

## Welcome to your CDP Climate Change Questionnaire 2019

### C0. Introduction

#### C0.1

##### **(C0.1) Give a general description 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 Dođal(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 emissions calculated as 1.560.289,5 tCO2. The emissions decreased because of commissioning of Kızıldere III's second unit.

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. 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.

## C0.2

**(C0.2) State the start and end date of the year for which you are reporting data.**

	Start date	End date	Indicate if you are providing emissions data for past reporting years
Row 1	January 1, 2018	December 31, 2018	No

## **C0.3**

**(C0.3) Select the countries/regions for which you will be supplying data.**

Turkey

## **C0.4**

**(C0.4) Select the currency used for all financial information disclosed throughout your response.**

TRY

## **C0.5**

**(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your consolidation approach to your Scope 1 and Scope 2 greenhouse gas inventory.**

Operational control

## **C-EU0.7**

**(C-EU0.7) Which part of the electric utilities value chain does your organization operate in? Select all that apply.**

Row 1

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**Electric utilities value chain**

Electricity generation

**Other divisions**

## C1. Governance

### C1.1

**(C1.1) Is there board-level oversight of climate-related issues within your organization?**

Yes

#### C1.1a

**(C1.1a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for climate-related issues.**

Position of individual(s)	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 climate change and renewable energy related issues. Smart Life 2030 transformation for low carbon economy 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 climate change are under control of Chief Sustainability Officer.

#### C1.1b

**(C1.1b) Provide further details on the board's oversight of climate-related issues.**

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Please explain
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<p>Scheduled – some meetings</p>	<p>Reviewing and guiding strategy                  Reviewing and guiding major plans of action                  Reviewing and guiding risk management policies                  Reviewing and guiding annual budgets</p>	<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. 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>
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## C1.2

**(C1.2) Provide the highest management-level position(s) or committee(s) with responsibility for climate-related issues.**

Name of the position(s) and/or committee(s)	Responsibility	Frequency of reporting to the board on climate-related issues
Chief Executive Officer (CEO)	Both assessing and managing climate-related risks and opportunities	Quarterly
Sustainability committee	Both assessing and managing climate-related risks and opportunities	Quarterly

## C1.2a

**(C1.2a) Describe where in the organizational structure this/these position(s) and/or committees lie, what their associated responsibilities are, and how climate-related issues are monitored (do not include the names of individuals).**

The utmost responsibility for overall management of ZD is on **The Chairman of The Board**. He is responsible for the strategy and policies of ZH companies including ZD. The executive board of ZH has a executive member who is **Chief Sustainability Officer** is also responsible for the

approvals of action plans related to sustainability and climate change.

**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.

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. Sustainability committee which is led by Sustainability Manager has responsibility for both assessment and management of the climate related risks and opportunities as listed below;

**Sustainability Manager;**

Leading Sustainability Committee

Reporting sustainability risks and opportunities and climate change target performance to CEO

Emission reduction target setting and performance review

Following international developments about climate change, environment and sustainability.

Identify the sustainability policies and strategies by assessing corporate GHG mitigation performance Identify the climate policies by conducting climate change mitigation activities

**Chief Risk Officer:**

Guidance on risk management methodologies

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

**Audit Manager:**

Performance revision and recommendations on climate change strategies in line with ZH Smart Life-2030.

Reviewing of action plans in terms of ethical principles of Zorlu Holding (ZH)

As a part of risk management, guidance on supply chain management with the reference of Supply Chain Principles.

Monitor & identify current and emerging regulations in terms of climate change

**HR Director**

Improve several communication channels and tools which will allow employees to contribute to the sustainability & climate change mitigation activities

Manage the environmental and social contributions

**Corporate Communications Manager**

Identify and manage green energy related sustainability plan, program, projects and actions.

Review and manage corporate environmental policy, including planning of climate related initiatives

Evaluate Zorlu Dogal (ZD) Plants' climate change and environmental performances periodically

Monitor& report climate change mitigation activities

**Environment and Corporate Affaires Assistant Manager:**

Evaluate corporate risks and opportunities in scope of sustainability & climate change principles and policies

Coordinate GHG management with site applications regarding environmental issues

Monitoring of environmental targets including emission reduction

**Accounting Manager**

Prepare financial statements for GHG related decision making

**Purchasing Manager**

Manage Green Supply issues.

Application of Supply Chain Principles of ZH which contains management of supplier emissions

**Investments Manager**

Recommend alternative solutions for the road map based on climate change risks and opportunities

**Project Finance and Development Manager**

Monitor & Review energy generation projects with local and renewable energy sources.

**Occupational Health and Safety Dept. & Environmental Management, Optimization and Control Systems Specialist**

Improve & manage data collection and measurement system for calculating the direct and indirect emissions resulting from ZD activities and its annual revision.

Prepare ZD Materiality Matrix, which includes reduction of emissions and protection of environment, energy efficiency, energy generation with local and

renewable energy resources,

As a requirement of ISO 14001 Standard, Environmental Management Representative presents the environmental targets (including Climate Change targets and ISO14064-1 system requirements), internal audit results, regulatory compliance matters, and CDP performance and action plans to the committee.

**Investor Relations Director, HEPP Representative, WPP Representative, GPP Representative**

Evaluate plant wise GHG indicators and technical assistance

**Electricity Trade Representative**

Register CDM projects within UNFCCC framework, Green Marketing issues

## C1.3

**(C1.3) Do you provide incentives for the management of climate-related issues, including the attainment of targets?**

Yes

## C1.3a

**(C1.3a) Provide further details on the incentives provided for the management of climate-related issues (do not include the names of individuals).**

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**Who is entitled to benefit from these incentives?**

Board Chair

**Types of incentives**

Recognition (non-monetary)

**Activity incentivized**

Behavior change related indicator

**Comment**



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;

\* 7 million TL provided to the social entrepreneurship ecosystem

\*Scholarships for 2000 students per year for training to equip them with the skills and competencies required by the 21st century.

\*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.

\* “Our Energy is for Children” project developed to ensure that our children become conscious of energy saving, climate change and renewable energy issues.

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**Who is entitled to benefit from these incentives?**

Chief Executive Officer (CEO)

**Types of incentives**

Monetary reward

**Activity incentivized**

Emissions reduction project

**Comment**

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 .

-Adaptation and mitigation activities in line with sustainability policy of the company.

-Reduction in energy consumption and fossil fuel resources consumption

-Support Smart Life-2030 and leadership on behaviour change.

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**Who is entitled to benefit from these incentives?**

Environment/Sustainability manager

**Types of incentives**

Monetary reward

**Activity incentivized**

Emissions reduction target

**Comment**

Sustainability Manager has target to;  
Achieve emission reduction targets,  
Support to Smart Life-2030 in terms of data development of data collection systems.

A certain amount of profit is shared as a bonus (monetary reward) by the achievement of the relevant indicators like recognition. Some good project ideas are rewarded with rewards like monetary support in trainings, plane tickets to the city chosen etc.

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**Who is entitled to benefit from these incentives?**

All employees

**Types of incentives**

Other non-monetary reward

**Activity incentivized**

Behavior change related indicator

**Comment**

In order to raise employee awareness on climate change and low-carbon economy, environmentally positive action ideas to protect nature contest is carried out in every "World Forestry Day" and "World Environment Day".

According to results, five successful employees are rewarded with participation in some outdoor activities with their families like forestation activities in our wind project areas.

## C2. Risks and opportunities

### C2.1

**(C2.1) Describe what your organization considers to be short-, medium- and long-term horizons.**

	From (years)	To (years)	Comment
Short-term	1	3	Extreme weather events related to climate change are defined under short term horizon risks.
Medium-term	3	10	Regulatory changes are defined under medium term horizon risks.
Long-term	10	20	Long term horizon is about strategic planning. The climate related risks are chronic weather changes.

### C2.2

**(C2.2) Select the option that best describes how your organization's processes for identifying, assessing, and managing climate-related issues are integrated into your overall risk management.**

Integrated into multi-disciplinary company-wide risk identification, assessment, and management processes

### C2.2a

**(C2.2a) Select the options that best describe your organization's frequency and time horizon for identifying and assessing climate-related risks.**

	Frequency of monitoring	How far into the future are risks considered?	Comment
Row 1	Six-monthly or more frequently	>6 years	Risk management is integrated to all departments of the company from Executive Board to the divisions. All our facilities are applying ISO 9001, &14001 Management Systems standards and that's make our company to review risks and opportunities daily within our operation. At the management level; The Sustainability Committee, appointed by CEO overviews and evaluates ZD risks opportunities related to climate change.

			<p>Chief risk officer is also the member of sustainability committee who guides about the application of risk procedures of ZD.</p> <p>The risks and opportunities are discussed and reported to CEO who is responsible of climate change performance and long term strategy. Inputs of the committee meetings are;</p> <ul style="list-style-type: none"> <li>*GHG and Energy data's submitted from plants,</li> <li>*Environmental compliance</li> <li>*Performance reports.</li> </ul>
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## C2.2b

### (C2.2b) Provide further details on your organization's process(es) for identifying and assessing climate-related risks.

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.

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.

Climate 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 climate change. 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 climate change performance. 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.

## C2.2c

### (C2.2c) Which of the following risk types are considered in your organization's climate-related risk assessments?

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	Current regulation is considered in our risk assessment because Turkish government declared its incentives to local coal through Strategic Plan item A.2 PG1.1. The objective is defined as to increase the electricity production from local coal to 60 billion KwH by 2019 which base year defined as 32,9 billion in 2013. Since our business strategy is based on sustainability and climate change, the company invest in low carbon technology and undertake more investment to produce same amount of electricity from renewable sources. In 2018 solar energy investments in terms of panel production and building of solar power plants, Horizon 2020-Geco Project to mitigate CO2 emissions in Geothermal Power Plants has been continued in line with Smart Life 2030.
Emerging regulation	Relevant, always included	Emerging regulation considered in our risk assessment however it is not defined as a risk because we produce electricity from renewable sources like hydro power plant and geothermal power plant. Also in 2018 investment on solar panels and solar power plants and Geco Project to mitigate the emissions from Geothermal project has been studied.
Technology	Relevant, always included	Technology is considered as a risk since energy sector is one of the most important sector that R&D projects are developing. Zorlu Holding the mother company of Zorlu Dogal launched Smart Life 2030 transformation plan for low carbon economy. Smart Life 2030 effected ZD's investment plans as follows; <ul style="list-style-type: none"> <li>- Investment on solar energy including panel development and building solar power plants.</li> <li>- Horizon 2020 - Geco Project to mitigate carbon emissions in geothermal power plants.</li> </ul> Those investments are the action plans of climate related risks, technological developments and customer behaviour changes.
Legal	Relevant, always	Climate change is not defined in any law of Turkey. There is only one regulation which is MRV (Measuring Reporting

	included	and Verfiying of GHG Emissions) and it is funded by World Bank. There is no penalty about fail to comply with that regulation because there is no climate policy. So legal is not considered in our risk assessment.
Market	Relevant, always included	Market risk is considered, assessed and defined as a risk because customer behaviour change with increased capacity of distributed energy production through solar panels or energy storage projects may cause increase demand to our power plants. As an action plan of the risk company invested in Solar Panel development and building of solar power plants.
Reputation	Relevant, always included	Reputation is considered in our risk assessment and concluded as an opportunity because Zorlu Dogal's corporate response and performance related to the environmental and climate change related issues increases the good reputation of the Company in the eyes of all stakeholders, especially investors and customers. Geothermal power plants has high GHG emissions but since it is a renewable energy source it is not risky as per international agreements. The second action plan to protect company reputation is, ZD accelerate solar panel and solar power plant investments and mitigation of GHG's in geothermal power plants with the vision of Smart Life-2030
Acute physical	Relevant, always included	Acute physical effects of climate change is considered in our risk assessment. Extreme weather conditions may damage our production facilities and create inefficiency on our equipment.
Chronic physical	Relevant, always included	Chronic physical effects of climate change is considered in our risk assessment and defined as a risk on our hydro power plants. Because decrease in rains expected in most of the regions of Turkey as per IPCC 5th assessment report and this may decrease in our energy production.
Upstream	Not relevant, explanation provided	Our facilities are producing electricity from natural resources. Upsteam is considered under physical climate change effects.
Downstream	Relevant, always included	Downstream is considered in our risk assessment. We defined distribution companies and consumers for downstream. Any damage on distribution lines or consumer places where they use electricity it will effect our sales and income.

## C2.2d

### (C2.2d) Describe your process(es) for managing climate-related risks and opportunities.

Zorlu DogalZD) is applying Organizational and Environmental Management Systems and those are certified by accredited third party as ISO 9001:2015 and ISO 14001:2015 certifications. All ZD facilities are applying those standards which are based on risk management standard. All defined risks and

opportunities are managing as per our risk management procedure and categorized as high, medium or low with a heat map. Some of the parameters that has to be assessed by the facilities in terms of climate change and sustainability are;

energy efficiency, use of natural sources and emission reduction projects, legal requirements, protection of environment, technology updates for efficiency and low carbon. Facilities report to sustainability committee about their climate related risks and opportunities.

The committee get risks and opportunities from all facilities with swot analysis of the company and stakeholder consultation reports. It is sustainability committee responsibility to consolidate the climate related risk and opportunities with their action plans. Regulatory risks as well as physical, reputational and market risks are some of the risks assessed at the company level by the sustainability committee. Chief Risk Officer is also the member of the sustainability committee and with the guidance of him risk taxonomy from COSO standards are used for categorization. It contains;

- identification of risks (from facility data, swot analysis, stakeholder consultation)
- assessing severity of risks (as per heat map defined in risk procedure)
- prioritization of risks (For the management of the risks action plans are prioritize)
- identification of the action plans.

Categorization on a heat map done as per impact and the frequency of the risk. All benefit/cost ratios are identified for the risks and defined action plans for high risks are sharing with CEO and executive board. The major action plan approvals are under responsibility of executive board. CEO is responsible to monitor the progress in climate related risks to control the long term strategy of the company.

As a reflection of Smart Life 2030 vision of executive board, ZD defined its target to invest in;

\*Solar Energy in terms of panel production and building of Solar Power Plants

\*Horizon 2020 - GECO Project to mitigate the CO2 in geothermal power plants

The risks we have identified over short term are;

-Extreme weather conditions,

Mid Term;

-Regulatory risks

-Growing distributed energy solutions

Long Term;

-Customer behaviour change and Low Carbon Economy Transition

To manage the transition risks like behaviour change and low carbon transition Smart Life 2030 transition plan has been launched in 2018. The company committed 50% GHG reduction and 50%increase in R&D investments for solar power energy and mitigation of emissions in geothermal power plants. For regulatory adaptation we are directly working with policy makers or NGO's like TUSIAD.

To manage the physical risks of the climate change like damage on hydro power plants, we are investing different type of renewable energy like solar panels with the vision of Smart Life - 2030.

## C2.3

**(C2.3) Have you identified any inherent climate-related risks with the potential to have a substantive financial or strategic impact on your business?**

Yes

## C2.3a

**(C2.3a) Provide details of risks identified with the potential to have a substantive financial or strategic impact on your business.**

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**Identifier**

Risk 1

**Where in the value chain does the risk driver occur?**

Direct operations

**Risk type**

Transition risk

**Primary climate-related risk driver**

Policy and legal: Other

**Type of financial impact**

Change in revenue mix and sources resulting in decreased revenues

**Company- specific description**

To support use of local resources due to economic aspects, government declared its incentives to local coal through Strategic Plan item A.2 PG1.1. The objective is defined as to increase the electricity production from local coal to 60 billion kWh by 2019 which base year defined as 32,9 billion in 2013. However since Zorlu Dogal business strategy is based on sustainability and climate change as launched through "Smart



Life 2030" in 2018, the company invest in low carbon economy transition and undertake more investment to produce same amount of electricity from renewable sources like solar panels and lower carbon geothermal plants.

**Time horizon**

Short-term

**Likelihood**

Likely

**Magnitude of impact**

Medium-high

**Are you able to provide a potential financial impact figure?**

Yes, a single figure estimate

**Potential financial impact figure (currency)**

22,996,999

**Potential financial impact figure – minimum (currency)**

**Potential financial impact figure – maximum (currency)**

**Explanation of financial impact figure**

As per International Energy Agency (IEA) "Projected Cost of Generating Electricity" hydro generation cost is between 40-80 USD/MWh. This publicly available document used for our risk scenario and lower costs are considered to define the financial impact. Hydro generation power plants needs 15 USD/MWh more investment and our 2018 generation from hyro power plants are 319.402,78 MWh. As a conclusion when we multiply our generation volume with the more investment need per Mwh we calculated the potential financial impact. (The average USD currency accepted as 4,80 for 2018)

**Management method**

Sustainability is our business strategy and strength with the vision of Smart Life 2030. The importance of transition to low carbon economy and customer behaviour change are explaining through NGO'S and direct communications with policy makers and other stakeholders. We are working for development of incentives for renewable energy production or low carbon products to accelerate the transition of low-carbon economy in line with new customer expectations and to be a global player in energy sector.

**Cost of management**

1,886,000

**Comment**

Zorlu Dogal, is one of the most important player in Turkish energy market who support the use of renewable sources.

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**Identifier**

Risk 2

**Where in the value chain does the risk driver occur?**

Direct operations

**Risk type**

Transition risk

**Primary climate-related risk driver**

Market: Changing customer behavior

**Type of financial impact**

Reduced demand for goods and/or services due to shift in consumer preferences

**Company- specific description**

Distributed electricity generation and electricity storage is growing in energy sector. Solar power plants are getting much more efficient both for price and generation capacities. This may cause reduced demand for electricity power plants.

**Time horizon**

Long-term

**Likelihood**

About as likely as not

**Magnitude of impact**

Low

**Are you able to provide a potential financial impact figure?**

Yes, a single figure estimate

**Potential financial impact figure (currency)**

1,560,543

**Potential financial impact figure – minimum (currency)**

**Potential financial impact figure – maximum (currency)**

**Explanation of financial impact figure**

Ministry of Energy and Natural Resources declared that total production capacity from solar power plant increased around 1% in 2018 for the production capacity. For this risk scenario we assume that this capacity increase creates reduced demand for our production and our revenue will decrease 0,15%. Our revenue was around 1.040.362.209,39 TRY in 2018. Total potential financial impact calculated by multiplying possible decrease demand percentage with the 2018 revenue.

**Management method**

In order to manage the risk we invest solar energy and we are distributor of First Solar and we have our own patent article as Zorlu Solar. We have 20% market share for solar and with working about solar power plants we are managing the reduced demand risk. The cost of management is the investment budget of solar in 2018.

**Cost of management**

28,304,000

**Comment**

Zorlu Dogal, is one of the most important player in Turkish energy market who support the use of renewable sources.

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**Identifier**

Risk 3

**Where in the value chain does the risk driver occur?**

Direct operations

**Risk type**

Physical risk

**Primary climate-related risk driver**

Acute: Increased severity of extreme weather events such as cyclones and floods

**Type of financial impact**

Increased capital costs (e.g., damage to facilities)

**Company- specific description**

Zorlu Doğal is producing electricity from natural resources and hydro power plants are on mountains. As per IPCC 5th assessment report extreme weather events are expected in Turkey and our power plants are all around Turkey. If extreme weather events damage our production facility we may face with business interruption. Since transportation is also difficult to hydro power plants it may take longer time than expected to repair the damage.

**Time horizon**

Long-term

**Likelihood**

About as likely as not

**Magnitude of impact**

Medium-low

**Are you able to provide a potential financial impact figure?**

Yes, a single figure estimate

**Potential financial impact figure (currency)**

294,025.57

**Potential financial impact figure – minimum (currency)**

**Potential financial impact figure – maximum (currency)**

**Explanation of financial impact figure**

Up to 7 days of business interruption is defined as risk scenario for hydro power plants. Our gross generation for 2018 from all our hydro power plants are 319.402,78 MWh and daily production accepted as 875,08 Mwh since they are working 365 days. For 7 days it cause 6.125.530 kwh sales loss. Guarantee sales price for hydro power plants are 7,3 USD cent/kwh. We multiplied gurantee price with the possible energy generation loss to define the potential financial risk. Average USD currency accepted as 4,80 TL for 2018.

**Management method**

To manage this risk we make an insurance for natural disasters which may cause business interruption. It categorised by risk potential of the project locations. Insurance fee for our hydro power plant given as cost of management.

**Cost of management**

851,826

**Comment**

Extreme weather events are expected as a result of climate change as per IPCC 5th assessment report.

**Identifier**

Risk 4

**Where in the value chain does the risk driver occur?**

Direct operations

**Risk type**

Physical risk

**Primary climate-related risk driver**

Chronic: Changes in precipitation patterns and extreme variability in weather patterns

**Type of financial impact**

Increased operating costs (e.g., inadequate water supply for hydroelectric plants or to cool nuclear and fossil fuel plants)

**Company- specific description**

Zorlu Dogal has hydro power plants and as per IPCC 5th assessment report rains will decrease all over Turkey except north east of Turkey with medium confidence. It may cause low production due to decreased water level in our hydro power plants.

**Time horizon**

Long-term

**Likelihood**

About as likely as not

**Magnitude of impact**

Medium-low

**Are you able to provide a potential financial impact figure?**

Yes, a single figure estimate

**Potential financial impact figure (currency)**

681,784.44

**Potential financial impact figure – minimum (currency)**

**Potential financial impact figure – maximum (currency)**

**Explanation of financial impact figure**

Due to lower water levels of hydro power plants our production may decrease. %1 decrease in production accepted in our risk scenario and it will cause 1% decrease of the incomes. Our revenue from HEPP was 68.178.444,38 in 2018 and potential financial impact calculated with multiplying our revenue with the assumed decrease in production.

**Management method**

Due to the expected physical impacts of climate change such as reduction or change in precipitation patterns, we may have less water in our HEPP's. Renovation on existing HEPPs with inefficient production systems and enable increased electricity production from the same reservoir using the same amount of water. The most representative example of this management method can be given as our renovation investment initialized during the reporting year for our İvizdere HEPP. Before renovation, İvizdere HEPP had a production capacity of 111 million kWh/year. Following the initialized renovation, this capacity will be increased to 133.5 million kWh/year.

**Cost of management**

17,030,000

**Comment**

We are working to improve our efficiency in existing power plants.

## C2.4

**(C2.4) Have you identified any climate-related opportunities with the potential to have a substantive financial or strategic impact on your business?**

Yes

## C2.4a

**(C2.4a) Provide details of opportunities identified with the potential to have a substantive financial or strategic impact on your business.**

---

**Identifier**

Opp1

**Where in the value chain does the opportunity occur?**

Customer

**Opportunity type**

Products and services

**Primary climate-related opportunity driver**

Development and/or expansion of low emission goods and services

**Type of financial impact**

Better competitive position to reflect shifting consumer preferences, resulting in increased revenues

**Company-specific description**

Zorlu Doğal is producing electricity from renewable sources like geothermal power plant and hydro power plant. Public conscious is growing about climate change and companies are prefer to use renewable energy sources especially who sell its products directly to the consumers. The wholesale price of electricity is lower than the price sold to consumers with bilateral agreement.

Corporate response and performance related to the environmental and climate change related issues increases the good reputation of the Company in the eyes of all stakeholders, especially investors and customers.



With higher public conscious and good reputation of Zorlu Dogal, selling electricity to directly consumers with bilateral agreements may create increase in our revenue.

**Time horizon**

Long-term

**Likelihood**

About as likely as not

**Magnitude of impact**

Medium-low

**Are you able to provide a potential financial impact figure?**

Yes, a single figure estimate

**Potential financial impact figure (currency)**

1,040,362.21

**Potential financial impact figure – minimum (currency)**

**Potential financial impact figure – maximum (currency)**

**Explanation of financial impact figure**

We accepted renewable energy preference will increase 0,1% in a long term. Our revenue in 2017 was 1.040.362.209,39 TRY. 0,1% of 2018 revenue might increase in a long term due to selling with higher prices.

**Strategy to realize opportunity**

We have dedicated budget for corporate social responsibility, including environmental investments, emissions monitoring, reporting and verification costs and awareness raising about sustainability and climate change.

**Cost to realize opportunity**

1,886,000

**Comment**

Zorlu Dogal is one of the leading companies whose business strategy is based on sustainability.

---

**Identifier**

Opp2

**Where in the value chain does the opportunity occur?**

Direct operations

**Opportunity type**

Markets

**Primary climate-related opportunity driver**

Use of public-sector incentives

**Type of financial impact**

Increased revenues through access to new and emerging markets (e.g., partnerships with governments, development banks)

**Company-specific description**

Zorlu Dogal is producing electricity from renewable sources which are hydro power plants and geothermal power plants. As per "Energy Production from Renewable Resources Law" incentives for renewable energy investments will be provided through guarantee sales to "Support Mechanism for Renewable Energy Sources (YEKDEM) with higher feed-in tariff according to conventional electricity production. Prices defined as 7.3 U.S. cents/kWh for hydroelectric power plants and 10.5 cents/kWh for geothermal power plants. As per our growing strategy we will increase our production capacity in geothermal power plants which will provide us guarantee income for 10 years.

**Time horizon**

Medium-term

**Likelihood**

Likely

**Magnitude of impact**

High

**Are you able to provide a potential financial impact figure?**

Yes, a single figure estimate

**Potential financial impact figure (currency)**

330,542,480.1

**Potential financial impact figure – minimum (currency)**

**Potential financial impact figure – maximum (currency)**

**Explanation of financial impact figure**

Zorlu Dogal is planning to increase its geothermal production capacity around 105 MW with the following projects;

Kızıldere IV (50 MW),

Alasehir II (25MW),

Alasehir III (30 MW).

We assume same efficiencies for the plants and potential financial impact is calculated with multiplying the expected production capacity increase ratio (34%) with the 2018 revenues from geothermal power plants(972.183.765,01 TRY).

**Strategy to realize opportunity**

Zorlu Dogal CAPEX for geothermal power plant in Kızıldere in 2018 is 258.179.625 TRY defined as cost to realize the opportunity.

**Cost to realize opportunity**

258,179,625

**Comment**

Zorlu Doğal has the biggest capacity who operates geothermal power plant in Turkey.

---

**Identifier**

Opp3

**Where in the value chain does the opportunity occur?**

Customer

**Opportunity type**

Markets

**Primary climate-related opportunity driver**

Access to new markets

**Type of financial impact**

Increased revenues through access to new and emerging markets (e.g., partnerships with governments, development banks)

**Company-specific description**

As per IPCC 5th assessment report extreme weather conditions are expected with medium confidence. This may cause increase in electricity demand for cooling or heating purposes. Climate related increase in demand may create increased revenue.

**Time horizon**

Long-term

**Likelihood**

About as likely as not

**Magnitude of impact**

Medium-low

**Are you able to provide a potential financial impact figure?**

Yes, a single figure estimate

**Potential financial impact figure (currency)**

69,704,268.03

**Potential financial impact figure – minimum (currency)**

**Potential financial impact figure – maximum (currency)**

**Explanation of financial impact figure**

As per IAE report energy demand will increase at least 6.7 % (low case scenario) annually until 2020 in Turkey. We used IAE report data for our opportunity scenario to calculate our potential financial impact. Based on our 2018 revenue (1.040.362.209,39 TRY ) we calculated the potential additional income due to energy demand increase(0,067).

**Strategy to realize opportunity**

Zorlu Dogal is continue to increase its production capacity. In 2018 CAPEX investment for geothermal power plant in Kızıldere was 249 million USD. Average USD currency accepted as 4,80 for 2018.

**Cost to realize opportunity**

1,195,000,000

**Comment**

Zorlu Dogal is one of the leading company in energy production and each year she increase its production capacity through new investments.

## C2.5

**(C2.5) Describe where and how the identified risks and opportunities have impacted your business.**

	Impact	Description
Products and services	Impacted	<p>Decentralized energy is developing all over the world and this may negatively effect all energy producers. Also extreme or chronic weather conditions may cause decrease decrease in our production due to damage on our production facilities and decreased water levels. The magnitude of the risks on our products related to climate change quantified and concluded as medium. The action plan about the risks on existing renewable sources is supported with solar power plants.</p> <p>Emission reduction units that developed based on UNFCCC methodology for renewable sources and incentives provided by ministry positively impact our business. The mangitude of impact on our business due to our products and services is calculated and defined as high because our products and services are in line with steps to fight with climate change.</p>
Supply chain and/or value chain	Not yet impacted	Our clients are in our value chain and their consicious increased about climate change and it can effect our business positively. However renewable energy sources are not highly preferred by energy consumers. due to unstability. With increase in demand our business will be highly impacted by our value chain.
Adaptation and mitigation activities	Impacted	Adaptation and mitigation activities for climate change positively impact our business because we produce electricity from renewable sources which is supported by international agreements like Kyoto Protocol. Emission trade can get investment incentives through carbon market and we have developed emission reduction project. It creates an income to our operation. The second issue about mitigation activities can be defined as Horizon 2020 - Geco Project that study for the emission reduction in geothermal power plants.
Investment in R&D	Not yet impacted	Decentralized electricity production and electricity storage is developing technologies all around the world. We define this development as a market risk however since those technologies are not financially feasible like conventional energy productions time horizon defined as long term. However when the technology became more achievable the magnitude of the impact will be high. With the vision of Zorlu Holding's Smart Life 2030 transformation plan to low carbon economy investment in solar panel development and building solar power plants has been started as an action plan.
Operations	Not yet impacted	We have hydropower plants and the weather events like drought might lead decreased level of water and less production. As per IPCC 5th assessment report weather changes expected in a long term and when it occurs, our operation will be highly effected due to low water level in dam and inefficient operation due to equipment failures.
Other, please specify	Not yet impacted	No other parameter defined that impact our business.

## C2.6

### (C2.6) Describe where and how the identified risks and opportunities have been factored into your financial planning process.

	Relevance	Description
Revenues	Impacted	<p>Our revenues effected by defined risks and opportunities in terms of incentives provided to renewable energy producers by ministry and emission reduction units developed as per UNFCCC-CDM Methodologies based on Kyoto Protocol mechanisms. Since our products are produced by low carbon technologies like hydro power plant we expect positive amount of impact due to our risk assessment procedure.</p> <p>Beside emission reduction incomes with the action plans to fight with climate change solar power income and involvement to lower carbon geothermal power plant studies can be stated as factored financial planings.</p>
Operating costs	Not yet impacted	Extreme weather conditions defined as risk due to possible damage on our power plant.
Capital expenditures / capital allocation	Impacted	For development of emission reduction units, the investment of development must be done at the investment stage. Also the investment of renewable energy costs higher than fossil fuel power plants. Since sustainability is the basis of our company the capital expenditures are defined as high impact. Also investment in solar power plant is chanced th allocation of capital expenditures.
Acquisitions and divestments	Not impacted	Due to increase in energy demand, we increase our production capacity however we dont do it with acquisitions, we are developing new projects and apply for licence.
Access to capital	Impacted	We are producing electricity from renewable sources . Geohermal power plant investments are very expensive investments but since they are green technologies it creates positive impact to access to capital. ZD is the first company that apply to Green Loan from Garanti Bank.
Assets	Impacted	Weather events defined as risk on our physical assets. If any damage occurs it will effect our financials to manage this risk we have our insurace about business interruption from natural disasters.
Liabilities	Not yet impacted	Climate related risks and opportunities not impacted financial plannings in terms of liabilities.
Other	Not yet	No other parameter is identified that effect our financial planning.

	impacted	
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## C3. Business Strategy

### C3.1

**(C3.1) Are climate-related issues integrated into your business strategy?**

Yes

#### C3.1a

**(C3.1a) Does your organization use climate-related scenario analysis to inform your business strategy?**

Yes, qualitative and quantitative

### C-AC3.1b/C-CE3.1b/C-CH3.1b/C-CO3.1b/C-EU3.1b/C-FB3.1b/C-MM3.1b/C-OG3.1b/C-PF3.1b/C-ST3.1b/C-TO3.1b/C-TS3.1b

**(C-AC3.1b/C-CE3.1b/C-CH3.1b/C-CO3.1b/C-EU3.1b/C-FB3.1b/C-MM3.1b/C-OG3.1b/C-PF3.1b/C-ST3.1b/C-TO3.1b/C-TS3.1b) Indicate whether your organization has developed a low-carbon transition plan to support the long-term business strategy.**

In development, we plan to complete it within the next 2 years

#### C3.1c

**(C3.1c) Explain how climate-related issues are integrated into your business objectives and strategy.**

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**.

Beyond energy needs of Zorlu Textile, ZH's Energy Group (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 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 emissions calculated as 1.560.289,59 tCO2 with 14% decrease.

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. 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.

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

### C3.1d

**(C3.1d) Provide details of your organization’s use of climate-related scenario analysis.**

Climate-related scenarios	Details
2DS	<p>We used scenario analysis in our risk assessment from our direct operations and value chain. As per IPCC 5th assessment report, the effect of weather events are expected in a long term so we defined 10 years or more for scenario analysis.</p> <p>We used company specific data's where we can find. However for risk and opportunity analysis we used some assumptions. All assumptions used are from publicly available references.</p> <p>We calculated the potential financial impacts of risks and opportunities with thee scenario analysis. All risks defined about climate change are reported to sustainability committee. Risk manager of Zorlu Holding is also in the committee and high risks and investment needed action plans are reported to executive board for the approval.</p> <p>We define market risk due to developing technology about decentralizred energy production and energy storage. It is one way to fight with climate change in therms of technology. Ministry of Energy and Natural Resources declared that total production capacity from solar power plant increased %1 in 2018 and we used this data for our scenario anaylsis. As per the financial potential impact Zorlu Dogal defined investments on solar energy(decentralized energy) .</p>

## C4. Targets and performance

### C4.1

**(C4.1) Did you have an emissions target that was active in the reporting year?**

Both absolute and intensity targets

## C4.1a

**(C4.1a) Provide details of your absolute emissions target(s) and progress made against those targets.**

---

**Target reference number**

Abs 1

**Scope**

Scope 1+2 (location-based)

**% emissions in Scope**

99.9

**Targeted % reduction from base year**

17

**Base year**

2017

**Start year**

2017

**Base year emissions covered by target (metric tons CO2e)**

736,379.5

**Target year**

2025

**Is this a science-based target?**

No, and we do not anticipate setting one in the next 2 years

**% of target achieved**

0

**Target status**

Underway

**Please explain**

As Zorlu Doğal renewable energy portfolio includes both geothermal and hydroelectric power plants, total absolute emissions include project emissions from both types of power plants. As our hydroelectric power plants power densities are below the required criteria, we only account for geothermal power plants related project emissions.

In the reporting year, a new power generation unit has added to the Kızıldere geothermal power plant. Therefore, the total emissions have increased compared to base-year. In geothermal power plants, there are two main factors that affect CO2 emissions: Natural discharge and injection. In our geothermal power plants which are the flash steam system, the amount of dissolved CO2 in the injected fluid is very small. The amount of saturated CO2 in the reservoir will be reduced over time thanks to dilution with keeping steady injection rate as per production rate. So CO2 emission will decrease in time.

## C4.1b

**(C4.1b) Provide details of your emissions intensity target(s) and progress made against those target(s).**

---

**Target reference number**

Int 2

**Scope**

Scope 1+2 (location-based)

**% emissions in Scope**

99.9

**Targeted % reduction from base year**

15.5

**Metric**

Metric tons CO<sub>2</sub>e per megawatt hour (MWh)\*

**Base year**

2017

**Start year**

2017

**Normalized base year emissions covered by target (metric tons CO<sub>2</sub>e)**

0.553

**Target year**

2025

**Is this a science-based target?**

No, and we do not anticipate setting one in the next 2 years

**% of target achieved**

0

**Target status**

Revised

**Please explain**

As Zorlu Doğal renewable energy portfolio includes both geothermal and hydroelectric power plants, total absolute emissions include project emissions from both types of power plants. As our hydroelectric power plants power densities are below the required criteria, we only account for geothermal power plants related project emissions.

In the reporting year, a new power generation unit has added to the Kızıldere geothermal power plant. Therefore, the total emissions have increased compared to base-year. In geothermal power plants, there are two main factors that affect CO2 emissions: Natural discharge and injection. In our geothermal power plants which are the flash steam system, the amount of dissolved CO2 in the injected fluid is very small. The amount of saturated CO2 in the reservoir will be reduced over time thanks to dilution with keeping steady injection rate as per production rate. So CO2 emission will decrease in time.

We aim to reduce our emissions intensity per generated electricity by 15.5% until 2025.

**% change anticipated in absolute Scope 1+2 emissions**

15.2

**% change anticipated in absolute Scope 3 emissions**

0

## C4.2

**(C4.2) Provide details of other key climate-related targets not already reported in question C4.1/a/b.**

## C4.3

**(C4.3) Did you have emissions reduction initiatives that were active within the reporting year? Note that this can include those in the planning and/or implementation phases.**

Yes

## C4.3a

**(C4.3a) Identify the total number of initiatives at each stage of development, and for those in the implementation stages, the estimated CO2e savings.**

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	1	
To be implemented*	0	
Implementation commenced*	0	
Implemented*	0	
Not to be implemented	0	

### C4.3b

**(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.**

### C4.3c

**(C4.3c) What methods do you use to drive investment in emissions reduction activities?**

Method	Comment
Dedicated budget for low-carbon product R&D	<p>Zorlu Dogal under Zorlu Holding Energy Group, continues to be the energy gateway to Turkey, not only by its investments but also by sharing its know-how through the projects realized with international cooperation. The Company has recently become one of the partners of the GECO (Geothermal Gas Emission Control) Project, which aims to support the sustainable management of natural mineral resources.</p> <p>The Horizon 2020 Program is the largest Research and Innovation Program in the European Union with €80 billion of funding available over seven years. The Program aims to make major discoveries, creative ideas and inventions from the laboratory to the world markets to create a more sustainable world.</p> <p>The Horizon 2020 Program will provide grant support to Zorlu Dogal for its participation in the GECO Project, considering the Company's successful performance in this field. The GECO Project includes various institutions and organizations from countries including France, the United Kingdom, Italy, Iceland, and Germany. Zorlu Dogal and Middle East Technical University are the only participants from Turkey. The project aims to conduct international field applications, test new</p>

	<p>equipment and technologies, and enable the transfer of know-how and experience in order to reduce carbon dioxide (CO2) emissions from geothermal energy in line with the goals set forth in “Reducing the Costs of Electricity Generation from Renewable Energy Sources” in the Horizon 2020 program.</p> <p>Under the project, initiated with the “Grant Agreement,” a grant of approximately €15 million will be provided to Zorlu Dogal for use in R&amp;D work in the area of sustainable generation of geothermal energy. Zorlu Dogal will contribute to the GECO Project with its vast experience and R&amp;D resources in the field of geothermal energy.</p>
<p>Compliance with regulatory requirements/standards</p>	<p><b>Geothermal Village Project</b>                  The project aims to utilize the excess heat produced by the geothermal power plant to power the greenhouse, heating, electricity generation, thermal tourism, food drying and aquaculture activities to be undertaken by the village which will be built next to the GPP, and the project development is underway.</p> <p><b>Horizon 2020 Program - GECO Project</b>                  The Horizon 2020 Program is the largest Research and Innovation Program in the European Union with €80 billion of funding available over seven years. The Program aims to take major discoveries, creative ideas and inventions from the laboratory to the world markets to create a more sustainable world.                  The project aims to conduct international field applications, test new equipment and technologies, and enable the transfer of know-how and experience in order to reduce carbon dioxide (CO2) emissions from geothermal energy in line with the goals set forth in “Reducing the Costs of Electricity Generation from Renewable Energy Sources” in the Horizon 2020 program.                  Under the project, initiated with the “Grant Agreement,” a grant of approximately €15 million will be provided to Zorlu Enerji for use in R&amp;D work in the area of sustainable generation of geothermal energy. Zorlu Enerji will contribute to the GECO Project with its vast experience and R&amp;D resources in the field of geothermal energy.</p> <p><b>Horizon 2020 Program - GeoSmart Project</b>                  The project aims to implement crosscountry field applications for the “Application of High-Performance Renewable Energy Technologies to Combined Heat and Power Plants” under the “Safe, Clean and Efficient Energy” heading of the Horizon 2020 Program, test new equipment and technologies and transfer know-how and experience. The activities planned within</p>



	<p>the scope of the project include the storage of geothermal fluids in liquid and vapor phases at the Kızıldere Geothermal Power Plants of Zorlu Enerji and in the Balmatt field in Belgium and to study the impacts of CSP (Concentrated Solar Power) and biomass technologies that can be integrated into the geothermal power plants on plant performance. The European Commission has waitlisted the project with an above-threshold score. The project is planned to be included in the main project list and implemented in the event that the Commission allocates funds for the project.</p>
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## C4.5

**(C4.5) Do you classify any of your existing goods and/or services as low-carbon products or do they enable a third party to avoid GHG emissions?**

Yes

## C4.5a

**(C4.5a) Provide details of your products and/or services that you classify as low-carbon products or that enable a third party to avoid GHG emissions.**

### Level of aggregation

Company-wide

### Description of product/Group of products

The avoided emissions result from third parties' purchase of renewable electricity we produce at our HEPPs and GEPPs. In 2018, Our company operated 7 HEPPs and 3 GEPPs. The total hydropower capacity reaches 118.9 MWe with average annual electricity production of 320 GWh. Our total geothermal power capacity is currently 305 MWe with an average annual electricity production of 1.901 GWh. Renewable energy sources are in line with action plans to fight climate change. UNFCCC defined methodologies for electricity producers from renewable energy sources to support their investments. The electricity produced from these plants is fed to the interconnected national grid system, enabling GHG emissions reduction otherwise would be emitted due to electricity produced by using fossil fuel sources.

The emission factor of the Turkey mixed grid is about 0,45-0,55 tCO<sub>2</sub>/MWh. For conservativeness, 0,4 tCO<sub>2</sub>/MWh is applied in calculations which correspond to 888,400 tCO<sub>2</sub> avoided annually. We generated about 2220 GWh electricity and reduce about 888,400 tCO<sub>2</sub> emissions by replacing the electricity that would need to be supplied via the National grid in the absence of the project activity.

**Are these low-carbon product(s) or do they enable avoided emissions?**

Avoided emissions

**Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions**

Other, please specify

UNFCCC CDM Methodology ACM0002

**% revenue from low carbon product(s) in the reporting year**

100

**Comment**

## C-EU4.6

**(C-EU4.6) Describe your organization's efforts to reduce methane emissions from your activities.**

In geothermal power plants, there are two main factors that affect methane emissions: Natural nutrition and injection. In our geothermal power plants which are flash steam system, the amount of dissolved methane in the injected stream is very small. The amount of methane produced in the reservoir will be reduced over time thanks to the efficiency of temperature and pressure recovery studies. Also, the right injection methods will reduce the methane emissions.

## C5. Emissions methodology

### C5.1

**(C5.1) Provide your base year and base year emissions (Scopes 1 and 2).**

#### Scope 1

---

**Base year start**

January 1, 2015

**Base year end**

December 31, 2015

**Base year emissions (metric tons CO<sub>2</sub>e)**

777,124.79

**Comment**

Zorlu Dogal base year emissions include the emission of our administrative buildings, geothermal and hydro power plants.

#### Scope 2 (location-based)

---

**Base year start**

January 1, 2015

**Base year end**

December 31, 2015

**Base year emissions (metric tons CO<sub>2</sub>e)**

832.37

**Comment**

Zorlu Dogal base year emissions include the emission of our administrative buildings, geothermal and hydro power plants.

## Scope 2 (market-based)

---

### Base year start

January 1, 2015

### Base year end

December 31, 2015

### Base year emissions (metric tons CO2e)

0

### Comment

Zorlu Dogal consumes electricity from the interconnected grid.

## C5.2

**(C5.2) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions.**

IPCC Guidelines for National Greenhouse Gas Inventories, 2006  
ISO 14064-1

## C6. Emissions data

### C6.1

**(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO2e?**

**Reporting year**

---



**Gross global Scope 1 emissions (metric tons CO2e)**

1,555,946

**Start date**

January 1, 2018

**End date**

December 31, 2018

**Comment**

The given gross global Scope 1 emissions represent our geothermal power plants, hydropower plants, and administrative buildings. Our greenhouse gas inventory report has been prepared in line with the ISO 14064-1 standard which has been verified by an accredited third party. We have been calculated our emissions based on the 2006 IPCC Guidelines for National Greenhouse Gas Inventories methodology according to the Tier 1 approach.

## C6.2

**(C6.2) Describe your organization's approach to reporting Scope 2 emissions.**

**Row 1**

---

**Scope 2, location-based**

We are reporting a Scope 2, location-based figure

**Scope 2, market-based**

We have no operations where we are able to access electricity supplier emission factors or residual emissions factors and are unable to report a Scope 2, market-based figure

**Comment**

We consumes electricity from the interconnected grid.

## C6.3

**(C6.3) What were your organization's gross global Scope 2 emissions in metric tons CO<sub>2</sub>e?**

### Reporting year

---

**Scope 2, location-based**

4,343

**Start date**

January 1, 2018

**End date**

December 31, 2018

**Comment**

The given gross global Scope 2 emissions represent our geothermal power plants, hydropower plants, and administrative buildings. Our greenhouse gas inventory report has been prepared in line with the ISO 14064-1 standard which has been verified by an accredited third party. We have been calculated our emissions based on the 2006 IPCC Guidelines for National Greenhouse Gas Inventories methodology according to the Tier 1 approach.

## C6.4

**(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?**

No

## C6.5

**(C6.5) Account for your organization's Scope 3 emissions, disclosing and explaining any exclusions.**

## Purchased goods and services

---

### Evaluation status

Relevant, not yet calculated

### Explanation

Zorlu Dogal has given priority to establish a data collection system for Scope 3 emissions starting with the most relevant categories. This category is planned to be included in the data collection boundary in the near future.

## Capital goods

---

### Evaluation status

Not relevant, explanation provided

### Explanation

Zorlu Dogal considers that emissions associated with capital goods are not material (less than 5% of total GHG emissions). Given the complexity of the process of gathering information, the company will formalize an accurate data gathering process to identify Scope 3 emissions sources from buildings, equipment, and machinery. The company does not predict its inclusion over a three year period, compared to the effort that would involve in training and gathering information.

## Fuel-and-energy-related activities (not included in Scope 1 or 2)

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### Evaluation status

Relevant, calculated

### Metric tonnes CO2e

843

### Emissions calculation methodology

DEFRA Greenhouse Gas Reporting: Conversion Factors 2018

### Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

**Explanation**

Fuel-and-energy-related activities include Well to tank (WTT) process emissions of consumed fuels and electricity. The data is based on energy consumptions that are monitored by us and crosschecked with the supplier invoice.

**Upstream transportation and distribution**

---

**Evaluation status**

Relevant, not yet calculated

**Explanation**

Zorlu Enerji has given priority to establish a data collection system for Scope 3 emissions starting with the most relevant categories. This category is planned to be included in the data collection boundary in the near future.

**Waste generated in operations**

---

**Evaluation status**

Relevant, calculated

**Metric tonnes CO2e**

2

**Emissions calculation methodology**

DEFRA Greenhouse Gas Reporting: Conversion Factors 2018

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

0

**Explanation**

We record all kind of waste generated in our activities every year and upload the amount of waste according to their waste code to the online system in line with the local regulation. By this declaration, we calculate emissions according to DEFRA GHG Conversion Factors.

**Business travel**

---



**Evaluation status**

Relevant, calculated

**Metric tonnes CO2e**

66

**Emissions calculation methodology**

The Greenhouse Gas Protocol -Corporate Value Chain (Scope 3) Accounting and Reporting Standard

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

98

**Explanation**

Emissions arising from air travel and short term car rentals conducted by Zorlu Enerji employees have been accounted for under business travel-related Scope 3 emissions. The car rentals information is based on our internal portal which includes detailed business travel information of all employees. We gathered travel information from our travel management company which includes both domestic and international flights. The emissions arising from air travel have been calculated.

**Employee commuting**

---

**Evaluation status**

Relevant, calculated

**Metric tonnes CO2e**

976

**Emissions calculation methodology**

The Greenhouse Gas Protocol -Corporate Value Chain (Scope 3) Accounting and Reporting Standard

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

100

**Explanation**

This data is provided by our suppliers and represents emissions arising from employee commuting.

### Upstream leased assets

---

#### Evaluation status

Not relevant, explanation provided

#### Explanation

We have not used upstream leased assets in the reporting year.

### Downstream transportation and distribution

---

#### Evaluation status

Relevant, not yet calculated

#### Explanation

Zorlu Enerji has given priority to establish a data collection system for Scope 3 emissions starting with the most relevant categories. This category is planned to be included in the data collection boundary in the near future.

### Processing of sold products

---

#### Evaluation status

Not relevant, explanation provided

#### Explanation

Our product, electricity, is directly consumed without any processing. Therefore, we do not have scope 3 emissions to account for under this category.

### Use of sold products

---

#### Evaluation status

Relevant, not yet calculated

**Explanation**

Emissions related to extraction and production of the product have already been accounted for as Scope 1 and 2 emissions. Only transmission and distribution related emissions can be considered for use of sold product emissions. However, we do not have access to reliable data to include this category yet.

**End of life treatment of sold products**

---

**Evaluation status**

Not relevant, explanation provided

**Explanation**

Our sold product, electricity, does not have an end of the life treatment process. Therefore, there are no Scope 3 emissions under this category.

**Downstream leased assets**

---

**Evaluation status**

Not relevant, explanation provided

**Explanation**

We have not used downstream leased assets in the reporting year.

**Franchises**

---

**Evaluation status**

Not relevant, explanation provided

**Explanation**

We do not have any franchises.

**Investments**

---

**Evaluation status**

Relevant, not yet calculated

**Explanation**

Zorlu Enerji has given priority to establish a data collection system for scope 3 emissions starting with the most relevant categories. This category is planned to be included in the data collection boundary in the near future when reliable data can be collected from suppliers.

**Other (upstream)**

---

**Evaluation status**

Not relevant, explanation provided

**Explanation**

There are no additional upstream emission sources

**Other (downstream)**

---

**Evaluation status**

Not relevant, explanation provided

**Explanation**

There are no additional downstream emission sources.

## C6.7

**(C6.7) Are carbon dioxide emissions from biologically sequestered carbon relevant to your organization?**

No

## C6.10

**(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO2e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.**

---

**Intensity figure**

0.00162

**Metric numerator (Gross global combined Scope 1 and 2 emissions)**

1,560,290

**Metric denominator**

unit total revenue

**Metric denominator: Unit total**

962,857,000

**Scope 2 figure used**

Location-based

**% change from previous year**

14.87

**Direction of change**

Decreased

**Reason for change**

The revenue and our absolute gross emissions have increased compared to the previous year. Since our revenue has increased more than our emission reduction, the intensity figure has decreased by 14.87% compared to the previous year.

## C7. Emissions breakdowns

### C7.1

**(C7.1) Does your organization break down its Scope 1 emissions by greenhouse gas type?**

Yes

## C7.1a

**(C7.1a) Break down your total gross global Scope 1 emissions by greenhouse gas type and provide the source of each used greenhouse warming potential (GWP).**

Greenhouse gas	Scope 1 emissions (metric tons of CO2e)	GWP Reference
CO2	1,494,609	IPCC Second Assessment Report (SAR - 100 year)
CH4	45,832	IPCC Second Assessment Report (SAR - 100 year)
N2O	14	IPCC Second Assessment Report (SAR - 100 year)
HFCs	15,491	IPCC Second Assessment Report (SAR - 100 year)

## C-EU7.1b

**(C-EU7.1b) Break down your total gross global Scope 1 emissions from electric utilities value chain activities by greenhouse gas type.**

	Gross Scope 1 CO2 emissions (metric tons CO2)	Gross Scope 1 methane emissions (metric tons CH4)	Gross Scope 1 SF6 emissions (metric tons SF6)	Gross Scope 1 emissions (metric tons CO2e)	Comment
Fugitives	1,494,025	45,832	0	1,555,348	The figure includes geothermal fugitive emissions.
Combustion (Electric utilities)	0	0	0	0	Our power plant generate electricity from renewable sources, hydro and geothermal. There is no combustion for electricity production.
Combustion (Gas utilities)	0	0	0	0	We don't have gas utilities.
Combustion	584	1	0	598	This figure includes the emission of diesel

(Other)					generator and off-road mobile sources such as forklifts, excavators etc.
Emissions not elsewhere classified	0	0	0	0	There is no other emissions.

## C7.2

**(C7.2) Break down your total gross global Scope 1 emissions by country/region.**

Country/Region	Scope 1 emissions (metric tons CO2e)
Turkey	1,555,946

## C7.3

**(C7.3) Indicate which gross global Scope 1 emissions breakdowns you are able to provide.**

- By business division
- By facility
- By activity

### C7.3a

**(C7.3a) Break down your total gross global Scope 1 emissions by business division.**

Business division	Scope 1 emissions (metric ton CO2e)
Geothermal Energy Operations	1,555,637
Hydro Energy Operations	159

## C7.3b

**(C7.3b) Break down your total gross global Scope 1 emissions by business facility.**

Facility	Scope 1 emissions (metric tons CO2e)	Latitude	Longitude
Alaşehir Geothermal Power Plant	78,840	38.233	28.261
Kızıldere I-II-III Geothermal Power Plant	1,476,797	37.956213	28.842528
Ataköy Hydro Power Plant	0	40.424004	36.884118
Beyköy Hydro Power Plant	7	40.073156	30.755448
Çıldır Hydro Power Plant	13	40.900774	43.328855
İkizdere Hydro Power Plant	36	40.795463	40.551031
Kuzgun Hydro Power Plant	4	40.183631	41.063687
Mercan Hydro Power Plant	0	39.413794	39.30221
Tercan Hydro Power Plant	99	39.755985	40.40183
İstanbul Headquarters	132	40.993661	28.699289
Ankara Office	19	39.892882	32.816238

## C7.3c

**(C7.3c) Break down your total gross global Scope 1 emissions by business activity.**

Activity	Scope 1 emissions (metric tons CO2e)
Stationary Combustion	156
Mobile Combustion	292
Fugitive Emissions	15,954
Process Activities	1,539,944



Office Activities	151
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### C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4

**(C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4) Break down your organization’s total gross global Scope 1 emissions by sector production activity in metric tons CO2e.**

	Gross Scope 1 emissions, metric tons CO2e	Comment
Electric utility generation activities	1,540,100	Geothermal project activities have emissions of CO2 and CH4 due to the release of non-condensable gases from produced steam. Geothermal power projects, non-condensable gases flow with the steam into the power plant. A small proportion of the CO2 is converted to carbonate/bicarbonate in the cooling water circuit. In addition, parts of the non-condensable gases are re-injected into the geothermal reservoir. However, as a conservative approach, the applied calculation methodology, ACM0002, assumes that all non-condensable gases entering the power plant are discharged to the atmosphere via the cooling tower. Hydropower plant has no emission since the electricity is generated from renewable sources.

### C7.5

**(C7.5) Break down your total gross global Scope 2 emissions by country/region.**

Country/Region	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low-carbon electricity, heat, steam or cooling accounted in market-based approach (MWh)
Turkey	4,343	0	9,479	0

### C7.6

**(C7.6) Indicate which gross global Scope 2 emissions breakdowns you are able to provide.**

By business division

By facility

## C7.6a

**(C7.6a) Break down your total gross global Scope 2 emissions by business division.**

Business division	Scope 2, location-based emissions (metric tons CO2e)	Scope 2, market-based emissions (metric tons CO2e)
Geothermal Energy Operations	4,279	0
Hydro Energy Operations	0	0

## C7.6b

**(C7.6b) Break down your total gross global Scope 2 emissions by business facility.**

Facility	Scope 2 location-based emissions (metric tons CO2e)	Scope 2, market-based emissions (metric tons CO2e)
Alaşehir Geothermal Power Plant	109	0
Kızıldere I-II-III Geothermal Power Plant	4,169	0
Ataköy Hydro Power Plant	0	0
Beyköy Hydro Power Plant	0	0
Çıldır Hydro Power Plant	0	0
İkizdere Hydro Power Plant	0	0
Kuzgun Hydro Power Plant	0	0
Mercan Hydro Power Plant	0	0
Tercan Hydro Power Plant	0	0

Istanbul Headquarters	54	0
Ankara Office	10	0

## C7.9

**(C7.9) How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to those of the previous reporting year?**

Increased

### C7.9a

**(C7.9a) Identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined) and for each of them specify how your emissions compare to the previous year.**

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption				
Other emissions reduction activities				
Divestment				
Acquisitions				
Mergers				
Change in output	823,846	Increased	112	In the reporting year, a new power generation unit has added to the Kızıldere geothermal power plant. Therefore, the total emissions have increased compared to

				base-year. In geothermal power plants, there are two main factors that affect CO2 emissions: Natural discharge and injection. In our geothermal power plants which are the flash steam system, the amount of dissolved CO2 in the injected fluid is very small. The amount of saturated CO2 in the reservoir will be reduced over time thanks to dilution with keeping steady injection rate as per production rate. So CO2 emission will decrease in time
Change in methodology				
Change in boundary				
Change in physical operating conditions				
Unidentified				
Other				

### C7.9b

**(C7.9b) Are your emissions performance calculations in C7.9 and C7.9a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?**

Location-based

## C8. Energy

### C8.1

**(C8.1) What percentage of your total operational spend in the reporting year was on energy?**

More than 0% but less than or equal to 5%

## C8.2

**(C8.2) Select which energy-related activities your organization has undertaken.**

	Indicate whether your organization undertakes this energy-related activity
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	No
Consumption of purchased or acquired steam	No
Consumption of purchased or acquired cooling	No
Generation of electricity, heat, steam, or cooling	Yes

## C8.2a

**(C8.2a) Report your organization's energy consumption totals (excluding feedstocks) in MWh.**

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total MWh
Consumption of fuel (excluding feedstock)		0	2,166	2,166
Consumption of purchased or acquired electricity		0	9,479	9,479
Consumption of self-generated non-fuel renewable energy		280,431		280,431
Total energy consumption		280,431	11,645	292,076

## C8.2b

**(C8.2b) Select the applications of your organization’s consumption of fuel.**

	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	Yes
Consumption of fuel for the generation of heat	Yes
Consumption of fuel for the generation of steam	No
Consumption of fuel for the generation of cooling	No
Consumption of fuel for co-generation or tri-generation	Yes

## C8.2c

**(C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.**

**Fuels (excluding feedstocks)**

Natural Gas

**Heating value**

LHV (lower heating value)

**Total fuel MWh consumed by the organization**

241

**MWh fuel consumed for self-generation of electricity**

0

**MWh fuel consumed for self-generation of heat**

241

**MWh fuel consumed for self-cogeneration or self-trigeneration**

0

**Comment**

We consume natural gas for the only generation of heat.

---

**Fuels (excluding feedstocks)**

Diesel

**Heating value**

LHV (lower heating value)

**Total fuel MWh consumed by the organization**

1,670

**MWh fuel consumed for self-generation of electricity**

0

**MWh fuel consumed for self-generation of heat**

1,670

**MWh fuel consumed for self-cogeneration or self-trigeneration**

0

**Comment**

Diesel is consumed by the vehicles and generator.

---

**Fuels (excluding feedstocks)**

Lignite Coal

**Heating value**

LHV (lower heating value)

**Total fuel MWh consumed by the organization**

248

**MWh fuel consumed for self-generation of electricity**

0

**MWh fuel consumed for self-generation of heat**

248

**MWh fuel consumed for self-cogeneration or self-trigeneration**

0

**Comment**

We consume lignite coal for the generation of heat.

---

**Fuels (excluding feedstocks)**

Motor Gasoline

**Heating value**

LHV (lower heating value)

**Total fuel MWh consumed by the organization**

7

**MWh fuel consumed for self-generation of electricity**

0

**MWh fuel consumed for self-generation of heat**



7

**MWh fuel consumed for self-cogeneration or self-trigeneration**

0

**Comment**

Gasoline is consumed by the vehicles.

## C8.2d

**(C8.2d) List the average emission factors of the fuels reported in C8.2c.**

### Diesel

---

**Emission factor**

74.1

**Unit**

kg CO2 per GJ

**Emission factor source**

2006 IPCC Guidelines for National Greenhouse Gas Inventories -Volume 2-Chapter 2 Stationary Combustion - Table 2.2 Default Emission Factors For Stationary Combustion in the Energy Industries

2006 IPCC Guidelines for National Greenhouse Gas Inventories -Volume 2-Chapter 3 Mobile Combustion - Table 3.2.1. Road Transport Default CO2 Emissions Factors and Uncertainty Ranges

**Comment**

All applied emission factors have been checked and verified by an accredited third-party verification organization.

### Lignite Coal

---

**Emission factor**

101.1

**Unit**

kg CO2 per GJ

**Emission factor source**

2006 IPCC Guidelines for National Greenhouse Gas Inventories -Volume 2-Chapter 2 Stationary Combustion - Table 2.2 Default Emission Factors For Stationary Combustion in the Energy Industries

**Comment**

All applied emission factors have been checked and verified by an accredited third-party verification organization.

**Motor Gasoline**

---

**Emission factor**

69.3

**Unit**

kg CO2 per GJ

**Emission factor source**

2006 IPCC Guidelines for National Greenhouse Gas Inventories -Volume 2-Chapter 3 Mobile Combustion - Table 3.2.1. Road Transport Default CO2 Emissions Factors and Uncertainty Ranges

**Comment**

All applied emission factors have been checked and verified by an accredited third-party verification organization.

**Natural Gas**

---

**Emission factor**

56.1

**Unit**

kg CO2 per GJ

**Emission factor source**

2006 IPCC Guidelines for National Greenhouse Gas Inventories -Volume 2-Chapter 2 Stationary Combustion - Table 2.2 Default Emission Factors For Stationary Combustion in the Energy Industries

**Comment**

All applied emission factors have been checked and verified by an accredited third-party verification organization.

**C8.2e**

**(C8.2e) Provide details on the electricity, heat, steam, and cooling your organization has generated and consumed in the reporting year.**

	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity	2,222,249	280,431	2,222,249	280,431
Heat	0	0	0	0
Steam	345,479	34,912	0	0
Cooling	0	0	0	0

**C-EU8.2e**

**(C-EU8.2e) For your electric utility activities, provide a breakdown of your total power plant capacity, generation, and related emissions during the reporting year by source.**

**Coal – hard**

**Nameplate capacity (MW)**

0

**Gross electricity generation (GWh)**

0

**Net electricity generation (GWh)**

0

**Absolute scope 1 emissions (metric tons CO2e)**

0

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

0

**Comment**

## Lignite

---

**Nameplate capacity (MW)**

0

**Gross electricity generation (GWh)**

0

**Net electricity generation (GWh)**

0

**Absolute scope 1 emissions (metric tons CO2e)**

0

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

0

**Comment**

## Oil

---

**Nameplate capacity (MW)**

0

**Gross electricity generation (GWh)**

0

**Net electricity generation (GWh)**

0

**Absolute scope 1 emissions (metric tons CO2e)**

0

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

0

**Comment**

## Gas

---

**Nameplate capacity (MW)**

0

**Gross electricity generation (GWh)**

0

**Net electricity generation (GWh)**

0

**Absolute scope 1 emissions (metric tons CO2e)**

0



**Scope 1 emissions intensity (metric tons CO2e per GWh)**

0

**Comment**

**Biomass**

---

**Nameplate capacity (MW)**

0

**Gross electricity generation (GWh)**

0

**Net electricity generation (GWh)**

0

**Absolute scope 1 emissions (metric tons CO2e)**

0

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

0

**Comment**

**Waste (non-biomass)**

---

**Nameplate capacity (MW)**

0

**Gross electricity generation (GWh)**

0



**Net electricity generation (GWh)**

0

**Absolute scope 1 emissions (metric tons CO2e)**

0

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

0

**Comment**

**Nuclear**

---

**Nameplate capacity (MW)**

0

**Gross electricity generation (GWh)**

0

**Net electricity generation (GWh)**

0

**Absolute scope 1 emissions (metric tons CO2e)**

0

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

0

**Comment**

**Geothermal**

---

**Nameplate capacity (MW)**

305

**Gross electricity generation (GWh)**

1,901

**Net electricity generation (GWh)**

1,622

**Absolute scope 1 emissions (metric tons CO2e)**

1,555,637

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

818.19

**Comment**

These figures cover all our geothermal power plants operating in 2017: Alaşehir, Kızıldere I, Kızıldere II and Kızıldere III

**Hydroelectric**

---

**Nameplate capacity (MW)**

120.7

**Gross electricity generation (GWh)**

321

**Net electricity generation (GWh)**

319

**Absolute scope 1 emissions (metric tons CO2e)**

159

**Scope 1 emissions intensity (metric tons CO2e per GWh)**



0.49

**Comment**

These figures cover all our hydroelectric power plants operating in 2017: Ataköy, Beyköy, Çıldır, İkizdere, Kuzgun, Mercan, Tercan

**Wind**

---

**Nameplate capacity (MW)**

0

**Gross electricity generation (GWh)**

0

**Net electricity generation (GWh)**

0

**Absolute scope 1 emissions (metric tons CO<sub>2</sub>e)**

0

**Scope 1 emissions intensity (metric tons CO<sub>2</sub>e per GWh)**

0

**Comment**

**Solar**

---

**Nameplate capacity (MW)**

0

**Gross electricity generation (GWh)**

0



**Net electricity generation (GWh)**

0

**Absolute scope 1 emissions (metric tons CO2e)**

0

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

0

**Comment**

**Other renewable**

---

**Nameplate capacity (MW)**

0

**Gross electricity generation (GWh)**

0

**Net electricity generation (GWh)**

0

**Absolute scope 1 emissions (metric tons CO2e)**

0

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

0

**Comment**

**Other non-renewable**

---

**Nameplate capacity (MW)**

0

**Gross electricity generation (GWh)**

0

**Net electricity generation (GWh)**

0

**Absolute scope 1 emissions (metric tons CO2e)**

0

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

0

**Comment**

**Total**

---

**Nameplate capacity (MW)**

425.7

**Gross electricity generation (GWh)**

2,222

**Net electricity generation (GWh)**

1,942

**Absolute scope 1 emissions (metric tons CO2e)**

1,555,796

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

700.1

**Comment**

These figures cover all our hydroelectric and geothermal power plants operating in 2018.

**C8.2f**

**(C8.2f) Provide details on the electricity, heat, steam and/or cooling amounts that were accounted for at a low-carbon emission factor in the market-based Scope 2 figure reported in C6.3.**

---

**Basis for applying a low-carbon emission factor**

Grid mix of renewable electricity

**Low-carbon technology type**

Hydropower

Other low-carbon technology, please specify

Geothermal

**Region of consumption of low-carbon electricity, heat, steam or cooling**

Europe

**MWh consumed associated with low-carbon electricity, heat, steam or cooling**

280,431

**Emission factor (in units of metric tons CO<sub>2</sub>e per MWh)**

0

**Comment**

The generation of low carbon electricity is realized by the facilities who use 13% of this amount for their own use, the rest is being fed into the national electricity grid.

## C-EU8.4

**(C-EU8.4) Does your electric utility organization have a transmission and distribution business?**

No

## C9. Additional metrics

### C9.1

**(C9.1) Provide any additional climate-related metrics relevant to your business.**

### C-EU9.5a

**(C-EU9.5a) Break down, by source, your total planned CAPEX in your current CAPEX plan for power generation.**

Primary power generation source	CAPEX planned for power generation from this source	Percentage of total CAPEX planned for power generation	End year of CAPEX plan	Comment
Geothermal	351,697,644	91.42	2019	Capex plans for geothermal projects including GECO project to mitigate GHG in geothermal power plants included.
Hydroelectric	23,322,675	7.35	2019	Capacity addition to Ikizdere is included.
Solar	28,304,000	1.23	2019	New solar investment is included.

### C-EU9.5b

**(C-EU9.5b) Break down your total planned CAPEX in your current CAPEX plan for products and services (e.g. smart grids, digitalization, etc.).**

Products and services	Description of product/service	CAPEX planned for product/service	Percentage of total CAPEX planned products and services	End of year CAPEX plan
Distributed generation	Solar systems	28,304,000	99	2020
Large-scale storage	Storage in Geothermal power plants with GECO project is included.	50,289	1	2020

### C-CO9.6/C-EU9.6/C-OG9.6

**(C-CO9.6/C-EU9.6/C-OG9.6) Disclose your investments in low-carbon research and development (R&D), equipment, products, and services.**

**Investment start date**

October 1, 2018

**Investment end date**

September 1, 2025

**Investment area**

Products

**Technology area**

Carbon capture and storage/utilisation

**Investment maturity**

Pilot demonstration

**Investment figure**

75,000,000



**Low-carbon investment percentage**

81-100%

**Please explain**

Various institutions and organizations from countries such as France, the UK, Italy, Iceland and Germany are taking part in the GECO Project. The project aims to conduct international field applications, test new equipment and technologies, and enable the exchange of existing know-how and experience to reduce emissions in line with the goals set forth in the “Mitigating Carbon Dioxide (CO2) Emissions from Geothermal Energy” under the section titled “Reducing the Costs of Electricity Generation from Renewable Energy Sources” in the Horizon 2020 Program. As part of the project, the injection of carbon dioxide gas into the reservoir to eliminate carbon dioxide emissions arising from the generation of electricity from geothermal sources will be tested in a total of four fields in Turkey, Iceland, Germany and Italy. The project officially began on October 1, 2018. The kick-off meeting for the project was held on October 24–26, 2018, in Reykjavik, Iceland. Technical and commercial activities related to the project are currently underway.

Under the project, initiated with the “Grant Agreement,” a grant of approximately €15 million will be provided to Zorlu Dogal for use in R&D work in the area of sustainable generation of geothermal energy.

Zorlu Dogal will contribute to the GECO Project with its vast experience and R&D resources in the field of geothermal energy.

## C10. Verification

### C10.1

**(C10.1) Indicate the verification/assurance status that applies to your reported emissions.**

	Verification/assurance status
Scope 1	Third-party verification or assurance process in place
Scope 2 (location-based or market-based)	Third-party verification or assurance process in place
Scope 3	No third-party verification or assurance

## C10.1a

**(C10.1a) Provide further details of the verification/assurance undertaken for your Scope 1 and/or Scope 2 emissions and attach the relevant statements.**

---

**Scope**

Scope 1

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Reasonable assurance

**Attach the statement**

**Page/ section reference**

Two assurance statement is attached. One of them is for Alaşehir GES, the other one is for Kızıldere I-II-III GES.

**Relevant standard**

ISO14064-3

**Proportion of reported emissions verified (%)**

99

---



**Scope**

Scope 2 location-based

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Reasonable assurance

**Attach the statement**

**Page/ section reference**

Two assurance statement is attached. One of them is for Alaşehir GES, the other one is for Kızıldere I-II-III GES.

**Relevant standard**

ISO14064-3

**Proportion of reported emissions verified (%)**

99

## **C10.2**

**(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?**

No, we do not verify any other climate-related information reported in our CDP disclosure

## C11. Carbon pricing

### C11.1

**(C11.1) Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)?**

No, but we anticipate being regulated in the next three years

### C11.1d

**(C11.1d) What is your strategy for complying with the systems in which you participate or anticipate participating?**

Turkey was not a party of Kyoto Protocol and Paris Agreement did not approved by the Turkish Parliment. However With the fund provided by World Bank, PMR project has started and now in 2019 it's in the development of second phase.

As Zorlu Dogal we generate electricity from renewable sources and a cap or a tax is not an option considered for our operation however if local ETS is developed we can generate local emission reduction units from our hydro power plants.

### C11.2

**(C11.2) Has your organization originated or purchased any project-based carbon credits within the reporting period?**

No

### C11.3

**(C11.3) Does your organization use an internal price on carbon?**

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

## C12. Engagement

### C12.1

**(C12.1) Do you engage with your value chain on climate-related issues?**

Yes, our suppliers

Yes, our customers

Yes, other partners in the value chain

### C12.1a

**(C12.1a) Provide details of your climate-related supplier engagement strategy.**

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**Type of engagement**

Information collection (understanding supplier behavior)

**Details of engagement**

Collect climate change and carbon information at least annually from suppliers

**% of suppliers by number**

1

**% total procurement spend (direct and indirect)**

1

**% Scope 3 emissions as reported in C6.5**

1

**Rationale for the coverage of your engagement**



ZH, the mother company of ZD launched Smart Life -2030 strategy for the low carbon transition. With the vision of Smart Life project Zorlu Supplier Principles has been issued in 2018 and information including GHG emissions has been requested from the suppliers. The project is in the beginning phase but it is accelerated to gain information and create consciousness in suppliers.

**Impact of engagement, including measures of success**

The project is in the beginning phase but it is accelerated to gain information and create consciousness in suppliers.

**Comment**

## C12.1b

**(C12.1b) Give details of your climate-related engagement strategy with your customers.**

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**Type of engagement**

Education/information sharing

**Details of engagement**

Run an engagement campaign to educate customers about the climate change impacts of (using) your products, goods, and/or services

**% of customers by number**

0

**% Scope 3 emissions as reported in C6.5**

0

**Please explain the rationale for selecting this group of customers and scope of engagement**



ZH the mother company of ZD launched Smart-Life 2030 Project for the transformation of low carbon economy. The reflections of this vision accelerated investments in solar energy in terms of solar panel development and building solar power plants and R&D studies for lower emission geothermal power plants.

With Smart Life project, targets has been set, information sharing meetings as "A Little Break", Dialogue Conferences has been organized to expand the vision, innovation culture importance is explained.

**Impact of engagement, including measures of success**

Smart-Life 2030 has been launched in 2018 and the mid targets defined for 2022. The performance measurement will be meaningful in the end of 2019 to see the created value .

**C12.1c**

**(C12.1c) Give details of your climate-related engagement strategy with other partners in the value chain.**

Beside ZH's low carbon transition plan reflections ZD has a integrated management system based on international standards like ISO 14001 and ISO 14064. Those standards based on life cycle approach to expand the vision of the company to all value chain. Once the risk assessment of the company done including value chain the action plans of the risks and operations developing by the company. In terms of climate change with the vision of Smart-Life 2030 project the goal is to create consciousness and support the transformation of low carbon economy.

**C12.3**

**(C12.3) Do you engage in activities that could either directly or indirectly influence public policy on climate-related issues through any of the following?**

- Direct engagement with policy makers
- Trade associations

**C12.3a**

**(C12.3a) On what issues have you been engaging directly with policy makers?**

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
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<p>Other, please specify</p> <p>Turkey INDC Preperation</p>	<p>Support</p>	<p>Turkey is a rapidly developing country alongside with its sustainable development. Turkish Energy Industry will act its best to tackle climate change with important projects carried out in renewable energy, energy efficiency and other low-carbon development scenarios. Turkey, as an Annex I country at the Convention with special circumstances recognized by the Conference of the Parties, can fully utilize the opportunities. Energy Industry can implement its internal strategies, actions and plans following National Climate Change Mitigation and Adaptation Plans by the supporting different instruments: 1- Broad dissemination of knowledge on mitigation opportunities (enabling finance solutions ,technology solutions adapted to local circumstances ,innovative alternatives to the conventional patterns) 2- Coherent and comprehensive implementation of high level targets in close cooperation with the government and other related sectors 3- Strengthening national institutions for technology, finance and capacity building.</p>	<p>Zorlu Doğal is committed to contribute to the development of appropriate measures to address energy and climate related challenges. We are actively involved in policy development through our participation in activities developed by public institutions. The views and proposals for the draft INDC-Turkey which is then submitted to UNFCCC were discussed and shared with the MoEU –Turkey.</p>
<p>Adaptation or resilience</p>	<p>Support</p>	<p>Zorlu Holding Energy Group (ZHEG) is a member of The Climate Platform, an initiative jointly established by Regional Environment Centre Turkey (REC Turkey) and TÜSİAD (Turkish Industry and Business Association) In July 2009 for the purpose of supporting efforts of Turkish business community tackling climate change, and transition to a low carbon economy. ZHEG has signed “The 2°C Convention” which invites the governments to accept their responsibilities regarding climate change; and to collaborate with each other on “international cooperation”, “effective market mechanisms”, “financing the transition to low carbon economy”, “encouraging innovation and efficiency,” “forest preservation” and “adaptation</p>	<p>The Company defends a strong support to renewable generation and supported the interaction between the Energy Sector Companies and the government to achieve mitigation an adaptation to climate change events.</p>

	<p>to climate change and risk reduction”. In this scope, Zorlu Doğal reported has reported greenhouse gas emissions from 2009 to 2016 within the framework of the ISO 14064-1 standard. IPCC 2006 Guidelines are used as the methodology for the related calculations.</p>	
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### C12.3b

**(C12.3b) Are you on the board of any trade associations or do you provide funding beyond membership?**

Yes

### C12.3c

**(C12.3c) Enter the details of those trade associations that are likely to take a position on climate change legislation.**

**Trade association**

TÜSİAD

**Is your position on climate change consistent with theirs?**

Consistent

**Please explain the trade association’s position**

ZHEG is a member of The Climate Platform, an initiative jointly established by Regional Environment Centre Turkey (REC Turkey) and TÜSİAD (Turkish Industry and Business Association) in July 2009 to support the efforts of Turkish business community tackling climate change, and to assist transition to low carbon economy. The Climate Platform brings together business world to discuss major topics of transition to low carbon economy such as technology transfer, financing and carbon management in supply chain. The major working areas of the platform, among others such as supporting the private sector on strengthening of corporate governance and risk management regarding climate change and providing insight, analysis and information to the private sector. The platform members support development of national climate change policies,

establishment of public-private sector cooperation for combating climate change and active participation of business community to the international negotiations.

**How have you influenced, or are you attempting to influence their position?**

Zorlu Doğal, is a member of the Climate Change Leaders Group formed under the Climate Platform. This group has been working on the climate policies of the Turkish private sector and the expectations in the post 2012 period. We have been following international meetings such as Durban and Doha. In the reporting period we discussed and shared our views on MRV with the MoEU. In this regard we are in favor of a legal infrastructure for monitoring and reporting of greenhouse gases with the expectation of a satisfactory national transition strategy to fill in the capacity gaps among the industry sector, consultants, verifiers and the relevant governmental units.

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**Trade association**

Turkish Cogeneration & Clean Energy Technologies Association TURKOTED

**Is your position on climate change consistent with theirs?**

Consistent

**Please explain the trade association's position**

TURKOTED was established in 1998 to support Cogeneration & Clean Energy Technologies Association with regards to wind and solar technology and to encourage the implementation and facilitation of clean energy technologies transition. To achieve this goal, TURKOTED works to develop sustainable energy policies and remove unnecessary barriers to implementation.

**How have you influenced, or are you attempting to influence their position?**

ZHEG is a member of The Turkish Cogeneration & Clean Energy Technologies Association and participates in its meetings. The association members support development of National Cogeneration & Clean Energy Technology policies. Zorlu Doğal support the association on preparation of an annual country report for COGEN Europe. Zorlu Doğal ensures that its views are acknowledged and integrated into its publications.



## C12.3f

### **(C12.3f) What processes do you have in place to ensure that all of your direct and indirect activities that influence policy are consistent with your overall climate change strategy?**

The overall alignment of Zorlu Doğal's position with the corporate climate strategy, has a strong support to:

- Renewable energy generation for a more sustainable energy like solar plant investments done in 2018,
- Responsible investment in green energy to shape the future and achieve the Sustainable Development Goals (SDGs) and the global climate action agenda with the vision of Smart Life 2030.
- Effective GHG emissions management aiming to reduce emissions with the Horizon 2020 - GECO project for low emission in geothermal power plants and to enforce the expected requirements related to the UNFCCC

Our company aims for a new market design that allows integration of low-carbon technologies, including renewable energy systems via long-term contracts.

We believe that stability and regulatory stability and regulatory compliance control are essential to create the conditions for the needed investments in the energy sector.

All managerial decisions related to our direct and indirect activities are taken with a sustainability approach through economic, social and environmental impacts. Our sustainability strategy that is compatible with climate change is annually improved and becoming even more comprehensive each year.

The strategy is developed by the support of top management and all departments. This approach has allowed our company to address Climate Change from both mitigation and adaptation perspectives. Key Executives including the CEO are actively taking part in various environmental and climate change platforms/ organizations thus these issues have top priority in our agenda. They periodically provide research and reports for new markets.

We consider that all climate and energy proposals should be accompanied by a transparent, inclusive and independently verified impact assessment. Innovation is the key driver to achieve a low-carbon economy. Technological change and development will significantly enhance the portfolio and, over time, will bring down the cost of reaching global climate change goals.

## C12.4

### **(C12.4) Have you published information about your organization's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s).**

**Publication**

In mainstream reports

**Status**

Complete

**Attach the document**

 Zorlu Jeotermal.pdf

 Zorlu Doğal Enerji.pdf

**Page/Section reference**

Annual Report: Zorlu Holding's Energy Group issue reports with the scope of both CDP reporting companies Zorlu Dogal and Zorlu Energy. Annual Report Page 84 -90 contain information about sustainability governance and strategy.

Verification Statements: ISO 14064 Verification statements has been attached and they contain emission datas of 2018.

**Content elements**

Governance

Strategy

Risks & opportunities

Emissions figures

Emission targets

**Comment**

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**Publication**

In voluntary sustainability report



**Status**

Complete

**Attach the document**

**Page/Section reference**

Zorlu Holding's Energy Group issue reports with the scope of both CDP reporting companies Zorlu Dogal and Zorlu Energy. Progress report 2018 contains data on page 3 about the emissions.

**Content elements**

Emissions figures  
Other metrics

**Comment**

## C14. Signoff

### C-FI

**(C-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.**

### C14.1

**(C14.1) Provide details for the person that has signed off (approved) your CDP climate change response.**

	Job title	Corresponding job category
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Row 1	Senior Assistant Manager	Environment/Sustainability manager
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## 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