements through an auction system.

EDPR has currently more than 1 GW of renewable energy projects under development, of which 0.23 GW of solar with start of operation expected for 2021 and 0.1 GW for 2022. Regarding wind 0.4 GW are expected for 2022 and 0.6 GW of wind for 2023 and 2024, all of them with long-term contracts secured.

WORLDWIDE OPPORTUNITIES LOW RISK + REGULATORY STABILITY

EDPR will expand its footprint along new countries with a dedicated team screening several markets and developing the best strategy for each market.

New countries are targeted at 10% of **EDPR 2019-22 targeted growth. As of June 2020, EDPR managed to secure 0.6 GW of such target** with the entrance in Greece and Colombia in its portfolio.

EDPR secured 150 MW of offshore wind in Greece through different auctions under a remuneration scheme providing 20 years CfD and to be commissioned between 2020 and 2022.

In the other side of the globe, **492 MW o offshore wind were awarded** through capacity auction in **Colombia** to be operational in 2022.

INVESTING IN OFFSHORE WIND TECHNOLOGY

Offshore wind energy is becoming an essential part of the global energy transition, leading to the market's rapid growth and increased competitiveness.

In 2019, a **Joint Venture** was announced by **EDPR and ENGIE** for worldwide offshore wind investments opportunities to bring together the industrial expertise and development capacity of both companies. EDPR and ENGIE will combine their offshore wind assets and project pipeline. As of Dec-2020, Ocean Winds has a total capacity of 25 MW in operation, 1.4 GW under construction and 5.1 GW under development, with a **target of 5 to 7 GW of projects in operation** or construction **and 5 to 10 GW under advanced development by 2025.**

2.2.2. Self-funding business

EDPR self-funding model has been a cornerstone of EDPR's strategy and its success has been crucial for funding and propel growth.

The self-funding model relies on a combination of the cash generated from operating assets and EDPR's strategy of selling stakes in projects in operation or under development, along with the US Tax Equity structures to finance the profitable growth of the business. This model allows the company to create value while recycling capital.

Sell-down strategy

Proceeds from selling majority stakes in operational or under development assets are also important sources of funds for the self-funding model of EDPR in financing its profitable growth. Under this strategy, EDPR sells majority stakes in projects in operation or in late stage of development, allowing the company to recycle capital, with up-front cash flow crystallization, and create value by reinvesting proceeds in accretive growth, with the option to provide operating and maintenance services. On the top of these, the Sell Down strategy makes visible the value creation on reported financial statements, with capital gains being booked in the income statement.

As of 2020, EDPR already announced more than €2.3 billion out of the >€4.0 billion of sell down proceeds for 2022, representing around 57.5% of such target.

Closed 3Q19		Closed 1Q20		Closed 4Q20		Closed 4Q20		Closed 4Q20 *Build & Transfer*	
997 MW 491 net MW	Full exit	137 MW 137 net MW	100% stake	242 MW 242 net MW	100% stake	563 MW 450 net MW	80% stake	102 MW 102 net MW	100% stake
8 years assets avg. age	€0.8bn proceeds	1 year assets avg. age	~€0.3bn proceeds	9 years assets avg. age	~€0.5bn proceeds	0-3 years assets avg. age	~€0.7bn proceeds	0 years assets avg. age	~€0.2bn proceeds
€1.6m EV/MW	€226m €0.4m/MW	€1.6m EV/MW	€87m €0.6m/MW	€2.1m EV/MW	€113m €0.5m/MW	€1.6m EV/MW	€159m €0.3m/MW	$1.7m EV/MW	€17m €0.2m/MW
	capital gains		*capital gains*		*capital gains*		*capital gains*		*capital gains*

2.2.3. Operational Excellence

One of the strategic pillars that has always been a keystone of the Company, setting it apart in the industry, is the drive to maximise the operational performance of its wind and solar plants. In this area, EDPR's teams, namely in operations and maintenance (O&M), have established a strong track record. EDPR has set targets for three key metrics: Load Factor, Technical Availability and Core Opex per MW. These metrics provide an overall view of the progress in EDPR wind assessment, O&M and cost control efforts, and also serve as good indicators for the overall operational efficiency of EDPR.

Maintaining high levels of availability

Availability is the ratio between the energy actually generated and the energy that would have been generated without any downtime due to internal reasons, namely due to preventive maintenance or repairs. Therefore, it is a clear performance indicator of the company's O&M practices as it focuses on reducing to a minimum any malfunctions and performing maintenance activities in the shortest possible timeframe. With a target of more than 97.5%, EDPR will continue to improve availability through new predictive maintenance optimisation measures supported by the 24/7 control and dispatch centre, reducing damages most common during extreme weather and improving the scheduling of planned stops. Also, a new spare parts warehousing strategy will be key in reducing downtime during unexpected repairs. The company has always maintained high levels of availability, having registered availability of 97% as of December 2020.

Leveraging quality growth on distinctive wind assessment toward 33% load factor

Load factor (or net capacity factor) is a measure for the renewable resource quality, that reflects the percentage of the maximum theoretical energy output, in a given period. EDPR 2019-22 Business Plan target a 33% load factor, mainly on the back of the increase competitiveness of new capacity additions. In 2020, EDPR reached a load factor of 30%.

Increasing efficiency, by reducing Core Opex/Avg. MW

In addition to all company initiatives to boost production, EDPR also focuses on strict cost control efforts to improve efficiency and profitability. Leveraging on the experience accumulated over time, EDPR plans to reduce Core Opex/ avg. MW by -1% CAGR 2019-22. Core Opex is defined by Supplies and Services (including O&M activities) and Personnel costs, which are the costs that EDPR can actively manage. The target of reducing the manageable company costs structure, also benefits from the economies of scale of a growing company. In 2020, adjusted by Sell-down, offshore costs (cross-charged to projects' SPVs), service fees, one offs and forex, Core Opex per avg. MW was +1% YoY, given upfront costs to support expected growth over the coming years and adjusted Core Opex per MWh was also +1% YoY.

M3 Program and self-performance

Based on EDPR's expertise, under the M3 program O&M teams will decide on the optimal balance between external contractors and in- house maintenance. This new program has quickly generated savings in operational expenses and increased control over quality. The self- perform program is a step further in EDPR's integration of maintenance tasks and activities, which is being implemented in the US, and consequently minimizes third-parties' dependency. EDPR targets to increase the share of its fleet under the M3 and Self-Perform program to c.60% by 2022, from c.30% levels in 2015, while at the same time keeping flexibility to choose the most competitive sourcing contract.

2.3. Risk management

In line with EDPR's controlled risk profile, Risk Management process defines the mechanisms for evaluation and management of risks and opportunities impacting the business, increasing the likelihood of the Company in achieving its financial, operational and sustainability targets, while minimising fluctuations of results.

Risk management process

EDPR's Enterprise Risk Management Process is an integrated and transversal management model that ensures the minimisation of the effects of risk on EDPR's capital and earnings, as well as the implementation of best practices of Corporate Governance and transparency.

EDPR's Enterprise Risk Management Process is inspired on Basel Committee on Banking Supervision's principles, guidelines and recommendations.

The process aligns EDPR's risk exposure with the Company's desired risk profile. Risk management policies are aimed to mitigate risks, without ignoring potential opportunities, thus, optimising return versus risk exposure.

The process is closely followed and supervised by the Audit, Control and Related Party Transactions Committee, an independent supervisory body composed of non-executive members.

Risk management is endorsed by the Executive Committee, supported by the Risk Committee and implemented in day-to-day decisions by all managers of the Company.

EDPR created three distinct meetings of the Risk Committee, separating discussions on execution of mitigation strategies from those on definition of new policies, in order to help decision-making:

- **Restricted Risk Committee:** Held every month, it is mainly focused on development risk and market risk from selling energy (electricity price, basis, profile, GCs and RECs). It is the forum to discuss the evolution of projects under development and construction and the execution of mitigation strategies to reduce merchant exposure. It also monitors the limits of defined risk policies, with regards to counterparty risk, operational risk and country risk.

- **Financial Risk Committee:** Held every quarter, it is held to review main financial risks and discuss the execution of mitigation strategies. Exchange rate risk, interest rate risk, inflation risk and credit risk arising from financial counterparties are risks reviewed in this committee.

- **Risk Committee:** Held every quarter, it is the forum where new strategic analysis is discussed and new policies and procedures are proposed for approval to the Executive Committee. Additionally, EDPR's overall risk position is reviewed, together with EBITDA@Risk and Net Income@Risk.

Risk map at EDPR

Risk Management at EDPR is focused on covering all risks of the Company. In order to have a holistic view, they are classified in five Risk Categories. Within each Risk Category, risks are classified in Risk Groups. The full description of the risks and how they are managed can be found in the Corporate Governance chapter. The graph below summarises the Risk Categories, the Risk Groups and the Risk Management mitigation strategies at EDPR.

RISK CATEGORIES		RISK GROUPS
MARKET RISKS	It refers to the risk to EDPR resulting from movements in market prices. Due to the relationship between wind production and energy price, production risk is considered within market risk. In particular, market risks are changes in energy prices, energy production risk, interest rates, foreign exchange rates and other commodity prices.	• Energy Price Risk • Energy Production Risk • Commodity Price Risk • Liquidity Risk • Inflation Risk • Exchange Rate Risk • Interest Rate Risk
COUNTERPARTY RISKS	Risk that counterparty to a transaction could default before final settlement of the transaction's cash flows. A direct economic loss would occur if transactions with the counterparty had positive economic value at the time of default. Even in the case of not defaulting, it may not comply with its contract obligations (timing, quality, etc.), implying additional higher costs due to its replacement or to delays in fulfilling thecontract.	• Counterparty Credit Risk • Counterparty Operational Risk
OPERATIONAL RISKS	Defined as the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events (such as an increase in equipment default rates, increasing O&M, or natural disasters) and ensuring Business continuity at all times.	• Development Risk • Legal Claims Risk (Compliance, • Corruption, Fraud) • Execution Risk • Personnel Risk (health and safety, human rights, discrimination) • Operation Risk (Damage to Physical Assets, Equip. Performance, Environmental) • Processes Risk (including Business Continuity) • Information • Technologies Risk
BUSINESS RISKS	Potential loss in the Company's earnings due to adverse changes in business margins. Such losses can result, above all, from a serious increase in equipment prices or changes in the regulatory environment. Changes in energy prices and energy production are considered market risks.	• Regulatory Risk (renewables) • Equipment Price Risk • Equipment Supply Risk
STRATEGIC RISKS	It refers to risks coming from macroeconomic, political, social or environmental situation in countries where EDPR is present, as well as those coming from a change in competitive landscape, from technology disruptions, from changes in energy markets or from governance decisions (investment decisions criteria, Corporate Governance and Reputational issues).	• Country Risk • Competitive Landscape Risk • Technology Disruptions Risk • Invest. Decisions Criteria Risk • Reputational Risk • Meteorological Changes • Corp. Organisation and Governance • Energy Planning

MITIGATION STRATEGIES

- Close analysis of natural hedges to define best alternatives
- Hedge of market exposure through long term power purchase agreements (PPA) or short and medium term financial contracts
- Natural FX hedging, with debt and revenues in same currency
- Execution of FX hedging for net investment (after deducting local debt)
- Execution of FX hedging to eliminate FX transaction risk, mainly in Capex
- Execution of interest rate hedging
- Execution of inflation hedging
- Alternative funding sources such as Tax equity structures and Multilateral/ Project Finance agreements

- Counterparty exposure limits by counterparty and at EDPR level
- Collateral requirement if limits are exceeded
- Monitoring of compliance with internal policy

- Supervision of suppliers by EDPR's engineering team
- Flexible CODs in PPAs to avoid penalties
- Partnerships with strong local teams
- Monitor recurrent operational risks during construction and development
- Close follow-up of O&M costs, turbine availability and failure rates
- Insurance against physical damage and business interruption
- Strict compliance with legal requirements and zero tolerance for discrimination, unethical behavior or fraud
- Attractive remuneration packages and training for personnel
- Revision and compliance with all regulations that affect EDPR activity (H&S, environmental, taxes...)
- Control of internal procedures
- Redundancy of servers and control centers of wind farms
- Information Technologies Risk

- Careful selection of energy markets based on country risk and energy market fundamentals
- Diversification in markets and remuneration schemes
- Diversification in technologies
- Follow-up of regulation changes in markets where EDPR is present to adjust strategy if needed
- Active involvement in major industry associations in all EDPR markets
- Signing of medium-term agreements with equipment manufacturers to ensure visibility of prices and supply
- Relying on a large base of equipment suppliers to ensure supply

- Careful selection of countries
- Worst case profitability analysis of every new investment considering all risks factors
- Risk-return metrics at project and equity level
- Profitability resilience metrics
- Consideration of stress case scenarios in the evolution of energy markets for new investment decisions
- Follow-up of cost effectiveness of renewable technologies and potential market disruptions

Risk analyses and impact of COVID-19 in EDPR

The year 2020 was marked by the outburst of the COVID-19 pandemic. In March, EDPR carried out a comprehensive assessment of the potential impacts on the company's operations, followed by recommendations of actions to be put in place and a process for continuous monitoring of the situation.

The impact of COVID-19 has been transversal across all areas and geographies of the company, but those impacts can be grouped under several risk categories:

- **Market Risk:**
  - **Energy price risk:** Energy price significantly dropped during 2020 in most of EDPR geographies due to the reduction in demand following the lockdown and a lower economic activity. However, impact of low energy prices on EDPR results was minimal, as EDPR's marginal merchant exposure was mostly hedged for 2020.
  - **FX risk:** Emerging economies suffered a strong depreciation of their currencies. Net Investment hedges at EDPR mitigated most of the FX fluctuations. On the other hand, a specific plan for hedging FX transactional exposures in Capex was set out, in order to avoid hedging at particularly unfavorable rates due to the pandemic.

Monitoring of market risk was performed on a monthly basis in the Restricted Risk Committee, adjusting the position when necessary.

- **Counterparty Risk:** Despite the increase in exposure from counterparties in financial hedges and the temporary deterioration of the financial situation of some of EDPR's PPA off-takers, impact for EDPR was negligible. The existing collateral in electricity hedges and a diversified portfolio of creditworthy PPA off-takers, some of which improved their credit metrics during the year, made EDPR resilient to increase in counterparty risk.

Monitoring of counterparty risk was also performed monthly in the Restricted Risk Committee.

- **Operational Risk:**
  - **Execution Risk:** The impact of the pandemic on the construction and execution of projects lead to some COD delays, due to construction stoppages and/or supply chain disruptions. To mitigate this risk, EDPR implemented a strategy of prioritization of projects and set out a review of contractual clauses to prevent or minimize changes in tariff regimes, PPA penalties or Capex increases. By the end of 2020, incentivized regime contracts or PPAs were all maintained despite some COD delays.

    Monitoring of the evolution of the execution risk at EDPR was performed on a weekly basis, together with the Engineering & Construction Department.
  - **Operation Risk:** No significant impact, as the potential reduction in plant availability due to delayed maintenance or repairs was residual.
  - **Personnel Risk:** EDPR initially implemented travel restrictions and other measures designed to stop the spread of the coronavirus and guarantee the safety of its personnel. In March, EDPR activated its Contingency Plan for pandemics, introducing home office in all geographies and restricting access to its facilities, while minimizing disruptions in its operations, thus ensuring business continuity. EDPR employees have a Reopening Plan for gradually returning to the facilities according to the development of the pandemic, with geographical specifications, guaranteeing the highest health & safety standards.

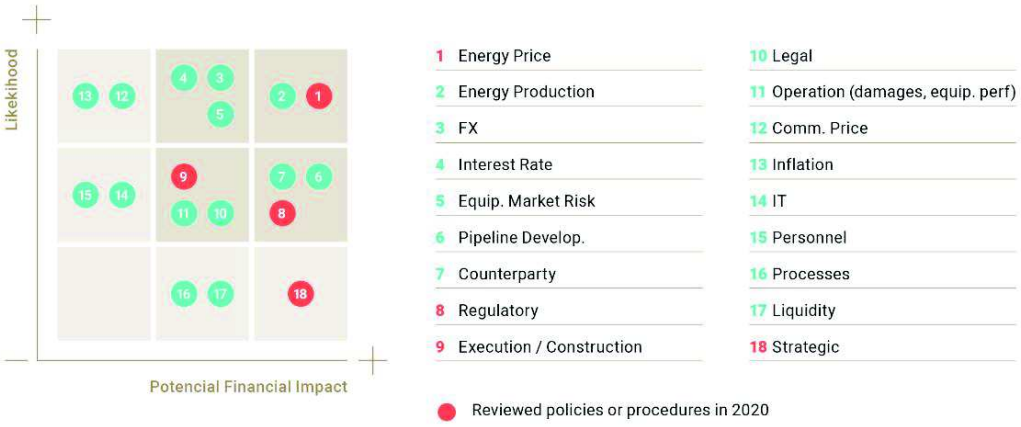
During 2020, EDPR updated its view on the sustainability of RES policies in the geographies where the Company is present and in new potential geographies. This deep-dive analysis was performed within the scope of the Country Risk Policy.

EDPR carried out a review of historical Capex deviations for projects in both Europe & Brazil and North American platforms, with the aim of improving the accuracy of Capex contingencies to be included in the modelling of future projects.

Finally, an updated methodology for EBITDA@Risk and NI@Risk was approved, through a bottom-up calculation allowing for a closer and more intuitive monitoring of the different risks. Considering EDPR's increase in size, NI@Risk limits were updated on EDPR's ERM (Enterprise Risk Management) framework.

EDPR risk matrix by financial impact

EDPR Risk Matrix is a qualitative assessment of likelihood and impact of the different risk categories within the Company. It is dynamic and it depends on market conditions and future internal expectations.



EDPR sustainability risks

EDPR's commitment with its stakeholders means that the Company cares about a responsible and sustainable development, assuring the best practices in this area. In this context, EDPR has identified five risk factors key to the sustainability of the Company. The highest standards have been put in place to mitigate these risks:

- **Corruption and Fraud Risk:** EDPR has implemented a Code of Ethics and an Anti-Corruption Policy. The Code of Ethics has its own regulation that defines a process and channel, open to all stakeholders, to report any potential claim or doubt on the application of the code. The Ethics Ombudsperson is behind this communication channel, and is responsible for analysing and presenting to the Ethics Committee any potential ethical problem. The Compliance Channel is also available to report any questionable practice and wrongdoing. The Integrity and Ethics section of the report (subchapter 1.3.4.) includes further information on how EDPR addresses and mitigates this risk.

- **Environmental Risk:** EDPR has implemented an Environmental Management System, certified with the ISO 14001:2015, in order to follow best practices in the sector. More information regarding how EDPR addresses and mitigates this risk is available at the Natural Capital section of the report (subchapter 3.5.).

- **Human Resource Risk:** EDPR forbids any kind of discrimination, violence or behaviour against human dignity, as stated in its Code of Ethics. Strict compliance is enforced, not only making the Ethics Channel available to all stakeholders but also through constant awareness for all employees of the Company. The Human Capital section of the report (subchapter 3.2.) and the Human Rights & Labour Practices section of the report (subchapter 3.4.2.) include further information on how EDPR addresses and mitigates this risk.

- **Health and Safety Risk:** EDPR has deployed a H&S management system, complying with the new ISO 45001:2018 standard, pursuing the “zero accidents” target. This year, the Covid-19 pandemic had impact on the H&S risk. The Health & Safety section of the report (subchapter 3.4.1.) addresses how EDPR has mitigated this risk.

- **Human Rights Risk:** EDPR has committed, through its Code of Ethics, to respect international human rights treaties and best work practices. All suppliers which sign a contract with EDPR are committed to be aligned with EDPR’s Code of Ethics principles. The Human Rights & Labour Practices section of the report (subchapter 3.4.2.) includes further information on how EDPR addresses and mitigates this risk.

In addition, quantification of the financial impact on the Company’s performance of these five sustainability risk factors is included within the Operational Risk analysis. EDPR frequently evaluates the economic impact of its Operational Risk, following the guidelines of Basel III. The analysis includes the identification, estimation and mitigation of individual operational risks belonging to the short, medium and long term in all its geographies. For this purpose, EDPR takes into account present and future relevance of these risks, as well as historical data of their impact, with the help of department heads. The final results of the Operational Risk analysis are then communicated to the Executive Committee and shared with every department involved.

In spite of the impact of the COVID-19 pandemic in Health & Safety, none of the five sustainability risk factors mentioned above had a material financial impact on the Company’s performance.

Emerging risks at EDPR

Changes in wind patterns at a global level caused by climate change

Academic papers have been published regarding how wind patterns have changed in recent years due to global warming and whether these changes may remain in the long run. There has been no clear conclusion, but it might imply that some regions will have weaker wind in the future, leading to drops in expected wind energy production, while some others will be experiencing an increase in wind energy production. Moreover, the deployment of a high density of windfarms in a region, both onshore and offshore, might affect the wind patterns itself.

In order to mitigate this wind energy production risk, when evaluating a new investment, EDPR considers stressed changes in forecasted wind energy production. In addition, the geographical diversification of EDPR portfolio mitigates this potential risk.

Increase of distributed generation resources in combination with the massive integration of new trends such as smart grids, electric vehicles or blockchain

Proliferation of distributed generation with combination of Solar PV and storage or batteries might lead to a possible change in the market in terms of reduction of demand from centralized generation by consumers due to self-consumption of distributed generation, decrease in electricity prices set for uncontracted centralized generation, and changing dynamics of energy flows in the grid, which might change the share of transmission and distribution costs for centralized generators.

Nonetheless, distributed generation could be seen as an opportunity for development of new products and services for those companies that adapt to this trend.