EDP - Energias de Portugal S.A. - Water 2018

W0. Introduction

W0.1

(W0.1) Give a general description of and introduction to your organization.

EDP – Energias de Portugal, S.A. (EDP) is a listed company whose ordinary shares are publicly traded in the Eurolist by NYSE Euronext Lisbon. The company is established and headquartered in Portugal, being organized under Portuguese laws.
EDP is a vertically integrated utility company, with operational activities in electricity generation, distribution and supply and gas supply. It is the largest generator, distributor and supplier of electricity in Portugal, the third largest electricity generation company in Spain. In Brazil, EDP is the fifth largest private operator in electricity generation, has two electricity distribution concessions and is the fourth largest private supplier in the liberalised market.
Through its subsidiary EDP Renewables, EDP is also one of the largest wind power operators worldwide, with wind farms in the Iberian Peninsula, United States of America, Canada, Brazil, France, Belgium, Italy, Poland, Romania and Mexico and developing off-shore wind projects in the United Kingdom. Additionally, EDP generates power from photovoltaic plants in Portugal, Romania and the United States of America.
EDP has a significant presence in the world energy scene and is present in 14 countries and 4 continents, with 9.9 million electricity customers, 1.6 million gas customers and about 12 thousand employees worldwide. In 2017, the company generated 70 TWh of electricity worldwide, of which about 56% from renewable energy sources and, by year end, had an installed capacity of 27 GW (74% renewable).
EDP's vision is to be a global energy providing company, leader in creating value, innovation and sustainability. The company addresses water related issues both at a strategic and operational level. Using natural resources sustainably, in particular water resources, is one of the strategic priorities for which EDP assumes specific commitments, in its reviewed Environmental Policy.
EDP responds to CDP Water Programme since 2010. Also, EDP publishes detailed information on its financial and sustainability performance and governance practices in its Annual Report and Sustainability Report, available on www.edp.com.
Key financial figures in 2017:
Turnover: 15,746 M€
EBITDA: 3,990 M€
Net profit: 1,113 M€
Net investment: 1,835 M€

Net debt: 13,902 M€
Total assets: 42,075 M€
Employees: 11,657
ISIN: PTEDP0AM0009
SEDOL: 4103596

W-EU0.1a

(W-EU0.1a) Which activities in the electric utilities sector does your organization engage in?

Electricity generation
Distribution
Other, please specify (Electricity and gas supply.)

W-EU0.1b

(W-EU0.1b) For your electricity generation activities, provide details of your nameplate capacity and the generation for each power source.

	Nameplate capacity (MW)	% of total nameplate capacity	Gross generation (MWh)
Coal – hard	3124.2	11.7	23170820
Lignite	0	0	0
Oil	0	0	0
Gas	3729	14	8278070
Biomass	0	0	0
Waste (non-biomass)	0	0	0
Nuclear	0	0	0
Geothermal	0	0	0
Hydroelectric	9018.8	33.9	11615787
Wind	10530.7	39.6	27530909
Solar	145.3	0.6	156691
Other renewable	0	0	0
Other non-renewable	49.1	0.2	254764

	Nameplate capacity (MW)	% of total nameplate capacity	Gross generation (MWh)
Total	26597.1	100	71007041

W0.2

(W0.2) State the start and end date of the year for which you are reporting data.

	Start date	End date
Reporting year	January 1 2017	December 31 2017

W0.3

(W0.3) Select the countries/regions for which you will be supplying data.

Belgium
Brazil
Canada
France
Italy
Mexico
Poland
Portugal
Romania
Spain
United Kingdom of Great Britain and Northern Ireland
United States of America

W0.4

(W0.4) Select the currency used for all financial information disclosed throughout your response.

EUR

W0.5

(W0.5) Select the option that best describes the reporting boundary for companies, entities, or groups for which water impacts on your business are being reported.

Companies, entities or groups over which financial control is exercised

W0.6

(W0.6) Within this boundary, are there any geographies, facilities, water aspects, or other exclusions from your disclosure?

Yes

W0.6a

(W0.6a) Please report the exclusions.

Exclusion	Please explain
Smaller office facilities in Spain and Brazil.	We do not monitor quantitative water parameters (withdrawals, discharges and consumption) in our smaller office facilities. These facilities use water supplied by municipal water systems and consumption is considered immaterial (estimated to represent less than 0.001% of the Group's total water withdrawals), thus not justifying the implementation of dedicated monitoring procedures.

W1. Current state

W1.1

(W1.1) Rate the importance (current and future) of water quality and water quantity to the success of your business.

	Direct use importance rating	Indirect use importance rating	Please explain
Sufficient amounts of good quality freshwater available for use	Vital	Not very important	Direct use: cooling in thermal generation (81% of withdrawal exc. hydro), process (18%) and general uses (1%). Also used in hydroelectric generation. Access to sufficient amounts of good quality freshwater is essential for operation of these assets, which accounted for 12% of 2017 revenues. Future dependency is expected to decrease with growth of wind capacity in generation portfolio, as per our 2020 Business Plan and long-term strategy. Indirect use (supply chain only. Use of products does not need water): main use is coal extraction (20-30% of total supply chain water). In 2017, 90% of coal came from mines in low water stress areas (WRI Baseline Water Stress less than 10%) and only 1% from high stress areas. Coal currently accounts for 12% of our total installed capacity, and procurement is made from a vast range of alternative suppliers in different geographies. Future dependency will be further reduced, as coal will account for only 5% of our total installed capacity in 2030.
Sufficient amounts of recycled, brackish and/or	Vital	Not very important	Direct use: cooling water in the refrigeration circuits of two coal power plants in the Iberia. Although it is not a scarce resource, sufficient quality seawater (e.g. low seaweed level) is essential for the optimal

	Direct use importance rating	Indirect use importance rating	Please explain
produced water available for use			operation of these assets which accounted for 5% of 2017 revenues. Future dependency is expected to decrease with the reduction of coal generation installed capacity to only 5% in 2030, as per our 2020 Business Plan and long- term strategy. Indirect use (supply chain only. Use of products does not need water): main use is coal extraction (20-30% of total supply chain water). In 2017, 90% of coal came from mines in low water stress areas (WRI BWS less than 10%) and only 1% from high stress areas. Coal currently accounts for 12% of our total installed capacity, and procurement is made from a vast range of alternative suppliers in different geographies.Future dependency will be further reduced, as coal will account for only 5% of our total installed capacity in 2030.

W1.2

(W1.2) Across all your operations, what proportion of the following water aspects are regularly measured and monitored?

	% of sites/facilities/operations	Please explain
Water withdrawals – total volumes	100%	At a corporate level, we quarterly monitor total water withdrawal volumes of our thermal (coal and natural gas), wind and solar power plants, as well as distribution activities and office buildings. Water withdrawals from hydro power plants are monitored on a regular basis, at an operational level, and consolidated annually at corporate level. Consolidation and monitoring is done at a corporate level through EDP's Corporate Sustainability Information System. Key Water indicators for EDP Group are published in EDP's Sustainability Report and subject to independent third-party verification.
Water withdrawals – volumes from water stressed areas	100%	We monitor, in a quarterly basis, water withdrawals of all facilities in water-stressed regions, identified through a water stress exposure assessment: assets mapping against recognized water indicators (e.g. WRI Baseline Water Stress) and further a downscaling analysis to local level, using national agencies information. These facilities represent less than 1% of EDP Group's total electricity generation.
Water withdrawals – volumes by source	100%	At a corporate level, we quarterly monitor total water withdrawal volumes by source of our thermal (coal and natural gas), wind and solar power plants, as well as distribution activities and office buildings. Water withdrawals by sources from hydro power plants are monitored on a regular basis, at an operational level, and consolidated annually at corporate level. Consolidation and monitoring at a corporate level are done through EDP's Corporate Sustainability Information System. Key Water indicators for EDP Group are published in EDP's Sustainability Report and subject to independent third-party verification.

	% of sites/facilities/operations	Please explain
Produced water associated with your metals & mining sector activities - total volumes	<Not Applicable>	<Not Applicable>
Produced water associated with your oil & gas sector activities - total volumes	<Not Applicable>	<Not Applicable>
Water withdrawals quality	100%	We monitor water withdrawals quality of our thermal (coal and natural gas) and hydro power plants, representing 99.9 % of total water consumption at EDP Group (for this indicator distribution activities and office buildings are excluded, as water is withdrawn from municipality companies). The monitoring frequency depends on the parameter and type of facility. For hydro power plants, parameters monitoring (e.g. Oxygen, Temperature, pH, conductivity, redox potential and turbidity) is mostly done every two months for all quality parameters, both at bottom and surface level, and in two different points of the reservoir. In thermal power plants, in addition to the type of parameter and facility, monitoring also depends on the process (refrigeration circuits and demineralized water processes) and withdrawal sources. Water parameters such as pH, conductivity, turbidity, chlorides, suspended solids, total organic carbon are monitored continuously, weekly or monthly.
Water discharges – total volumes	100%	At a corporate level, we quarterly monitor total water discharge volumes of our thermal (coal and natural gas), wind and solar power plants, as well as distribution activities and office buildings. Water discharges from hydro power plants are monitored on a regular basis, at an operational level, and consolidated annually at corporate level. Consolidation and monitoring at a corporate level are done through EDP's Corporate Sustainability Information System. Key Water indicators for EDP Group are published in EDP's Sustainability Report and subject to independent third-party verification.
Water discharges – volumes by destination	100%	At a corporate level, we quarterly monitor total water discharges by destination of our thermal (coal and natural gas), wind and solar power plants, as well as distribution activities and office buildings. Water discharges by destination from hydro power plants are monitored on a regular basis, at an operational level, and consolidated annually at corporate level. Consolidation and monitoring at a corporate level are done through EDP's Corporate Sustainability Information System. Key Water indicators for EDP Group are published in EDP's Sustainability Report and subject to independent third-party verification.
Water discharges – volumes by treatment method	Not relevant	Hydro power plants, wind and solar farms represent 74% of EDP's total generation capacity. We monitor total water discharge volumes by treatment method in our thermal power plants, where such monitoring is either a legal requirement or an environmental management system requirement.
Water discharge quality – by standard effluent parameters	Not relevant	Hydro power plants, wind and solar farms represent 74% of EDP's total generation capacity. We monitor water discharge quality parameters in our thermal power plants, where such monitoring is

	% of sites/facilities/operations	Please explain
		either a legal requirement or an environmental management system requirement. Wastewater quality discharges from thermal power plants are publicly available on EDP's website.
Water discharge quality – temperature	Not relevant	Hydro power plants, wind and solar farms represent 74% of EDP's total generation capacity. We monitor water discharge temperature in our thermal power plants (wastewater and cooling water), where such monitoring is either a legal requirement or an environmental management system requirement.
Water consumption – total volume	100%	At a corporate level, we quarterly monitor water consumption volumes of our thermal (coal and natural gas), wind and solar power plants, as well as distribution activities and office buildings. Water consumption from hydro power plants are monitored on a regular basis, at an operational level, and consolidated annually at corporate level. Consolidation and monitoring is done at a corporate level through EDP's Corporate Sustainability Information System. Key Water indicators for EDP Group are published in EDP's Sustainability Report and subject to independent third-party verification.
Water recycled/reused	Not relevant	Hydro power plants, wind and solar farms represent 74% of EDP's total generation capacity. In Pecém thermal power plant, EDP both recycles water in its refrigeration circuits, and reuses treated water from the Effluent Treatment Station, using it as cooling water in the refrigeration circuits. In its hydro portfolio, EDP has 2,807MW of pumping storage, representing 14% of water used for hydro power generation in 2017, but only 0.4% of total withdrawals.
The provision of fully-functioning, safely managed WASH services to all workers	100%	We provide access to clean water and suitable sanitation conditions to all employees in 100% of our facilities. This is a legal requirement in the geographies where EDP operates and is a company commitment under its participation in the United Nations' Global Compact.

W-EU1.2a

(W-EU1.2a) For your hydroelectric operations, what proportion of the following water aspects are regularly measured and monitored?

	% of sites/facilities/operations measured and monitored	Please explain
Fulfilment of downstream environmental flows	26 - 50%	EDP fulfills downstream environmental flows in 100% of its facilities where legally applicable. In Europe, the European legislation requires the implementation of environmental flow (e-flows) regimes as a mitigation environmental measure, to improve artificial water body ecological status and to achieve good ecological potential. In Brazil, there is also a legal obligation for the fulfilment of downstream environmental flows in some hydro power plants, also being 100% implemented by EDP Brazil. EDP monitors the effectiveness of

	% of sites/facilities/operations measured and monitored	Please explain
		these e-flows, being available for future readjustments if needed to achieve a good ecological potential of the artificial water body. Until now, results point out to the increase of the ecological quality downstream.
Sediment loading	26 - 50%	Since the construction of our dams, there is no register of any problems with the operationality of discharge equipment. This information is consistent with literature review on sediment deposition in the mediterranean countries. For this reason, sediment loading monitoring is made for specific hydro power facilities from time to time in Iberia, and in Brazil in a quarterly basis. EDP is promoting a detailed study in some Portuguese reservoirs using bathymetric surveys to confirm previous results. Until now, the outcomes confirm the low impact of sediment deposition in our sites: Reduction of operative capacity of EDP's dams caused by sediment accumulation has not been observed since their construction (50s and 60s of the XX century, mainly) and is not perceptible in the monitoring system of hydric balance, implemented since the 90s.
Other, please specify	Please select	

W1.2b

(W1.2b) What are the total volumes of water withdrawn, discharged, and consumed across all your operations, and how do these volumes compare to the previous reporting year?

	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Total withdrawals	139776607	Much lower	Total water withdrawals include all assets within EDP's boundary defined in W0.5 and W0.6a, with: hydro, representing 98,6% of the volume disclosed; thermal (coal and natural gas) representing 1,3% of the volume disclosed; and wind, solar, as well as distribution activities and office buildings, representing less than 0,1%. Specifically, for hydro power plants we used the new CDP's definition. Data was collected either through direct measurements or by calculations, using electricity generated at the site level and the reservoir water level. In 2017, water withdrawal was 49% lower than in 2016. This result is due to two facts: - the severe drought that occurred in the Iberian Peninsula, with a 47% decrease in hydro power generation; - Hydro power generation accounts for 99% of the total water withdrawals. Due to this high hydro power contribution in the EDP Group's water performance, water withdrawals will tend to decrease or increase depending on if it is a dry or wet year, respectively. However, future water withdrawals dependency is expected to decrease with growth of wind capacity in generation portfolio, as per our 2020 Business Plan and long-term strategy. We use the following thresholds for monitoring trends: +/- 15%: "about the same"; +/- 16-50%: "higher"/"lower"; +/- 51%: "much higher"/"much lower".

	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Total discharges	147205679	Much lower	Total discharges include all assets within EDP's boundary defined in W0.5 and W0.6a, with: hydro, representing 98,6% of the volume disclosed; thermal (coal and natural gas) representing 1,3% of the volume disclosed; and wind, solar, as well as distribution activities and office buildings, representing less than 0,1%. Specifically, for hydro power plants we used the new CDP's definition. Data was collected either through direct measurements or by calculations, using electricity generated at the site level and the reservoir water level. In 2017, water discharge was 48% lower than in 2016. This result is due to two facts: - the severe drought that occurred in the Iberian Peninsula, with a 47% decrease in hydro power generation; - Hydro power generation accounts for 99% of the total water discharges. Due to this high hydro power contribution in the EDP Group's water performance, water discharges will tend to decrease or increase depending on if it is a dry or wet year, respectively. However, future water discharges are expected to decrease with growth of wind capacity in generation portfolio, as per our 2020 Business Plan and long-term strategy. We use the following thresholds for monitoring trends: +/- 15%: "about the same"; +/- 16-50%: "higher"/"lower"; +/- 51%: "much higher"/"much lower".
Total consumption	0	About the same	Water consumption is a company-wide calculation (withdrawals minus discharges), which resulted in a -7,429,072 megaliters (the platform does not allow the reporting of negative values). The negative water consumption is due to the use of water stored in hydro power plants reservoirs. Water discharges (for instance dam outlet and spillway) were higher than the river inflows. Therefore, it is worth noticing that this volume is not water consumption. Due to the high hydro power contribution in the EDP Group's water performance (99% of total water withdrawals and discharges), and its non-consumptive use of water, water consumption will tend to stay steady over the years. Future water use is expected to decrease with growth of wind capacity in generation portfolio, as per our 2020 Business Plan and long-term strategy. We use the following thresholds for monitoring trends: +/- 15%: "about the same"; +/- 16-50%: "higher"/"lower"; +/- 51%: "much higher"/"much lower".

W1.2d

(W1.2d) Provide the proportion of your total withdrawals sourced from water stressed areas.

	% withdrawn from stressed areas	Comparison with previous reporting year	Identification tool	Please explain
Row 1	0.01	About the same	WBCSD Global Water Tool	EDP has two thermal power plants located in water-stressed areas (Pecém in Brazil and Castejón in Spain), representing 0.01% of the total water withdrawals reported in question 1.2b, about the same as in 2016. In

	% withdrawn from stressed areas	Comparison with previous reporting year	Identification tool	Please explain
				terms of absolute values, water withdrawals from these facilities had a 3% decrease between 2016 and 2017, for a slight increase (5%) in electricity generation. For water stress exposure assessment EDP uses the WBCSD Global Water Tool (version 2015) and WRI Aqueduct to conduct a first high-level risk assessment, by mapping all its thermal and hydro generation assets against widely recognized water availability indicators (Annual Renewable Water Supply per Person (ARWS) and Baseline Water Stress (BWS)). Wind generation and distribution assets are excluded given their low dependency on water availability. Analysis is conducted at watershed level, using both current state indicators and projections and applying the following thresholds: ARWS less than 1,700 m3/person/year and BWS higher than 20%. A downscaling analysis at local level is done, using information gathered from National Governmental Agencies (location specific water availability indicators) and company's operational teams (asset water dependency, constraints from local competitive uses). This is done for all geographies where EDP has generation activities (Portugal, Spain and Brazil), and considering the facilities location. It is worth noticing that withdrawal sources are closely located to the facilities and, thus, water-stress classification is valid for both situations. Assessment is updated on a 2-3-year basis or whenever a new project requires it. We use the following thresholds for monitoring trends: +/- 15%: "about the same"; +/- 16-50%: "higher"/"lower"; +/- 51%: "much higher"/"much lower".

W1.2h

(W1.2h) Provide total water withdrawal data by source.

	Relevance	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Fresh surface water, including rainwater, water from wetlands, rivers, and lakes	Relevant	138038200	Much lower	12% of 2017 revenues came from thermal and hydro power plants that depend on fresh surface water (only from rivers). In 2017, water withdrawal from fresh surface water was much lower than in 2016, due to two facts: - the severe drought that occurred in the Iberian Peninsula, with a 47% decrease in hydro power generation; - Hydro power generation accounts for more than 99% of the total water withdrawals from fresh surface water sources. Due to this high hydro power contribution in the EDP Group's water performance, water withdrawals from fresh surface water will tend to decrease or increase depending on if it is a dry or wet year, respectively. However, future water withdrawals dependency is expected to decrease with growth of wind

	Relevance	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
				capacity in generation portfolio, as per our 2020 Business Plan and long-term strategy. We use the following thresholds for monitoring trends: +/- 15%: “about the same”; +/- 16-50%: “higher”/”lower”; +/- 51%: “much higher”/”much lower”.
Brackish surface water/seawater	Relevant	1721378	Higher	Seawater is relevant as it is used as cooling water in the refrigeration circuits of the two coastal coal power plants in Portugal and Spain. Due to the severe drought that occurred in the Iberian Peninsula, in 2017 electricity generation from these facilities had a 27% increase when compared to 2016, justifying the higher volume when compared to 2016. Future dependency is expected to decrease with the reduction of coal generation installed capacity to only 5% in 2030, as per our 2020 Business Plan and long- term strategy. We use the following thresholds for monitoring trends: +/- 15%: “about the same”; +/- 16-50%: “higher”/”lower”; +/- 51%: “much higher”/”much lower”.
Groundwater – renewable	Relevant	11	About the same	Withdrawals from wells are used for human consumption and other general uses. Given the very low volumes involved and the availability of alternative sources, company dependency on this source is low. We use the following thresholds for monitoring trends: +/- 15%: “about the same”; +/- 16-50%: “higher”/”lower”; +/- 51%: “much higher”/”much lower”.
Groundwater – non-renewable	Relevant	170	About the same	Withdrawals from deep water holes are mainly used in process water circuits. Given the very low volumes involved and the availability of alternative sources, company dependency on this source is low. We use the following thresholds for monitoring trends: +/- 15%: “about the same”; +/- 16-50%: “higher”/”lower”; +/- 51%: “much higher”/”much lower”.
Produced water	Not relevant	<Not Applicable>	<Not Applicable>	Not applicable. EDP does not use produced or process water.
Third party sources	Relevant	16848	About the same	Pecém coal power plant is the main user of third-party sources in EDP Group, being supplied by the local water supply concessionaire. There was no substantial variation of its production from last year, resulting in similar water volumes withdrawn. We use the following thresholds for monitoring trends: +/- 15%: “about the same”; +/- 16-50%: “higher”/”lower”; +/- 51%: “much higher”/”much lower”.

W1.2i

(W1.2i) Provide total water discharge data by destination.

	Relevance	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Fresh surface water	Relevant	145482342	Much lower	In 2017, water discharge was much lower than in 2016, due to two facts: - the severe drought that occurred in the Iberian Peninsula, with a 47% decrease in hydro power generation; - Hydro power generation accounts for more than 99% of the total water discharges to fresh surface water. Due to this high hydro power contribution in the EDP Group's water performance, water discharges to fresh surface water will tend to decrease or increase depending on if it is a dry or wet year, respectively. However, future water discharges dependency is expected to decrease with growth of wind capacity in generation portfolio, as per our 2020 Business Plan and long-term strategy. We use the following thresholds for monitoring trends: +/- 15%: "about the same"; +/- 16-50%: "higher"/"lower"; +/- 51%: "much higher"/"much lower".
Brackish surface water/seawater	Relevant	1723329	Higher	Discharges to seawater are mainly of cooling water used in the refrigeration circuits of three EDP's coal power plants: Sines, Aboño and Pecém. Due to the severe drought that occurred in the Iberian Peninsula, in 2017 electricity generation from these facilities had a 21% increase, justifying the higher discharged volume when compared to 2016. Future dependency is expected to decrease with the reduction of coal installed capacity to only 5% in 2030, as per our 2020 Business Plan and long- term strategy. We use the following thresholds for monitoring trends: +/- 15%: "about the same"; +/- 16-50%: "higher"/"lower"; +/- 51%: "much higher"/"much lower".
Groundwater	Not relevant	<Not Applicable>	<Not Applicable>	EDP does not make discharges to groundwater.
Third-party destinations	Relevant	8.4	About the same	These effluents sum up all domestic wastewater produced in all activities within the reporting boundary and sent to municipal treatment. It is expected that third-party destinations will remain constant over the years. We use the following thresholds for monitoring trends: +/- 15%: "about the same"; +/- 16-50%: "higher"/"lower"; +/- 51%: "much higher"/"much lower".

W-EU1.3

(W-EU1.3) Do you calculate water intensity for your electricity generation activities?

Yes

W-EU1.3a

(W-EU1.3a) Provide the following intensity information associated with your electricity generation activities.

Water intensity value	Numerator: water aspect	Denominator: unit of production	Comparison with previous reporting year	Please explain
0.53	Freshwater withdrawn	MWh	About the same	Intensity indicator is expressed in m3/MWh. Numerator refers to total freshwater withdrawals in EDP's activities, excluding hydroelectricity generation. It Includes surface water, ground water and municipal/other third-party supplies, in all geographies where the company operates and for the following types of uses: closed and open thermal power plant cooling circuits, process water for water-steam circuits, human consumption, irrigation and cleaning. It excludes municipal water supply in smaller office facilities estimated to account for less than 0.001% of total water withdrawals, as per exclusions disclosed in answer W0.6. Information is collected directly mostly from meter devices in each facility. Denominator refers to total net electricity generation. Information is collected through online systems that monitor each power plant's electricity injection in the electricity grid. In 2017, water intensity indicator was 10% higher than in 2016. Increase in thermal electricity generation (+27% compared to 2016) occurred because of the severe drought that occurred in the Iberian Peninsula (where we concentrate 90% of our thermal electricity generation capacity) led to increased use of water in refrigeration circuits, as well as in water-steam circuits (process water). We use the following thresholds for monitoring trends in water intensity indicator: +/- 15%: "about the same"; +/- 16-50%: "higher"/"lower"; +/- 51%: "much higher"/"much lower". Water intensity indicator is used for internal and external reporting (e.g. Sustainability Report, Corporate Website, ESG analysts) of water dependency and efficiency in water use, to drive water performance improvement projects at operational level (e.g. water management project in Pecém thermal power plant, located in a water stress area in Brazil) and to inform our water strategy.

W2. Business impacts

W2.1

(W2.1) Has your organization experienced any detrimental water-related impacts?

No

W2.2

(W2.2) In the reporting year, was your organization subject to any fines, enforcement orders, and/or other penalties for water-related regulatory violations?

No

W3. Procedures

W-EU3.1

(W-EU3.1) How does your organization identify and classify potential water pollutants associated with your business activities in the electric utilities sector that could have a detrimental impact on water ecosystems or human health?

EDP has a third-party certification, by Lloyds, of its corporate environmental management system (CEMS), according to ISO 14001:2015. The CEMS covers the scope: "Corporate management of environmental policies and strategic environmental plans, environmental information and performance of EDP Group organisations" and it frames operation's performance at a site level. Under this standard, EDP identifies its main environmental aspects and their materiality, considering stakeholder's expectations and the result of an internal Environmental Risk Assessment Tool, detailed at a business level, linking environmental aspects with impacts and risks (regulatory, operational, etc.). This tool covers both impacts in the environment (Ex. Water pollutants) but also company's dependency on natural resources (ex: water dependence).

Additionally, for each discharge point of the Thermal Power Plants, EDP must comply with pollutant emission limits according to environmental licensing permits. Thus, the pollutants to be monitored are expressly included in these licenses, issued by the National Environmental Authorities. Moreover, in Europe, these parameters are based on a facilities' performance level achieved with the application of the best available techniques (BAT), as considered by the European Commission. BATs evolve over time and are discussed with the economic agents of each activity sector. EDP

participated in the latest BAT analysis for the large combustion plant sector. EDP monitors these pollutants with different frequencies in accordance with the environmental permits. Include as examples, the limit level of discharge of heavy metals and temperature level (thermal pollution).

Hydro Power Plants do not emit pollutants into the water. Water quality parameters are regularly monitored in the reservoir as the existence of the dams can scale up some pollution problems already present in the water upstream the reservoir. For example, when high levels of organic matter and nutrients exist due to diffuse pollution from agriculture or urban sewage discharges, it can increase the level of water eutrophication in the reservoir with the consequent decrease of the water quality. In critical situations, where dams exist in rivers with significant bad upstream quality, EDP has been voluntarily involved in the implementation of solutions to increase water quality in the reservoirs, mitigating the environmental impacts resulting from these situations. In formal or informal multipurpose reservoirs, EDP also actively acts in acute situations that lead to water quality decrease. A strong and common example of this situation is after strong summer fires, with the increase of ashes in the river streams or in reservoirs used afterwards for water consumption.

Finally, EDP has also in place Emergency Procedures to prevent accidental spills (ex. from oil or chemical substance), as they may become potential pollution sources. A wide range of measures are implemented, such as retention basins in transformers and in oil tanks, water/oil separators and the existence of spill absorbent materials in the most critical areas of industrial facilities. Potential detrimental impacts on water (both for ecosystems and human health) associated with pollutants release are limited to our electricity generation activities. For our other electricity sector activities, electricity distribution and electricity and gas supply such impacts are deemed not relevant. In our supply chain, water main use is coal extraction, with coal representing 12% of our total installed capacity. EDP is a member of Bettercoal promoting site and self-assessments of the mines. 100% of its suppliers follow Bettercoal Code, which includes the commitment to natural resource sustainable management and pollution control. EDP also monitors and promotes the Environmental Management Systems of its fuel suppliers, with 78% certified in accordance with ISO 14001.

W-EU3.1a

(W-EU3.1a) Describe how your organization minimizes the adverse impacts of potential water pollutants associated with your activities in the electric utilities sector on water ecosystems or human health.

Potential water pollutant	Description of water pollutant and potential impacts	Management procedures	Please explain
Hydrocarbons	Hydrocarbons from accidental spills and not due to a continuous discharge situation. Oil spills may cause water body's physical and chemical changes, with the decrease of oxygen in the water, and affecting fauna and flora (by coating, and by reducing the availability of food, for example). Frequency is extremely low (1 situation with limited impact within EDP Group in the last decade).	Compliance with effluent quality standards Measures to prevent spillage, leaching, and leakages Community/stakeholder engagement Emergency preparedness Other, please specify (Environmental Risk Management Tool.)	The compliance with wastewater quality standards is ensured through its treatment, monitoring and reporting to the competent authorities. To prevent spillage, leaching, and leakages, there are retention basins in transformers and in oil tanks, water/oil separators and spill absorbent materials in the most critical areas of industrial facilities. Moreover, the collection of several kind of wastewaters in different drainage networks is a complementary procedure to risk mitigation regarding potential water pollutants' impacts: chemical wastewaters, oily wastewaters, domestic sewage and clean rain water. Annually, Environmental Declarations are made for all thermal power plants in Iberia, where environmental performance results are provided. These declarations are distributed to the main stakeholders. Also, visits to the industrial facilities are promoted. There are emergency plans in place, as well as specific training actions and accident drills (including testing of scenarios with water

Potential water pollutant	Description of water pollutant and potential impacts	Management procedures	Please explain
			damage). EDP has ongoing several Environmental Risk Management Modeling for each of its critical facilities to evaluate the potential damage of oil spills and other potential environmental impacts (occurring as consequences of accidental situations), to better inform decision making.
Coal combustion residuals	Coal combustion residuals (fly ashes, bottom ashes and gypsum) from coal power plants rejected into the water by accident, and not due to a continuos discharge situation. These accidental leakages may have high level content of heavy metals, with potential environmental impacts both in fauna and flora, as well as in human health when the food chain is contaminated.	Compliance with effluent quality standards Measures to prevent spillage, leaching, and leakages Community/stakeholder engagement Emergency preparedness Other, please specify (Environmental Risk Management Tool.)	The compliance with effluent quality standards is ensured through waste water treatment, monitoring and report to the competent authorities. Coal power plants have landfills for ash and gypsum waste, equipped with sedimentation basins to prevent these kinds of wastes from reaching the water. Annually, Environmental Declarations are made for all thermal power plants in Iberia, where environmental performance results are provided. These declarations are distributed to the main stakeholders. Also, visits to the industrial facilities are promoted. There are emergency plans in place, as well as specific training actions and accident drills (including testing of scenarios with water damage). EDP has ongoing several Environmental Risk Management Modeling for each of its critical facilities to evaluate the potential damage of oil spills and other potential environmental impacts (occurring as consequences of accidental situations), to better inform decision making.
Thermal pollution	The discharge of hot water in EDP's thermal power plants can extraordinarily lead to a raise in temperature of the local water body. This may contribute to the decrease of dissolved oxygen and the change of the local natural environmental with adverse impacts in local fauna and flora living conditions. No significant environmental impacts have been recorded.	Compliance with effluent quality standards Measures to prevent spillage, leaching, and leakages Community/stakeholder engagement Emergency preparedness Other, please specify (Monitoring of waterbody temperature.)	Thermal pollution is controlled at all EDP thermal power plants as there are legal limits to the temperature rise in the receiving water body. Annually, Environmental Declarations are made for all thermal power plants in Iberia, where environmental performance results are provided. These declarations are distributed to the main stakeholders. Also, visits to the industrial facilities are promoted. Also, there are emergency plans in place, as well as specific training actions and accident drills (including testing of scenarios with water damage). EDP has ongoing several Environmental Risk Management

Potential water pollutant	Description of water pollutant and potential impacts	Management procedures	Please explain
			Modeling for each of its critical facilities to evaluate the potential damage of oil spills and other potential environmental impacts (occurring as consequences of accidental situations), to better inform decision making.
Please select	<Not Applicable>	<Not Applicable>	

W3.3

(W3.3) Does your organization undertake a water-related risk assessment?

Yes, water-related risks are assessed

W3.3a

(W3.3a) Select the options that best describe your procedures for identifying and assessing water-related risks.

Direct operations

Coverage

Full

Risk assessment procedure

Water risks are assessed as part of an enterprise risk management framework

Frequency of assessment

Every two years

How far into the future are risks considered?

>10 years

Type of tools and methods used

Tools on the market
Enterprise Risk Management
International methodologies
Databases

Tools and methods used

WBCSD Global Water Tool
WRI Aqueduct

ISO 31000 Risk Management Standard
Environmental Impact Assessment
IPCC Climate Change Projections
FAO/AQUASTAT
Regional government databases
Other, please specify (Internal company methods.)

Comment

Internal company methods include, but are not limited to, standard risk identification and quantification methodologies (e.g. Monte Carlo simulations, short and long-term impact estimation on EBITDA), and an environmental corporate risk assessment tool aligned with the ISO 31000 and ISO 14001:2015, which includes water-related regulation follow-up procedures at corporate, business unit and asset level, supported by a proprietary Regulation Database information system, managed at corporate level.

Supply chain

Coverage

None

Risk assessment procedure

<Not Applicable>

Frequency of assessment

<Not Applicable>

How far into the future are risks considered?

<Not Applicable>

Type of tools and methods used

<Not Applicable>

Tools and methods used

<Not Applicable>

Comment

Current and future water availability in supply chain is not important (W1.1). Main water use is in coal extraction. 90% of 2017 coal purchases came from low water stress areas mines (WRI BWS less than 10%). Coal accounts for 12% of total installed capacity, and procurement is based on diversified range of suppliers. Future dependency will be further reduced (5% of total installed capacity in 2030). As such,we do not include supply chain water risks in our risk assessment procedure.

Other stages of the value chain

Coverage

None

Risk assessment procedure
<Not Applicable>
Frequency of assessment
<Not Applicable>
How far into the future are risks considered?
<Not Applicable>
Type of tools and methods used
<Not Applicable>
Tools and methods used
<Not Applicable>
Comment
Use of EDP's products (electricity and gas) does not involve water use. As such, we do not include other stages of the value chain water risks in our risk assessment procedures.

W3.3b

(W3.3b) Which of the following contextual issues are considered in your organization's water-related risk assessments?

	Relevance & inclusion	Please explain
Water availability at a basin/catchment level	Relevant, always included	Current and future water availability is vital to EDP's thermal and hydro electricity generation. Water (freshwater; sea water in two power plants) is used for cooling and for water-steam circuits in our CCGT and coal-fired power plants in Portugal, Spain and Brazil (26% of installed capacity). Use is mostly non-consumptive (99% of withdrawals are returned to water bodies with minimal changes) but assets operation depends upon enough water being available for withdrawal. Water is also essential for electricity generation in our hydroelectric power plants in Portugal, Spain and Brazil (34% of installed capacity). All water use in hydro generation depends upon enough incoming flows availability. Current and future availability is assessed through: i) EDP's Corporate Business Risk model – Assessment of key risks, as well as mapping of emerging risks. Water availability risks (e.g. business risks such as increase in competitive uses; strategic risks such as climate-change induced structural changes in hydro flows) are embedded into the model's taxonomy, phases and responsibilities. It uses standard risk methodologies and inputs from sustainability and business unit teams (e.g. climate scenarios; local level competitive uses); ii) Assessment of generation assets' exposure to water stress locations. It uses WBCSD Global Water Tool, WRI Aqueduct and FAO/AQUASAT (current – forecasts up to 2040) for a high-level assessment, downscaled with information from National Agencies (location specific indicators) and operational teams' inputs (local competitive uses); iii) Detailed risk quantification for competitive uses and structural decrease in hydro flows in EDP Water Risk Map. Risks are aggregated according to expected frequency and impact and applying Monte Carlo simulation for short/medium (up to 5 years) and

	Relevance & inclusion	Please explain
		long-term time horizons (5-50 years). Financial implications are expressed by the value of maximum loss (95% percentile).
Water quality at a basin/catchment level	Relevant, always included	Water quality is mostly essential for water-steam process in thermal power plants. Dry years may decrease the water quality withdrawn by the company, leading to the increase of operational costs of the water treatment process. This is an operational physical risk identified and included indirectly in the corporate risk map. The decrease of water availability is directly associated with local degradation of water quality, thus, this risk is assessed indirectly through the current and future availability assessment: i) EDP's Corporate Business Risk model – Assessment of key risks, as well as mapping of emerging risks. Water availability risks (e.g. business risks such as increase in competitive uses; strategic risks such as climate-change induced structural changes in hydro flows) are embedded into the model's taxonomy, phases and responsibilities. It uses standard risk methodologies and inputs from sustainability and business unit teams (e.g. climate scenarios; local level competitive uses); ii) Assessment of generation assets' exposure to water stress locations. It uses WBCSD Global Water Tool, WRI Aqueduct and FAO/AQUASAT (current – forecasts up to 2040) for a high-level assessment, downscaled with information from National Agencies (location specific indicators) and operational teams' inputs (local competitive uses); iii) Detailed risk quantification for competitive uses and structural decrease in hydro flows in EDP Water Risk Map. Risks are aggregated according to expected frequency and impact and applying Monte Carlo simulation for short/medium (up to 5 years) and long-term time horizons (5-50 years). Financial implications are expressed by the value of maximum loss (95% percentile).
Stakeholder conflicts concerning water resources at a basin/catchment level	Relevant, always included	Current and future stakeholder conflicts - most relevant competitive uses of water – can constraint operation of our thermal and hydro power plants. Thermal power plants located in high water stress areas are the most vulnerable (Castejón in Spain and Pecém in Brazil). In Portugal, some of EDP's hydro reservoirs are multipurpose, and operation must conciliate the needs of the different water users. Examples include Castelo de Bode reservoir, also the main water supplier to Lisbon. Risks arising from potential restrictions to operation are integrated into EDP's water risk assessment through: i) EDP's Corporate Business Risk model – Assessment of key risks, as well as mapping of emerging risks. Increase in competitive uses is a water availability business risk and is embedded into the model's taxonomy, phases and responsibilities. It uses standard risk methodologies and inputs from sustainability and business unit teams (e.g. climate scenarios; local level competitive uses); ii) Detailed quantification of risks associated with competitive uses in EDP Water Risk Map. Risks are aggregated according to expected frequency and impact and applying Monte Carlo simulation for short/medium (up to 5 years) and long-term time horizons (5-50 years). Financial implications are expressed by the value of maximum loss (95% percentile). EDP cooperates with local and national competent authorities in the development of River Basin Management Plans and implementation of action plans on flood regularization, ecological flows, flow supply for touristic activities and waterbodies continuity. In Brazil, for Pecém Power Plant (located in water-stressed area), EDP's team holds regular meetings with State entities, to anticipate future conflicts. In Portugal, EDP has an open channel with the Portuguese main water supply company and works with the competent authorities in water resource management.

	Relevance & inclusion	Please explain
Implications of water on your key commodities/raw materials	Not relevant, explanation provided	The most relevant commodities for EDP's operation are fossil fuels (coal and natural gas) for electricity generation. Extraction of such commodities is water intensive and suppliers in water stress areas are exposed to potential operating restrictions. According to the 2015 characterization study of EDP's supply chain impacts, water use in coal extraction accounts for 20-30% of our total supply chain water use. In 2017, 90% of EDP's coal purchases came from mines located in low water stress areas (WRI Baseline Water Stress <10%) and only 1% from high stress areas. Coal accounts for 12% of total installed capacity, and procurement is made from a vast range of alternative suppliers in different geographies. Future dependency will be even further reduced, as coal will account for only 5% of our total installed capacity in 2030. We therefore do not consider water implications on commodities (fossil fuels) to be relevant for EDP risk profile and so we do not factor it in our regular risk assessment and procedures.
Water-related regulatory frameworks	Relevant, always included	Water-related regulation (e.g. hydro generation taxes, ecological flows legal regimes, water discharges quality requirements, regulation of the EU Water Framework Directive) can constraint the operation of our thermal and hydro power plants (e.g. requirement to release ecological flows in hydro power plants), as well as increase investment and operational costs (e.g. higher investment associated with the installation of cooling towers that reduce water withdrawals in thermal power plants; increase in wastewater treatment costs prior to discharge). Current and future water related regulatory and tariff risks are assessed through: i) EDP's Corporate Business Risk model – Assessment of key risks, as well as mapping of emerging risks. Water regulation risks (e.g. regulatory risks such as changes in water pricing) are embedded into the model's taxonomy, phases and responsibilities. Assessment uses standard risk methodologies and inputs from sustainability and business unit teams (e.g. water-related environmental regulation; emerging regulatory issues); ii) Specific water-regulation follow-up procedures conducted at corporate, business unit and asset level (e.g. identification of emerging issues; participation in public consultations; involvement in River Basin Management Plans) and supported by a proprietary Regulation Database information system, managed at corporate level.
Status of ecosystems and habitats	Relevant, always included	Current and future local ecosystem and habitat status is integrated into EDP's water risk assessment in the planning phase of all new thermal and hydro generation projects. Projects undergo Environmental Impact Assessment, including monitoring programs on water communities and fresh water habitats prior to development, and forecast of potential future impacts and design of mitigation measures. In the operation phase, risk is assessed and managed mostly at business unit level (Portugal, Spain and Brazil), In the operation phase, risk is assessed and managed mostly at business unit level (Portugal, Spain and Brazil), through site-specific monitoring plans that assess any material changes on the status of water ecosystems and habitats resulting from the power plant operation. Examples of such monitoring plans include: i) water quality monitoring of reservoirs, encompassing biological quality parameters, physicochemical and hydromorphological parameters; ii) use of limnological information collected under the monitoring of reservoirs to support the implementation process of environmental flow regimes; iii) EDP also has in place a global site-specific modelling program to assess potential risks to local ecosystems. Several scenarios of accidents with potential environmental impacts, such as fires, spills, etc. are tested against a baseline

	Relevance & inclusion	Please explain
		environmental condition. Results inform new mitigation action plans, including monitoring plans implemented in addition to the National Environmental Authorities requirements.
Access to fully-functioning, safely managed WASH services for all employees	Not relevant, explanation provided	EDP provides access to clean water and suitable sanitation conditions for all employees in 100% of our facilities. This is a legal requirement in the geographies where EDP operates and is a company commitment under its participation in the United Nations' Global Compact. The issue therefore poses no risks to our operations and, as such, is not included in our water risk assessment.
Other contextual issues, please specify	Not considered	No other issues factored into EDP's water related risk assessment.

W3.3c

(W3.3c) Which of the following stakeholders are considered in your organization’s water-related risk assessments?

	Relevance & inclusion	Please explain
Customers	Relevant, always included	EDP conducts a materiality analysis, assessing and setting the relevance of an issue for EDP and its stakeholders, to support the organisation's decision-making and strategy development process. Material issues obtained with this process are the ones able to affect the value creation for the company in the short, medium and long term, and at the same time, are recognized as being important for the different EDP's stakeholders. This process is updated in an annual basis and includes the following stakeholders (not exhaustive): suppliers, regulators, peers, investors, customers, employees, local communities, NGO; academia, media, etc. These are key stakeholders for EDP as they affect or are affected by the company’s strategy and performance, in accordance to AA 1000 standards. Water is considered a material issue inside the Environmental Issues Category, and the yearly results of this process is directly linked to the Corporate Environmental Risk Tool and supports the water related risk assessment developed by the company. Our Materiality process does not identify water as a significant issue to engage with customers as EDP does not provide water-consuming products or services and costumers do not perceive water as a key issue associated with the company/sector.
Employees	Relevant, always included	EDP conducts a materiality analysis, assessing and setting the relevance of an issue for EDP and its stakeholders, to support the organisation's decision-making and strategy development process. Material issues obtained with this process are the ones able to affect the value creation for the company in the short, medium and long term, and at the same time, are recognized as being important for the different EDP's stakeholders. This process is updated in an annual basis and includes the following stakeholders (not exhaustive): suppliers, regulators, peers, investors, customers, employees, local communities, NGO; academia, media, etc. These are key stakeholders for EDP as they affect or are affected by the company’s strategy and performance, in accordance to AA 1000 standards. Water is considered a material issue inside the Environmental Issues Category, and the yearly results of this process is directly linked to the Corporate Environmental Risk Tool and supports the water related risk assessment developed by the company. EDP has an internal ongoing project - Econnosco - targeting employees, which aims to raise awareness and promote ecoefficiency on the use of resources,

	Relevance & inclusion	Please explain
		including water. Since 2015 the project is also implemented in Brazil and important reductions on water consumption have been obtained. The project allows us to gather information on staff level of awareness to water-related issues, providing inputs for our water risk assessment process.
Investors	Relevant, always included	EDP conducts a materiality analysis, assessing and setting the relevance of an issue for EDP and its stakeholders, to support the organisation's decision-making and strategy development process. Material issues obtained with this process are the ones able to affect the value creation for the company in the short, medium and long term, and at the same time, are recognized as being important for the different EDP's stakeholders. This process is updated in an annual basis and includes the following stakeholders (not exhaustive): suppliers, regulators, peers, investors, customers, employees, local communities, NGO; academia, media, etc. These are key stakeholders for EDP as they affect or are affected by the company's strategy and performance, in accordance to AA 1000 standards. Water is considered a material issue inside the Environmental Issues Category, and the yearly results of this process is directly linked to the Corporate Environmental Risk Tool and supports the water related risk assessment developed by the company. Our water risk assessment includes the quantification of the potential financial impact of each identified risk on the company's EBITDA. We report the issue in CDP Water Programme, as well as in several different ESG road shows or other investor surveys, when the topic is raised.
Local communities	Relevant, always included	EDP conducts a materiality analysis, assessing and setting the relevance of an issue for EDP and its stakeholders, to support the organisation's decision-making and strategy development process. Material issues obtained with this process are the ones able to affect the value creation for the company in the short, medium and long term, and at the same time, are recognized as being important for the different EDP's stakeholders. This process is updated in an annual basis and includes the following stakeholders (not exhaustive): suppliers, regulators, peers, investors, customers, employees, local communities, NGO; academia, media, etc. These are key stakeholders for EDP as they affect or are affected by the company's strategy and performance, in accordance to AA 1000 standards. Water is considered a material issue inside the Environmental Issues Category, and the yearly results of this process is directly linked to the Corporate Environmental Risk Tool and supports the water related risk assessment developed by the company. At a local level, water issues are perceived in different ways and strongly dependent on the Company's type of facility as well as local environmental conditions. EDP reports local environmental declarations under its EMAS - Eco-Management and Audit Scheme Registers in Iberia and when perceived as locally needed, some initiatives are taken to increase water quality or availability to local communities. A recent example is linked to the new S. Manoel hydro power plant in Brazil, where 17 indigenous villages are being supplied with potable water supply systems (catchment and distribution), benefiting 1100 people.
NGOs	Relevant, always included	EDP conducts a materiality analysis, assessing and setting the relevance of an issue for EDP and its stakeholders, to support the organisation's decision-making and strategy development process. Material issues obtained with this process are the ones able to affect the value creation for the company in the short, medium and long term, and at the same time, are recognized as being important for the different EDP's stakeholders. This process is updated in an annual basis and includes the following stakeholders (not exhaustive): suppliers, regulators, peers, investors, customers, employees, local communities, NGO; academia, media, etc. These are key stakeholders for EDP as they affect or are affected by the company's strategy and performance, in accordance to AA 1000 standards. Water is considered a material issue inside the

	Relevance & inclusion	Please explain
		Environmental Issues Category, and the yearly results of this process is directly linked to the Corporate Environmental Risk Tool and supports the water related risk assessment developed by the company. EDP has in place several partnerships with NGOs, either local or national, concerning mostly environmental protection, where water is always a key element considered. The most recent direct support to a water project is the voluntary support of Olhos d'Água Project in EDP Brazil. The aim of this partnership is to recover and protect 13 springs located in small rural properties close to the Guandu River through the reforestation of the surrounding areas. The project involves local farmers through awareness raising and training for more sustainable production patterns.
Other water users at a basin/catchment level	Relevant, always included	EDP conducts a materiality analysis, assessing and setting the relevance of an issue for EDP and its stakeholders, to support the organisation's decision-making and strategy development process. Material issues obtained with this process are the ones able to affect the value creation for the company in the regulators, peers, investors, customers, employees, local communities, NGO; academia, media, etc. These are key stakeholders for EDP as they affect or are affected by the company's strategy and performance, in accordance to AA 1000 standards. Water is considered a material issue inside the Environmental Issues Category, and the yearly results of this process is directly linked to the Corporate Environmental Risk Tool and supports the water related risk assessment developed by the company. Water users at a catchment level are considered local communities with direct interest in water issues, so engagement to support water risk assessment is also made through local initiatives or through formal multistakeholder commissions on Reservoirs Management or River Basin Councils working groups. Current and future stakeholder conflicts – of which the most relevant are competitive uses – are then integrated into our water risk management process. This involves, when necessary, the cooperation with the competent authorities to ensure adequate management of shared water resources by addressing issues such as: flood regularization, ecological flows or flow supply for touristic activities. EDP has in place edp+perto, an internal training tool aiming to raise internal capacity to deal with the local engagement process and best practices of local stakeholder management. Current and future stakeholder conflicts are addressed in this training program.
Regulators	Relevant, always included	EDP conducts a materiality analysis, assessing and setting the relevance of an issue for EDP and its stakeholders, to support the organisation's decision-making and strategy development process. Material issues obtained with this process are the ones able to affect the value creation for the company in the short, medium and long term, and at the same time, are recognized as being important for the different EDP's stakeholders. This process is updated in an annual basis and includes the following stakeholders (not exhaustive): suppliers, regulators, peers, investors, customers, employees, local communities, NGO; academia, media, etc. These are key stakeholders for EDP as they affect or are affected by the company's strategy and performance, in accordance to AA 1000 standards. Water is considered a material issue inside the Environmental Issues Category, and the yearly results of this process is directly linked to the Corporate Environmental Risk Tool and supports the water related risk assessment developed by the company. Water regulation issues are closely followed both at corporate and Business Unit level. EDP cooperates with: Eurelectric Hydro Group and Environmental Protection WG; Portuguese Environmental Authorities, in Portugal; Consejo Nacional del Agua (Spain National Water Council) and UNESA, in Spain. In Brazil, EDP participates in the Ceará State Watershed Committee, the entity that manages local water resources in the water stress area where our Pecém thermal power plant is located.

	Relevance & inclusion	Please explain
River basin management authorities	Relevant, always included	EDP conducts a materiality analysis, assessing and setting the relevance of an issue for EDP and its stakeholders, to support the organisation's decision-making and strategy development process. Material issues obtained with this process are the ones able to affect the value creation for the company in the short, medium and long term, and at the same time, are recognized as being important for the different EDP's stakeholders. This process is updated in an annual basis and includes the following stakeholders (not exhaustive): suppliers, regulators, peers, investors, customers, employees, local communities, NGO; academia, media, etc. These are key stakeholders for EDP as they affect or are affected by the company's strategy and performance, in accordance to AA 1000 standards. Water is considered a material issue inside the Environmental Issues Category, and the yearly results of this process is directly linked to the Corporate Environmental Risk Tool and supports the water related risk assessment developed by the company. In Portugal, EDP works with the environmental authorities, namely in Public Water Bodies Programs, in ecological flows regimes, in Flood Risk Management Plans, in the Portuguese Commission on Reservoirs Management and in the River Basin Councils. In Brazil, EDP participates in the Ceará State Watershed Committee, the entity that manages local water resources in the water stress area where our Pecém thermal power plant is located.
Statutory special interest groups at a local level	Relevant, always included	EDP conducts a materiality analysis, assessing and setting the relevance of an issue for EDP and its stakeholders, to support the organisation's decision-making and strategy development process. Material issues obtained with this process are the ones able to affect the value creation for the company in the short, medium and long term, and at the same time, are recognized as being important for the different EDP's stakeholders. This process is updated in an annual basis and includes the following stakeholders (not exhaustive): suppliers, regulators, peers, investors, customers, employees, local communities, NGO; academia, media, etc. These are key stakeholders for EDP as they affect or are affected by the company's strategy and performance, in accordance to AA 1000 standards. Water is considered a material issue inside the Environmental Issues Category, and the yearly results of this process is directly linked to the Corporate Environmental Risk Tool and supports the water related risk assessment developed by the company. Special interest groups at a local level are integrated into our stakeholder management procedures. Tourist activities, for example, are object of special attention in hydro power plants with multipurpose reservoirs. In Caniçada hydro power plant (Portugal), EDP agreed to operate its hydro power plant having in consideration a water level that allows, simultaneously, recreational activities. Another example is in the Castelo de Bode dam (Portugal) where EDP provides water for nautical sports such as kayaking, adjusting its flows to guarantee these activities when needed.
Suppliers	Relevant, always included	EDP conducts a materiality analysis, assessing and setting the relevance of an issue for EDP and its stakeholders, to support the organisation's decision-making and strategy development process. Material issues obtained with this process are the ones able to affect the value creation for the company in the short, medium and long term, and at the same time, are recognized as being important for the different EDP's stakeholders. This process is updated in an annual basis and includes the following stakeholders (not exhaustive): suppliers, regulators, peers, investors, customers, employees, local communities, NGO; academia, media, etc. These are key stakeholders for EDP as they affect or are affected by the company's strategy and performance, in accordance to AA 1000 standards. Water is considered a material issue inside the Environmental Issues Category, and the yearly results of this process is directly linked to the Corporate Environmental Risk Tool and supports the water related risk assessment developed by the company. Assessment of potential supply

	Relevance & inclusion	Please explain
		chain water risks was included in our 2015 characterization study of EDP's purchases. The study identified sustainability impacts of our supply chain, including water consumption. It was conducted using procurement data, environmentally extended input-output data and a global water resources model. Main water use is associated with fossil fuel extraction. 30% of our purchases' water footprint comes from raw materials, mainly fossil fuels. Restrictions to suppliers' operations in water stress areas can potentially impact supply and price in international markets, thus increasing our operational costs. However, we do not anticipate a substantive impact in our operation as currently less than 30% of our installed capacity is fossil-fuel based, with no future investment in thermal generation planned. Risk is further mitigated by working with a vast range of alternative supplier's active in different geographies.
Water utilities at a local level	Relevant, always included	EDP conducts a materiality analysis, assessing and setting the relevance of an issue for EDP and its stakeholders, to support the organisation's decision-making and strategy development process. Material issues obtained with this process are the ones able to affect the value creation for the company in the short, medium and long term, and at the same time, are recognized as being important for the different EDP's stakeholders. This process is updated in an annual basis and includes the following stakeholders (not exhaustive): suppliers, regulators, peers, investors, customers, employees, local communities, NGO; academia, media, etc. These are key stakeholders for EDP as they affect or are affected by the company's strategy and performance, in accordance to AA 1000 standards. Water is considered a material issue inside the Environmental Issues Category, and the yearly results of this process is directly linked to the Corporate Environmental Risk Tool and supports the water related risk assessment developed by the company. Current and future stakeholder conflicts – of which the most relevant are competitive uses – are integrated into our water risk identification and management procedures. Special attention is paid to hydro power plants with multipurpose reservoirs, of which we operate several in Portugal, where we strive to conciliate the needs of the different water users. Examples include Castelo de Bode hydro power plant, which reservoir is also the main water supplier to the city of Lisbon. EDP has an open channel with the Portuguese main water supply company, which owns the local water uptake, to support the engagement process.
Other stakeholder, please specify	Not considered	No other stakeholders considered into EDP's water related risk assessment.

W3.3d

(W3.3d) Describe your organization's process for identifying, assessing, and responding to water-related risks within your direct operations and other stages of your value chain.

Identification, assessment and management of water-related risks are integrated into EDP's risk procedures and undertaken for all EDP Group in a two-layer process: 1) Corporate Business Risk model – Water business risks (e.g. increase in competitive uses), regulatory risks (e.g. changes in water pricing) and strategic risks (e.g. climate-change induced structural change in water availability) are embedded into the model's taxonomy, phases and responsibilities. It uses standard risk methodologies (e.g. ISO 31000, short/long-term impact on EBITDA), and is conducted on a short to medium timescale (< 5-10 years) for most risks, using

a long-term perspective for climate-related physical risks (e.g. structural reduction in precipitation). 2) In-depth Water Risk Analysis - a) Assessment of generation assets' exposure to water stress locations. It uses WBCSD Global Water Tool, WRI Aqueduct and FAO/AQUASAT (current/forecasts up to 2040) for a high-level assessment, followed by downscaling with National Agencies information (water availability indicators) and operational teams' inputs (water dependency, competitive uses); b) Water regulation follow-up. It is conducted at corporate, business unit and asset level (e.g. participation in public consultations; involvement in River Basin Management Plans); c) Water Risk Map. Includes business, regulatory, strategic and operational water risks, aggregated according to expected frequency and impact, applying Monte Carlo simulation for short/medium (< 5 years) and long-term time horizons (5-50 years). Financial implications are expressed by the value of maximum loss (95% percentile). Risk response involves its adequate integration into the company's development strategy, business plan and project investment analysis (e.g. scenario analysis with water availability and regulation effects in energy prices and volumes; hydro resource evaluation integrating long-term effects of climate change and impact on new hydro capacity).

W4. Risks and opportunities

W4.1

(W4.1) Have you identified any inherent water-related risks with the potential to have a substantive financial or strategic impact on your business?

Yes, only within our direct operations

W4.1a

(W4.1a) How does your organization define substantive financial or strategic impact on your business?

Substantive financial impact is one that can affect over 1% of the Group's EBITDA. Definition applies to EDP's direct operations. Examples include the impact of decrease in EDP hydro generation in Iberia, in a long-term perspective (up to 50 years), resulting from climate change-induced structural decrease in precipitation (estimated financial impact of 60 M€).

W4.1b

(W4.1b) What is the total number of facilities exposed to water risks with the potential to have a substantive financial or strategic impact on your business, and what proportion of your company-wide facilities does this represent?

	Total number of facilities exposed to water risk	% company-wide facilities this represents	Comment
Row 1	64	1-25	The number of facilities exposed to water risk account for 16% of EDP Group's facilities: Two thermal power plants, Pecém in Brazil and Castejón in Spain, and the remaining are hydro power plants in Portugal.

W4.1c

(W4.1c) By river basin, what is the number and proportion of facilities exposed to water risks that could have a substantive impact on your business, and what is the potential business impact associated with those facilities?

Country/Region

Portugal

River basin

Lima

Number of facilities exposed to water risk

3

% company-wide facilities this represents

Less than 1%

Production value for the metals & mining activities associated with these facilities

<Not Applicable>

% company's annual electricity generation that could be affected by these facilities

Less than 1%

% company's global oil & gas production volume that could be affected by these facilities

<Not Applicable>

% company's total global revenue that could be affected

Less than 1%

Comment

Facilities in Lima River Basin account for 0.7%, 0.5% and 0.4% of EDP Group's facilities, electricity generation and revenues, respectively. Identified in EDP Water Risk Map as being exposed to risks of reduced availability of water inflows for electri city

generation driven by hydro volatility, revision of ecological flows regime and climate change induced structural decrease in precipitation.

Country/Region
Portugal
River basin
Other, please specify (Cávado)
Number of facilities exposed to water risk
6
% company-wide facilities this represents
1-25
Production value for the metals & mining activities associated with these facilities
<Not Applicable>
% company's annual electricity generation that could be affected by these facilities
1-25
% company's global oil & gas production volume that could be affected by these facilities
<Not Applicable>
% company's total global revenue that could be affected
Less than 1%
Comment
Facilities in Cávado River Basin account for 1.5%, 1.7% and 0.1% of EDP Group's facilities, electricity generation and revenues, respectively. Identified in EDP Water Risk Map as being exposed to risks of reduced availability of water inflows for electricity generation driven by hydro volatility, revision of ecological flows regime and climate change induced structural decrease in precipitation.

Country/Region
Portugal
River basin
Douro
Number of facilities exposed to water risk
24
% company-wide facilities this represents

1-25

Production value for the metals & mining activities associated with these facilities

<Not Applicable>

% company's annual electricity generation that could be affected by these facilities

1-25

% company's global oil & gas production volume that could be affected by these facilities

<Not Applicable>

% company's total global revenue that could be affected

1-25

Comment

Facilities in Douro River Basin account for 6.0%, 4.6% and 1.3% of EDP Group's facilities, electricity generation and revenues, respectively. Identified in EDP Water Risk Map as being exposed to risks of reduced availability of water inflows for electricity generation driven by hydro volatility, increase of competitive uses, adjustment of ecological flows (e-flows) regime and climate change induced structural decrease in precipitation.

Country/Region

Portugal

River basin

Other, please specify (Mondego)

Number of facilities exposed to water risk

16

% company-wide facilities this represents

1-25

Production value for the metals & mining activities associated with these facilities

<Not Applicable>

% company's annual electricity generation that could be affected by these facilities

Less than 1%

% company's global oil & gas production volume that could be affected by these facilities

<Not Applicable>

% company's total global revenue that could be affected

Less than 1%

Comment

Facilities in Mondego River Basin account for 4.0%, 0.4% and 0.3% of EDP Group's facilities, electricity generation and revenues, respectively. Identified in EDP Water Risk Map as being exposed to risks of reduced availability of water inflows for electri city generation driven by hydro volatility, revision of ecological flows regime and climate change induced structural decrease in precipitation.

Country/Region
Portugal
River basin
Tejo
Number of facilities exposed to water risk
11
% company-wide facilities this represents
1-25
Production value for the metals & mining activities associated with these facilities
<Not Applicable>
% company's annual electricity generation that could be affected by these facilities
1-25
% company's global oil & gas production volume that could be affected by these facilities
<Not Applicable>
% company's total global revenue that could be affected
Less than 1%
Comment
Facilities in Tejo River Basin account for 2.7%, 1.2% and 0.3% of EDP Group's facilities, electricity generation and revenues , respectively. Identified in EDP Water Risk Map as being exposed to risks of reduced availability of water inflows for electri city generation driven by hydro volatility, revision of ecological flows regime and climate change induced structural decrease in precipitation.

Country/Region
Portugal
River basin
Guadiana
Number of facilities exposed to water risk

2

% company-wide facilities this represents

Less than 1%

Production value for the metals & mining activities associated with these facilities

<Not Applicable>

% company's annual electricity generation that could be affected by these facilities

Less than 1%

% company's global oil & gas production volume that could be affected by these facilities

<Not Applicable>

% company's total global revenue that could be affected

Less than 1%

Comment

Facilities in Guadiana River Basin account for 0.5%, 0.8% and 0.3% of EDP Group's facilities, electricity generation and revenues, respectively. Identified in EDP Water Risk Map as being exposed to risks of reduced availability of water inflows for electricity generation driven by hydro volatility, revision of ecological flows regime and climate change induced structural decrease in precipitation.

Country/Region

Spain

River basin

Ebro

Number of facilities exposed to water risk

1

% company-wide facilities this represents

Less than 1%

Production value for the metals & mining activities associated with these facilities

<Not Applicable>

% company's annual electricity generation that could be affected by these facilities

1-25

% company's global oil & gas production volume that could be affected by these facilities

<Not Applicable>

% company's total global revenue that could be affected

Less than 1%

Comment

Castejón Natural Gas power plant account for 0.2%, 2.1% and 0.7% of EDP Group's facilities, electricity generation and revenues, respectively. It is located in a water stress area identified through the two stage EDP water stress exposure assessment: high level mapping using WBCSD Global Water Tool/WRI Aqueduct and local level assessment using national agencies specific water availability indicators and internal knowledge of company's operational teams.

Country/Region

Brazil

River basin

Other, please specify (Atlântico Nordeste Oriental)

Number of facilities exposed to water risk

1

% company-wide facilities this represents

Less than 1%

Production value for the metals & mining activities associated with these facilities

<Not Applicable>

% company's annual electricity generation that could be affected by these facilities

1-25

% company's global oil & gas production volume that could be affected by these facilities

<Not Applicable>

% company's total global revenue that could be affected

1-25

Comment

Pecém Coal power plant account for 0.2%, 6.7% and 3.3% of EDP Group's facilities, electricity generation and revenues, respectively. It is located in a water stress area identified through the two stage EDP water stress exposure assessment: high level mapping using WBCSD Global Water Tool/WRI Aqueduct and local level assessment using national agencies specific water availability indicators and internal knowledge of company's operational teams.

W4.2

(W4.2) Provide details of identified risks in your direct operations with the potential to have a substantive financial or strategic impact on your business, and your response to those risks.

Country/Region

Portugal

River basin

Other, please specify (All portuguese river basins in 4.1c.)

Type of risk

Physical

Primary risk driver

Increased water scarcity

Primary potential impact

Reduced revenues from lower sales/output

Company-specific description

According to IPCC (Intergovernmental Panel on Climate Change) projections, average precipitation in Iberia is expected to decrease by up to 10% by 2035, compared with the 1986-2005 period. In Longer Term perspective, up to 2100, EEA (European Environment Agency) and IPCC forecast average decreases of annual precipitation in Portugal and Spain that range from 10 to 30%. Hydro generation is an important source of value for EDP in Iberia, mainly in Portugal where 76% of the Group's hydro capacity is installed (in Spain, it accounts for only 5%). A structural decrease in precipitation, and thus in hydro generation, can negatively affect EDP's revenues. Assessment of this risk is part of EDP Water Risk Map, first developed in 2015, a comprehensive quantification exercise, including market, regulatory, strategic and operational water risks. It covers the company's operations in Portugal and Spain. Risks are aggregated according to expected frequency and impact and applying Monte Carlo simulation for short/medium (up to 5 years) and long-term time horizons (5-50 years). Financial implications are expressed by the value of maximum loss (95% percentile). In the first semestre of 2018, a deep-dive exercise on climate change risks provided a more in-depth knowledge of key climate risks, namely related with changing precipitation patterns. This analysis allowed an updated of the 2015 Water Risk Map.

Timeframe

More than 6 years

Magnitude of potential impact

Medium-high

Likelihood

More likely than not

Potential financial impact

60000000

Explanation of financial impact

Decrease in EDP hydro generation in Iberia, in a long-term perspective (up to 50 years). Value assumes a structural decrease of 10% in hydro productivity, an yearly production of 12TWh and a pool price of 50€/MWh.

Primary response to risk

Other, please specify (Generation portfolio diversification)

Description of response

EDP manages the risk mainly through a diversified generation portfolio in terms of technologies and geographies. EDP's Business Plan 2016-2020 investments in new generation capacity are also diversified: 5 GW additions (30% hydro, 65% wind, 5% solar) in Europe (45%), North America (50%) and Brazil (5%). Geographic diversification significantly reduces the risk, as structural reduction in precipitation is not likely to occur in all geographies and with same magnitude. EDP developed a specific Water Risk Map and conducts a periodic assessment of generation assets exposure to water stress areas, using high level mapping tools (WBCSD Global Water Tool and WRI Aqueduct) and local level analysis (site specific data from local authorities and information on assets specific operating conditions from local company staff). All new power plant project valuation considers sensitivities to lower inflows scenarios, thus enabling informed decision making.

Cost of response

980000000

Explanation of cost of response

Major risk mitigation process is EDP's diversification strategy for generation portfolio growth. According to the company's Business Plan 2016-2020, EDP will invest a total of € 980 M€/year (average net investment) in the 2016-2020 period on new renewable generation installed capacity. This investment will be distributed across diversified geographies and generation technologies.

Country/Region

Portugal

River basin

Douro

Type of risk

Physical

Primary risk driver

Other, please specify (Increase in competitive uses.)

Primary potential impact

Reduced revenues from lower sales/output

Company-specific description

Water transfers in Spain are expected to increase until 2027, mainly due to irrigation purposes. This will reduce trans-border river flows to Portugal and thus water inflows to many of EDP's hydroelectric power plants in Portugal, especially in the Douro river basin. This increase in competitive uses has a potential negative impact in the volume of electricity generation from these assets. Assessment of this risk is part of EDP Water Risk Map, first developed in 2015, a comprehensive quantification exercise, including business, regulatory, strategic and operational water risks. It covers the company's operations in Iberia, where 81% of the Group's total hydro generation capacity is located (76% in Portugal and 5% in Spain). Risks are aggregated according to expected frequency and impact and applying Monte Carlo simulation for short/medium (up to 5 years) and long-term time horizons (5-50 years). Financial implications are expressed by the value of maximum loss (95% percentile). In the first semestre of 2018, a deep-dive exercise on climate change risks provided a more in-depth knowledge of key climate risks, namely related with changing precipitation patterns. This analysis allowed an updated of the 2015 Water Risk Map.

Timeframe

More than 6 years

Magnitude of potential impact

Medium-high

Likelihood

Likely

Potential financial impact

68000000

Explanation of financial impact

Decrease in EDP hydro generation in Portugal, in a medium to long-term perspective (up to 15 years). Value assumes the structural decrease in the Douro basin hydro generation assets in line with inputs of Spanish Hydrological Plans will may lead to a maximum loss (P95%) of 68M€.

Primary response to risk

Engage with regulators/policymakers

Description of response

EDP manages the risk mainly through a diversified generation portfolio in terms of technologies and geographies. EDP's Business Plan 2016-2020 investments in new generation capacity are also diversified: 5 GW additions (30% hydro, 65% wind, 5% solar) in Europe (45%), North America (50%) and Brazil (5%). Geographic diversification significantly reduces the risk, as structural reduction in precipitation is not likely to occur in all geographies and with same magnitude. EDP developed a specific Water Risk Map and conducts a periodic assessment of generation assets exposure to water stress areas, using high level mapping tools

(WBCSD Global Water Tool and WRI Aqueduct) and local level analysis (site specific data from local authorities and information on assets specific operating conditions from local company staff). All new power plant project valuation considers sensitivities to lower inflows scenarios, thus enabling informed decision making. EDP is also following the negotiations between the Portuguese and Spanish governments on the Iberian Water Convention. This international treaty will define national obligations regarding water use in international rivers, including river flows to Portugal. Our generation Business Unit staff has been providing technical information and expertise to the Portuguese negotiators.

Cost of response

980000000

Explanation of cost of response

EDP's diversification strategy for generation portfolio growth. According to its Business Plan 2016-2020, EDP will invest a total of € 1.4 bn/year (net investment) in the 2016-2020 period, 70% of which on new renewable generation installed capacity. This investment is distributed across geographies and generation technologies. It is a one-off investment for the 2016-2020 period. Current expenditure cost of follow-up of negotiations between Portuguese and Spanish governments is not material.

Country/Region

Portugal

River basin

Other, please specify (All portuguese river basins in 4.1c.)

Type of risk

Regulatory

Primary risk driver

Regulatory uncertainty

Primary potential impact

Reduced revenues from lower sales/output

Company-specific description

Under the implementation of the European Union Water Framework Directive, concession contracts signed in 2008 for EDP's hydroelectric power plants in Portugal demand new ecological flow regimes. This has a potential negative impact on our operation: reduced revenues (reduction in the volume of electricity generation from these assets) and increase in investment costs (CAPEX in ecological flow devices in hydroelectric plants currently not prepared for the new needs). Assessment of this risk is part of EDP Water Risk Map, first developed in 2015, a comprehensive quantification exercise, including business, regulatory, strategic and operational water risks. It covers the company's operations in Iberia, where 81% of the Group's total hydro generation capacity is located (76% in Portugal and 5% in Spain). Risks are aggregated according to expected frequency and

impact and applying Monte Carlo simulation for short/medium (up to 5 years) and long-term time horizons (5-50 years). Financial implications are expressed by the value of maximum loss (95% percentile).

Timeframe

1 - 3 years

Magnitude of potential impact

Medium-low

Likelihood

Likely

Potential financial impact

3000000

Explanation of financial impact

Decrease in EDP hydro generation in Portugal, in an annual basis, in the short, mid-term. Value assumes maximum loss (P25%) with e-flows in all EDP's concessions with this legal requirement.

Primary response to risk

Engage with regulators/policymakers

Description of response

Negotiations are currently being held with Portuguese authorities to establish the new regime details, namely volumes to be released and its relation to yearly hydrological conditions. These are expected to minimize the financial impact risk on the company's operations. . EDP has an ongoing 7-year monitoring plan of the ecological status of water bodies downstream of its hydro generation assets. Periodic reports are sent to national authorities and will help inform its final decision on the ecological flows regimes, adjusting the need for new investments to the real ecological conditions of the affected ecosystems.

Cost of response

500000

Explanation of cost of response

Current expenditure cost of downstream ecological status monitoring plan and of engagement with national authorities on the new ecological flows regime definition. Monitoring and engagement costs are recurring.

Country/Region

Spain

River basin

Ebro

Type of risk

Physical

Primary risk driver

Increased water stress

Primary potential impact

Increased operating costs

Company-specific description

Castejón gas power plant has been identified as a generation asset at risk from water stress location in our updated Water Stress Exposure Assessment 2017-2018. A high-level assessment revealed an Annual Renewable Water Supply indicator below 1,700 m3/person/year and a Baseline Water Stress indicator over 20%, according to WBCSD Global Water Tool and WRI Aqueduct. Also, Water stress situation was confirmed by information from National Information Systems on Water Resources. Castejón has not been subject to any water-related constraints in the last years, although evidences have shown that electricity generation might be facing future operational constraints. Due to low river flow, cooling water discharges can be compromised because of the high temperatures impact on the ecosystem.

Timeframe

More than 6 years

Magnitude of potential impact

Low

Likelihood

Likely

Potential financial impact

1000000

Explanation of financial impact

Revenue loss from stopping generation during water scarcity situations, up to 1 week, in a 10-year period.

Primary response to risk

Adopt water efficiency, water re-use, recycling and conservation practices (Storage tank to use in water scarce time)

Description of response

There are risk reduction measures undergoing, namely water use optimization measures: investment in a reserve tank with automated connections to reduce between 20-30% of water withdrawals from the river in dry seasons.

Cost of response

25000

Explanation of cost of response

Annualised CAPEX during the Castejón’s useful life of the reserve tank.

Country/Region
Brazil
River basin
Other, please specify (Atlântico Nordeste Oriental)
Type of risk
Physical
Primary risk driver
Increased water stress
Primary potential impact
Increased operating costs
Company-specific description
Pecém coal-fired plant has been identified as a generation asset at risk from water stress location in our updated Water Stress Exposure Assessment 2017-2018. A high-level assessment revealed an Annual Renewable Water Supply indicator below 1,700 m3/person/year and a Baseline Water Stress indicator over 20%, according to WBCSD Global Water Tool and WRI Aqueduct. Also, Water stress situation was confirmed by information from National Information Systems on Water Resources. Pecém is installed at the industrial and Port Complex of Pecém, where multiple other water users, namely industrial, are also present. Water for plant operation is provided by the municipal water and sewage concessionaire. Projected increase in both water scarcity in the region and competitive uses is foreseen to have a potential negative financial effect for the company: higher operation costs (rising water tariffs and taxes) and limitations to operation.
Timeframe
Current up to 1 year
Magnitude of potential impact
Medium
Likelihood
Unlikely
Potential financial impact
17000000
Explanation of financial impact
Increase in water stress leads to new regulatory constraints, namely with an increase of water tariffs and taxes, as well as potential limits to operation. Potential financial impact was obtained by the maximum annual loss initially announced by the

Brazilian authorities. At the present time, this value is considered a pass-through cost, according with the existing Power Purchase Agreement

Primary response to risk

Adopt water efficiency, water re-use, recycling and conservation practices (Water reuse and recycling practices.)

Description of response

EDP started investing in the second semester of 2017 in water reuse and recycling initiatives in Pecém power plant: water recycling in its refrigeration circuits and treated water reuse from the Effluent Treatment Station, using it as cooling water in the refrigeration circuits. Also, EDP participates in the region's Watershed Committee, the entity that manages the state's water resources, and are involved in negotiations with the local State Government regarding the final value for the water emergency tax announced in the September 2016.

Cost of response

4000000

Explanation of cost of response

CAPEX in the plant's water reuse and recycling process. It is expected that the return on investment will occur in less than next 3 years. Current expenditure cost of follow-up of negotiations between the Brazilian authorities, which is a recurring cost, is fully integrated into our budgetary cycles.

W4.2c

(W4.2c) Why does your organization not consider itself exposed to water risks in its value chain (beyond direct operations) with the potential to have a substantive financial or strategic impact?

	Primary reason	Please explain
Row 1	Risks exist, but no substantive impact anticipated	Main water use in EDP's supply chain is associated with coal extraction. The 2015 characterization study of EDP's purchases showed that 30% of our purchases' water footprint comes from raw materials, including but not limited to fuels. The study identified economic, social and environmental impacts of our supply chain, including water consumption and was conducted using procurement data, environmentally extended input-output data and a global water resources model. Restrictions to coal suppliers' operations in water stress areas can potentially impact supply and price in international markets, thus increasing our operational costs. However, we do not anticipate a substantive impact as in 2017 90% of coal came from mines in low water stress areas (WRI Baseline Water Stress <10%) and only 1% from high stress areas. Coal currently accounts for 12% of our total electricity generation installed capacity, and procurement is made from a vast range of alternative suppliers in different geographies. Future risk exposure will be further reduced, as coal will account for only 5% of our total installed capacity in 2030 as per our current Business Plan and long-term strategy.

W4.3

(W4.3) Have you identified any water-related opportunities with the potential to have a substantive financial or strategic impact on your business?

Yes, we have identified opportunities, and some/all are being realized

W4.3a

(W4.3a) Provide details of opportunities currently being realized that could have a substantive financial or strategic impact on your business.

Type of opportunity

Markets

Primary water-related opportunity

Stronger competitive advantage

Company-specific description & strategy to realize opportunity

Hydro generation is an important source of renewable, non-air polluting, CO2 free electricity and we expect demand to grow, in-line with both market shifting preferences, increasingly stringent environmental regulations on fossil-based generation and due to the key role it can play in. Currently, 74% of EDP's installed capacity is based on renewable sources, with hydro making up to 34%. Under our 2016-2020 Business Plan we will invest €1.4 bn/year, 70% of which on new renewable installed capacity. 30% of the new capacity will be hydro plants, built in Portugal and Brazil. This gives EDP a competitive advantage. Hydro is key for supplying reserve system services. This technology can start rapidly from a standstill condition and deliver a controled power output within a very short period. It is key to secure peak hours. Part of the hydro capacity includes pumping, allowing storage upstream and electricity generation in peak hours. This mechanism also maximizes wind/solar generation, using it to storage water in off-peak hours when there is wind and sun. Another advantage includes having reservoirs upstream several run-of-river hydro plants. This improves the resilience of downstream assets, helping to reduce potential long-term climate change impacts. In addition, the planned installation of hydro micro-generation turbines on ecological flow devices will deliver additional kWh and minimise the impact of the ecological flows regime on the asset's operation.

Estimated timeframe for realization

1 to 3 years

Magnitude of potential financial impact

High

Potential financial impact

1000000000

Explanation of financial impact
1,000M€ of revenues calculated based on the future revenues projected for 2018, obtained from EDP's hydro power portfolio.

W5. Facility-level water accounting

W5.1

(W5.1) For each facility referenced in W4.1c, provide coordinates, total water accounting data and comparisons with the previous reporting year.
Facility reference number
Facility 1
Facility name (optional)
3 Hydro power plants in Lima river basin.
Country/Region
Portugal
River basin
Lima
Latitude
41.866054
Longitude
-8.241919
Primary power generation source for your electricity generation at this facility
Hydroelectric
Oil & gas sector business division
<Not Applicable>
Total water withdrawals at this facility (megaliters/year)
1294.75
Comparison of withdrawals with previous reporting year
Much lower
Total water discharges at this facility (megaliters/year)
1290.48

Comparison of discharges with previous reporting year
Much lower
Total water consumption at this facility (megaliters/year)
0
Comparison of consumption with previous reporting year
Much lower
Please explain
Water consumption was 4,28 megaliters/year (the platform uses controls and does not allow a positive value in this row). Data was obtained by direct measurements/calculations, considering electricity generated and the reservoir level. Coordinates a re at the center of the river basin.The high decreases, in withdrawal and discharge, are due to the severe drought in Iberia in 2017.Thresholds used: +/- 15%: “about the same”; +/- 16-50%: “higher”/”lower”; +/- 51%: “much higher”/”much lower”.

Facility reference number
Facility 2
Facility name (optional)
6 Hydro power plants in Cávado river basin.
Country/Region
Portugal
River basin
Other, please specify (Cávado)
Latitude
41.61674
Longitude
-8.36298
Primary power generation source for your electricity generation at this facility
Hydroelectric
Oil & gas sector business division
<Not Applicable>
Total water withdrawals at this facility (megaliters/year)
2741.16
Comparison of withdrawals with previous reporting year
Much lower

Total water discharges at this facility (megaliters/year)
3058.96
Comparison of discharges with previous reporting year
Much lower
Total water consumption at this facility (megaliters/year)
0
Comparison of consumption with previous reporting year
Much higher
Please explain
Water consumption was -318 megaliters/year (the platform does not allow negative values). Coordinates are at the center of the river basin.The high decreases, in both withdrawals and discharges, are due to the severe drought in Iberia in 2017.Data was obtained by direct measurements/calculations, considering electricity generated and the reservoir level.Thresholds used: +/- 15%: “about the same”; +/- 16-50%: “higher”/”lower”; +/- 51%: “much higher”/”much lower”.

Facility reference number
Facility 3
Facility name (optional)
24 Hydro power plants in Douro river basin.
Country/Region
Portugal
River basin
Douro
Latitude
41.153052
Longitude
-7.779113
Primary power generation source for your electricity generation at this facility
Hydroelectric
Oil & gas sector business division
<Not Applicable>
Total water withdrawals at this facility (megaliters/year)
34369.62

Comparison of withdrawals with previous reporting year
Much lower
Total water discharges at this facility (megaliters/year)
36081.43
Comparison of discharges with previous reporting year
Much lower
Total water consumption at this facility (megaliters/year)
0
Comparison of consumption with previous reporting year
Much higher
Please explain
Water consumption was -1,712 megaliters/year (the platform does not allow negative values). Coordinates are at the center of the river basin.The high decreases, in withdrawal and discharge, are due to the severe drought in Iberia in 2017.Data was obtained by direct measurements/calculations, considering electricity generated and the reservoir level.Thresholds used: +/- 15%: “about the same”; +/- 16-50%: “higher”/”lower”; +/- 51%: “much higher”/”much lower”.

Facility reference number
Facility 4
Facility name (optional)
16 Hydro power plants in Mondego river basin.
Country/Region
Portugal
River basin
Other, please specify (Mondego)
Latitude
40.385266
Longitude
-8.043322
Primary power generation source for your electricity generation at this facility
Hydroelectric
Oil & gas sector business division
<Not Applicable>

Total water withdrawals at this facility (megaliters/year)
2684.34
Comparison of withdrawals with previous reporting year
Much lower
Total water discharges at this facility (megaliters/year)
3137.6
Comparison of discharges with previous reporting year
Much lower
Total water consumption at this facility (megaliters/year)
0
Comparison of consumption with previous reporting year
Lower
Please explain
Water consumption was -453 megaliters/year (the platform does not allow negative values). Coordinates are at the center of the river basin.The high decreases, both in withdrawals and discharges, are due to the severe drought in Iberia in 2017.Data was obtained by direct measurements/calculations, considering electricity generated and the reservoir level.Thresholds used: +/- 15%: “about the same”; +/- 16-50%: “higher”/”lower”; +/- 51%: “much higher”/”much lower”.

Facility reference number
Facility 5
Facility name (optional)
11 Hydro power plants in Tejo river basin.
Country/Region
Portugal
River basin
Tejo
Latitude
39.480479
Longitude
-7.991989
Primary power generation source for your electricity generation at this facility
Hydroelectric

Oil & gas sector business division
<Not Applicable>
Total water withdrawals at this facility (megaliters/year)
8713.06
Comparison of withdrawals with previous reporting year
Much lower
Total water discharges at this facility (megaliters/year)
9032.15
Comparison of discharges with previous reporting year
Much lower
Total water consumption at this facility (megaliters/year)
0
Comparison of consumption with previous reporting year
Much lower
Please explain
Water consumption was -319 megaliters/year (the platform does not allow negative values). Coordinates are at the center of the river basin.The high decreases both in withdrawals and discharges, were due to the severe drought in Iberia in 2017..Data was obtained by direct measurements/calculations, considering electricity generated and the reservoir level.Thresholds used: +/- 15%: “about the same”; +/- 16-50%: “higher”/”lower”; +/- 51%: “much higher”/”much lower”.

Facility reference number
Facility 6
Facility name (optional)
2 Hydro power plants in Guadiana river basin.
Country/Region
Portugal
River basin
Guadiana
Latitude
38.046951
Longitude
-7.650575

Primary power generation source for your electricity generation at this facility
Hydroelectric
Oil & gas sector business division
<Not Applicable>
Total water withdrawals at this facility (megaliters/year)
550.94
Comparison of withdrawals with previous reporting year
Lower
Total water discharges at this facility (megaliters/year)
4356.53
Comparison of discharges with previous reporting year
Lower
Total water consumption at this facility (megaliters/year)
0
Comparison of consumption with previous reporting year
About the same
Please explain
Water consumption was -3,806 megaliters/year (the platform does not allow negative values). Coordinates are at the center of the river basin.The high decreases, both in withdrawals and discharges, are due to the severe drought in Iberia in 2017.Data was obtained by direct measurements/calculations, considering electricity generated and the reservoir level.Thresholds used: +/- 15%: “about the same”; +/- 16-50%: “higher”/”lower”; +/- 51%: “much higher”/”much lower”.

Facility reference number
Facility 7
Facility name (optional)
Castejón.
Country/Region
Spain
River basin
Ebro
Latitude
42.0833

Longitude
-1.6
Primary power generation source for your electricity generation at this facility
Gas
Oil & gas sector business division
<Not Applicable>
Total water withdrawals at this facility (megaliters/year)
2017.13
Comparison of withdrawals with previous reporting year
About the same
Total water discharges at this facility (megaliters/year)
398.47
Comparison of discharges with previous reporting year
About the same
Total water consumption at this facility (megaliters/year)
0
Comparison of consumption with previous reporting year
About the same
Please explain
Water cunsumption was 1,618.66 magaliters/year (the platform uses controls and does not allow a positive value in this row). Castejón's electricity generation has increased 9% when compared to 2016. This explains the steady volumes of withdrawals and discharges between 2016 and 2017. We use the following thresholds for monitoring trends in water intensity indicator: +/- 15%: "about the same"; +/- 16-50%: "higher"/"lower"; +/- 51%: "much higher"/"much lower".

Facility reference number
Facility 8
Facility name (optional)
Pecém.
Country/Region
Brazil
River basin
Other, please specify (Atlântico Nordeste Oriental)

Latitude
-4
Longitude
-38.87542
Primary power generation source for your electricity generation at this facility
Coal - hard
Oil & gas sector business division
<Not Applicable>
Total water withdrawals at this facility (megaliters/year)
11778.41
Comparison of withdrawals with previous reporting year
About the same
Total water discharges at this facility (megaliters/year)
867.76
Comparison of discharges with previous reporting year
Much lower
Total water consumption at this facility (megaliters/year)
0
Comparison of consumption with previous reporting year
About the same
Please explain
Consumption: 10,910.64 megalitres/year (platform uses controls and doesn't allow positive values in this row). Water withdrawals reduced slightly due to water efficiency investments in 2017. The decreased of discharges result from both the high evaporation levels of the refrigeration circuit technology and the water reuse efficiency process in place. Thresholds used for monitoring trends in water intensity indicator: +/-15%: about the same; +/- 16-50%:higher/lower; +/- 51%:much higher/much lower

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W5.1a

(W5.1a) For each facility referenced in W5.1, provide withdrawal data by water source.
Facility reference number

Facility 1

Facility name

3 Hydro power plants in Lima river basin.

Fresh surface water, including rainwater, water from wetlands, rivers and lakes

1294.75

Brackish surface water/seawater

0

Groundwater - renewable

0

Groundwater - non-renewable

0

Produced water

0

Third party sources

0

Comment

Data includes 3 facilities in Lima River Basin which use fresh water from rivers. Data was obtained using CDP's definition, through direct measurements or calculations. considering all volumes sent to downstream (dam outlet, spillways, environmental flows and third-party withdrawals), as well as reservoir annual water variation (volumes at the beginning and end of the year) and electricity generated.

Facility reference number

Facility 2

Facility name

6 Hydro power plants in Cávado river basin.

Fresh surface water, including rainwater, water from wetlands, rivers and lakes

2741.16

Brackish surface water/seawater

0

Groundwater - renewable

0

Groundwater - non-renewable

0

Produced water

0

Third party sources

0

Comment

Data includes 6 facilities in Cávado River Basin which use fresh water from rivers. Data was obtained using CDP's definition, through direct measurements or calculations. considering all volumes sent to downstream (dam outlet, spillways, environmental flows and third-party withdrawals), as well as reservoir annual water variation (volumes at the beginning and end of the year) and electricity generated.

Facility reference number

Facility 3

Facility name

24 Hydro power plants in Douro river basin.

Fresh surface water, including rainwater, water from wetlands, rivers and lakes

34369.62

Brackish surface water/seawater

0

Groundwater - renewable

0

Groundwater - non-renewable

0

Produced water

0

Third party sources

0

Comment

Data includes 24 facilities in Douro River Basin which use fresh water from rivers. Data was obtained using CDP's definition, through direct measurements or calculations. considering all volumes sent to downstream (dam outlet, spillways, environmental flows and third-party withdrawals), as well as reservoir annual water variation (volumes at the beginning and end of the year) and electricity generated.

Facility reference number
Facility 4
Facility name
16 Hydro power plants in Mondego river basin.
Fresh surface water, including rainwater, water from wetlands, rivers and lakes
2684.34
Brackish surface water/seawater
0
Groundwater - renewable
0
Groundwater - non-renewable
0
Produced water
0
Third party sources
0
Comment
Data includes 16 facilities in Mondego River Basin which use fresh water from rivers. Data was obtained using CDP's definition, through direct measurements or calculations. considering all volumes sent to downstream (dam outlet, spillways, environmental flows and third-party withdrawals), as well as reservoir annual water variation (volumes at the beginning and end of the year) and electricity generated.

Facility reference number
Facility 5
Facility name
11 Hydro power plants in Tejo river basin.
Fresh surface water, including rainwater, water from wetlands, rivers and lakes
8713.06
Brackish surface water/seawater
0
Groundwater - renewable

0

Groundwater - non-renewable

0

Produced water

0

Third party sources

0

Comment

Data includes 11 facilities in Tejo River Basin which use fresh water from rivers. Data was obtained using CDP's definition, through direct measurements or calculations. considering all volumes sent to downstream (dam outlet, spillways, environmental flows and third-party withdrawals), as well as reservoir annual water variation (volumes at the beginning and end of the year) and electricity generated.

Facility reference number

Facility 6

Facility name

2 Hydro power plants in Guadiana river basin.

Fresh surface water, including rainwater, water from wetlands, rivers and lakes

550.94

Brackish surface water/seawater

0

Groundwater - renewable

0

Groundwater - non-renewable

0

Produced water

0

Third party sources

0

Comment

Data includes 2 facilities in Guadiana River Basin which use fresh water from rivers. Data was obtained using CDP's definition, through direct measurements or calculations. considering all volumes sent to downstream (dam outlet, spillways, environmental

flows and third-party withdrawals), as well as reservoir annual water variation (volumes at the beginning and end of the year) and electricity generated.

Facility reference number
Facility 7
Facility name
Castejón.
Fresh surface water, including rainwater, water from wetlands, rivers and lakes
2015.54
Brackish surface water/seawater
0
Groundwater - renewable
0
Groundwater - non-renewable
0
Produced water
0
Third party sources
1.58
Comment
Data includes 1 facility in Ebro River Basin which uses fresh water from a river for the cooling and process water circuits, and from a municipal water supplier for human consumption.

Facility reference number
Facility 8
Facility name
Pecém.
Fresh surface water, including rainwater, water from wetlands, rivers and lakes
0
Brackish surface water/seawater
0
Groundwater - renewable

0

Groundwater - non-renewable

0

Produced water

0

Third party sources

11778.41

Comment

Data includes 1 facility in the Atlântico Nordeste Oriental River Basin which uses fresh water from a municipal water supplier for the cooling and process water circuits, and from another type of third party organization for human consumption.

W5.1b

(W5.1b) For each facility referenced in W5.1, provide discharge data by destination.

Facility reference number

Facility 1

Facility name

3 Hydro power plants in Lima river basin.

Fresh surface water

1290.48

Brackish surface water/Seawater

0

Groundwater

0

Third party destinations

0

Comment

Data includes 3 facilities in Lima River Basin which use fresh water from rivers. Data was obtained using CDP's definition, through direct measurements or calculations. considering all volumes sent to downstream (dam outlet, spillways, environmental flows and third-party withdrawals).

Facility reference number
Facility 2
Facility name
6 Hydro power plants in Cávado river basin
Fresh surface water
3058.96
Brackish surface water/Seawater
0
Groundwater
0
Third party destinations
0
Comment
Data includes 6 facilities in Cávado River Basin which use fresh water from rivers. Data was obtained using CDP's definition, through direct measurements or calculations. considering all volumes sent to downstream (dam outlet, spillways, environmental flows and third-party withdrawals).

Facility reference number
Facility 3
Facility name
24 Hydro power plants in Douro river basin.
Fresh surface water
36081.43
Brackish surface water/Seawater
0
Groundwater
0
Third party destinations
0
Comment

Data includes 24 facilities in Douro River Basin which use fresh water from rivers. Data was obtained using CDP's definition, through direct measurements or calculations. considering all volumes sent to downstream (dam outlet, spillways, environmental flows and third-party withdrawals).

Facility reference number
Facility 4
Facility name
16 Hydro power plants in Mondego river basin.
Fresh surface water
3137.6
Brackish surface water/Seawater
0
Groundwater
0
Third party destinations
0
Comment
Data includes 16 facilities in Mondego River Basin which use fresh water from rivers. Data was obtained using CDP's definition, through direct measurements or calculations. considering all volumes sent to downstream (dam outlet, spillways, environmental flows and third-party withdrawals).

Facility reference number
Facility 5
Facility name
11 Hydro power plants in Tejo river basin.
Fresh surface water
9032.15
Brackish surface water/Seawater
0
Groundwater
0
Third party destinations

0

Comment

Data includes 11 facilities in Tejo River Basin which use fresh water from rivers. Data was obtained using CDP's definition, through direct measurements or calculations. considering all volumes sent to downstream (dam outlet, spillways, environmental flows and third-party withdrawals).

Facility reference number

Facility 6

Facility name

2 Hydro power plants in Guadiana river basin.

Fresh surface water

4356.53

Brackish surface water/Seawater

0

Groundwater

0

Third party destinations

0

Comment

Data includes 2 facilities in Guadiana River Basin which use fresh water from rivers. Data was obtained using CDP's definition, through direct measurements or calculations. considering all volumes sent to downstream (dam outlet, spillways, environmental flows and third-party withdrawals).

Facility reference number

Facility 7

Facility name

Castejón.

Fresh surface water

397.45

Brackish surface water/Seawater

0

Groundwater

0

Third party destinations

1.02

Comment

Data includes 1 facility in Ebro River Basin which discharges water from the refrigeration circuit into the river and domestic effluents to a third-party water treatment facility.

Facility reference number

Facility 8

Facility name

Pecém.

Fresh surface water

0

Brackish surface water/Seawater

867.76

Groundwater

0

Third party destinations

0

Comment

Data includes 1 facility in the Atlântico Nordeste Oriental River Basin which domestic wastewater is discharged to the local municipal water and sewage concessionaire. Cooling water end up being discharged into the ocean.

W5.1c

(W5.1c) For each facility referenced in W5.1, provide the proportion of your total water use that is recycled or reused, and give the comparison with the previous reporting year.

Facility reference number

Facility 1

Facility name

Lima River Basin (3 hydro facilities).

% recycled or reused
None
Comparison with previous reporting year
About the same
Please explain
There is no water recycling or reuse in the 3 facilities located in Lima river Basin. EDP has concluded in 2017 all its inves tments to increase pumping services in its hydro power plants portfolio.

Facility reference number
Facility 2
Facility name
Cávado River Basin (6 hydro facilities).
% recycled or reused
26-50%
Comparison with previous reporting year
Higher
Please explain
Data was obtained using pumping volumes, considering CDP's definition. More pumping is likely in dry years (e.g. 2017), so electricity generation is not compromised. 67% of these facilities have pumping, resulting in an overall increase of water recycling. Alone, the 4 pumping facilities recycled 46% of water in 2017. It will tend to decrease or increase depending on the inter-annual hydro volatility.EDP investments to increase pumping services in its hydro portfolio was concluded in 2017.

Facility reference number
Facility 3
Facility name
Douro River Basin (24 hydro facilities).
% recycled or reused
2-10%
Comparison with previous reporting year
About the same
Please explain

Data was obtained using pumping volumes, considering CDP's definition.More pumping is likely in dry years (e.g. 2017), so electricity generation is not compromised.Only 13% of these facilities have pumping systems,justifying the overall steady variation from 2016.Alone, the 3 pumping facilities recycled 37% of water in 2017.It will tend to decrease or increase depend ing on the inter-annual hydro volatility.EDP investments to increase pumping services in its hydro portfolio was concluded in 2017.

Facility reference number
Facility 4
Facility name
Mondego River Basin (16 hydro facilities).
% recycled or reused
2-10%
Comparison with previous reporting year
About the same
Please explain
Data was obtained using pumping volumes, considering CDP's definition.More pumping is likely in dry years (e.g. 2017), so electricity generation is not compromised.Only 6% of these facilities have pumping systems, justifying the steady overall variation from 2016.Alone, the pumping facility recycled 26% of water in 2017. It will tend to decrease or increase depending on the in ter-annual hydro volatility.EDP investments to increase pumping services in its hydro portfolio w as concluded in 2017.

Facility reference number
Facility 5
Facility name
Tejo River Basin (11 hydro facilities).
% recycled or reused
None
Comparison with previous reporting year
About the same
Please explain
There is no water recycling or reuse in the facilities located in Tejo River Basin. EDP has concluded in 2017 all its investments to increase pumping services in its hydro power plants portfolio.

Facility reference number

Facility 6

Facility name

Guadiana River Basin (2 hydro facilities).

% recycled or reused

26-50%

Comparison with previous reporting year

About the same

Please explain

Data was obtained using pumping volumes, considering CDP's definition. Both facilities have pumping systems and in 2017 there was a 44% of water recycling. Due to the Alqueva's reversible system, electricity generation is less dependent on affluent volume and weather patterns. This explains why there is no significant variation on water recycling (pumping) from 2016. EDP investments to increase pumping services in its hydro portfolio was concluded in 2017.

Facility reference number

Facility 7

Facility name

Castejón.

% recycled or reused

None

Comparison with previous reporting year

About the same

Please explain

There is no water recycling or reuse in Castejón thermal power plant .

Facility reference number

Facility 8

Facility name

Pecém.

% recycled or reused

11-25%

Comparison with previous reporting year

This is our first year of measurement

Please explain
In Pecém thermal power plant, EDP recycles water in its refrigeration circuits, and reuses treated water from the Effluent Treatment Station, using it as cooling water in the refrigeration circuits. Water recycled volume was obtained through the number of cycles in the refrigeration circuit with the same water volume. It is expected an increase of recycled/reused water in 2018 since those initiatives started to be implemented in last semester of 2017.

W5.1d

(W5.1d) For the facilities referenced in W5.1, what proportion of water accounting data has been externally verified?
Water withdrawals – total volumes
% verified
76-100
What standard and methodology was used?
EDP's Sustainability Report is externally verified (3rd party), including GRI water indicators. Water volumes withdrawn are shared and validated by the competent environmental authority. 91% of EDP's facilities identified as exposed to water risks are certified in accordance to ISO 14001, having this water aspect monitored and externally verified. EDP committs to achieve 100% ISO 14001 certification by 2020 for operations with environmental impacts.
Water withdrawals – volume by source
% verified
76-100
What standard and methodology was used?
EDP's Sustainability Report is externally verified (3rd party), including GRI water indicators. Water volumes withdrawn by source are shared and validated by the competent environmental authority. 91% of EDP's facilities identified as exposed to water risks are certified in accordance to ISO 14001, having this water aspect monitored and externally verified. EDP committs to achieve 100% ISO 14001 certification by 2020 for operations with environmental impacts.
Water withdrawals – quality
% verified
76-100
What standard and methodology was used?
EDP's Sustainability Report is externally verified (3rd party), including GRI water indicators. Water quality indicators are shared and validated by the competent environmental authority. 91% of EDP's facilities identified as exposed to water risks are certified

in accordance to ISO 14001, having this water aspect monitored and externally verified. EDP committs to achieve 100% ISO 14001 certification by 2020 for operations with environmental impacts.

Water discharges – total volumes

% verified

76-100

What standard and methodology was used?

EDP's Sustainability Report is externally verified (3rd party), including GRI water indicators. Water discharges are shared and validated by the competent environmental authority. 91% of EDP's facilities identified as exposed to water risks are certified in accordance to ISO 14001, having this water aspect monitored and externally verified. EDP committs to achieve 100% ISO 14001 certification by 2020 for operations with environmental impacts.

Water discharges – volume by destination

% verified

76-100

What standard and methodology was used?

EDP's Sustainability Report is externally verified (3rd party), including GRI water indicators. Water discharges by destination are shared and validated by the competent environmental authority. 91% of EDP's facilities identified as exposed to water risks are certified in accordance to ISO 14001, having this water aspect monitored and externally verified. EDP committs to achieve 100% ISO 14001 certification by 2020 for operations with environmental impacts.

Water discharges – volume by treatment method

% verified

76-100

What standard and methodology was used?

EDP's Sustainability Report is externally verified (3rd party), including GRI water indicators. Water discharges by treatment method are controlled by the competent environmental authority. 91% of EDP's facilities identified as exposed to water risks are certified in accordance to ISO 14001, having this water aspect monitored and externally verified. EDP committs to achieve 100% ISO 14001 certification by 2020 for operations with environmental impacts.

Water discharge quality – quality by standard effluent parameters

% verified

76-100

What standard and methodology was used?

EDP's Sustainability Report is externally verified (3rd party), including GRI water indicators. Water discharge quality is controlled by the competent environmental authority, under the environmental permits. 91% of EDP's facilities identified as exposed to

water risks are certified in accordance to ISO 14001, having this water aspect monitored and externally verified. EDP committs to achieve 100% ISO 14001 certification by 2020 for operations with environmental impacts.

Water discharge quality – temperature

% verified

76-100

What standard and methodology was used?

EDP's Sustainability Report is externally verified (3rd party), including GRI water indicators. Water quality of cooling water are controlled by the competent environmental authority, under the environmental permits. 91% of EDP's facilities identified as exposed to water risks are certified in accordance to ISO 14001, having this water aspect monitored and externally verified. EDP committs to achieve 100% ISO 14001 certification by 2020 for operations with environmental impacts.

Water consumption – total volume

% verified

76-100

What standard and methodology was used?

EDP's Sustainability Report is externally verified (3rd party), including GRI water indicators. Water consumption is shared and validated by the competent environmental authority. 91% of EDP's facilities identified as exposed to water risks are certified in accordance to ISO 14001, having this water aspect monitored and externally verified. EDP committs to achieve 100% ISO 14001 certification by 2020 for operations with environmental impacts.

Water recycled/reused

% verified

76-100

What standard and methodology was used?

EDP's Sustainability Report is externally verified (3rd party), including GRI water indicators. 91% of EDP's facilities identified as exposed to water risks are certified in accordance to ISO 14001, having this water aspect monitored and externally verified. EDP committs to achieve 100% ISO 14001 certification by 2020 for operations with environmental impacts.

W6. Governance

W6.1

(W6.1) Does your organization have a water policy?

Yes, we have a documented water policy that is publicly available

W6.1a

(W6.1a) Select the options that best describe the scope and content of your water policy.

	Scope	Content	Please explain
Row 1	Company-wide	Description of business dependency on water Description of business impact on water Description of water-related performance standards for direct operations Description of water-related standards for procurement Reference to international standards and widely-recognized water initiatives Company water targets and goals Commitment to align with public policy initiatives, such as the SDGs Commitments beyond regulatory compliance Commitment to water-related innovation Commitment to stakeholder awareness and education Commitment to water stewardship and/or collective action Acknowledgement of the human right to water and sanitation Recognition of environmental linkages, for example, due to climate change	EDP has reviewed its Environmental Policies (Environmental Policy, Water Policy and Biodiversity Policy) in earlier 2018, aggregating all environmental commitments in just one Environmental Policy. This aims to guarantee a better corporate management approach, assuming all key environmental issues will have to follow the same commitments, when applicable. Water is a key natural resource for EDP. We depend on it to operate our facilities, and we recognize the adverse environmental impacts resulting from our activities. Under our Environmental Policy we explicit commit to promote the efficient use of natural resources, namely the use and sustainable management of water in all the processes, operations and installations. To complement the new Environmental Policy, EDP has published in its website a clear understanding of what the issue means to the company as well as its management approach, supporting company's performance. Environmental Policy_Management Approach.pdf

W6.2

(W6.2) Is there board level oversight of water-related issues within your organization?

Yes

W6.2a

(W6.2a) Identify the position(s) of the individual(s) on the board with responsibility for water-related issues.

Position of individual	Please explain
Director on board	A Director on EDP Corporate Executive Board has formal responsibility over sustainability issues (CSO), including water. Director currently in charge is assigned with all the company's cross-cutting critical themes, namely risk management and sustainability. This Director is responsible for: approving/submitting to Board's approval the company's water targets, policies and actions; ensuring inclusion of water risks (e.g. exposure of generation assets to water stress locations, new water taxes) in the company's risk profile; integrating water-related issues into electricity generation investment/divestment analysis (e.g. water dependency vs water stress locations, regulatory issues, price volatility-volume fluctuation for hydro generation); reporting on climate-related issues to EDP General and Supervisory Board (GSB), the highest-level corporate body below the General Shareholders Meeting, which includes a Corporate Governance and Sustainability Committee, headed by the GSB chairman.

W6.2b

(W6.2b) Provide further details on the board's oversight of water-related issues.

	Frequency that water-related issues are a scheduled agenda item	Governance mechanisms into which water-related issues are integrated	Please explain
Row 1	Scheduled - some meetings	Monitoring implementation and performance Overseeing acquisitions and divestiture Overseeing major capital expenditures Reviewing and guiding annual budgets Reviewing and guiding business plans	The Executive Board of Directors, in the person of the Director responsible for sustainability, is briefed monthly by the company's Corporate Sustainability Office – coordinating, whenever needed, with the Corporate Risk Management Office and the company's Business Units – on sustainability issues, including water. Reports include: i) regular updates on the implementation of the company's policies, actions and targets on sustainability issues, including water-related issues (e.g. performance against targets); ii) Water-stress risk assessment revision and acute situations of potencial impact on electricity generation; iii) results of in-depth water risk analysis (e.g. Water Risk Map); iv) inputs for analysis of investments/divestments on electricity generation, impacting business plans and annual budgets (e.g. water dependency vs exposure to water stress locations); v) proposal for new water policies, actions and targets. The Executive Director in charge of sustainability regularly takes the most relevant water-related issues to the Executive Board meetings. Said Director also reports on water to EDP's General and Supervisory Board, oversees the Corporate Sustainability and Risk Management Offices and supports the Sustainability Committee, chaired by the President of the executive Board where the top management of the most

	Frequency that water-related issues are a scheduled agenda item	Governance mechanisms into which water-related issues are integrated	Please explain
		Reviewing and guiding major plans of action Reviewing and guiding risk management policies Reviewing and guiding corporate responsibility strategy Setting performance objectives	relevant business units discuss the Group's sustainability performance and its annual Operational Environment and Sustainability Plan.

W6.3

(W6.3) Below board level, provide the highest-level management position(s) or committee(s) with responsibility for water-related issues.

Name of the position(s) and/or committee(s)

Other C-Suite Officer, please specify (Head of Corporate Sustainability Office.)

Responsibility

Both assessing and managing water-related risks and opportunities

Frequency of reporting to the board on water-related issues

More frequently than quarterly

Please explain

Highest-level of responsibility below Board lies with the Head of EDP Corporate Sustainability Department (CSD), who is also Head of the Corporate Risk Management Department, facilitating the integration of water-related issues into the company's risk profile and procedures. Corporate departments are headed by the company's most senior managers. The Head of CSD is responsible for assisting the Executive Board of Directors (EBD) in defining policies, actions and targets, including those related to water, and monitoring their implementation at Business Unit level. The Head of CSD reports directly to the company's EBD in charge of sustainability. Monthly reports include updates on the implementation/proposal for new water-related policies, actions and targets; identification of potential water shortage and associated impact on electricity generation; in-depth water risk analysis; water-related inputs for analysis of investments/divestments.

W-FB6.4/W-CH6.4/W-EU6.4/W-OG6.4/W-MM6.4

(W-FB6.4/W-CH6.4/W-EU6.4/W-OG6.4/W-MM6.4) Do you provide incentives to C-suite employees or board members for the management of water-related issues?

Yes

W-FB6.4a/W-CH6.4a/W-EU6.4a/W-OG6.4a/W-MM6.4a

(W-FB6.4a/W-CH6.4a/W-EU6.4a/W-OG6.4a/W-MM6.4a) What incentives are provided to C-suite employees or board members for the management of water-related issues?

	Who is entitled to benefit from these incentives?	Indicator for incentivized performance	Please explain
Monetary reward	Board/Executive board Director on board Corporate executive team Chief Executive Officer (CEO) Chief Financial Officer (CFO) Chief Operating Officer (COO) Chief Purchasing Officer (CPO) Chief Risk Officer (CRO) Chief Sustainability Officer (CSO)	Other, please specify (EDP's performance in the DJSI Index)	Members of EDP Corporate Executive Board of Directors, in accordance with the Board's remuneration policy, have the company's sustainability performance factored into their multiannual variable remuneration. This is a KPI extended to all employees at a corporate level and includes the level of EDP's performance on Water strategy and water risk analysis, as well as water eco-efficiency (performance on withdraws, discharges and consumption).
Recognition (non-monetary)	No one is entitled to these incentives	<Not Applicable>	

	Who is entitled to benefit from these incentives?	Indicator for incentivized performance	Please explain
Other non-monetary reward	No one is entitled to these incentives	<Not Applicable>	

W6.5

(W6.5) Do you engage in activities that could either directly or indirectly influence public policy on water through any of the following?

Yes, direct engagement with policy makers
Yes, trade associations

W6.5a

(W6.5a) What processes do you have in place to ensure that all of your direct and indirect activities seeking to influence policy are consistent with your water policy/water commitments?

EDP engages directly with water policy makers in all geographies where it operates thermal and hydro assets. Examples include participation in drafting River Management Plans in the Portuguese Commission on Reservoirs and in the Spanish National Water Council. In Brazil, for Pecém (asset in water-stressed area), EDP holds regular meetings with Ceará State authorities. Engagement in international water regulation (e.g. EU Water Framework Directive) is conducted via trade associations, notably Eurelectric.
The company's Water Management Working Group integrates Corporate Centre and Business Units (BUs) and supports the implementation of EDP's Environmental Policy, and its Water Management approach. This WG ensures the alignment with the different company's operational commitments in all activities – including direct and indirect policy engagement - across geographies. If any inconsistency is detected, it is taken to the Sustainability Committee to be discussed, and decisions are then implemented by BUs.
EDP also has dedicated structures in each geography that manage the relation with supervisory bodies and other public policy makers: Corporate Regulation and Competition Department in Portugal, Regulation and Institutional Relationship Department in Spain and Regulatory Issues Department in Brazil. These ensure the overall alignment of policy engagement activities with the corporate water strategy and implement corrective measures whenever inconsistency is detected.

W7. Business strategy

W7.1

(W7.1) Are water-related issues integrated into any aspects of your long-term strategic business plan, and if so how?

	Are water-related issues integrated?	Long-term time horizon (years)	Please explain
Long-term business objectives	Yes, water-related issues are integrated	11-15	Water-related issues are integrated into several of EDP's long-term business objectives, namely: i) Low carbon generation: hydroelectric generation is an important source of renewable, non-air polluting, CO2 free electricity and is key to achieving our 2030 target of reducing CO2/kWh by 75% from 2005 levels. Currently, over 70% of EDP's generation portfolio is based on renewable sources, with hydro making up to 30% of total installed capacity. ii) Low risk profile: at a strategic level, water related risks (e.g. physical risks like exposure to water stress locations or regulatory risks like new water taxes or fees) are now subject to periodic assessment processes, contributing to the company's low risk profile.
Strategy for achieving long-term objectives	Yes, water-related issues are integrated	11-15	Strategy to achieve the above mentioned long-term objectives includes: i) Low carbon generation: long-term investment in renewable generation portfolio, where hydro generation plays an important role. EDP's Business Plan 2016-2020 investments in new generation capacity foresees: 5 GW additions (30% hydro, 65% wind, 5% solar) in Europe (45%), North America (50%) and Brazil (5%). ii) Low risk profile: Geographic diversification of hydro generation capacity additions is a risk reduction strategy as structural reduction in precipitation, as foreseen in IPCC scenarios, is not likely to occur in all geographies and with same magnitude.
Financial planning	Yes, water-related issues are integrated	11-15	Water-related issues are integrated into several aspects of our financial planning, namely: i) Capital allocation (Planning for new locations): all EDP new electricity generation investments go through a detailed analysis which considers water dependency vs exposure to water stress locations, as well as water related regulatory and reputational risks, namely those arising from competitive uses. For new hydroelectric installed capacity, project investment analysis undergoes hydro resource evaluation encompassing scenario analysis of price volatility and changes due to volume fluctuations. ii) Change in revenues and expenditures (constraints to generation asset operation): In Brazil, the extreme drought context of recent years forced power producers to meet their short positions through electricity purchases at high market spot prices. EDP has hydroelectric generation assets in that country and joined the hydro risk renegotiation deal (with retroactive effects to January 2015) proposed by the Brazilian regulator, which materially limits the level of risk associated to the volatility in hydro generation.

W7.2

(W7.2) What is the trend in your organization's water-related capital expenditure (CAPEX) and operating expenditure (OPEX) for the reporting year, and the anticipated trend for the next reporting year?

	Water-related CAPEX (+/- % change)	Anticipated forward trend for CAPEX (+/- % change)	Water-related OPEX (+/- % change)	Anticipated forward trend for OPEX (+/- % change)	Please explain
Row 1	-0.43	-0.28	0	-0.01	Water-related CAPEX reduction was mainly due to the end of the investment in new hydropower plants in Portugal. In addition to this, the anticipated forward trend for CAPEX is also explained by the end of São Manoel Hydropower Plant investment (Brazil). In 2017, water-related CAPEX represented 12% of EDP Group's total CAPEX. OPEX variations (change from last year and forward trend) is not material.

W7.3

(W7.3) Does your organization use climate-related scenario analysis to inform its business strategy?

	Use of climate-related scenario analysis	Comment
Row 1	Yes	EDP uses EIA scenarios to assess climate-related transition risks. We integrate EIA's 450 Scenario, CPS (Current Policy Scenario) and NPS (New Policy Scenario) into our energy planning exercises and evaluate impacts on our entire business portfolio up to 2030, taking into account EDP Group Business Plan. We also used EIA 2DS Scenario for setting its GHG reduction Science Based Target (SBT). EDP's SBT was formally approved by the Science Based Target Initiative in early 2017. EDP uses IPCC scenarios to assess climate-related physical risks. We use IPCC's RCP 8.5 Scenario (business as usual), as well as RCP 6.0, 4.5 and 2.6 Scenarios (aggressive CO2 emission reductions), to identify the most relevant chronic and acute risks and evaluate potential impacts on our electricity generation and distribution activates up to 2050.

W7.3a

(W7.3a) Has your organization identified any water-related outcomes from your climate-related scenario analysis?

Yes

W7.3b

(W7.3b) What water-related outcomes were identified from the use of climate-related scenario analysis, and what was your organization's response?

	Climate-related scenario(s)	Description of possible water-related outcomes	Company response to possible water-related outcomes
Row 1	RCP 2.6 Other, please specify (IPCC SRES A2, A1B, B1)	EDP assesses climate-related physical risks through IPCC's RCP 8.5 Scenario (BaU), RCP 6.0, 4.5 and 2.6 Scenarios (aggressive CO2 emission reductions), to identify the most relevant chronic and acute risks and evaluate potential impacts on electricity generation and distribution up to 2050. Under IPCC-RCP projections, average precipitation in Iberia is expected to decrease by up to 10% by 2035, compared with the 1986-2005 period. Up to 2100, EEA and IPCC forecast average decreases of annual precipitation in Iberia ranging from 10-30%. Hydro generation in Iberia accounts for 81% of the Group's hydro capacity. Thus, a structural decrease in precipitation can negatively affect EDP's revenues. Also, with IPPC SRES A2, A1B and B1, EDP assessed the risk from the number, duration and magnitude increase of extreme events, such as temperature extremes (contribution for water scarcity). Both risks are part of EDP Water Risk Map, a comprehensive quantification exercise, including market, regulatory, strategic and operational water risks, covering operations in Iberia.Risks are aggregated according to expected frequency and impact, applying Monte Carlo simulation for short/medium (up to 5 years) and long-term time horizons (5-50 years). Financial implications are expressed by the value of maximum loss (95% percentile).In early 2018, a deep-dive exercise on climate change risks provided a more in-depth knowledge of key climate risks, namely related with changing precipitation patterns.	EDP manages the risk mainly through a diversified generation portfolio in terms of technologies and geographies. EDP's Business Plan 2016-2020 investments in new generation capacity are also diversified: 5 GW additions (30% hydro, 65% wind, 5% solar) in Europe (45%), North America (50%) and Brazil (5%). Geographic diversification significantly reduces the risk, as structural reduction in precipitation is not likely to occur in all geographies and with same magnitude. EDP developed a specific Water Risk Map and conducts a periodic assessment of generation assets exposure to water stress areas, using high level mapping tools (WBCSD Global Water Tool and WRI Aqueduct) and local level analysis (site specific data from local authorities and information on assets specific operating conditions from local company staff). All new power plant project valuation considers sensitivities to lower inflows scenarios, thus enabling informed decision making.

W7.4

(W7.4) Does your company use an internal price on water?

Row 1

Does your company use an internal price on water?

Yes

Please explain

EDP uses an internal price on water to measure its exposure to risks or opportunities from water-related issues. A range up to 5€/m3 is used and calculated taking in consideration different approaches, such as: - Cost of an average MWh not generated by a hydro facility due to competitive uses (e.g. E-flows; increase in domestic consumption in multipurpose reservoirs; etc.) or

decrease in precipitation during the fiscal year; - Cost of water treatment for thermal process, varying with water quality parameters .

W8. Targets

W8.1

(W8.1) Describe your approach to setting and monitoring water-related targets and/or goals.

	Levels for targets and/or goals	Monitoring at corporate level	Approach to setting and monitoring targets and/or goals
Row 1	Company-wide targets and goals Activity level specific targets and/or goals Country level targets and/or goals	Targets are monitored at the corporate level Goals are monitored at the corporate level	Goals and targets are set to measure EDP's progress on water management, within specific commitments assumed by EDP in its Group's Environmental Policy, particularly in using water resource sustainably, a strategic priority for the company. Considering consumptive fresh water uses, thermal power plants account for more than 99% of the total fresh water withdrawals of EDP Group. Thus, it is also within this scope that targets are defined, due to its corporate impact. Also, due to some geographic specificities, for instance higher operational risk from current and forecast structural reduction in precipitation, country-specific targets are also defined with corporate relevance.

W8.1a

(W8.1a) Provide details of your water targets that are monitored at the corporate level, and the progress made.

Target reference number

Target 1

Category of target

Water consumption

Level

Company-wide

Primary motivation

Risk mitigation

Description of target

15% reduction of EDP Group's total fresh water consumption relative to electricity generation.

Quantitative metric

% reduction per product

Baseline year
2016
Start year
2016
Target year
2018
% achieved
16
Please explain
The percentage achieved is in line with the planned progress. It is expected that the highest decrease will occur during 2018 due to the water reuse and recycling measures that started to take place at the end of 2017 in Pecém, which accounts for almost half of EDP Group's fresh water consumption. In addition to risk mitigation, this target was also defined to reduce costs and EDP's environmental impacts.

Target reference number
Target 2
Category of target
Water consumption
Level
Country level
Primary motivation
Risk mitigation
Description of target
Annually, an absolute threshold is defined for process water consumption used in water-steam circuits in all thermal power plants in Portugal.
Quantitative metric
Other, please specify (Consumption below a predefined threshold)
Baseline year
2017
Start year
2017
Target year

2017
% achieved
100
Please explain
At the end of 2017, consumption was below the target: 84% of the predefined threshold. This target is defined annually and gets more demanding every year. In addition to risk mitigation, this target was also defined to reduce costs and EDP's environmental impacts.

W8.1b

(W8.1b) Provide details of your water goal(s) that are monitored at the corporate level and the progress made.
Goal
Promotion of water data transparency
Level
Company-wide
Motivation
Brand value protection
Description of goal
Clarify and make publicly available the water-related definitions and assumptions considered within the EDP Group for adequate management.
Baseline year
2016
Start year
2017
End year
2019
Progress
On track. 100% for 2017 expected tasks: Revision of all water definitions linking strategic indicators with operational indicators. In 2018 definitions are being tested, reviewed and will become publicly disclosed in 2019.

W9. Linkages and trade-offs

W9.1

(W9.1) Has your organization identified any linkages or tradeoffs between water and other environmental issues in its direct operations and/or other parts of its value chain?

Yes

W9.1a

(W9.1a) Describe the linkages or tradeoffs and the related management policy or action.

Linkage or tradeoff

Linkage

Type of linkage/tradeoff

Decreased GHG emissions

Description of linkage/tradeoff

Nine of EDP's hydroelectric power plants in Portugal have pumping devices. This allows us to reuse water by pumping it upstream during low load hours, storing it in the dam reservoir, and using it for generation again in high demand periods. Pumping is mostly done at night, making full use of zero-GHG wind power electricity. Reusing water in hydroelectric power plants through pumping is a water management action with relevant positive impacts in the low carbon transition of electricity systems and GHG emissions reduction: i) maximizes wind generation; ii) secures energy storage capacity that increases system flexibility to accommodate a growing share of intermittent renewable sources (wind, solar photovoltaic); iii) improves the resilience of downstream run-of-river hydroelectric assets, helping to reduce potential long-term climate change impacts. In 2017, EDP generated a total of 1,803 GWh of renewable hydro electricity from pumped storage, a 48% increase from the previous year.

Policy or action

EDP enhances the positive impact of the linkage by continuously increasing the pumping storage capacity of its most important hydroelectricity generation assets. Through its 2016-2020 Business Plan, EDP more than doubled the pumping equipped hydroelectric capacity in that period, in particular in Portugal. In 2017, two hydroelectric power plants in Portugal (Venda Nova III and Foz-Tua, a total of 1 043 MW) came online, both equipped with pumped storage.

Linkage or tradeoff

Tradeoff

Type of linkage/tradeoff

Decreased energy efficiency (In closed refrigeration circuits.)

Description of linkage/tradeoff

6 of EDP's thermoelectric power plants in Portugal, Spain and Brazil (60% of our thermal generating capacity) have wet cooling circuits. The use of cooling towers reduces water withdrawals and subsequent rejection of water in more than 90% compared to open-circuits. However, the cooling capacity of closed refrigeration circuits is lower than that of open circuits (e.g. a coal-fired dry cooled power plant, compared to once-through open-loop one, has an energy penalty in the range 4-16% depending on the equipment and operating conditions), thus reducing the energy efficiency of the power plant and increasing GHG and air emissions for the same electricity output. In 2017, the overall efficiency of EDP's thermal power plants stood at 45,6%, a 1% improvement from the previous year. This was achieved by the optimization of operating conditions in our CCGT power plants that compensated for the slight efficiency reduction in coal power plants.

Policy or action

EDP reduces the negative impact of the trade-off by the on-going implementation of operational measures that optimize the energy efficiency of the fuel conversion in each thermal power plant. This minimizes the effect of the reduced efficiency of closed water-efficient cooling circuits. As an example of a recent energy efficiency measure implemented by EDP was the fuel switching (from fueloil to natural gas) of coal thermal power plants startups. Optimization of power plant energy efficiency is part of both the company's operational performance improvement plans and of its ISO 14 001 Environmental Management System, which currently cover 88% of the assets with potential environment impacts, including 90% of the company's electricity installed capacity. Overall energy efficiency of EDP thermal power plants (coal and natural gas fired CCGT) improved 1% since 2016 and 3% since 2014. EDP's new thermal power plant projects have been fitted with cooling towers. Additional investment and expenditure costs were integrated into the corresponding business plans and budget cycles. All new electricity generation capacity foreseen in EDP 2016-2020 Business Plan is renewable based (wind, hydro and solar photovoltaic) and our growth strategy does not include investment in additional thermal generation capacity.

W10. Verification

W10.1

(W10.1) Do you verify any other water information reported in your CDP disclosure (not already covered by W5.1d)?

Yes

EDP_ExtVerification_Water_Sustainability_report_2017.pdf

W10.1a

(W10.1a) Which data points within your CDP disclosure have been verified, and which standards were used?

Disclosure module	Data verified	Verification standard	Please explain
W0. Introduction	- Electricity generation: nameplate capacity and the generation by power source (W-EU0.1b).	ASAE3000	Verification of identified data points is within the scope of the independent assurance of EDP Sustainability Report. Assurance is conducted by an independent third party according to ISAE 3000, for each annual edition of the report. The report is prepared according to the Global Reporting Initiative GRI Standards - "Comprehensive Option" and the G4 Electric Utilities Sector Disclosures. Information is consolidated at EDP Group level following the financial consolidation rules applied by the company. For 2017 data, a set of 31 key indicators were verified with a reasonable level of assurance and the remaining with a limited level of assurance. Identified data points were verified within the scope of the reasonable assurance of GRI G4-EU1 and GRI G4-EU2 indicators (Electricity generation installed capacity and output per energy source).
W1. Current state	- Water aspects regularly measured and monitored (W1.2; W-EU1.2a) - Total water withdrawn, discharged and consumed (W1.2b) - Total water withdrawals - by source (W1.2h) - Total water discharges - by destination (W1.2i) - % of total water use recycled or reused (W1.2j)	ASAE3000	Verification of identified data points is within the scope of the independent assurance of EDP Sustainability Report. Assurance is conducted by an independent third party according to ISAE 3000, for each annual edition of the report. The report is prepared according to the Global Reporting Initiative GRI Standards - "Comprehensive Option" and the G4 Electric Utilities Sector Disclosures. Information is consolidated at EDP Group level following the financial consolidation rules applied by the company. For 2017 data, a set of 31 key indicators were verified with a reasonable level of assurance and the remaining with a limited level of assurance. Identified data points were verified within the scope of: i) the limited assurance of GRI 103-2 indicator (Water management approach and its components); ii) the reasonable assurance of GRI 303-1 indicator (Total water withdrawals by source). Verified values exclude use of water in hydroelectric generation; iii) the limited assurance of GRI 306-1 (Total water discharge by destination) and GRI 303-3 (% of recycled and reused water) indicators. Verified values exclude use of water in hydroelectric generation.
W2. Business impacts	- Penalties, fines and/or enforcement orders (W2.2, W2.2.a, W2.2.b)	ASAE3000	Verification of identified data points is within the scope of the independent assurance of EDP Sustainability Report. Assurance is conducted by an independent third party according to ISAE 3000, for each annual edition of the report. The report is prepared according to the Global Reporting Initiative GRI Standards - "Comprehensive Option" and the G4 Electric Utilities Sector Disclosures. Information is consolidated at EDP Group level

Disclosure module	Data verified	Verification standard	Please explain
			following the financial consolidation rules applied by the company. For 2017 data, a set of 31 key indicators were verified with a reasonable level of assurance and the remaining with a limited level of assurance. Identified data points were verified within the scope of the reasonable assurance of GRI 307-1 indicators (Non-compliance with environmental laws and regulations – fines and penalties).
W3. Procedures	- Potential water pollutants with detrimental impact on water ecosystems or human health (W-EU3.1; W-EU3.1a)	ASAE3000	Verification of identified data points is within the scope of the independent assurance of EDP Sustainability Report. Assurance is conducted by an independent third party according to ISAE 3000, for each annual edition of the report. The report is prepared according to the Global Reporting Initiative GRI Standards - "Comprehensive Option" and the G4 Electric Utilities Sector Disclosures. Information is consolidated at EDP Group level following the financial consolidation rules applied by the company. For 2017 data, a set of 31 key indicators were verified with a reasonable level of assurance and the remaining with a limited level of assurance. Identified data points were verified within the scope of the limited assurance of GRI 306-5 (Water bodies affected by water discharges) and GRI 303-2 (Water sources significantly affected by water withdrawals) indicators.
W6. Governance	- Water policy (W6.1, W6.1a) - Board level oversight and management responsibilities (W6.2, W6.2a, W6.3)	ASAE3000	Verification of identified data points is within the scope of the independent assurance of EDP Sustainability Report. Assurance is conducted by an independent third party according to ISAE 3000, for each annual edition of the report. The report is prepared according to the Global Reporting Initiative GRI Standards - "Comprehensive Option" and the G4 Electric Utilities Sector Disclosures. Information is consolidated at EDP Group level following the financial consolidation rules applied by the company. For 2017 data, a set of 31 key indicators were verified with a reasonable level of assurance and the remaining with a limited level of assurance. Identified data points were verified within the scope of the limited assurance of GRI 103-2 indicator (Water management approach and its components).
W8. Targets	- Corporate water targets and goals (W8.1, W8.1a, W8.1b)	ASAE3000	Verification of identified data points is within the scope of the independent assurance of EDP Sustainability Report. Assurance is conducted by an independent third party according to ISAE 3000, for each annual edition of the report. The report is prepared according to the Global Reporting Initiative GRI Standards - "Comprehensive Option" and the G4 Electric Utilities Sector Disclosures. Information is consolidated at EDP Group level following the financial consolidation rules applied by the company. For 2017

Disclosure module	Data verified	Verification standard	Please explain
			data, a set of 31 key indicators were verified with a reasonable level of assurance and the remaining with a limited level of assurance. Identified data points were verified within the scope of the limited assurance of GRI 103-2 indicator (Water management approach and its components).

W11. Sign off

W-FI

(W-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

W11.1

(W11.1) Provide details for the person that has signed off (approved) your CDP water response.

	Job title	Corresponding job category
Row 1	Member of EDP Executive Board with formal responsibility over sustainability, risk and other company's cross-cutting critical themes.	Director on board

W11.2

(W11.2) Please indicate whether your organization agrees for CDP to transfer your publicly disclosed data on your impact and risk response strategies to the CEO Water Mandate's Water Action Hub [applies only to W2.1a (response to impacts), W4.2 and W4.2a (response to risks)].

Yes

Submit your response

In which language are you submitting your response?

English

Please confirm below

I have read and accept the applicable Terms