

Welcome to your CDP Water Security Questionnaire 2019

W0. Introduction

W0.1

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

Zorlu Dogal(ZD) is under umbrella of Zorlu Holding AŞ (ZH) which is one of the biggest companies of Turkey. ZH companies operating in the consumer electronics, household appliances, textiles and energy sectors. The founding pillar of ZH, textile remains one of the key sectors of the Group today. With Korteks, Turkey's largest integrated polyester yarn manufacturer and exporter, and Zorluteks, Europe's leading household linen producer, under its fold, Zorlu Textiles Group is constantly growing and enhancing its position in domestic and international markets. The main investments in energy sector started with the energy needs of textile sector.

ZH as a company that produces goods and services in different sectors ranging from energy to textiles, white goods to technology, have the mindset and the tools that are necessary for building a better future.

As an innovative institution that adapts rapidly to technological developments and transfers knowledge to all its stakeholders; ZH focused on producing "**sustainable solutions**" based on the future prosperity of people, society and the planet.

We dream of a better future, fed by innovative and technological changes. ZH call this transformation "**Smart Life - 2030**". And for this reason, ZH began a journey to **inspire** our employees, to **strengthen** our environment and to **create value for our society**.

Beyond energy needs of Zorlu Textile, ZH's Energy Group (ZHEG) was founded in 1993 to decrease the energy needs of Turkey in 90's as group of companies serving at a global scale in different fields of the energy sector especially "Electricity Generation", "Electricity Distribution", "Electricity Sales and Trade". ZHEG makes difference among its rivals with its integrated structure which combines engineering, supply and construction services with maintenance, repair and operation services. ZHEG is a major player in the domestic market with 1086 MW of installed capacity in Turkey and its portfolio comprises 7 hydroelectric, 3 wind, 4 geothermal and 3 natural gas power plants. ZHEG defines sustainable energy as "generating and using energy in compliance with intergenerational justice approach without causing irreversible damages to environment and destroying the ecological balance."

Zorlu Doğal(ZD) which is the scope of this report, owner of 7 hydropower power plants and 4 Geothermal power plants. In 2018 the company commissioned the second unit of Kızıldere III with 65 MW and capacity increase of İkizdere HEPP from 18,6 to 24,94 MW. In 2015 ZD, has obtained

the first National "Domestic Production Incentive" due to the best energy efficiency and production performance in its plants, Kızıldere II and Alaşehir I geothermal power plants. Mainly focusing on geothermal energy investments in Turkey, ZD is the leading player in geothermal energy in Turkey with its 305 MW of installed capacity and accounts for nearly 30% of the total installed geothermal energy capacity in the country. In 2018 ZD continued to apply ISO 14046 Water Management System and all data has been verified by third party.

With the reflection of ZH's sustainability vision, ZD defines its sustainability strategy as to be among the frontrunners of the global innovation economy of the future. The targets based on ZD strategy are;

- Increasing the R&D investments by 50%
- Prioritize energy efficiency with the vision of natural resource efficiency and investment on renewable energy sources to decrease 50% GHG intensity of the company's energy source mixture
- Promoting responsible consumption and production awareness to manage supply chain in line with "Zorlu Supply Chain Principles" issued in 2018.

As described above, sustainability is not only in the strategy of ZD it is all ZH and ZHEG strategy to be in line with developing low carbon economy and efficient resource management including water. Investment on solar energy and Horizon 2020 Programme - GECO Project to mitigate CO2 continued in 2018 by ZD. To manage and keep this structure strong ZD has a sustainability committee which led by Sustainability Manager and members are, chief risk officer, business unit managers, audit manager, and other support function managers. This wide range and high level of committee provide holistic and comprehensive perspective, bring expansion of sustainability knowledge and behaviour change in the company. Sustainability committee reports to ZD CEO whose review the climate change performance and directing long term strategy. CEO reports to ZH executive board. Board chair and sustainability board members are responsible about climate change in terms of strategy and approval of action plans respectively.

We have been a pioneer in sustainability in the Turkish energy industry both with our business activities and our projects. As the first company to publish a sustainability report and to calculate its carbon footprint, we are extremely glad to volunteer in participating in the BIST Sustainability Index for the third time.

W-EU0.1a

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

Electricity generation

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	0	0	0
Lignite	0	0	0
Oil	0	0	0
Gas	0	0	0
Biomass	0	0	0
Waste (non-biomass)	0	0	0
Nuclear	0	0	0
Geothermal	305	80.75	1,901
Hydroelectric	120.7	32	321
Wind	0	0	0
Solar	0	0	0
Other renewable	0	0	0
Other non-renewable	0	0	0
Total	0	0	0

W0.2

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

	Start date	End date
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Reporting year	January 1, 2018	December 31, 2018
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W0.3

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

Turkey

W0.4

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

TRY

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 operational 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
Ankara Office	Zorlu Doğal has only 2 employees operating in a small office in a 5 block facility which the Company does not have any access to water consumption data. As it constitutes considerably small fraction of the overall water accounting data and therefore considered as “not material”,

we have not yet taken any measures to include this facility in our water accounting.

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	As an electricity producer, freshwater is and will always be a vital component of our production and direct operations both now and in the future as both our Hydroelectric power plants and geothermal power plants use water as the primary input for production. Compared with our direct operations, fresh water availability in terms of quality and quantity has considerably less importance rating for our indirect operations in general.
Sufficient amounts of recycled, brackish and/or produced water available for use	Important	Not important at all	As an electricity producer, recycled water as a secondary water source is and will always be an important component of our production and direct operations both now and in the future. Compared with our direct operations recycled water availability in terms of quality and quantity has considerably less importance rating for our indirect operations in general.

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%	With the vision of Smart Life 2030, Zorlu Holding is in the process of setting water targets in terms of less and efficient use of natural resources, for all its group companies including Zorlu

		Doğal. In order to track our performance, we monitor all water-related data including the total volume of water withdrawals at our power plants as well as in our Istanbul Headquarters.
Water withdrawals – volumes from water stressed areas	Not relevant	it is not technically feasible to monitor this aspect.
Water withdrawals – volumes by source	100%	With the vision of Smart Life 2030, Zorlu Holding is in the process of setting water targets in terms of less and efficient use of natural resources, for all its group companies including Zorlu Doğal. In order to track our performance, we monitor all water-related data including total volume of water withdrawals by the source at our power plants as well as in our Istanbul Headquarters. In Alaşehir Plant, both well and municipal waters are used. In Kızıldere Plants water is supplied from wells and surface water. 100% of water withdrawal is measured.
Water withdrawals quality	76-99	In Alaşehir Plant, both well and municipal waters are used. In Kızıldere Plants water is supplied from wells and surface water. All withdrawal water is analyzed before using to ensure that quality parameters are met the limit figure.
Water discharges – total volumes	100%	AWith the vision of Smart Life 2030, Zorlu Holding is in the process of setting water targets in terms of less and efficient use of natural resources, for all its group companies including Zorlu Doğal. In order to track our performance, we monitor all water-related data including the total volume of water discharges in each location we operate. Alaşehir and Kızıldere plant's treated wastewater is discharged into the surface water (river) in line with the Discharge Permission Certificate. %78 of discharged water is monitored through meters.
Water discharges – volumes by destination	76-99	With the vision of Smart Life 2030, Zorlu Holding is in the process of setting water targets in terms of less and efficient use of natural resources, for all its group companies including Zorlu Doğal. In order to track our performance, we monitor all water-related data including water discharges by destination in each location we operate. Alaşehir and Kızıldere plant's treated wastewater is discharged into the surface water (river) in line with the Discharge Permission Certificate. All discharged destination are known and followed.
Water discharges – volumes by treatment method	100%	With the vision of Smart Life 2030, Zorlu Holding is in the process of setting water targets in terms of less and efficient use of natural resources, for all its group companies including Zorlu

		Doğal. In order to track our performance, we monitor all water-related data including total volume of water discharge volumes by treatment method at our power plants as well as in our Istanbul Headquarters. All treated of wastewater is analyzed periodically by an accredited laboratory to comply with Turkish Water Pollution Control Regulation. BOD, COD, TSS and pH parameters are analyzed periodically.
Water discharge quality – by standard effluent parameters	100%	With the vision of Smart Life 2030, Zorlu Holding is in the process of setting water targets in terms of less and efficient use of natural resources, for all its group companies including Zorlu Doğal. In order to track our performance, we monitor all water-related data especially in our Geothermal Energy Power Plants (GEPP) where we have the regulatory obligation to report the standard effluent parameters. All treated of wastewater is analyzed periodically by an accredited laboratory to comply with Turkish Water Pollution Control Regulation. BOD, COD, TSS and pH parameters are analyzed periodically.
Water discharge quality – temperature	Not relevant	The discharged water is domestic wastewater. Therefore, it does not have thermal pollution impact and discharged water does not change the temperature of the discharged area.
Water consumption – total volume	100%	With the vision of Smart Life 2030, Zorlu Holding is in the process of setting water targets in terms of less and efficient use of natural resources, for all its group companies including Zorlu Doğal. In order to track our performance, we monitor all water-related data including the total volume of water consumption in each location we operate.
Water recycled/reused	76-99	In our geothermal power plants, the geothermal fluid is reinjected to the reservoir. All reinjected amount is monitored continuously. Geothermal reinjection involves returning some, or even all, of the water produced from a geothermal reservoir back into the geothermal system, after energy has been extracted from the water. Geothermal reinjection, which involves injecting energy-depleted fluid back into geothermal systems, is an integral part of all modern, sustainable and environmentally friendly geothermal utilization projects. It is an efficient method of waste-water disposal as well as a means to provide additional recharge to geothermal systems.
The provision of fully-functioning, safely managed	100%	With the vision of Smart Life 2030, Zorlu Holding is in the process of setting water targets in terms of less and efficient use of natural resources, for all its group companies including Zorlu

WASH services to all workers		Doğal. In order to track our performance, we monitor all water-related data and make sure we provide fully-functioning WASH services to all Zorlu Doğal employees.
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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	76 - 99%	<p>With the aim of preserving the downstream natural habitat, water with a sufficient flow has been released to the river. There are no irrigation areas between the diversion weir and the power plants. Therefore, continuous water flow for natural wild is assured. Our İkizdere HEPP site is located on the border of the İkizdere district and its surroundings a wide population in terms of species diversity and is a very important region in terms of biodiversity. Through our flora and fauna studies at İkizdere HPP for the detection of rare and threatened species on a global, European and local scale, we performed land studies for a year mainly in the growing season. Mercan HEPP is located in Munzur Valley National Park. Natural resources such as rivers and springs in this region include vegetation, unique wild and local animals and endemic plant species. No negative impacts that could affect biological diversity have been identified in our power plants, which continue generating electricity as channel type HEPPs. In addition, no invasive species, insects or pathogens were observed. Among our methods for the identification of endangered and rare species based on the IUCN endangered levels and CITES, Bern and international agreements/local regulations, we followed various procedures; the collection of plant samples for important species with correct methods, transforming collected plant samples to a herbarium and/or recording in a way that would be possible to identify with digital cameras. At Zorlu Enerji, we care about passing on Turkey's natural and cultural heritage to future generations by preserving them. For this reason, we have started monitoring the living species in our power plant locations. Since the beginning of our operations, we have been monitoring the change in the number of species that are valuable and threatened in terms of biodiversity in the region, especially red-spotted trout in our facilities that do not possess fish passages. We have</p>

		determined that it is possible to reverse these changes through implementing fish migration practices as well as online sap water monitoring systems and biological monitoring systems, and we are doing the related implementation planning of these measures.
Sediment loading	100%	Necessary precautions including minimum flow, sediment, and fish passage have been included in all of our HEPPs. The weir does not affect the spawning habitat for fish. Through the scouring sluice just by the weir spillway, any sediments accumulating before the weir will be released to downstream. Our run-off river types HEPPs include a sediment passage and involve the accumulation of sediment. There is no significant accumulation is expected at our dam type HEPPs, as there exist a sediment passage in the weir design and all sediments are trapped.
Other, please specify	Not relevant	There are no other water aspects.

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	1,830,687	Higher	In the reporting year, a new power generation unit has added to the Kızıldere geothermal power plant. Therefore, water withdrawal increased. The total withdrawn water amount is increased by 13% compared to the previous year. In this report, our threshold for "higher" and "lower" is between 4% and %19.
Total discharges	1,728,051	Higher	In the reporting year, a new power generation unit has added to the Kızıldere geothermal power plant. Therefore, water withdrawal increased. The total discharged water amount is increased by 13% compared to the previous year. In this report, our threshold for "higher" and "lower" is between 4% and %19.
Total	102,635	Higher	In the reporting year, a new power generation unit has added to the Kızıldere geothermal power

consumption			plant. Therefore, water consumption increased. The total withdrawn water amount is increased by 13% compared to the previous year. In this report, our threshold for "higher" and "lower" is between 4% and %19.
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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	1,757,657	Higher	In the reporting year, a new power generation unit has added to the Kızildere geothermal power plant. Thus, water withdrawn has increased by 11% compared to the previous year. In this report, our threshold for "higher" and "lower" is between 4% and %19.
Brackish surface water/Seawater	Not relevant			Brackish surface water or seawater is not withdrawn.
Groundwater – renewable	Relevant	73,025	Much higher	In the reporting year, a new power generation unit has added to the Kızildere geothermal power plant. Thus, water withdrawn has increased compared to the previous year. In this report, our threshold for "much higher" and "much lower" is 20%.
Groundwater – non-renewable	Not relevant			In the reporting year, groundwater is not withdrawn.
Produced/Entrained water	Not relevant			Produced water is not withdrawn.
Third party sources	Relevant	3.45	Much lower	The water supply from third party sources is decreased by 57% compared to the previous year. In this report, our threshold for "much higher" and "much lower" is 20%.

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	1,669,783	Higher	In the reporting year, water discharged to the fresh surface water has increased by 10% compared to the previous year. In this report, our threshold for "higher" and "lower" is between 4% and %19.
Brackish surface water/seawater	Not relevant			Our wastewater is not discharged to brackish surface water.
Groundwater	Relevant	58,266	This is our first year of measurement	In our geothermal power plants, the geothermal fluid is re-injected to the reservoir. This figure represents the amount of re-injected water.
Third-party destinations	Relevant	2.29	Much higher	Total supplied water from municipality is increased compared to the previous year. In this report, our threshold for "much higher" and "much lower" is 20%.

W1.2j

(W1.2j) What proportion of your total water use do you recycle or reuse?

	% recycled and reused	Comparison with previous reporting year	Please explain
Row 1	1-10	About the same	In our geothermal power plants, the geothermal fluid is re-injected to the reservoir. All re-injected amount is monitored continuously. Geothermal re-injection involves returning some, or even all, of the water produced from a geothermal reservoir back into the geothermal system, after energy has been extracted from the water. In this report, our threshold for "about the same" is 3%.

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 (m3)	Numerator: water aspect	Denominator: unit of production	Comparison with previous reporting year	Please explain
1.97	Total water withdrawals	MWh	Higher	We produced 931,288 MWh electricity and 1,830,686 megaliter water is withdrawn in this year. The intensity is increased %7 comparing to the previous year. In this report, our threshold for "higher" and "lower" is between 3% and 19%.

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?

We take into account our impact on all living species, over all geographies where we operate. During the identification of new investment locations, we conduct comprehensive feasibility studies to identify measures to reduce environmental risks during the investment process and we carry out relevant environmental protection activities from the beginning phase of an investment. In this context, we carry out environmental impact analyses, monitoring studies, biodiversity surveys and biodiversity monitoring-conservation programs, mammalogy and ornithology surveys, ecosystem assessments, habitat restorations, landscape restoration plans and practices, forestation and planting practices and tree transplantation in order to measure, monitor, evaluate and reduce environmental impacts.

During the reporting period, we prepared a Biodiversity Action Plan (BAP) for our Kızıldere location, where we carried out the necessary studies in line with national legislation and the standards determined by the leading international financing institutions. As a part of these efforts, we are considering international standards to develop our own biodiversity policy.

We carried out transplantation operations to transport approximately 1,600 fig and olive trees from the location we picked for our Kızıldere III GPP in the Buharkent district of Aydın to another location without any loss or damage. The project started in October 2015 and was completed in 2017. As a responsible investor, we are still taking care of the fruit trees which are in our investment area.

Some of the habitat management and biodiversity projects that our Company actively pursues include; bat and bird monitoring practices approved by the Ministry of Forestry and Water Affairs in our WPP sites in Osmaniye and Helitrophium Thermophilum Conservation Program that is carried out in cooperation with Ege University in Kızıldere GPP in Denizli.

Rize İkizdere and Tunceli Mercan Hydroelectric Power Plants (HPPs) of Zorlu Doğal stand out with their biodiversity conservation efforts due to their locations.

Our İkizdere HPP site is located in the border of the İkizdere district of Rize province in the Eastern Black Sea Region. İkizdere is located in the western part of the “Lesser Caucasus” area at the “Caucasus” hot spot. The İkizdere water basin and its surroundings, which form the boundaries of our area of operation, house a wide population in terms of species diversity and is a very important region in terms of biodiversity.

Mercan HPP is located in Munzur Valley National Park in the Ovacık district of Tunceli in Eastern Anatolia. Natural resources such as rivers and springs in this region include vegetation, unique wild and local animals and endemic plant species. We operate in an area of 8.65 Ha (0.0865 km²) as part of our activities in İkizdere & Mercan HPP.

No negative impacts that could affect biological diversity have been identified in our power plants, which continue generating electricity as channel type HPPs. In addition, no invasive species, insects or pathogens were observed.

Through our flora and fauna studies at İközdere HPP for the detection of rare and threatened species on a global, European and local scale, we performed land studies for a year mainly in the growing season.

Among our methods for the identification of endangered and rare species based on the IUCN endangered levels and CITES, Bern and international agreements/local regulations, we followed various procedures; the collection of plant samples for important species with correct methods, transforming collected plant samples to a herbarium and/or recording in a way that would be possible to identify with digital cameras.

At Zorlu Dogal, we care about passing on Turkey's natural and cultural heritage to future generations by preserving them. For this reason, we have started monitoring the living species in our power plant locations. Since the beginning of our operations, we have been monitoring the change in the number of species that are valuable and threatened in terms of biodiversity in the region, especially red-spotted trout in our facilities that do not possess fish passages. We have determined that it is possible to reverse these changes through implementing fish migration practices as well as online sap water monitoring systems and biological monitoring systems, and we are doing the related implementation planning of these measures.

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
Contaminated cooling water	In our power plants closed-loop water cooling is used. A closed-loop cooling system exchanges heat with the main cooling water system in conventional tube and shell heat exchangers or plate and frame heat exchangers. Chilled water systems (air chillers) exchange heat with the compressor, which in turn uses a cooling tower to throw heat back into the environment. Demineralized water is used for closed-loop cooling water makeup, but chemical treatments are required to prevent corrosion and, in some systems, freezing. In a closed-loop system, oxygen pitting is the most common type of corrosion.	Measures to prevent spillage, leaching, and leakages	Regular maintenance is applied and necessary precautions are taken.

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 other company-wide risk assessment system

Frequency of assessment

Six-monthly or more frequently

How far into the future are risks considered?

>6 years

Type of tools and methods used

Tools on the market

Enterprise Risk Management

International methodologies

Tools and methods used

Water Footprint Network Assessment tool

WRI Aqueduct

ISO 31000 Risk Management Standard

Life Cycle Assessment
IPCC Climate Change Projections
Other, please specify
ISO 14046 Water Management Standard

Comment

ZD apply ISO 14001 based on ISO 31000 Risk Management and life cycle approach to manage all value chain. In all facilities stakeholders and their needs and expectations defined. As per operation and stakeholder expectations risks and opportunities defined. Risks are categorized as per risk management procedure.

Water related risks and opportunities are assessing under sustainability and all risks and opportunities are communicated to sustainability committee. Sustainability committee is appointed by CEO overviews and evaluates Zorlu Dogal's risks & opportunities related to water . Chief Risk Manager is also a member of the committee and COSO taxonomy are used to categorize the risks. The risks and opportunities are discussed and reported to the executive board through CEO who is responsible of sustainability performance including water. Sustainability Committee Coordination meetings, held at quarterly intervals, brings an opportunity to review and discuss data submitted from all plants covering environmental compliance and GHG emissions reduction activities. Beside data from all plants Sustainability committee's other inputs are Swot Analysis and Stakeholder Meeting results. As per data consolidated in the committee climate related risks and opportunities and Sustainability policy are defining and reporting to the CEO and then Executive Board. The Executive board is authorized to approve the major actions defined in risk analysis and designing the sustainability strategy.

Supply chain

Coverage

Full

Risk assessment procedure

Water risks are assessed in an environmental risk assessment

Frequency of assessment

Annually

How far into the future are risks considered?

>6 years

Type of tools and methods used

Tools on the market
Enterprise Risk Management
International methodologies

Tools and methods used

WRI Aqueduct
ISO 31000 Risk Management Standard
Life Cycle Assessment
IPCC Climate Change Projections
Alliance for Water Stewardship Standard
Other, please specify

Comment

ZD apply ISO 14001 based on ISO 31000 Risk Management and life cycle approach to manage all value chain. In all facilities stakeholders and their needs and expectations defined. As per operation and stakeholder expectations risks and opportunities defined. Risks are categorized as per risk management procedure.

Other stages of the value chain

Coverage

Full

Risk assessment procedure

Water risks are assessed in an environmental risk assessment

Frequency of assessment

Six-monthly or more frequently

How far into the future are risks considered?

>6 years

Type of tools and methods used

Enterprise Risk Management
International methodologies

Tools and methods used

ISO 31000 Risk Management Standard
Life Cycle Assessment

Comment

ZD apply ISO 14001 based on ISO 31000 Risk Management and life cycle approach to manage all value chain. In all facilities stakeholders and their needs and expectations defined. As per operation and stakeholder expectations risks and opportunities defined. Risks are categorized as per risk management procedure.

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	Water availability at basin or catchment level is always relevant in our water related risk assessment because we produce electricity and our income is directly linked with the water availability for both our hydro and geothermal power plants.
Water quality at a basin/catchment level	Relevant, always included	Water quality is included to our risk assessment because for both hydro and geothermal power plant we control and manage the water quality. The quality of water may effect the efficiency of our critical equipments.
Stakeholder conflicts concerning water resources at a basin/catchment level	Relevant, always included	For geothermal power plant we use underground water and our neighbour power plants use the same reservoir. It is under control of government with the production capacities but considered for risk assessment.

Implications of water on your key commodities/raw materials	Relevant, always included	As water is vital for our operations mainly operations both in GEPPs and HEPPs, water related risks in terms of implications in cases of not having water at sufficient amounts are assessed covering the whole lifetime of each power plant. Therefore, while conducting water risks assessment we use both the WRI Aqueduct tool and internal company knowledge in order to make sure we have access to sufficient amount of water for our business continuity.
Water-related regulatory frameworks	Relevant, always included	While assessing water related risks, we make sure we comply with regulations and consider current and possible future tariffs scenarios by using both internal company knowledge and our dialogue with national regulatory bodies as well as local water utilities.
Status of ecosystems and habitats	Relevant, always included	As part of “environmental and social impact assessment” conducted for all our power plants, numerous ecosystem and local habitat related current status and potential impacts are assessed including air quality, flora and fauna, soil, groundwater and underground water sources. We use both WRI Aqueduct Tool and internal & local company knowledge while assessing these risks and impacts.
Access to fully-functioning, safely managed WASH services for all employees	Relevant, always included	While assessing water related risks, we prioritize water availability and quality. However, we also plan our operations in a way to make sure our operations to have minimum or no negative impact on water while making sure our employees have access to necessary WASH services. While conducting water risks assessment we use WRI Aqueduct tool to assess water availability and quality.
Other contextual issues, please specify	Not relevant, explanation provided	We have not identified any other contextual issues regarding water risks.

W3.3c

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

	Relevance & inclusion	Please explain
Customers	Not relevant, included	With life cycle approach we consider all our value chain including customers needs and expectation to our risk assessment. By engaging with our customers we make sure we communicate all material aspects of our

		operations together with our sustainability performance including water related KPIs.
Employees	Relevant, always included	We are currently not exposed to any water related risks from employees, however, by engaging with our employees we make sure we communicate both our performance against set water targets, but also we constantly seek ways to raise awareness on their role in improving our performance.
Investors	Relevant, always included	By engaging with investors through public platforms such as CDP Water Program, we make sure we communicate all material aspects of our operations together with our sustainability performance.
Local communities	Relevant, always included	Water is a local resource and local communities are the most relevant party of our risk assessment. For hydro power plants we consider seasonality and min water discharge to the river basin for the use of local stakeholders for their use and agricultural activities. In geothermal power plant we give hot water to plant house and hotel. Also our neighbour electricity producers are considered as local communities in our risk assessment.
NGOs	Relevant, always included	By engaging with leading NGOs we make sure we communicate all material aspects of our operations together with our sustainability performance and evaluate any collaboration opportunities to raise awareness.
Other water users at a basin/catchment level	Relevant, always included	Water is a local resource and local communities are the most relevant party of our risk assessment. For hydro power plants we consider seasonality and min water discharge to the river basin for the use of local stakeholders for their use and agricultural activities. In geothermal power plant we give hot water to plant house and hotel. Also our neighbour electricity producers are considered as local in our risk assessment.
Regulators	Relevant, always included	By engaging with regulators and policy makers, we make sure we communicate all material aspects of our operations together with our performance. We take necessary measures to comply with environmental and water related regulations.
River basin management authorities	Not relevant, explanation provided	There is no river basin management in Turkey.
Statutory special interest groups at a local level	Not relevant, explanation provided	We have not yet identified any statutory special interest group at local level.

Suppliers	Not relevant, included	With life cycle approach we consider all our value chain including suppliers needs and expectation to our risk assessment. We produce electricity and get the water directly from natural resources however in terms of technology development for energy generation suppliers are also considered in terms of water risks.
Water utilities at a local level	Relevant, always included	In order to assess current and future tariff scenarios and we communicate with water utilities with whom we have a commercial relationship.
Other stakeholder, please specify	Not relevant, explanation provided	We have not yet identified any other stakeholder group to include in our water 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.

In Zorlu Holding (ZH) companies including Zorlu Dogal (ZD), all cases that may cause to deviation to achieve our aims and objectives are defined as risk.

Corporate risk management department is responsible to manage all defined risks consistently, with an overall approach and economically.

Identification and managing risks are important in terms of strategical and financial planning. With merging risk management to strategical and financial planning, the company created an awareness for the future possible cases that may cause not to achieve to its objectives and also a chance to be proactive. As a result of this 2018 ZH started Smart Life 2030 which covers all Zorlu companies including Zorlu Dogal for the transformation to low-carbon economy and less and efficient natural resource consumption.

We are applying ISO 9001:2015 Management System, ISO 14001:2015 Management System Standards in our company which are based on ISO 31000 Risk Management Standard and life cycle approach to manage all value chain. In all facilities we define stakeholders and their needs and expectations. As per our operation and stakeholder expectations we define our risks and opportunities. In 2018 based on Smart-Life 2030 strategy risks has been reviewed in all power generation plants terms of low carbon economy. We categorize risks as per risk management procedure.

Water related risks and opportunities are assessing under sustainability and all sustainability risks and opportunities are communicated to sustainability committee. Sustainability committee is appointed by CEO overviews and evaluates Zorlu Dogal's risks & opportunities related to water. Chief Risk Manager is also a member of the committee and COSO taxonomy are used to categorize the risks. The risks and opportunities are discussed and reported to the executive board through CEO who is responsible of sustainability performance including water. Sustainability Committee Coordination

meetings, held at quarterly intervals, brings an opportunity to review and discuss data submitted from all plants covering environmental compliance and GHG emissions reduction activities. Beside data from all plants Sustainability committee's other inputs are Swot Analysis and Stakeholder Meeting results. As per data consolidated in the committee climate related risks and opportunities and Sustainability policy are defining and reporting to the CEO and then Executive Board. The Executive board is authorized to approve the major actions defined in risk analysis and designing the sustainability strategy.

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?

Zorlu Holding (ZH), the mother company of Zorlu Dogal (ZD), as a company that produces goods and services in different sectors ranging from energy to textiles, white goods to technology, have the mindset and the tools that are necessary for building a better future. As an innovative institution that adapts rapidly to technological developments and transfers knowledge to all its stakeholders; ZH focused on producing "**sustainable solutions**" based on the future prosperity of people, society and the planet. We dream of a better future, fed by innovative and technological changes. ZH call this transformation "**Smart Life - 2030**". And for this reason, ZH began a journey to **inspire** our employees, to **strengthen** our environment and to **create value for our society**.

Zorlu Dogal(ZD) which is the scope of this report, owner of 7 hydropower power plants and 4 Geothermal power plants. The company continues investing in projects supporting security of supply and sustainability thanks to its high capacity production power, qualified human resources, balanced portfolio, resource diversity and competency to introduce innovative solutions.

In 2018 Zorlu Dogal water data managed through ISO 14046 Water Management System and verified by third party. With the reflection of ZH's sustainability vision, ZD defines its sustainability strategy as to be among the frontrunners of the global innovation economy of the future. The targets based on ZD strategy are;

- Increasing the R&D investments by 50%
- Prioritize energy efficiency with the vision of natural resource efficiency and less consumption
- Investment on renewable energy sources to decrease 50% GHG intensity of the company's energy source mixture
- Promoting responsible consumption and production awareness to manage supply chain in line with "Zorlu Supply Chain Principles" issued in 2018.

As described above, sustainability is not only in the strategy of ZD it is all ZH strategy to be in line with developing low carbon economy. To manage and keep this structure strong ZD has a sustainability committee which led by Sustainability Manager and members are , chief risk officer, business unit managers, audit manager, and other support function managers. This wide range and high level of committee provide holistic and comprehensive perspective, bring expansion of sustainability knowledge and behaviour change in the company. Sustainability committee reports to ZD CEO whose review the sustainability performance including water and directing long term strategy. CEO reports to ZH executive board. Board chair and sustainability board members are responsible about climate change in terms of strategy and approval of action plans respectively. We have been a pioneer in sustainability in the Turkish energy industry both with our business activities and our projects. As the first company to publish a sustainability report and to apply water management standard ISO 14046, we are extremely glad to volunteer in participating in the BIST Sustainability Index for the third time.

In 2018 investment on solar power including both building solar power plant and panel production has been done to accelerate the efficient use of natural resources. It is defined as the long term risks action plan to support the transformation due to expected customer behaviour change.

Applied water management as explained above has great importance for our direct operations as water is used for production in Hydro and Geothermal Power plants. In the cases of not having access to water, our business continuity will be at high risk and will face disruption. As we do not have any back up water tank to store water to feed our production process, our operations will stop if we cannot withdraw or have access to water at sufficient amounts. Therefore, we define water related substantive change as not having access to water needed for our direct operations.

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	11	100	Both our geothermal and hydro power plants produce electricity from water with different technologies.

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

Turkey

River basin

Other, please specify

Gediz

Number of facilities exposed to water risk

1

% company-wide facilities this represents

1-25

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

1-25

% company's total global revenue that could be affected

1-25

Comment

Alaşir GEPP assessed as per electricity generation in 2018.

Country/Region

Turkey

River basin

Other, please specify

Büyük Menderes

Number of facilities exposed to water risk

2

% company-wide facilities this represents

51-75

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

51-75

% company's total global revenue that could be affected

76-99

Comment

Kızıldere Geothermal Power Plant assessed as per 2018 electricity generation.

Country/Region

Turkey

River basin

Other, please specify

Yeşilirmak

Number of facilities exposed to water risk

1

% company-wide facilities this represents

Less than 1%

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

Less than 1%

% company's total global revenue that could be affected

Less than 1%

Comment

Ataköy HEPP assessed as per 2018 electricity generation.

Country/Region

Turkey

River basin

Other, please specify

Sakarya

Number of facilities exposed to water risk

1

% company-wide facilities this represents

Less than 1%

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

Less than 1%

% company's total global revenue that could be affected

Less than 1%

Comment

Beyköy HEPP assessed as per 2018 electricity generation.

Country/Region

Turkey

River basin

Other, please specify

Aras

Number of facilities exposed to water risk

1

% company-wide facilities this represents

Less than 1%

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

Less than 1%

% company's total global revenue that could be affected

Less than 1%

Comment

Çıldır HES has been assessed as per 2018 power generation.

Country/Region

Turkey

River basin

Other, please specify

Çoruh

Number of facilities exposed to water risk

1

% company-wide facilities this represents

Less than 1%

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

Less than 1%

% company's total global revenue that could be affected

Less than 1%

Comment

İkizdere and Kuzgun HEPP assessed as per 2018 power generation .

Country/Region

Turkey

River basin

Other, please specify

Dicle-Firat

Number of facilities exposed to water risk

2

% company-wide facilities this represents

Less than 1%

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

Less than 1%

% company's total global revenue that could be affected

Less than 1%

Comment

Mercan - Tercan HEPP's assessed as per 2018 power generation volumes.

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

Turkey

River basin

Other, please specify

Büyük Menderes

Type of risk

Physical

Primary risk driver

Declining water quality

Primary potential impact

Reduction or disruption in production capacity

Company-specific description

Geothermal power plants produce electricity from underground water and the quality of the water affects the production because in terms of critical equipment efficiency and the well may become useless for production.

Timeframe

More than 6 years

Magnitude of potential impact

High

Likelihood

Unlikely

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

3,240,612

Potential financial impact figure - minimum (currency)

Potential financial impact figure - maximum (currency)

Explanation of financial impact

In our production facility we have around 30 wells. We assumed 1% decrease on production based on water quality. 2018 1% of total electricity generation income from the facility divided to the number of wells to estimate the financial impact of risk.

Primary response to risk

Improve monitoring

Description of response

The ingredient of the water is monitoring strictly. If any change occurs out of the limitations our operation team interfere.

Cost of response

350,000

Explanation of cost of response

The laboratory testings to follow the quality of water defined as cost of the response.

Country/Region

Turkey

River basin

Other, please specify

Yeşilirmak, Aras, Çoruh, Dicle-Fırat

Type of risk

Physical

Primary risk driver

Drought

Primary potential impact

Reduction or disruption in production capacity

Company-specific description

We have 7 hydro power plants around the Turkey and as per IPCC 5th assessment report drought is expected all over Turkey with medium confidence. Since production of electricity is based on water level, we may face decreased electricity production.

Timeframe

More than 6 years

Magnitude of potential impact

Low

Likelihood

About as likely as not

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

407,339.28

Potential financial impact figure - minimum (currency)

Potential financial impact figure - maximum (currency)

Explanation of financial impact

İkizdere HEPP is sampled to define the financial impact. If the production from our hydro power plants decrease 10% with drought our income will decrease at the same level. As per 2018 results, production from İkizdere HEPP were 116.249,79 MWh. 10% of it multiplied with the gurantee sales price 7,3 usd and average usd currency accepted as 4,80 for 2018.

Primary response to risk

Adopt water efficiency, water re-use, recycling and conservation practices
Increased production efficiency

Description of response

In order to be better prepared in cases of seasonal or gradual drought or decrease in precipitation averages, we renovate our existing inefficient power plants such as İkizdere HEPP and commissioned in 2018. Investment is done to achieve higher production volumes by using same amount of water available in our HEPP reservoirs.

Cost of response

23,322,675

Explanation of cost of response

Renovation of İkizdere hydropower plant defined as cost of response.

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	We produce electricity from natural resources and they are renewable resources. Our GEPP's are closed cycle and for hydro projects we have run off rivers. Through stakeholder consultations we get needs and expectations from our value chain and it is concluded that we have no substantive impact.

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

Products and services

Primary water-related opportunity

Sales of new products/services

Company-specific description & strategy to realize opportunity

We have our hydro and geothermal power plants in our production portfolio and since we are using renewable sources like water to produce electricity the government set guarantee price for 10 years which is higher than the average electricity sales price.

Estimated timeframe for realization

Current - up to 1 year

Magnitude of potential financial impact

High

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

551,269,994

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact

Our revenue from commissioning of Kızıldere 3 commissioning defined as financial impact of the opportunity because we sell our produced electricity to YEKDEM (guarentee prices).

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)

Alaşehir Geothermal Power Plant

Country/Region

Turkey

River basin

Other, please specify

Gediz

Latitude

38.233

Longitude

28.261

Primary power generation source for your electricity generation at this facility

Geothermal

Total water withdrawals at this facility (megaliters/year)

18,685.98

Comparison of withdrawals with previous reporting year

Much higher

Total water discharges at this facility (megaliters/year)

15,940.85

Comparison of discharges with previous reporting year

Much higher

Total water consumption at this facility (megaliters/year)

2,745.13

Comparison of consumption with previous reporting year

Much lower

Please explain

Water consumption is decreased by 82% compared to the previous year. The ratio of water transmission losses is decreased and the efficiency of the water-saving is improved in this year. Our water consumption figure is a calculation using withdrawals minus discharges.

Facility reference number

Facility 2

Facility name (optional)

Kızıldere I-II-III Geothermal Power Plant

Country/Region

Turkey

River basin

Other, please specify

Büyük Menderes Basin

Latitude

37.956213

Longitude

28.842528

Primary power generation source for your electricity generation at this facility

Geothermal

Total water withdrawals at this facility (megaliters/year)

54,407.67

Comparison of withdrawals with previous reporting year

Much higher

Total water discharges at this facility (megaliters/year)

42,397.74

Comparison of discharges with previous reporting year

Much higher

Total water consumption at this facility (megaliters/year)

12,009.93

Comparison of consumption with previous reporting year

Much lower

Please explain

Water consumption is decreased by 40% compared to the previous year. The ratio of water transmission losses is decreased and the efficiency of the water-saving is improved in this year. Our water consumption figure is a calculation using withdrawals minus discharges.

Facility reference number

Facility 3

Facility name (optional)

Ataköy Hydro Power Plant

Country/Region

Turkey

River basin

Other, please specify
Yeşilırmak Basin

Latitude

40.424004

Longitude

36.884118

Primary power generation source for your electricity generation at this facility

Hydroelectric

Total water withdrawals at this facility (megaliters/year)

211,097.35

Comparison of withdrawals with previous reporting year

Lower

Total water discharges at this facility (megaliters/year)

200,542.48

Comparison of discharges with previous reporting year

Much lower

Total water consumption at this facility (megaliters/year)

10,554.87

Comparison of consumption with previous reporting year

Much lower

Please explain

The water is withdrawn from the reservoir surface. Water consumption is decreased by 56% compared to the previous year. Our water consumption figure is a calculation using withdrawals minus discharges.

Facility reference number

Facility 4

Facility name (optional)

Beyköy Hydro Power Plant

Country/Region

Turkey

River basin

Other, please specify

Sakarya Basin

Latitude

40.073156

Longitude

30.755448

Primary power generation source for your electricity generation at this facility

Hydroelectric

Total water withdrawals at this facility (megaliters/year)

869,005.68

Comparison of withdrawals with previous reporting year

Higher

Total water discharges at this facility (megaliters/year)

825,555.17

Comparison of discharges with previous reporting year

Much lower

Total water consumption at this facility (megaliters/year)

43,450.51

Comparison of consumption with previous reporting year

Much higher

Please explain

Beyköy is channel type hydroelectric power plant. Withdrawn water is released to the same river after used for electricity generation. Discharge amount includes domestic purpose water use.

Facility reference number

Facility 5

Facility name (optional)

Çıldır Hydro Power Plant

Country/Region

Turkey

River basin

Other, please specify
Aras Basin

Latitude

40.900774

Longitude

43.328855

Primary power generation source for your electricity generation at this facility

Hydroelectric

Total water withdrawals at this facility (megaliters/year)

39,719.5

Comparison of withdrawals with previous reporting year

Much lower

Total water discharges at this facility (megaliters/year)

37,733.53

Comparison of discharges with previous reporting year

Much lower

Total water consumption at this facility (megaliters/year)

1,985.98

Comparison of consumption with previous reporting year

Much lower

Please explain

Water consumption is decreased by 69% compared to the previous year. The ratio of water transmission losses is decreased and the efficiency of the water-saving is improved in this year. Our water consumption figure is a calculation using withdrawals minus discharges.

Facility reference number

Facility 6

Facility name (optional)

İkizdere Hydro Power Plant

Country/Region

Turkey

River basin

Other, please specify
Çoruh Basin

Latitude

40.795463

Longitude

40.551031

Primary power generation source for your electricity generation at this facility

Hydroelectric

Total water withdrawals at this facility (megaliters/year)

138

Comparison of withdrawals with previous reporting year

Lower

Total water discharges at this facility (megaliters/year)

1.38

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

İkizdere is channel type hydroelectric power plant. Withdrawn water is released to the same river after used for electricity generation. Discharge amount includes domestic purpose water use.

Facility reference number

Facility 7

Facility name (optional)

Kuzgun Hydro Power Plant

Country/Region

Turkey

River basin

Other, please specify

Çoruh Basin

Latitude

40.183631

Longitude

41.063687

Primary power generation source for your electricity generation at this facility

Hydroelectric

Total water withdrawals at this facility (megaliters/year)

86,276.76

Comparison of withdrawals with previous reporting year

Lower

Total water discharges at this facility (megaliters/year)

81,962.92

Comparison of discharges with previous reporting year

Much lower

Total water consumption at this facility (megaliters/year)

4,313.84

Comparison of consumption with previous reporting year

Much lower

Please explain

Water consumption is decreased by 54% compared to the previous year. Our water consumption figure is a calculation using withdrawals minus discharges.

Facility reference number

Facility 8

Facility name (optional)

Mercan Hydro Power Plant

Country/Region

Turkey

River basin

Other, please specify
Firat Basin

Latitude

39.413794

Longitude

39.30221

Primary power generation source for your electricity generation at this facility

Hydroelectric

Total water withdrawals at this facility (megaliters/year)

160,906.05

Comparison of withdrawals with previous reporting year

Lower

Total water discharges at this facility (megaliters/year)

152,860.75

Comparison of discharges with previous reporting year

Much lower

Total water consumption at this facility (megaliters/year)

8,045.3

Comparison of consumption with previous reporting year

Much lower

Please explain

Mercan HEPP is channel type hydroelectric power plant. Withdrawn water is released to the same river after used for electricity generation. Discharge amount includes domestic purpose water use.

Facility reference number

Facility 9

Facility name (optional)

Tercan Hydro Power Plant

Country/Region

Turkey

River basin

Other, please specify
Firat Basin

Latitude

39.755985

Longitude

40.40183

Primary power generation source for your electricity generation at this facility

Hydroelectric

Total water withdrawals at this facility (megaliters/year)

390,585.27

Comparison of withdrawals with previous reporting year

Much higher

Total water discharges at this facility (megaliters/year)

371,055.44

Comparison of discharges with previous reporting year

Much lower

Total water consumption at this facility (megaliters/year)

19,529.83

Comparison of consumption with previous reporting year

Lower

Please explain

Water consumption is decreased by 17% compared to the previous year. Our water consumption figure is a calculation using withdrawals minus discharges.

Facility reference number

Facility 10

Facility name (optional)

Istanbul Headquarters

Country/Region

Turkey

River basin

Other, please specify

Marmara Basin

Latitude

40.993661

Longitude

28.699289

Primary power generation source for your electricity generation at this facility

Hydroelectric

Total water withdrawals at this facility (megaliters/year)

1.01

Comparison of withdrawals with previous reporting year

Much higher

Total water discharges at this facility (megaliters/year)

0.91

Comparison of discharges with previous reporting year

Much lower

Total water consumption at this facility (megaliters/year)

0.1

Comparison of consumption with previous reporting year

Much higher

Please explain

Our water consumption figure is a calculation using withdrawals minus discharges.

W5.1a

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

Facility reference number

Facility 1

Facility name

Alaşehir Geothermal Power Plant

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

0

Brackish surface water/seawater

0

Groundwater - renewable

18,684.75

Groundwater - non-renewable

0

Produced/Entrained water

0

Third party sources

1.23

Comment

In our geothermal power plants, the geothermal fluid is reinjected to the reservoir. Geothermal reinjection involves returning some, or even all, of the water produced from a geothermal reservoir back into the geothermal system, after energy has been extracted from the water. Thus, reinjection geothermal fluid is renewable groundwater.

Facility reference number

Facility 2

Facility name

Kızıldere I-II-III Geothermal Power Plant

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

66.92

Brackish surface water/seawater

0

Groundwater - renewable

54,340.75

Groundwater - non-renewable

0

Produced/Entrained water

0

Third party sources

0

Comment

In our geothermal power plants, the geothermal fluid is reinjected to the reservoir. Geothermal reinjection involves returning some, or even all, of the water produced from a geothermal reservoir back into the geothermal system, after energy has been extracted from the water. Thus, reinjection geothermal fluid is renewable groundwater.

Facility reference number

Facility 3

Facility name

Ataköy Hydro Power Plant

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

211,097.35

Brackish surface water/seawater

0

Groundwater - renewable

0

Groundwater - non-renewable

0

Produced/Entrained water

0

Third party sources

0

Comment

Facility reference number

Facility 4

Facility name

Beyköy Hydro Power Plant

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

869,005.44

Brackish surface water/seawater

0

Groundwater - renewable

0

Groundwater - non-renewable

0

Produced/Entrained water

0

Third party sources

0.24

Comment

Facility reference number

Facility 5

Facility name

Çıldır Hydro Power Plant

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

39,719.5

Brackish surface water/seawater

0

Groundwater - renewable

0

Groundwater - non-renewable

0

Produced/Entrained water

0

Third party sources

0

Comment

Facility reference number

Facility 6

Facility name

İkizdere Hydro Power Plant

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/Entrained water

0

Third party sources

1.38

Comment

Facility reference number

Facility 7

Facility name

Kuzgun Hydro Power Plant

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

82,276.76

Brackish surface water/seawater

0

Groundwater - renewable

0

Groundwater - non-renewable

0

Produced/Entrained water

0

Third party sources

0

Comment

Facility reference number

Facility 8

Facility name

Mercan Hydro Power Plant

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

160,906.05

Brackish surface water/seawater

0

Groundwater - renewable

0

Groundwater - non-renewable

0

Produced/Entrained water

0

Third party sources

0

Comment

Facility reference number

Facility 9

Facility name

Tercan Hydro Power Plant

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

390,584.67

Brackish surface water/seawater

0

Groundwater - renewable

0

Groundwater - non-renewable

0

Produced/Entrained water

0

Third party sources

0.6

Comment

Facility reference number

Facility 10

Facility name

İstanbul Headquarters

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/Entrained water

0

Third party sources

1.01

Comment

W5.1b

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

Facility reference number

Facility 1

Facility name

Alaşehir Geothermal Power Plant

Fresh surface water

1.11

Brackish surface water/Seawater

0

Groundwater

15,939.74

Third party destinations

0

Comment

Domestic wastewater is discharged into the river.

In our geothermal power plants, the geothermal fluid is reinjected to the reservoir. Geothermal reinjection involves returning some, or even all, of the water produced from a geothermal reservoir back into the geothermal system, after energy has been extracted from the water.

Facility reference number

Facility 2

Facility name

Kızıldere I-II-III Geothermal Power Plant

Fresh surface water

71.59

Brackish surface water/Seawater

0

Groundwater

42,326.15

Third party destinations

0

Comment

Domestic wastewater is discharged into the DSI channel in line with the Discharge Permission Certificate.

In our geothermal power plants, the geothermal fluid is reinjected to the reservoir. Geothermal reinjection involves returning some, or even all, of the water produced from a geothermal reservoir back into the geothermal system, after energy has been extracted from the water.

Facility reference number

Facility 3

Facility name

Ataköy Hydro Power Plant

Fresh surface water

200,542.48

Brackish surface water/Seawater

0

Groundwater

0

Third party destinations

0

Comment

Facility reference number

Facility 4

Facility name

Beyköy Hydro Power Plant

Fresh surface water

825,555.17

Brackish surface water/Seawater

0

Groundwater

0

Third party destinations

0

Comment

Facility reference number

Facility 5

Facility name

Çıldır Hydro Power Plant

Fresh surface water

37,733.53

Brackish surface water/Seawater

0

Groundwater

0

Third party destinations

0

Comment

Facility reference number

Facility 6

Facility name

İkizdere Hydro Power Plant

Fresh surface water

0

Brackish surface water/Seawater

0

Groundwater

0

Third party destinations

1.38

Comment

Facility reference number

Facility 7

Facility name

Kuzgun Hydro Power Plant

Fresh surface water

81,962.92

Brackish surface water/Seawater

0

Groundwater

0

Third party destinations

0

Comment

Facility reference number

Facility 8

Facility name

Mercan Hydro Power Plant

Fresh surface water

152,860.75

Brackish surface water/Seawater

0

Groundwater

0

Third party destinations

0

Comment

Facility reference number

Facility 9

Facility name

Tercan Hydro Power Plant

Fresh surface water

371,055.44

Brackish surface water/Seawater

0

Groundwater

0

Third party destinations

0

Comment

Facility reference number

Facility 10

Facility name

Istanbul Headquarters

Fresh surface water

0

Brackish surface water/Seawater

0

Groundwater

0

Third party destinations

0.91

Comment

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

Alaşehir Geothermal Power Plant

% recycled or reused

76-99%

Comparison with previous reporting year

About the same

Please explain

In Alaşehir Geothermal Power Plant, the geothermal fluid is reinjected to the reservoir. All reinjected amount is monitored continuously. At the previous year, 86% of the withdrawn geothermal fluid is reinjected to the ground. This year, reinjection is increased to 88%.

Facility reference number

Facility 2

Facility name

Kızıldere I-II-III Geothermal Power Plant

% recycled or reused

51-75%

Comparison with previous reporting year

About the same

Please explain

In Kızıldere Geothermal Power Plant, the geothermal fluid is reinjected to the reservoir. All reinjected amount is monitored continuously. At the previous year, 92% of the withdrawn geothermal fluid is reinjected to the ground. This year, reinjection is decreased to 88%.

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

1-25

What standard and methodology was used?

It has been verified according to the "ISO 14046:2014 Environmental management - Water footprint Standard" by an accredited third-party verification body. All data has been verified with reasonable assurance level. Only Geothermal Power Plants has been verified, Hydro Power Plants have not been verified.

Water withdrawals – volume by source

% verified

1-25

What standard and methodology was used?

It has been verified according to the "ISO 14046:2014 Environmental management - Water footprint Standard" by an accredited third-party verification body. All data has been verified with reasonable assurance level. Only Geothermal Power Plants has been verified, Hydro Power Plants have not been verified.

Water withdrawals – quality

% verified

51-75

What standard and methodology was used?

It has been verified according to the "ISO 14046:2014 Environmental management - Water footprint Standard" by an accredited third-party verification body. All data has been verified with reasonable assurance level. Only Geothermal Power Plants has been verified, Hydro Power Plants have not been verified.

Water discharges – total volumes

% verified

1-25

What standard and methodology was used?

It has been verified according to the "ISO 14046:2014 Environmental management - Water footprint Standard" by an accredited third-party verification body. All data has been verified with reasonable assurance level. Only Geothermal Power Plants has been verified, Hydro Power Plants have not been verified.

Water discharges – volume by destination

% verified

51-75

What standard and methodology was used?

It has been verified according to the "ISO 14046:2014 Environmental management - Water footprint Standard" by an accredited third-party verification body. All data has been verified with reasonable assurance level. Only Geothermal Power Plants has been verified, Hydro Power Plants have not been verified.

Water discharges – volume by treatment method

% verified

Not verified

What standard and methodology was used?

It has not been verified.

Water discharge quality – quality by standard effluent parameters

% verified

51-75

What standard and methodology was used?

It has been verified according to the "ISO 14046:2014 Environmental management - Water footprint Standard" by an accredited third-party verification body. All data has been verified with reasonable assurance level. Only Geothermal Power Plants has been verified, Hydro Power Plants have not been verified.

Water discharge quality – temperature

% verified

Not verified

What standard and methodology was used?

It has not been verified.

Water consumption – total volume

% verified

1-25

What standard and methodology was used?

It has been verified according to the "ISO 14046:2014 Environmental management - Water footprint Standard" by an accredited third-party verification body. All data has been verified with reasonable assurance level. Only Geothermal Power Plants has been verified, Hydro Power Plants have not been verified.

Water recycled/reused

% verified

76-100

What standard and methodology was used?

It has been verified according to the "ISO 14046:2014 Environmental management - Water footprint Standard" by an accredited third-party verification body. All data has been verified with reasonable assurance level. Only Geothermal Power Plants has been verified, Hydro Power Plants have not been verified.

W6. Governance

W6.1

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

Yes, we have a documented water policy, but it is not 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 water-related performance standards for direct operations 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 Acknowledgement of the human	Water is one of the fundamental raw materials of energy generation and an indispensable natural resource in order to continue generation processes in our geothermal and hydroelectric power plants. Our main objectives at Zorlu Doğal are; to keep the amount of water we withdraw from natural resources at a minimum level, monitor water consumption at the corporate level annually, and provide support for the conservation of water resources. As a result, we are making continuous improvements through water efficiency projects. Our main goal with these projects along with water consumption reduction is to recycle and reuse the water we consume as much as possible. The geothermal fluid used in generation at the geothermal plants is injected back into the ground after being processed. We are currently investigating new technologies for water efficiency during electricity generation, and carrying out studies to integrate innovative technologies that increase the amount of water recovered.

	right to water and sanitation Recognition of environmental linkages, for example, due to climate change	
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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) (do not include any names) of the individual(s) on the board with responsibility for water-related issues.

Position of individual	Please explain
Board Chair	The utmost responsibility for overall management of ZD is on the Board Chair of Zorlu Holding. The Board Chairman has an active role in defining strategies and policies by coinciding with sustainability and renewable energy related issues. Smart Life 2030 transformation for low carbon economy including efficient and less use of natural resources has been started with the vision of Board Chair and expanded to all ZH companies including ZD.
Chief Sustainability Officer (CSO)	ZD under umbrella of ZH, reports to executive board of ZH. ZH chief sustainability officer is responsible to approve the action plans presented by the CEO of ZD. Based on the risk management model of the company high budget required action plans related to sustainability and water are under control of Chief Sustainability Officer.

W6.2b

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

Frequency that water-	Governance mechanisms into	Please explain
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	related issues are a scheduled agenda item	which water-related issues are integrated	
Row 1	Scheduled - some meetings	Overseeing major capital expenditures Reviewing and guiding annual budgets Reviewing and guiding major plans of action Reviewing and guiding risk management policies Reviewing and guiding strategy Reviewing and guiding corporate responsibility strategy Reviewing innovation/R&D priorities	<p>ZH executive board has utmost responsibility on management of ZD. The board chair is responsible for the strategy and policies. Board member (Chief Sustainability Officer) has the responsibility for action plans and budgets.</p> <p>2018 with the leadership of executive board Smart Life 2030 has been launched with its targets for the transition of low carbon economy and efficient and less consumption of natural resources including water. This strategy and budget of transition has been approved by the executive board.</p> <p>With the strategy and guidance of executive board, ZD defined its action plans and present it to the board for the approval.</p>

W6.3

(W6.3) Provide the highest management-level position(s) or committee(s) with responsibility for water-related issues (do not include the names of individuals).

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

Chief Executive Officer (CEO)

Responsibility

Both assessing and managing water-related risks and opportunities

Frequency of reporting to the board on water-related issues

Quarterly

Please explain

CEO of ZD is responsible for both assessing and managing climate related risks and opportunities through;

- Directing the long-term corporate strategy,
- Performance review about climate change related targets
- Engaging with national and international institutions regarding to climate change negotiations
- Planning of new investments including R&D.

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

Chief Risk Officer (CRO)

Responsibility

Both assessing and managing water-related risks and opportunities

Frequency of reporting to the board on water-related issues

Quarterly

Please explain

Responsibilities of CRO are;

Guidance on risk management methodologies

Assessment and management of the defined risks by the business units.

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

Sustainability committee

Responsibility

Both assessing and managing water-related risks and opportunities

Frequency of reporting to the board on water-related issues

Quarterly

Please explain

CEO is advised and assisted by the “Sustainability Committee” consisting high level executives and managers of various departments as listed below, in the company. This wide range and high level of committee;

- Provide holistic and comprehensive perspective,
- Bring expansion of sustainability knowledge
- Behaviour change in the company.

The establishment of the committee is completed by the end of 2014 and it has started to work actively to integrate these aspects into its corporate business targets and strategies since 2015.

With the vision of Smart Life -2030 , sustainability and climate related issues are reevaluated in terms of risks and opportunities.

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 (do not include the names of individuals)?

	Who is entitled to benefit from these incentives?	Indicator for incentivized performance	Please explain
Monetary reward	Chief Executive Officer (CEO)	Efficiency project or target – direct operations	Profit is shared as a bonus (monetary reward) by the achievement of the relevant indicators listed below; -Performance indicators include efficiency in electricity production from renewable sources .

			<p>-Adaptation and mitigation activities in line with sustainability policy of the company.</p> <p>-Reduction in energy consumption and fossil fuel resources consumption</p> <p>-Support Smart Life-2030 and leadership on behaviour change.</p>
Recognition (non-monetary)	Board chair	Behavior change related indicator	<p>The Board Chairman has an active role in defining strategies and policies including climate change related issues with focus on adaptation & mitigation activities. In 2018 Smart Life - 2030 has been launched for the transition of low-carbon economy. The company started to invest smart grid solutions, electrical vehicles and charging stations in Turkey. This transformation needs behaviour change not only in the company but also in all value chain. To support this transformation collaborations started as listed below;</p> <p>* 7 million TL provided to the social entrepreneurship ecosystem</p> <p>*Scholarships for 2000 students per year for training to equip them with the skills and competencies required by the 21st century.</p> <p>*In order to observe and experience the effects of digitalization in lives, ZH have established the Dialogue platform that combines different channels, disciplines, people, technology, artists and ideas.</p> <p>* “Our Energy is for Children” project developed to ensure that our children become conscious of energy saving, climate change and renewable energy issues.</p>
Other non-monetary reward	No one is entitled to these incentives		

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, 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?

We are one of the group companies of Zorlu Holding and we are working with TUSIAD (Turkish Industry and Business Association) in Environment and Climate Change Working Group. We have actively collaborated to evaluate the possible regulative scenarios including in terms of environment including water.

W6.6

(W6.6) Did your organization include information about its response to water-related risks in its most recent mainstream financial report?

No, but we plan to do so in the next two years

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	Since our business based on water quantity and quality our business plan is based on water related issues in terms of operation. With the vision of Smart Life 2030 we have objective to use less and efficient natural resource consumption. Another issue is water related management is monitored through ISO 14046 Water Management System.
Strategy for achieving long-	Yes, water-related issues are	11-15	Water related risk and opportunities are integrated our business plan to achive the objectives because all efficiencies, expected income increases are related to our operation and our operation

term objectives	integrated		based on water quality and quantity. With the vision of Smart Life 2030 we have objective to use less and efficient natural resource consumption.
Financial planning	Yes, water-related issues are integrated	11-15	Water related risk and opportunities are integrated our business plan in terms of financial planning because all efficiencies, expected income increases are related to our operation and our operation based on water quality and quantity.

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?

Row 1

Water-related CAPEX (+/- % change)

0

Anticipated forward trend for CAPEX (+/- % change)

0

Water-related OPEX (+/- % change)

0

Anticipated forward trend for OPEX (+/- % change)

0

Please explain

In 2018 data management has been continued and water related CAPX and OPEX data's did not changed. Investments that will cause efficiency are monitoring under CAPEX and OPEX changes of R&D budget.

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	Scenario analysis has been used for assessing risks and opportunities. We use 2 degrees of temprature increase scenario based on IPCC 5th assessment report.

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	2DS	As per our scenario analysis based on IPCC 5th assessment report, decrease in water levels and rain falls will occur all over Turkey. It will directly effect our production in hydro power plants.	We are investing efficiency in our production facilities and aim to decrease the water intensity per generated electricity.

W7.4

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

Row 1

Does your company use an internal price on water?

No, and we do not anticipate doing so within the next two years

Please explain

We did not define internal price on water.

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	Targets are monitored at the corporate level Goals are monitored at the corporate level	In 2016, we have started to apply ISO 14046 standard and the water footprint monitoring system is improved as a result of ISO 14046 implementation studies. 100% of water withdrawal is measured. Water withdrawals from wells are monitored continuously.

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 withdrawals

Level

Company-wide

Primary motivation

Climate change adaptation and mitigation strategies

Description of target

We aim to reduce our total water withdrawals 50% by 2022.

Quantitative metric

% reduction in total water withdrawals

Baseline year

2016

Start year

2017

Target year

2022

% achieved

44

Please explain

In this reporting year, we have reduced 44% comparing to the base year which is defined as 2016.

W8.1b

(W8.1b) Provide details of your water goal(s) that are monitored at the corporate level and the progress made.

Goal

Engaging with local community

Level

Site/facility

Motivation

Corporate social responsibility

Description of goal

Zorlu Doğal has hydro power plants in its portfolio and their production is based on the water level in the river. It's a local source and also used for both domestic needs and agricultural activities for the villagers who lives there. With defined frequency of stakeholder meetings we will monitor their water needs and where possible rearrange production hours.

Baseline year

2017

Start year

2018

End year

2022

Progress

The target set in 2018 so the progress will be monitored 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 energy use

Description of linkage/tradeoff

As an electricity producer, water is one of the main natural sources required for our operations. Our water consumption directly affects our energy consumption as using more water results in additional energy consumption in order to condition that water as part of our operations.

Policy or action

In order to better manage this linkage, we chose to build new power plants with the most efficient available technology and reduce both energy and water consumption at an optimum level.



W10. Verification

W10.1

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

No, we do not currently verify any other water information reported in our CDP disclosure

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	Senior Assistant Manager	Environment/Sustainability manager

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 how your response should be handled by CDP

	Public or Non-Public Submission	I am submitting to
I am submitting my response	Public	Investors

Please confirm below

I have read and accept the applicable Terms