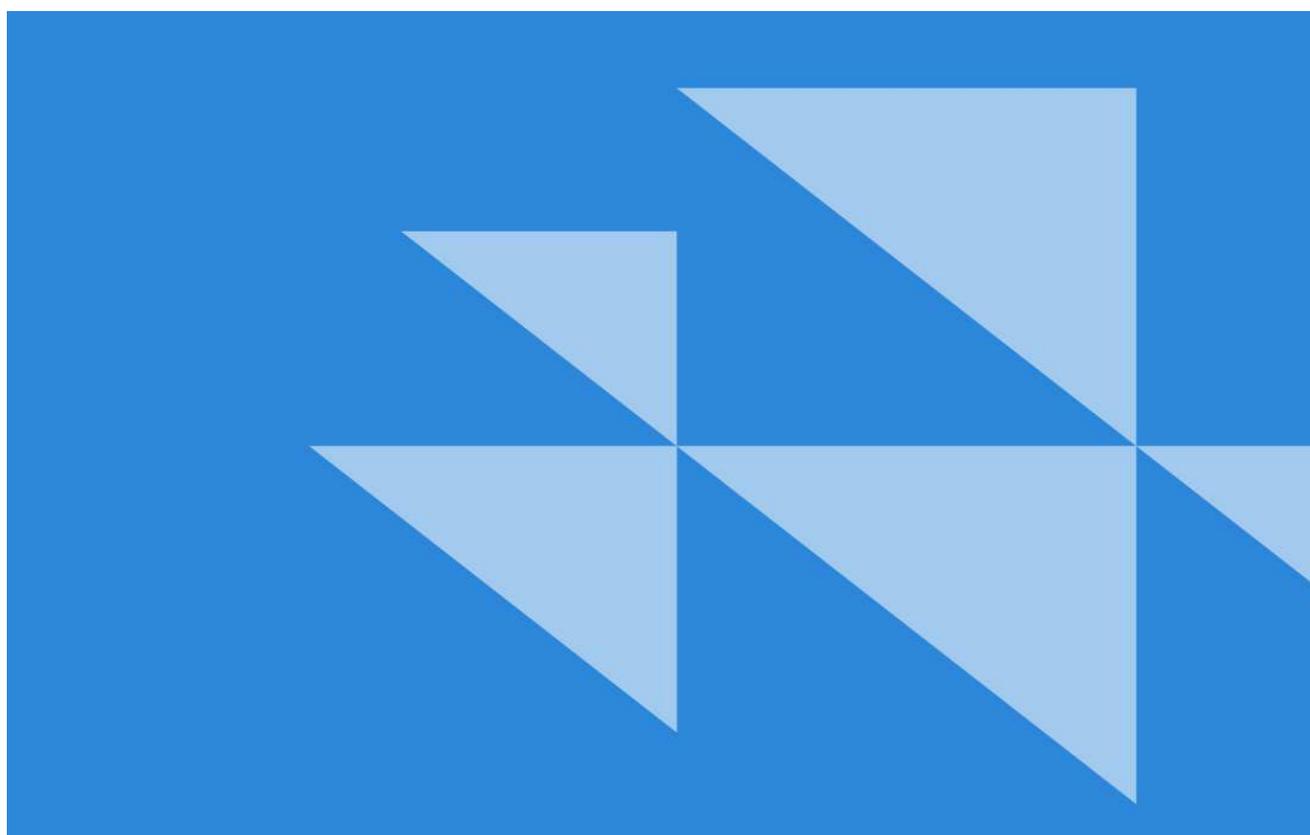




CDP – Water Security Questionnaire 2018



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W0 Introduction

Introduction

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

Founded in 1952 by the then governor of Minas Gerais, Juscelino Kubitschek de Oliveira, Companhia Energética de Minas Gerais (Cemig) operates in the fields of generation, transmission, commercialization and distribution of electricity, energy solutions (Efficientia S.A.) and distribution of natural gas (Gasmig). The group consists of the holding, Companhia Energética de Minas Gerais - Cemig, the wholly-owned subsidiaries Cemig Geração e Transmissão S.A. (Cemig GT) and Cemig Distribuição S.A. (Cemig D), totaling 175 Companies, 15 Consortia and 2 FIPs (Investment Funds in Shares), resulting in assets present in 22 Brazilian states and the Federal District. Since its foundation, the Company has assumed the role of bringing the collective welfare to the regions where it operates in an innovative and sustainable way. This determination led to its position as the largest power distributor in lines extension and networks, and one of the largest power generation and power transmission Companies in the country. Cemig also has operations in exploration and distribution of natural gas (Gasmig) and data transmission (Cemig Telecom). Cemig holds 26.06% direct and 22.80% indirect interest in Light S.A., an energy distributor working in 31 municipalities in the State of Rio de Janeiro, covering a region with more than 11 million consumers. It also has a 36.97% interest in Empresa de transmissão Transmissora Aliança de Energia Elétrica S.A. (Taesa), which gives it control of this company, and 34.15% of the total capital, in addition to 6.8% indirectly through of Light, of Renova Energia S.A.

Cemig is a publicly-held company controlled by the Government of the State of Minas Gerais (51%) and its shares are traded in São Paulo, BM&FBovespa SA, New York, New York Stock Exchange (NYSE), and in Madrid, the Latin American Stock Market (Latibex). Consolidated net operating revenue of the Company reached R\$ 21.71 billion in 2017, based on a matrix, which main source of energy are renewable resources.

Cemig's generating plant has an installed capacity of 5,727 MW, of which 99.30% refers to hydraulic generation; 0.20%, to thermal generation; 0.50% to wind generation; and 0.01%, to solar generation. The Company has 5,287 km of transmission lines. In the field of electricity distribution, it is responsible for the management of the largest electricity distribution network in Latin America, with more than 529 thousand km of extension. At the end of 2017, Cemig had 5,864 employees.

For its commitment to principles of social and environmental responsibility, its economic and financial strength and technical excellence, the Company is internationally recognized as a reference in sustainability in its sector and is positioned as one of the main consolidation vectors of the Brazilian electricity industry. Cemig has been part of Dow Jones Sustainability Index (DJSI World) for 18 years since its implementation. For the 13th consecutive year, it also participated in the BM&FBovespa Corporate Sustainability Index (ISE) and was selected for the 8th time to compose the Carbon Efficient Index (ICO2), created in 2010 by BM&FBovespa and

BNDES. In 2017 Cemig was listed among the leading companies in climate change management in Latin America by the Water Program, the quality of information disclosed to investors and the global market. The recognition was granted by the CDP Latin America.

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

- Electricity generation
- Transmission
- Distribution

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

Primary power generation source	Nameplate capacity (MW)	% of total nameplate capacity	Gross generation (MWh)
Oil	131	1.82	38,650.00
Hydroelectric	7,012	97.48	19,592,950.00
Wind	49	0.68	98,380.00
Solar	1	0.02	1,652.00
Total	7,193	100	19,731,632.00

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

Start date	End date
From: 01/01/2017	To: 12/31/2017

(W0.3) Select the countries for which you will provide data.

Brazil

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

BRL

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

- Companies, entities or groups over which operational control is exercised

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

- No

W1 Current state

Dependence

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

Water quality and quantity	Direct use importance rating	Indirect use importance rating	Please explain
Sufficient amounts of good quality freshwater available for use	Select from: <ul style="list-style-type: none"> • Vital 	Select from: <ul style="list-style-type: none"> • Not important at all 	Direct Use: Cemig's generation plants are predominantly composed of hydroelectric plants, which have 3,500 km ² of reservoirs, representing 97.48% of the Company's installed capacity. Thus, the amount of water is of fundamental importance so as not to harm the generation of energy. The amount of water is sensitive to climatic variations, vulnerable to the consequences of the exploitation of other natural resources, is greatly affected by human actions and is subject to the regulatory environment. Thermal plants also depend on water, albeit in much smaller volumes. Indirect Use: The Company performs the geographical mapping of its critical suppliers, identifying whether they are located in areas of water stress. All these suppliers are located in Brazil, so they are not exposed to water stress.
Sufficient amounts of recycled, brackish and/or produced water available for use	<ul style="list-style-type: none"> • Not important at all 	<ul style="list-style-type: none"> • Not important at all 	Direct Use: Most of Cemig's power generation does not have the use of water. There is a low consumption in its operations, only in a thermoelectric plant (HPP Igarapé) and in administrative activities, with the water recirculation rate considered insignificant in these operations. Indirect Use: The percentage of recycling is considered insignificant. In 2017, Cemig promoted the Concurso Ideia Iluminada (Illuminated Idea Contest), aiming to identify initiatives that aim to reduce water consumption. It was selected the project that contemplates the reuse of rainwater at the company's location in Governador Valadares. The project is already being implemented.

Water quality and quantity	Direct use importance rating	Indirect use importance rating	Please explain
			<p>and in administrative activities, with the water recirculation rate considered insignificant in these operations. Indirect Use: The percentage of Direct Use: Most of Cemig's power generation does not have the use of water. There is a low consumption in its operations, only in a thermoelectric plant (HPP Igarapé) and in administrative activities, with the water recirculation rate considered insignificant in these operations. Indirect Use: The percentage of recycling is considered insignificant. In 2017, Cemig promoted the Concurso Ideia Iluminada (Illuminated Idea Contest), aiming to identify initiatives that aim to reduce water consumption. It was selected the project that contemplates the reuse of rainwater at the company's location in Governador Valadares. The project is already being implemented.</p> <p>is</p>

Company-wide water accounting

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

Water aspect	% of sites/facilities/operations	Please explain
Water withdrawals – total volumes	<ul style="list-style-type: none"> • 76-99 	Cemig has water meters for both groundwater and surface water. It should be noted that all water withdrawals are granted by the environmental agency.
Water withdrawals – volumes from water stressed areas	<ul style="list-style-type: none"> • Not relevant 	Cemig does not have water catchment in a water stress area.
Water withdrawals – volumes by source	<ul style="list-style-type: none"> • 76-99 	Cemig has water meters for both groundwater and surface water. It should be noted that all water withdrawals are granted by the environmental agency.
Water withdrawals quality	<ul style="list-style-type: none"> • 76-99 	Cemig has water meters for both groundwater and surface water. It should be noted that all water withdrawals are granted by the environmental agency.
Water discharges – total volumes	<ul style="list-style-type: none"> • 76-99 	Cemig's effluents are generated only in its administrative processes. In the TPP Igarapé, the water returns to the watercourse after being used. On the other hand, the effluents generated in the administrative units are discharged in the public network or intended for controlled septic tanks, not affecting, directly, any watercourse. The estimation for the volumes is based on the principles of the Brazilian standard NBR 7229.
Water discharges – volumes by destination	76-99	Cemig estimates the volume of effluents disposed of in sewage and in its effluent treatment plants, using the principles of the Brazilian standard NBR 7229.
Water discharges – volumes by treatment method	76-99	Effluents generated in administrative units are disposed of in public sewage systems or in controlled septic tanks and do not directly affect water bodies.
Water discharge quality – by standard effluent parameters	76-99	Cemig has water meters, both measuring the consumption of groundwater or surface water. It should be noted that all water withdrawals are granted by the environmental agency. Therefore, the Company knows and reports in its Annual and Sustainability Report the total amount of water consumed.
Water discharge quality – temperature	76-99	Effluents generated in administrative units are disposed of in public sewage systems or in controlled septic tanks and do not directly affect water bodies.
Water consumption – total volume	76-99	Cemig has water meters, both measuring the consumption of groundwater or surface

Water aspect	% of sites/facilities/operations	Please explain
		water. It should be noted that all water withdrawals are granted by the environmental agency. Therefore, the Company knows and reports in its Annual and Sustainability Report the total amount of water consumed.
Water recycled/reused	<ul style="list-style-type: none"> • Not relevant 	Direct Use: Most of Cemig's power generation does not have the use of water. There is a low consumption in its operations, only in its thermoelectric plants and administrative activities, and water recirculation rate is considered insignificant in these operations. Indirect Use: The percentage of recycling is considered insignificant.
The provision of fully-functioning, safely managed WASH services to all workers	<ul style="list-style-type: none"> • 100% 	The provision of water, sanitation and hygiene services perfectly meet and is managed safely for all employees. In all water fountains of the company, water analyzes are carried out to verify compliance with the standards established in Ordinance 2914 of the Ministry of Health. In all units of the company there are adequate sanitation.

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

Water aspect	% of sites/facilities/operations measured and monitored	Please explain
Fulfillment of downstream environmental flows	<ul style="list-style-type: none"> • 100% 	Cemig has an area dedicated to the management of water resources, which through planning it adopts operational measures in its hydroelectric power plants that aim to calculate the optimal generation of each plant, guaranteeing the best use of water for generation, without impacting others uses of the river basin. For each hydroelectric power plant there is an Operational Instruction that defines its technical and operational parameters. Cemig also carries out initiatives for integrated river basin management where it has enterprises, through participation in the National and State Councils for Water Resources, River Basin Committees, Technical Chambers and Working Groups, together with representatives of the government, other users of water resources and organized civil association.
Sediment loading	<ul style="list-style-type: none"> • 100% 	Sediment monitoring is carried out at 86 stations located in its hydroelectric power plants, where water samples are collected and analyzed in an accredited laboratory.

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

Water aspect	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Total withdrawals	363.76	• Lower	It includes the withdrawal of surface water, artesian wells and public supply. All Cemig's groundwater catchment are in accordance with the concessions granted by the Government. The following reasoning was used to classify the variations: On the same = 0 to 10% Greater / smaller = 11 to 55% Much larger / much smaller = 56 to 100%.
Total discharges	276.45	• Lower	The effluents generated in the administrative units are disposed of in the public network or in controlled septic tanks and, therefore, do not directly affect any watercourse.
Total consumption	363.76	• Lower	Total water consumption of Cemig, includes public supply, surface catchment and artesian wells. In 2016, the value was 385.2 Mega liters.

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

Source	Relevance	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Fresh surface water, including rainwater, water from wetlands, rivers, and lakes	• Relevant	23.88	• Higher	Consumption in 2016 was 7.65 megaliters / year and is mainly due to the Igarapé thermal plant provided during the year. The value increased due to the greater generation of energy of Igarapé in 2017.
Brackish surface water/seawater	• Not relevant			
Groundwater – renewable	• Not relevant			
Groundwater – non-renewable	• Relevant	130.26	• Lower	The consumption in 2016 was 149.25 megaliters / year, this result was due to the greater level of activity in the units consuming groundwater.
Produced water	• Not relevant			

Source	Relevance	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Third party sources	<ul style="list-style-type: none"> • Relevant 	209.67	<ul style="list-style-type: none"> • Lower 	Consumption in 2016 was 228.28 megaliters / year. This is the result of measures such as change of processes, management of consumption at the facility and faster correction of leaks, and the installation of new equipment, which also reduces consumption.

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

Destination	Relevance	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Fresh surface water	<ul style="list-style-type: none"> • Relevant 	4.55	<ul style="list-style-type: none"> • Higher 	The figures given for the generation of effluents are 80% of the withdrawal / catchment value of the administrative area. This relationship is in accordance with the principles of the Brazilian standard NBR 7229. The following reasoning was used to classify the variations: approximately the same = 0 to 10% Higher / Lower = 11 to 55% Much higher / Much lower = 56 to 100%.
Brackish surface water/seawater	<ul style="list-style-type: none"> • Not relevant 			
Groundwater	<ul style="list-style-type: none"> • Relevant 	104.17	<ul style="list-style-type: none"> • Lower 	The figures given for the generation of effluents are 80% of the withdrawal / catchment value of the administrative area. In 2016 the value was 119,40 megaliters.
Third-party destinations	<ul style="list-style-type: none"> • Relevant 	167.74	<ul style="list-style-type: none"> • Lower 	The figures given for the generation of effluents are 80% of the withdrawal / catchment value of the administrative area. Effluents generated in administrative units are disposed of in public sewage systems, or in controlled septic tanks, and do not directly affect any water body. This value represents the sum of the use of groundwater and public abstraction.

Water intensity

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

- Yes

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

Water intensity value	Numerator: water aspect	Denominator: unit of production	Comparison with previous reporting year	Please explain
0.72	<ul style="list-style-type: none"> • Freshwater withdrawn 	<ul style="list-style-type: none"> • MWh 	<ul style="list-style-type: none"> • Much lower 	<p>Cemig operates in the generation, transmission and distribution businesses, the latter two of which do not use water in the production process. In relation to the generation business, Cemig's generating facility is predominantly composed of hydroelectric power plants, with only one thermal plant that makes consultative use of water, even though it was dispatched only to meet the contingencies of the electric sector. Thus, the calculations are relative to its thermal plant.</p> <p>In 2016 there was thermal operation because the contract with Vallourec Manesmann was terminated in December 2016. For the calculation of 2017 was considered only the thermal plant of Igarapé, so the value was much lower (8.02 in 2016)</p>

W2 Business impacts

Recent impacts on your business

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

- Yes

(W2.1a) Describe the water-related detrimental impacts experienced by your organization, your response, and the total financial impact.

Country/Region	Brazil
River basin	Other, please specify
Type of impact driver	Doce River; Physical
Primary impact driver	Declining water quality
Primary impact	Other, please specify : Property damage
Description of impact	On November 5, 2015 occurred the rupture of the dam of Fundão of mineral waste from the company Samarco Mineração S.A., located in Mariana, Minas Gerais, located in a headwaters region of the Doce River Basin, resulted in an environmental disaster of magnitude and repercussion. The rupture of the dam released an estimated 34 m ³ of mineral waste, water and materials used in its construction, causing several socioeconomic and environmental impacts in the Rio Doce Basin. At the time of rupture of the dam of Fundão, there was a paralysis of power generation in the hydroelectric power plants of Candonga, Baguari and Aimorés, in which Cemig holds a stake. Since then, Cemig Group has monitored the suspended solids, as well as assessing safety issues, especially from the Candonga Power Plant which has received most of the sediment.
Primary response	Other, please specify: Infrastructure maintenance
Total financial impact	0.00
Description of response	Cemig owns an equity interest in Aliança Energia, a member of the Hydroelectric Power Plant of Candonga, at a 45% proportion, resulting in a 22.5% interest in this plant. In terms of physical guarantee, Candonga power plant represents less than 1% of Cemig Group. This power plant suffered an incident in November 2015 concerning the rupture of tailings dam of Samarco Mineração S.A., belonging to Vale and BHP Billinton, located in Mariana, Minas Gerais. Since then, Candonga reservoir is undergoing maintenance, funded by Samarco, in order to return this plant into operation. In order to honor the energy sales contracts signed before the incident, Aliança Energia acquired in the free energy market all necessary amount, which generated at first a negative result. Considering that the occurred incident was the responsibility of a third party, Aliança Energia filed a request in court for the Brazilian National Electric Energy Agency - ANEEL to maintain the commercial operation of the power plant and its permanence in the Energy Reallocation Mechanism - MRE, including retroactive to the date of the incident. In April 2017, the HPP Candonga was awarded in court, by means of a preliminary injunction, guaranteeing the permanence of the power plant in the MRE, retroactive to the date of the incident. Thereby, it cannot be said that the incident suffered by HPP Candonga in 2015 caused financial losses to Cemig.

Compliance impacts

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

- No

W3 Procedures

Potential water pollutants management procedures

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

The company does not generate pollutants that contaminate water in its electric power generation process. However, water quality in Cemig reservoirs is regularly monitored in a network that includes the main hydrographic basins of the State of Minas Gerais, in 42 reservoirs and more than 180 stations for the collection of physical, chemical and biological data. The monitoring network has been adjusted to improve support in water quality management in reservoirs and comply with environmental licensing restrictions, the state and federal resolutions. Achieving these objectives is a gradual process, and the continuity and standardization of monitoring has provided effective interaction between management agencies and users with a view to achieving fully sustainable management of water resources.

The water quality monitoring collections generate a large volume of information, which is analyzed and stored, thus guaranteeing an extensive database (Siságua), which allows the analysis of the temporal and spatial evolution of the reservoirs and their environment. The improvement of the system (Siságua) provides a differentiated structure of management, fast and precise generation of information, and mainly useful. Information systems have been assuming a strategic role in organizations, corroborating for a more efficient management.

In order to inform in a concise and objective way to the authorities and the public the influence that the activities related to the development processes cause in the environmental dynamics of the aquatic ecosystems, Cemig uses and makes available in the monitoring of water quality, the Quality Index of the Waters (IQA, Índice de Qualidade das Águas), through the results obtained from nine specific parameters. This index shows the degree of contamination of river waters by organic materials, nutrients and solids, which are usually indicators of pollution associated with domestic waste. Further information can be found at: [http://www.cemig.com.br/en-us/Company and Future/Sustainability/Programs/environmental programs/Biodiversity/Pages/water quality.aspx](http://www.cemig.com.br/en-us/Company%20and%20Future/Sustainability/Programs/environmental%20programs/Biodiversity/Pages/water%20quality.aspx)

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

Potential water pollutant	Description of water pollutant and potential impacts	Management procedures	Please explain
No potential water pollutants identified			The generation of the hydroelectric energy activity does not generate pollutants in the water. However, due to the lack of collection and treatment of sewage in Brazilian cities, the contamination of rivers by organic materials changes the quality of the water in the reservoirs. In the thermal plant of Igarapé did not occur contamination of the waters.
Hydrocarbons	In substations of the transmission and distribution system of energy there is equipment that contains insulating oil inside. Any leakage of this oil may contaminate the water bodies.	<ul style="list-style-type: none"> • Compliance with effluent quality standards • Measures to prevent spillage, leaching, and leakages • Community/stakeholder engagement • Emergency preparedness 	Cemig has in many of its substations equipment called water and oil separator that aims to contain the oil in case of leaks. These boxes are monitored to verify compliance with environmental legislation. In addition, there are contingency plans in the company.

Other management procedures

Risk identification and assessment procedures

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

- Yes, water-related risks are assessed

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

Value chain stage	Coverage	Risk assessment procedure	Frequency of assessment	How far into the future are risks considered?	Type of tools and methods used	Tools and methods used	Comment
Direct operations	<ul style="list-style-type: none"> • Full 	<ul style="list-style-type: none"> • Water risks are assessed as part of an enterprise risk management framework 	<ul style="list-style-type: none"> • Six-monthly or more frequently 	<ul style="list-style-type: none"> • 6 to 10 years 	<ul style="list-style-type: none"> • Tools on the market • Enterprise Risk Management 	<ul style="list-style-type: none"> • Global Water Tool for Power Utilities • COSO Enterprise Risk Management Framework • ISO 31000 Risk Management Standard • Other, please specify: The SAP RM (Risk Management) software 	In 2013, a risk management software, SAP RM, was deployed. This tool allowed the risk mapping process to be done continuously as information updates, checks and evaluations of the controls and action plans are informed by the owners of each activity within the system.
Supply chain	<ul style="list-style-type: none"> • Partial 	<ul style="list-style-type: none"> • Water risks are assessed as part of an enterprise risk management framework 	<ul style="list-style-type: none"> • Six-monthly or more frequently 	<ul style="list-style-type: none"> • 6 to 10 years 	<ul style="list-style-type: none"> • Tools on the market • Enterprise Risk Management 	<ul style="list-style-type: none"> • Water Footprint Network Assessment tool • COSO Enterprise Risk Management Framework • ISO 31000 Risk Management Standard • Other, please specify: SAP RM 	Based on the Corporate Risk Management System, Cemig analyzes the scenarios and determines the degree of financial exposure to risks, considering the probability of occurrence and its impact and establishes control measures for the following risks: sedimentation of the reservoirs, deviations in the weather forecast, loss of physical guarantee of PCHs and reduction of water availability with impacts on commercialization.
Other stages of the value chain	<ul style="list-style-type: none"> • Partial 	<ul style="list-style-type: none"> • Water risks are assessed as part of an enterprise risk management framework 	<ul style="list-style-type: none"> • Six-monthly or more frequently 	<ul style="list-style-type: none"> • 2 to 5 years 	<ul style="list-style-type: none"> • Tools on the market • Enterprise Risk Management 	<ul style="list-style-type: none"> • COSO Enterprise Risk Management Framework • ISO 31000 Risk Management Standard • Other, please specify: SAP RM 	In the scenarios analyzed, the company evaluates the impacts arising from regulatory changes and price structure that may impact the operation of its enterprises. Cemig participates in the Water Resources Committees and Basin Committees, Technical Chambers, Working Groups and acts with the Sectorial Associations, where it follows the regulatory and tariff scenario, and contributes to the decision making regarding the regulation of water uses in the basins and their impacts.

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

Contextual issue	Relevance & inclusion	Please explain
Water availability at a basin/catchment level	<ul style="list-style-type: none"> • Relevant, always included 	<p>Cemig, aware of the importance of water resources for the maintenance of its businesses and for society, established its Water Resources Policy, which defined the principles that guide the Company's actions in relation to the subject. By developing its activities, the Company undertakes to adopt practices for the rational, integrated and sustainable use of water resources, for the prevention and defense against critical hydrological events, both of natural origin and the inadequate use of natural resources, taking into account the needs of the current and future generations and water availability. In addition, Cemig has an area dedicated to the management of water resources, which through planning adopts operational measures in its hydroelectric plants that aim to calculate the optimal generation of each plant, ensuring the best use of water for this generation without impacting other uses of the river basin. For each hydroelectric power plant there is the Operational Instruction, which defines its technical and operational parameters. In order to minimize the risk associated with the water quality of its reservoirs, Cemig regularly monitors a network that includes the main hydrographic basins of the State of Minas Gerais in more than 200 data collection points that monitor, in addition to the established physical and chemical parameters in Brazilian legislation, biological groups such as phytoplankton, zooplankton and zoobentos. All data generated is stored in the database - SISÁGUA, which integrates the database of the Institute of Water Management of the State of Minas Gerais (IGAM, Instituto Mineiro de Gestão das Águas) Further information is available at: http://www.cemig.com.br/en-us/Company_and_Future/Sustainability/Programs/environmental_programs/Biodiversity/Pages/water_quality.aspx</p>
Water quality at a basin/catchment level	<ul style="list-style-type: none"> • Relevant, always included 	<p>Cemig monitors in real time the amount of water available in the rivers and their power plants, through 262 telemetry stations belonging to the Hydrometeorological Monitoring and Telemetry System. The water quality of Cemig reservoirs is regularly monitored in a network that includes the main hydrographic basins of Minas Gerais, in 42 reservoirs and more than 180 physical, chemical and biological data collection stations, such as phytoplankton, zooplankton and zoobentos. More information is available at: http://www.cemig.com.br/pt-br/Empresa_e_Futuro/Sustentabilidade/Programas/programas/ambiental_programs/Biodiversity/Pages/water_quality.aspx In addition, the monitoring of sediment is carried out in 86 stations located in its hydroelectric power plants, where water samples are collected and analyzed in an accredited laboratory. These monitoring allow us to analyze trends and estimate the frequency of events that may impact the operations of Cemig and specify necessary measures for their mitigation.</p>
Stakeholder conflicts concerning water resources at a basin/catchment level	<ul style="list-style-type: none"> • Relevant, always included 	<p>Cemig monitors and follows up on conflicts with stakeholders through its active participation in Water Resources Committees, Basin Committees, Technical Chambers and Working Groups, where there is participation of various river basin users and other stakeholders. Conflicts due to the priority of use and impacts caused in river basins are discussed and deliberated in such forums with the participation of water resources management agencies. Cemig has interests in 5 river basins committees of rivers under the power of the Federal Government and 20 river basins committees of rivers under the power of the State. The company also monitors the news disseminated in the various communication channels, as well as receives demands during periods of flood or</p>

Contextual issue	Relevance & inclusion	Please explain
		drought and acts to resolve any conflicts with communities located in hydrographic basins where it has hydroelectric projects. Cemig implements the Programa Proximidade (Proximity Program), certified in ISO 9001, which is committed to working with key stakeholders such as government, civil defense, fire brigade, military police, water and environment management agencies, river basin committees, municipal authorities, community associations, class representatives, large users and various media, which allow the identification of conflicts related to water with other users and promote social development in communities around the power plants. Stakeholder engagement is carried out in river basins where potential conflicts are mapped. Further information regarding this programs and others can be found at: http://www.cemig.com.br/pt-br/Empresa_e_Futuro/Sustentabilidade/Programas/programa_ambiental/Pages/elacoes_com_society.aspx
Implications of water on your key commodities/raw materials	<ul style="list-style-type: none"> • Relevant, always included 	Water is the main raw material of Cemig. Cemig monitors in real time the amount of water available in the rivers and in its power plants, through 262 stations of telemetry belonging to the Hydrometeorological Monitoring and Telemetry System (STH). It also monitors and tracks the risks related to water quality in its reservoirs through a network of 583 monitoring points in 200 stations. This monitoring allows analyzing trends and estimating the frequency of events that may impact Cemig's operations, as well as specifying the measures necessary for its mitigation, providing feedback to risk management tools.
Water-related regulatory frameworks	<ul style="list-style-type: none"> • Relevant, always included 	Cemig actively takes part in every deliberative and regulator forum of hydrous resources, both in federal and state scopes, acting on the elaboration of policies and guidelines and, at the same time, monitoring the regulatory tendencies, and that is an important subsidy for the elaboration of estimates of the impacts on the Company's enterprises. Estimates of potential regulatory changes include alterations on granting of awards rules, financial compensation, charging mechanisms, and price structure. The charges for great hydroelectric power plants are already regulated and there is no prediction for regulatory changes on short and medium terms, and for the Small Hydro Electric Centrals, the charge for the use of water continues to wait for the analysis of the federal authority. For the use of raw water in administrative areas and for thermal electric generation, the various Hydrographic Basins Committees are implementing their respective charging mechanisms.
Status of ecosystems and habitats	<ul style="list-style-type: none"> • Relevant, always included 	Cemig monitors the presence of invasive species, such as golden mussel mollusk, which can bring damage to pipes and equipment.
Access to fully-functioning, safely managed WASH services for all employees	<ul style="list-style-type: none"> • Not relevant, included 	All Cemig employees are served by water, sanitation and hygiene services.
Other contextual issues, please specify	<ul style="list-style-type: none"> • Not considered 	

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

Stakeholder	Relevance & inclusion	Please explain
Customers	<ul style="list-style-type: none"> • Relevant, always included 	<p>In a scenario of unfavorable hydrology, hydroelectric generation in Brazil is reduced and, therefore, companies cannot meet 100% of the volume planned in the contracts (physical guarantee). Thus, the National System Operator (ONS, Operador Nacional do Sistema) is required to dispatch thermal plants to meet part of the national demand. The greater the water deficit, the greater the chances the Company will have to buy energy in the short-term market to meet the requirements of the contracts. The impact of this materialization of risk for this stockholder will depend on the marketing strategy and the risk management strategy adopted by Cemig.</p>
Employees	<ul style="list-style-type: none"> • Relevant, always included 	<p>Total water consumption for administrative purposes at Cemig was 335,789 m³, including public water supply, surface catchment and artesian wells, representing a reduction of 35.6% when compared to the last five years. This is the result of measures such as change of processes, management of water consumption, faster correction of leaks, installation of aerating nozzles in toilets. All Cemig employees have access to adequate sanitary conditions, so it is not a problem to be considered in the risk assessment. In 2017, the Concurso Ideia Iluminada (Illuminated Idea Contest) was held, in which all employees were able to propose solutions to reduce water consumption.</p>
Investors	<ul style="list-style-type: none"> • Relevant, always included 	<p>The higher the water deficit, the higher the cost for Brazilian companies. The impact of the materialization of this risk for this stockholder will depend on the marketing strategy and risk management adopted by Cemig.</p>
Local communities	<ul style="list-style-type: none"> • Relevant, always included 	<p>For the operation of the reservoirs, Cemig mapped the main agents of the communities upstream and downstream of the power plants, always proactively informing about severe flood and drought situations. The Programa Proximidade (Proximity Program) was created with the objective of strengthening the ties between the communities, the Company and the local Civil Defense teams.</p>
NGOs	<ul style="list-style-type: none"> • Relevant, always included 	<p>Cemig always seeks to protect local communities as a whole. The direct channel</p>

Stakeholder	Relevance & inclusion	Please explain
		<p>between NGOs and the Company is via Programa Proximidade and Cemig's participation in the water resources forums, where such organizations play an important role in representing the civil society. NGOs participate actively and strategically in the formulation of the laws and regulations of the National Water Resources Policy and the National Water Resources Management System. NGOs also participate in the technical discussions among the principal board agencies that formulate rules and establish guidelines, such as the National Council of Water Resources (CNRS, Conselho Nacional de Recursos Hídricos), the State Council of Water Resources (CERS, Conselho Estadual de Recursos Hídricos), the Federal and State Basin Committees, the Technical Chambers and working groups, especially those dealing with the development of strategic plans for water resources and the regulation of Concessions and collection for the use of water.</p>
Other water users at a basin/catchment level	<ul style="list-style-type: none"> • Relevant, always included 	<p>For the operation of the reservoirs, Cemig mapped the minimum and maximum level of restrictions to guarantee the continuity of the water supply for human use in the downstream municipalities. Such restrictions are passed on to the ONS (National Electric System Operator) and incorporated into the operating rules of the power plants.</p>
Regulators	<ul style="list-style-type: none"> • Relevant, always included 	<p>Cemig participates in the National Council of Water Resources, State Council of Water Resources - MG, River Basin Committees, Technical Chambers and Working Groups, Class Associations (Abrage) Public hearings, where the Hydrographic Basin Master Plans are discussed, prepared and approved, the resolutions, bill of law, normative deliberations and the regulation of granting and charging for the use of water resources. In these environments, the expertise of its specialists is used to act in the preparation of policies and guidelines regarding the regulation of water uses in the basins.</p>
River basin management authorities	<ul style="list-style-type: none"> • Relevant, always included 	<p>Cemig participates in the Water Resources and Watershed Committees, Technical Councils, Working Groups and works with Sectorial Associations (ABRAGE, APINE and ABRAGEL), which provide full monitoring of the regulatory and tariff scenario. In these environments, the Company establishes a dialogue with these local agents, exposing the expected scenarios and evaluating the</p>

Stakeholder	Relevance & inclusion	Please explain
		possible impacts that changes in the occupation and use of water resources can cause in the Company's activities.
Statutory special interest groups at a local level	<ul style="list-style-type: none"> • Relevant, always included 	Cemig participates in the Water Resources and Watershed Committees, Technical Councils, Working Groups and works with Sectorial Associations (ABRAGE, APINE and ABRAGEL), which provide full monitoring of the regulatory and tariff scenario. In these environments, the Company establishes a dialogue with these local agents, exposing the expected scenarios and evaluating the possible impacts that changes in the occupation and use of water resources can cause in the Company's activities.
Suppliers	<ul style="list-style-type: none"> • Relevant, always included 	The Company performs the geographical mapping of its critical suppliers, identifying whether they are located in areas under water stress. As a result, all of these suppliers are located in Brazil, so they are not exposed to water stress. Even so, since 2012, Cemig monitors the water consumption of its critical service providers.
Water utilities at a local level	<ul style="list-style-type: none"> • Relevant, always included 	Cemig maintains a grant control tool for all the Company's units, in order to always monitor the validity of the certificates, aiming at the continuity of water supply for local activities.
Other stakeholder, please specify	<ul style="list-style-type: none"> • Not considered 	All stakeholders have been reported.

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

Cemig has a centralized risk and opportunity management program that identifies strategic and process / operational risks, as well as opportunities to provide information to the senior management to make decisions regarding the risks and opportunities of greater relevance, including climate change.

This program consists of a tool integrated to multidisciplinary processes, which allows the mapping and evaluation of both risks and strategic opportunities and process/operational risks.

Strategic risks are related to the Company's objectives and vision, or strategic decisions that risk not achieving the planned success. Process/operational risks arise in the exercise of business functions, being associated with people, systems and processes. With regard to risks and opportunities related to water, they are considered strategic, identified and monitored by the process described above.

W4 Risks and opportunities

Risk exposure

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

- Yes, both in direct operations and the rest of our value chain

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

The company defines the strategic risks as those related to the objectives and vision of the Company, or to strategic decisions that have the risk of not achieving the planned success. In relation to the significant financial impact, they are those that can cause a significant adverse effect on the business, affecting the financial condition and its results of operations. **Cemig considers as a measure of substantial financial impact of water risks if there is a loss in the Company's net operating revenue above 1%.** Cemig uses scales to classify risks and opportunities according to their financial impacts, intangible impacts, probability of occurrence and relevance to the Company, with the distribution of percentage estimates between each of the points for each of the scales. Based on these scales, Cemig prioritizes each risk, which allows the hierarchy of risks within a risk/opportunity exposure matrix containing the risks/opportunities raised throughout the process. In addition, information on the financial implications of risks/opportunities, their controls and measures is fed specifically to the above mentioned "financial impacts" variable used to define the risk/opportunity position in the exposure matrix. Considering it, the system calculates the cost/income of the inherent risk/opportunity (i.e., no management actions), of residual risk/opportunity (after implementation of controls) and planned residual risk/opportunity (after implementation of measures). This allows prioritized decision making based on robust financial analyzes of scenarios with and without risk/opportunity management.

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

Total number of facilities exposed to water risk	% company-wide facilities this represents	Comment
50	<ul style="list-style-type: none"> • 51-75 	Changes in seasonal rainfall patterns, with extreme rainfall events and more pronounced droughts, as well as changes in geographic distribution, may affect the Company. In addition, there may be a change in the average amount of precipitation, changing the amount of water that reaches the reservoirs of hydroelectric power plants. As Cemig's electricity production is basically hydraulic, these changes can cause a reduction in its generation capacity.

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

Country	Brazil
River basin	All Basins that Cemig has Hydro Power
Number of facilities exposed to water risk	50
% company-wide facilities this represents	26-50
% company's annual electricity generation that could be affected by these facilities	26-50
% company's total global revenue that could be affected	Less than 1%
Comment	Considering that currently the management of this risk is carried out within the historical pattern of climate change, the current management cost is the cost for contracting hedge for short-term price protection. The Energy Reallocation Mechanism (MRE) aims to mitigate the impact of the generation variability of hydroelectric power plants. This mechanism shares the generation of all the hydroelectric power plants of the system in order to compensate for the lack of generation of one plant with the surplus of another one. However, this mechanism is not able to mitigate the whole risk of the generating agents, because when there is an extremely unfavorable hydrological scenario, and the set of power plants cannot reach the sum of their Physical Guarantees, this mechanism then makes an adjustment in the Physical Guarantee of each power plant through the Physical Warranty Adjustment Factor ("GSF"), leading generators to short-term market exposure.

Water-related risks and response

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

Risk 1:	
Country	Brazil
River basin	All Basins that Cemig has Hidro Power
Type of risk	Physical
Primary risk driver	Severe weather events
Type of potential impact	Reduction or disruption in production capacity

Company-specific description	Climate change can cause changes in seasonal rainfall patterns, with extreme rainfall events and more pronounced droughts, as well as changes in its geographic distribution. In addition, there may be a change in the average amount of precipitation, changing the amount of water that reaches the reservoirs of hydroelectric power plants. As Cemig's electricity production is basically hydraulic, these changes can cause a reduction in its generation capacity. In 2017, the hydrology of the watersheds that support the energy system was the worst in five years, with levels at 76% of the previous historical average. The situation was especially adverse in the Northeast Region, with the worst year in history - with levels at 29% of the average. The low flows were reflected in a storage level of 22.81% in the reservoirs of the energy system, 6% below the level of September 2014. In this scenario of low water storage and low flows, prices have been high throughout the year, with the average spot price (PLD) for the year being BRL 324.17/MWh. Another factor affected by the situation of the system was the Generation Scaling Factor (GSF), which expresses the hydroelectric generation as a percentage of the seasonal outtake guarantees of a power plant. In 2017, the average GSF index in the system was 0.81, which means that hydroelectric agents had 19% of their production demand exposed at spot prices.
Timeframe	More than 6 years
Magnitude of potential impact	Medium-low
Likelihood	Likely
Potential financial impact	1,518,000,000
Explanation of financial impact	In 2017, the hydrological basins responsible for the energy system were the worst in five years, with levels at 76% of the previous historical average. Another factor affected by the situation of the system was the GSF, CEMIG-D's hydrological risk expenses (passed on to consumers) rose considerably to BRL 1.518 billion. Despite the recovery of costs through tariffs, these costs represented a pressure on the Company's cash position in 2017.
Primary response to risk	Use of risk transfer instruments
Description of response	Considering that currently the management of this risk is carried out within the historical pattern of climate change, the current management cost is the cost for contracting hedge for short-term price protection. The Generation Scaling Factor (GSF) that relates hydraulic generation to the seasonal physical guarantee of the power plants, in 2017, the average GSF of the system was 0.81, which leads to hydroelectric agents at a 19% exposure of their energy in the short-term market. Throughout the year there have been times when the GSF reached 0.6, the lowest figure ever recorded. In this scenario of low water storage and low flows, prices have been high throughout the year, with the average spot price (PLD) for the year at BRL 324.17/MWh. In anticipation of these effects in 2017, CEMIG GT planned to save energy to cover this exposure to hydrological risk (GSF), thereby reducing the effects of poor hydrology. The Irapé and Queimado power plants had their risk renegotiated.
Cost of response	595,000,000
Explanation of cost of response	Considering that currently the management of this risk is carried out within the historical pattern of climate change, the current management cost is the cost for contracting hedge for short-term price protection. For example, by 2017, the cost of purchasing energy to protect the hydrological risk will be BRL 595 million. It is estimated that this expense could generate a protection of Cemig GT's revenue of approximately BRL 1,087 million, generating a benefit of BRL 493 million.

Risk 2:	
Country	Brazil
River basin	All Basins that Cemig has Hydro Power
Type of risk	Physical
Primary risk driver	Severe weather events
Type of potential impact	Revenue reduction
Company-specific description	Undesirable impacts on reservoirs due to siltation, which could occur more quickly or (in an optimistic scenario) more slowly, depending on how the change in precipitation and hydrologic levels occur in each reservoir. Cemig monitors reservoir siltation in a number of ways, including: mapping changes in the shape of reservoir beds due to sedimentary deposits; monitoring of volume reduction of reservoirs; life studies of the reservoir; and monitoring the sedimentation volume.
Timeframe	More than 6 years
Magnitude of potential impact	Medium
Likelihood	Unlikely
Potential financial impact	39,550,525
Explanation of financial impact	Less than 0.5% of Cemig GT's net operating revenue. It occurs due to the reduction or disturbance of the capacity of electric power generation by hydroelectric power plants, caused by the accumulation of sediments in the reservoir.
Primary response to risk	Promoting best practices
Description of response	This risk is managed by a series of actions such as mapping the changes of the morphology of the reservoir bed compared to the sediment deposition; monitoring of the volume decrease of the reservoirs; studies on the useful life of the reservoirs; and monitoring the sediment supply.
Cost of response	79,141,736
Explanation of cost of response	The costs are annual and associated to the maintenance of equipment and meteorological teams, the maintenance of the telemetry and hydro-meteorological monitoring system (STH, Sistema de Telemetria e Monitoramento Hidrometeorológico), with sediment monitoring services in 86 stations located in hydroelectric power plants.

Risk 3:	
Country	Brazil
River basin	In all basins with power plants
Type of risk	Regulatory
Primary risk driver	
Type of potential impact	Increased operating costs
Company-specific description	Charges for large hydroelectric power plants are already regulated and there is no forecast of regulatory changes in the short and medium-term, and for Small Hydroelectric Plants, charging for the use of water is considered exempt under current legislation. In case of regulatory changes, there may be a charge for the use of water for power plants with an installed power capacity of less than 30MW (SHPs). For the use of raw water in administrative areas and for thermoelectric generation, the various River Basins Committees are implementing their respective collection mechanisms.
Timeframe	More than 6 years
Magnitude of potential impact	Low
Likelihood	Unlikely
Potential financial impact	2,145,833
Explanation of financial impact	The financial impact refers to the estimated collection of the tribute for Small Hydroelectric Plants (SHPs). For large hydroelectric power plants, this value is calculated by the following equation (7.00% x energy generated in MWh x TAR). The Annual Reference Rate (TAR) in 2017 was BRL 72.20 and for 2018 was set at BRL 74.03, a variation of 2.53%. Further information: http://www.cemig.com.br/en-us/Company_and_Future/Sustainability/water_resources/Pages/charging_for_water_use.aspx
Primary response to risk	Engage with regulators/policymakers
Description of response	Cemig's operation to manage the risks of regulatory changes are made through participation in the National Council of Water Resources, State Council of Water Resources - MG, River Basin Committees, Technical Chambers and Working Groups, Class Associations (Abrage) Public hearings, where the Hydrographic Basin Master Plans are discussed, prepared and approved, the resolutions, bill of law, normative resolutions and the regulation of granting and charging for the use of water resources. In these environments, the expertise of its specialists is used to act in the preparation of policies and guidelines regarding the regulation of water uses in the basins. At the same time, the Company has an oversight of institutional relationship and sectorial regulation that monitors regulatory changes and activates the water resources management team whenever the theme is adherent. Estimates of potential regulatory changes include changes in the rules for granting concessions for financial compensation, billing mechanisms and pricing structure.
Cost of response	350,000
Explanation of cost of response	The costs to manage this risk of regulatory changes are associated with the maintenance of the water resources management team and the institutional relationship and sector regulation team.

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

Risk 1	
Country	Brazil
River basin	In all of Cemig's hydroelectric power
Stage of value chain	Use phase
Type of risk	Reputation & markets
Primary risk driver	Changes in consumer behavior
Type of potential impact	Reduced revenues from lower sales/output
Company-specific description	Continued increases in energy prices due to unfavorable hydrological scenarios associated with the country's adverse economic scenario increase the risk of consumer default or energy theft. The losses from delinquency directly impact the cash of Cemig D, since the company must pay, regardless of whether or not it receives payment from final consumers: the invoice of the energy supplied by the generators; the transmission service; the electric sector charges and the Pis/Cofins and ICMS taxes levied on energy.
Timeframe	Current - up to 1 year
Magnitude of potential impact	Medium-high
Likelihood	Virtually certain
Potential financial impact	228,428,000
Explanation of financial impact	The financial impact is related to the loss of revenue and consequent pressure on the distributor's cash flow due to the risk of not covering the maintenance and operation costs of the system. The financial impact refers to 2017 and refers to losses with delinquency. The amount is disclosed in the Management Report of Cemig D, at the link: http://cemig.foinvest.com.br/ptb/16046/Cemig%20D%204T17_Final.pdf
Primary response to risk	Engagement with Consumers
Description of response	In order to mitigate this risk, the Company uses various communication and collection tools to avoid increasing delinquency, among them, telephone contacts, sending of email, SMS messages, billing warning letters, negatives of defaulting customers in credit protection and judicial collection companies. Therefore, in order to reduce the number of debtors, in November the Company launched the Debt Negotiation Campaign with differentiated conditions for payment and installment payment. The action has a Call Center (0800) specific for the customer that opts for remote negotiation. In the city of Belo Horizonte, exclusive face-to-face service structure was made available.
Cost of response	14,842,380
Explanation of cost of response	Costs involve measures to reduce commercial losses. In 2017, approximately 99 thousand inspections were carried out in consumer units. This action provided the recovery and energy increment of 47.7 GWh and 96 GWh, respectively. These amounts of energy correspond to aggregate revenues for the Company of BRL 39.1 and BRL 46.1 million, respectively. Also, SGC/SAP/SAS/MECE inspection target selection software is used.

Water-related opportunities

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

- Yes, we have identified opportunities but are unable to realize them

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

Type of opportunity 1	<ul style="list-style-type: none"> • Other
Primary water-related opportunity	Increase of production capacity
Company-specific description & strategy to realize opportunity	<p>Cemig increased its share in hydroelectric generation. At the Aneel Auction for the Hiring of Concession of Hydroelectric Power Plants under the Physical Guarantee and Energy Quotas regime, in December 2015, Cemig GT was awarded with Lot D, which consists of 18 hydroelectric power plants. Out of 18 power plants in Lot D, 14 were previously operated by Cemig, with the most important being Três Marias, Itutinga and Salto Grande. In addition to these, Cemig GT also won concessions for four other hydroelectric power plants: Ervália, Coronel Domiciano, Sinceridade e Neblina. Even new, special purpose companies were created to manage these concessions. Together, they have a total installed capacity of 699.59 MW and a physical guarantee of 420.57 MW. In recent years, Cemig has acquired important acquisitions in the field of hydroelectric generation and the following can be highlighted: participation in Belo Monte Hydroelectric Power Plant, in the Santo Antônio Hydroelectric Power Plant, acquisition of a stake in Companhia PCH Brasil. Other information in the Annual and Sustainability Report.</p>
Estimated timeframe for realization	<ul style="list-style-type: none"> • Current - up to 1 year
Magnitude of potential financial impact	<ul style="list-style-type: none"> • High
Potential financial impact	2,337,135,000
Explanation of financial impact	<p>Revenue obtained in 2017 from the hydroelectric power plants in lot D.</p> <p>In June 2016, the Concession Contracts 08 to 16/2016, relating to 18 hydroelectric power plants in Lot D of the 12/2015 Aneel Auction, won by Cemig GT, was transferred to related specific purpose entities (SHPs), wholly owned subsidiaries of Cemig GT. In 2016, all power plant production was sold in the market regulated by the Quotas System of Physical Guarantees. Since 2017, the second phase of the contract entered into force: 70% of the energy produced by these power plants was sold in the regulated market and 30% in the free market.</p>

Type of opportunity 2	<ul style="list-style-type: none"> • Other
Primary water-related opportunity	Improved community relations
Company-specific description & strategy to realize opportunity	In the quest to promote a closer relationship and foster social development in communities close to hydroelectric power plants, Cemig performs the Programa Proximidade (Proximity Program). In this Program, meetings are held where specialists give objective lectures to clarify operational aspects of reservoirs, prepare the Emergency Action Plan (PAE), and publicize Cemig's environmental actions conducted in reservoirs of dams. Other issues such as dam safety and safe coexistence with the electric system are also among the topics addressed.
Estimated timeframe for realization	Current - up to 1 year
Magnitude of potential financial impact	<ul style="list-style-type: none"> • Low
Potential financial impact	16,777.11
Explanation of financial impact	The financial impact was estimated by calculating the spontaneous media (favorable news) of Programa Proximidade (Proximity Program) through the dissemination of the Program in newspapers, websites, radio, TV and other media.

Type of opportunity 3	<ul style="list-style-type: none"> • Services and Products
Primary water-related opportunity	Sales of new products / services
Company-specific description & strategy to realize opportunity	The main opportunity is related to the development of new business related to distributed generation. The company intends to provide new energy service to its customers through distributed generation using mainly solar and wind sources. With this strategy, Cemig reduces its risk exposure related to energy purchase oscillations due to adverse hydrological scenarios and earns revenue with the new portfolio of distributed generation service.
Estimated timeframe for realization	<ul style="list-style-type: none"> • 1 to 3 years
Magnitude of potential financial impact	<ul style="list-style-type: none"> • Medium
Potential financial impact	150,000,000
Explanation of financial impact	The financial impact is related to the estimated growth of the distributed generation market in the state of Minas Gerais, through the projects to be implemented by Cemig. In 2012, Aneel Normative Resolution No. 482/2012 came into force, which establishes the general conditions for the access of microgeneration and distributed minigeration to the electric energy distribution systems through the electric energy compensation modalities. Thus, the Brazilian consumer was capable of generating its own electricity from renewable sources and provide the surplus to the electricity grid of its locality. Since the publication of Resolution 482 in 2012 until December 2017, 4,217 generating units have already been connected, of which 4,157 (98.55%) are photovoltaic solar, 43 (1.02%) as a thermal source (biogas), 17 as a hydraulic source (0.40%) and 01 cogeneration source (biomass). Totaling an installed capacity of 67.5MW as Distributed Generation, which represents approximately 1.2% of Cemig's current generation installed capacity.

Type of opportunity 4	<ul style="list-style-type: none"> • Other
Primary water-related opportunity	Cost reduction
Company-specific description & strategy to realize opportunity	In 2017, Cemig promoted the Concurso Ideia Iluminada (Illuminated Idea Contest) with the objective of recognizing proposals from its employees that may reduce water consumption or the reuse. One of the selected projects aims at the use of rainwater to encourage the use of this resource and decrease the current value of the water bill. The objective of this project is to promote the adaptation of rainwater drainage from Vila Mariana Building to collection, filtration and storage to reduce the use of treated water, paying less for the water bill. The chosen area was a set of three roofs, located at Rua Santo Inácio Loyola, nº 56, district of Vila Mariana in Governador Valadares. We are interested in this area, mainly because there has been a growing increase in the amounts paid in the water bill and a good part of this treated water supplies the washing of sheds, yards, service areas, watering of gardens and plants, washing equipment in the workshop, etc. So if tap water and toilets continue to be supplied by treated water, we could substitute other uses for non-potable water.
Estimated timeframe for realization	<ul style="list-style-type: none"> • 4 to 6 years
Magnitude of potential financial impact	<ul style="list-style-type: none"> • Low
Potential financial impact	26,400
Explanation of financial impact	Considering the average consumption in the analyzed period, it was 94.5 m ³ per month, considering 55% of economy, consumption drops to an average of 42 m ³ . Turning this into real values, consumption of 94.5m ³ is around BRL 800.00 (eight hundred Brazilian reais), with the drop to 42m ³ this account drops to BRL 360.00 (three hundred and sixty Brazilian reais), so an economy of BRL 440.00 (four hundred and forty Brazilian reais) per month. In a period of 5 years (60 months) this implementation will bring us savings of about BRL 26,400.00 (twenty six thousand and four hundred Brazilian reais).

Type of opportunity 5	<ul style="list-style-type: none"> • Other
Primary water-related opportunity	Better relationships in the community
Company-specific description & strategy to realize opportunity	Installation of floating photovoltaic panels on top of the reservoir located in the municipality of Grão Mogol, in the north region of Minas Gerais. Photovoltaic cells with a total power of 1.2 MWp (megawatt-peak) will be installed in the water reservoir of the small hydroelectric reservoir, which covers an area of 27 hectares (27 soccer fields). With the installation of the floating photovoltaic pilot plant, the hybrid plant will reach a total power of 2.2MW at the time of highest solar radiation of the day. This energy will be used to supply 1.25 thousand families from 21 municipalities, located in a semi-arid region, near the reservoir. In addition, employment and income will be generated, with the use of labor from the surrounding cities. One of the advantages of the system with energy plates under the water mirror is that it prevents water evaporation, which is a great loss of power plants. Moreover, it also improves the efficiency of the plates, which will remain cool because they are in contact with the water, increasing its efficiency. The expectation is that we can produce more energy than we produce with conventional plates.
Estimated timeframe for realization	<ul style="list-style-type: none"> • 4 to 6 years
Magnitude of potential financial impact	<ul style="list-style-type: none"> • Low-medium
Potential financial impact	24,400,000
Explanation of financial impact	The investment is related to the resources applied in the project.

W5 Facility-level water accounting

Facility-level water accounting

(W5.1) For each facility referenced in W4.1c, provide coordinates, total water accounting data and comparisons with the previous reporting year.

Facility reference number	Facility name (optional)	Country	River basin	Latitude	Longitude	Primary power generation source for your electricity generation at this facility
Facility 1	Maintenance Management of West Region Generation Assets	Brazil	Grande River and Paranaíba River	-47.93	-19.75	Hydroelectric
Total water withdrawals (megaliters/year) at this facility	Comparison of withdrawals with previous reporting year	Total water discharges (megaliters/year) at this facility	Comparison of discharges with previous reporting year	Total water consumption (megaliters/year) at this facility	Comparison of consumption with previous reporting year	Please explain
78.29	About the same	62.63	About the same	15.66	About the same	In 2016, the total value of water withdrawals was 86.12 megaliters. This reduction is the result of several actions carried out by Cemig over the years, such as educational campaigns for more conscious use of water, preventive maintenance in water installations, replacement of old pipes, valves and taps, elimination of leaks and changes in procedures.

Facility reference number	Facility name (optional)	Country	River basin	Latitude	Longitude	Primary power generation source for your electricity generation at this facility
Facility 2	Maintenance Management of East Region Generation Assets	Brazil	Rio Doce	-42.56	-19.46	Hydroelectric
Total water withdrawals (megaliters/year) at this facility	Comparison of withdrawals with previous reporting year	Total water discharges (megaliters/year) at this facility	Comparison of discharges with previous reporting year	Total water consumption (megaliters/year) at this facility	Comparison of consumption with previous reporting year	Please explain
0.04	Much lower	0.03	Much lower	0.01	Much lower	In 2016, the total value of water withdrawals was 0.41 megaliters. This reduction is the result of several actions carried out by Cemig over the years, such as educational campaigns for more conscious use of water, preventive maintenance in water installations, replacement of old pipes, valves and taps, elimination of leaks and changes in procedures.

Facility reference number	Facility name (optional)	Country	River basin	Latitude	Longitude	Primary power generation source for your electricity generation at this facility
Facility 3	Maintenance management of the Triângulo Region Generation Assets	Brazil	Grande River and Paranaíba River	-48.31	-18.88	Hydroelectric
Total water withdrawals (megaliters/year) at this facility	Comparison of withdrawals with previous reporting year	Total water discharges (megaliters/year) at this facility	Comparison of discharges with previous reporting year	Total water consumption (megaliters/year) at this facility	Comparison of consumption with previous reporting year	Please explain
30.66	Lower	24.53	Lower	6.13	Lower	In 2016, the total value of water withdrawals was 38.43 megaliters. This reduction is the result of several actions carried out by Cemig over the years, such as educational campaigns for more conscious use of water, preventive maintenance in water installations, replacement of old pipes, valves and taps, elimination of leaks and changes in procedures.

Facility reference number	Facility name (optional)	Country	River basin	Latitude	Longitude	Primary power generation source for your electricity generation at this facility
Facility 4	Maintenance Management of North Region Generation Assets.	Brazil	São Francisco River and Jequitinhonha	-44.25	-44.99	Hydroelectric
Total water withdrawals (megaliters/year) at this facility	Comparison of withdrawals with previous reporting year	Total water discharges (megaliters/year) at this facility	Comparison of discharges with previous reporting year	Total water consumption (megaliters/year) at this facility	Comparison of consumption with previous reporting year	Please explain
2.3	About the same	1.8	About the same	0.5	About the same	In 2016, the total value of water withdrawals was 2.09 megaliters. This reduction is the result of several actions carried out by Cemig over the years, such as educational campaigns for more conscious use of water, preventive maintenance in water installations, replacement of old pipes, valves and taps, elimination of leaks and changes in procedures.

Facility reference number	Facility name (optional)	Country	River basin	Latitude	Longitude	Primary power generation source for your electricity generation at this facility
Facility 5	Maintenance management of the South Region Generation Assets.	Brazil	Rio Grande	-44.99	-21.23	Hydroelectric
Total water withdrawals (megaliters/year) at this facility	Comparison of withdrawals with previous reporting year	Total water discharges (megaliters/year) at this facility	Comparison of discharges with previous reporting year	Total water consumption (megaliters/year) at this facility	Comparison of consumption with previous reporting year	Please explain
3.87	Lower	3.09	Lower	0.78	Lower	In 2016, the total value of water withdrawals was 5.61 megaliters. This reduction is the result of several actions carried out by Cemig over the years, such as educational campaigns for more conscious use of water, preventive maintenance in water installations, replacement of old pipes, valves and taps, elimination of leaks and changes in procedures.

Facility reference number	Facility name (optional)	Country	River basin	Latitude	Longitude	Primary power generation source for your electricity generation at this facility
Facility 6	Maintenance Management of Central-North Region Transmission Assets	Brazil	Sao Francisco	-44.01	-19.94	Not applicable
Total water withdrawals (megaliters/year) at this facility	Comparison of withdrawals with previous reporting year	Total water discharges (megaliters/year) at this facility	Comparison of discharges with previous reporting year	Total water consumption (megaliters/year) at this facility	Comparison of consumption with previous reporting year	Please explain
19.29	About the same	15.43	About the same	3.86	About the same	In 2016, the total value of water withdrawals was 20.55 megaliters.

Facility reference number	Facility name (optional)	Country	River basin	Latitude	Longitude	Primary power generation source for your electricity generation at this facility
Facility 7	Maintenance Management of East Region Transmission Assets	Brazil	Rio Doce	-42.54	-19.47	Not applicable
Total water withdrawals (megaliters/year) at this facility	Comparison of withdrawals with previous reporting year	Total water discharges (megaliters/year) at this facility	Comparison of discharges with previous reporting year	Total water consumption (megaliters/year) at this facility	Comparison of consumption with previous reporting year	Please explain
2.67	About the same	2.13	About the same	0.54	About the same	In 2016, the total value of water withdrawals was 2.80 megaliters. This reduction is the result of several actions carried out by Cemig over the years, such as education campaigns for more conscious use of water, preventive maintenance in water installations, replacement of old pipes, valves and taps, elimination of leaks, replacement of old pipes, valves and taps, elimination of leaks and changes in procedures.

Facility reference number	Facility name (optional)	Country	River basin	Latitude	Longitude	Primary power generation source for your electricity generation at this facility
Facility 8	Maintenance Management of Southeast Region Transmission Assets	Brazil	Rio Grande	-43.77	-21.21	Not applicable
Total water withdrawals (megaliters/year) at this facility	Comparison of withdrawals with previous reporting year	Total water discharges (megaliters/year) at this facility	Comparison of discharges with previous reporting year	Total water consumption (megaliters/year) at this facility	Comparison of consumption with previous reporting year	Please explain
2.08	About the same	1.67	About the same	0.41	About the same	In 2016, the total value of water withdrawals was 2.00 megaliters.

Facility reference number	Facility name (optional)	Country	River basin	Latitude	Longitude	Primary power generation source for your electricity generation at this facility
Facility 9	Maintenance Management of Triângulo Region Transmission Assets.	Brazil	Grande River and Paranaíba River	-48.31	18.89	Not applicable
Total water withdrawals (megaliters/year) at this facility	Comparison of withdrawals with previous reporting year	Total water discharges (megaliters/year) at this facility	Comparison of discharges with previous reporting year	Total water consumption (megaliters/year) at this facility	Comparison of consumption with previous reporting year	Please explain
4.69	About the same	3.76	About the same	0.93	About the same	In 2016, the total value of water withdrawals was 4.74 megaliters.

Facility reference number	Facility name (optional)	Country	River basin	Latitude	Longitude	Primary power generation source for your electricity generation at this facility
Facility 10	Barreiro Thermoelectric Power Plant	Brazil	Sao Francisco	-44.01	18.97	Other renewable
Total water withdrawals (megaliters/year) at this facility	Comparison of withdrawals with previous reporting year	Total water discharges (megaliters/year) at this facility	Comparison of discharges with previous reporting year	Total water consumption (megaliters/year) at this facility	Comparison of consumption with previous reporting year	Please explain
0	Much lower	0	Much lower	0	Much lower	In 2016 the value was 27.85 megaliters. The Barreiro Thermoelectric Power Plant did not operate in 2016, as the contract between Cemig and Vallourec, which operates the plant, ended in December 2016.

Facility reference number	Facility name (optional)	Country	River basin	Latitude	Longitude	Primary power generation source for your electricity generation at this facility
Facility 11	Igarapé Thermoelectric Power Plant	Brazil	Sao Francisco	-44.28	-19.92	Oil
Total water withdrawals (megaliters/year) at this facility	Comparison of withdrawals with previous reporting year	Total water discharges (megaliters/year) at this facility	Comparison of discharges with previous reporting year	Total water consumption (megaliters/year) at this facility	Comparison of consumption with previous reporting year	Please explain
27.96	Higher	7.82	Higher	9.77	Higher	In 2016 the value was 11.26 megaliters. The Igarapé Thermoelectric Power Plant (131 MW) operates to meet the contingencies of the National Interconnected Electric System. It is important to note that the energy dispatch decision in Brazil (composition of the hydrothermal generation every week) is made by the National Electric System Operator (ONS, Operador Nacional do Sistema Elétrico) based on prospective analyzes of future forecast inflow scenarios. In 2016 the plant was not dispatched.

Facility reference number	Facility name (optional)	Country	River basin	Latitude	Longitude	Primary power generation source for your electricity generation at this facility
Facility 12	CEMIG's Head office and other installations	Brazil	São Francisco	--43,92	-19,92	Not applicable

Facility reference number	Facility name (optional)	Country	River basin	Latitude	Longitude	Primary power generation source for your electricity generation at this facility
Facility 13	Cemig Distribuição	Brazil	Doce, Grande, São Francisco and others	-44.03	-19.85	Not applicable
Total water withdrawals (megaliters/year) at this facility	Comparison of withdrawals with previous reporting year	Total water discharges (megaliters/year) at this facility	Comparison of discharges with previous reporting year	Total water consumption (megaliters/year) at this facility	Comparison of consumption with previous reporting year	Please explain
76.06	Lower	60.85	Lower	15.21	Lower	In 2016, the total water withdrawal value was 108.29 megaliters. This reduction is the result of several actions carried out by Cemig over the years, such as educational campaigns for more conscious use of water, preventive maintenance in water installations, replacement of old pipes, valves and taps, elimination of leaks and changes in procedures. Another reason to reduce consumption was due to the reduction in the number of employees of the company.

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

Facility reference number	Facility name	Fresh surface water, including rainwater, water from wetlands, rivers, and lakes	Brackish surface water /seawater	
Facility 1	Maintenance Management of West Region Generation Assets	3.21	0	
Groundwater (renewable)	Groundwater (non-renewable)	Produced water	Third party sources	Comment
0	72.05	0	72.05	In 2016, the total value of water withdrawals was 86.12 megaliters. This reduction is the result of several actions carried out by Cemig over the years, such as educational campaigns for more conscious use of water, preventive maintenance in water installations, replacement of old pipes, valves and taps, elimination of leaks and changes in procedures.

Facility reference number	Facility name	Fresh surface water, including rainwater, water from wetlands, rivers, and lakes	Brackish surface water /seawater	
Facility 2	Maintenance Management of East Region Generation Assets	0	0	
Groundwater (renewable)	Groundwater (non-renewable)	Produced water	Third party sources	Comment
0	0.04	0	0	In 2016, the total value of water withdrawals was 0.41 megaliters. This reduction is the result of several actions carried out by Cemig over the years, such as educational campaigns for more conscious use of water, preventive maintenance in water installations, replacement of old pipes, valves and taps, elimination of leaks and changes in procedures.

Facility reference number	Facility name	Fresh surface water, including rainwater, water from wetlands, rivers, and lakes	Brackish surface water /seawater	
Facility 3	Maintenance management of the Triângulo Region Generation Assets	0	0	
Groundwater (renewable)	Groundwater (non-renewable)	Produced water	Third party sources	Comment
0	30.66	0	0	In 2016, the total value of water withdrawals was 38.43 megaliters. This reduction is the result of several actions carried out by Cemig over the years, such as educational campaigns for more conscious use of water, preventive maintenance in water installations, replacement of old pipes, valves and taps, elimination of leaks and changes in procedures.

Facility reference number	Facility name	Fresh surface water, including rainwater, water from wetlands, rivers, and lakes		Brackish surface water /seawater
Facility 4	Maintenance Management of North Region Generation Assets	0.71		0
Groundwater (renewable)	Groundwater (non-renewable)	Produced water	Third party sources	Comment
0	1.56	0	0.04	Maintenance Management of North Region Generation Assets

Facility reference number	Facility name	Fresh surface water, including rainwater, water from wetlands, rivers, and lakes		Brackish surface water /seawater
Facility 5	Maintenance management of the South Region Generation Assets	1.77		0
Groundwater (renewable)	Groundwater (non-renewable)	Produced water	Third party sources	Comment
0	2.1	0	0	In 2016, the total value of water withdrawals was 5.61 megaliters. This reduction is the result of several actions carried out by Cemig over the years, such as educational campaigns for more conscious use of water, preventive maintenance in water installations, replacement of old pipes, valves and taps, elimination of leaks and changes in procedures.

Facility reference number	Facility name	Fresh surface water, including rainwater, water from wetlands, rivers, and lakes		Brackish surface water /seawater
Facility 6	Maintenance Management of Central-North Region Transmission Assets	0		0
Groundwater (renewable)	Groundwater (non-renewable)	Produced water	Third party sources	Comment
0	9.67	0	9.62	In 2016, the total value of water withdrawals was 20.55 megaliters.

Facility reference number	Facility name			Fresh surface water, including rainwater, water from wetlands, rivers, and lakes	Brackish surface water /seawater
Facility 7	Maintenance Management of East Region Transmission Assets			0	0
Groundwater (renewable)	Groundwater (non-renewable)	Produced water	Third party sources	Comment	
0	0.14	0	2.53	In 2016, the total value of water withdrawals was 2.80 megaliters. This reduction is the result of several actions carried out by Cemig over the years, such as education campaigns for more conscious use of water, preventive maintenance in water installations, replacement of old pipes, valves and taps, elimination of leaks, replacement of old pipes, valves and taps, elimination of leaks and changes in procedures.	

Facility reference number	Facility name			Fresh surface water, including rainwater, water from wetlands, rivers, and lakes	Brackish surface water /seawater
Facility 8	Maintenance Management of Southeast Region Transmission Assets			0	0
Groundwater (renewable)	Groundwater (non-renewable)	Produced water	Third party sources	Comment	
0	0.77	0	1.31	In 2016, the total value of water withdrawals was 2.00 megaliters.	

Facility reference number	Facility name			Fresh surface water, including rainwater, water from wetlands, rivers, and lakes	Brackish surface water /seawater
Facility 9	Maintenance Management of Triângulo Region Transmission Assets			0	0
Groundwater (renewable)	Groundwater (non-renewable)	Produced water	Third party sources	Comment	
0	3.42	0	1.28	In 2016, the total value of water withdrawals was 4.74 megaliters.	

Facility reference number	Facility name			Fresh surface water, including rainwater, water from wetlands, rivers, and lakes	Brackish surface water /seawater
Facility 10	Barreiro Thermoelectric Power Plant			0	0
Groundwater (renewable)	Groundwater (non-renewable)	Produced water	Third party sources	Comment	
0	0	0	0	In 2016 the value was 27.85 megaliters. The Barreiro Thermoelectric Power Plant did not operate in 2016, as the contract between Cemig and Vallourec, which operates the plant, ended in December 2016.	

Facility reference number	Facility name			Fresh surface water, including rainwater, water from wetlands, rivers, and lakes	Brackish surface water /seawater
Facility 11	Igarapé Thermoelectric Power Plant			18.19	0
Groundwater (renewable)	Groundwater (non-renewable)	Produced water	Third party sources	Comment	
0	9.78	0	0	In 2016 the value was 11.26 megaliters. The Igarapé Thermoelectric Power Plant (131 MW) operates to meet the contingencies of the National Interconnected Electric System. It is important to note that the energy dispatch decision in Brazil (composition of the hydrothermal generation every week) is made by the National Electric System Operator (ONS, Operador Nacional do Sistema Elétrico) based on prospective analyzes of future forecast inflow scenarios. In 2016 the plant was not dispatched.	

Facility reference number	Facility name			Fresh surface water, including rainwater, water from wetlands, rivers, and lakes	Brackish surface water /seawater
Facility 12	Cemig's Headquarter and other facilities.			0	0
Groundwater (renewable)	Groundwater (non-renewable)	Produced water	Third party sources	Comment	
0	0	0	115.83	In 2016, the total value of water withdrawals was 75.02 megaliters.	

Facility reference number	Facility name			Fresh surface water, including rainwater, water from wetlands, rivers, and lakes	Brackish surface water /seawater
Facility 13	Cemig Distribuição			0	0
Groundwater (renewable)	Groundwater (non-renewable)	Produced water	Third party sources	Comment	
0	0.03	0	76.03	In 2016, the total water withdrawal value was 108.29 megaliters. This reduction is the result of several actions carried out by Cemig over the years, such as educational campaigns for more conscious use of water, preventive maintenance in water installations, replacement of old pipes, valves and taps, elimination of leaks and changes in procedures. Another reason to reduce consumption was due to the reduction in the number of employees of the company.	

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

Facility reference number	Facility name	Fresh surface water	Seawater	Groundwater	Wastewater for another organization	Comment
Facility 1	Management of maintenance of assets Western Generation	2.57	0	57.64	2.43	In 2016 the value was 68.20 megaliters. Cemig's effluents are generated only in its administrative processes. The effluents generated in the administrative units are discharged in the public network or intended for controlled septic, not affecting, directly, any watercourse. The estimation for the volumes is based on the principles of the Brazilian standard NBR 7229.
Facility 2	Management of maintenance of assets East Generation	0	0	0.03	0	In 2016 the value was 0.33 megaliters. Cemig's effluents are generated only in its administrative processes. The effluents generated in the administrative units are discharged in the public network or intended for controlled septic, not affecting, directly, any watercourse. The estimation for the volumes is based on the principles of the Brazilian standard NBR 7229.
Facility 3	Management of maintenance of assets Triangle Generation.	0	0	24.53	0	In 2016 the value was 30.74 megaliters. Cemig's effluents are generated only in its administrative processes. The effluents generated in the administrative units are discharged in the public network or intended for controlled septic, not affecting, directly, any watercourse. The estimation for the volumes is based on the principles of the Brazilian standard NBR 7229.
Facility 4	Management of maintenance of assets North Generation.	0.57	0	1.25	0.03	In 2016 the value was 1.67 megaliters. Cemig's effluents are generated only in its administrative processes. The effluents generated in the administrative units are discharged in the public network or intended for controlled septic, not affecting, directly, any watercourse. The estimation for the volumes is based on the principles of the Brazilian standard NBR 7229.
Facility 5	Management of maintenance of assets South Generation.	1.41	0	1.68	0	In 2016 the value was 4.49 megaliters. Cemig's effluents are generated only in its administrative processes. The effluents generated in the administrative units are discharged in the public network or intended for controlled septic, not affecting, directly, any watercourse. The estimation for the volumes is based on the principles of the Brazilian standard NBR 7229.
Facility 6	Management of maintenance of assets Center North Transmission	0	0	7.34	7.69	In 2016 the value was 16.44 megaliters. Cemig's effluents are generated only in its administrative processes. The effluents generated in the administrative units are discharged in the public network or intended for controlled septic, not affecting, directly, any watercourse. The estimation for the volumes is based on the principles of the Brazilian standard NBR 7229.

Facility reference number	Facility name	Fresh surface water	Seawater	Groundwater	Wastewater for another organization	Comment
Facility 7	Management of maintenance of assets East Transmission	0	0	0.11	2.02	In 2016 the value was 2.24 megaliters. Cemig's effluents are generated only in its administrative processes. The effluents generated in the administrative units are discharged in the public network or intended for controlled septic, not affecting, directly, any watercourse. The estimation for the volumes is based on the principles of the Brazilian standard NBR 7229.
Facility 8	Management of maintenance of assets Southeast Transmission	0	0	0.62	1.04	In 2016 the value was 1.60 megaliters. Cemig's effluents are generated only in its administrative processes. The effluents generated in the administrative units are discharged in the public network or intended for controlled septic, not affecting, directly, any watercourse. The estimation for the volumes is based on the principles of the Brazilian standard NBR 7229.
Facility 9	Management of maintenance of assets Triangle Transmission.	0	0	2.73	1.02	In 2016 the value was 3.79 megaliters. Cemig's effluents are generated only in its administrative processes. The effluents generated in the administrative units are discharged in the public network or intended for controlled septic, not affecting, directly, any watercourse. The estimation for the volumes is based on the principles of the Brazilian standard NBR 7229.
Facility 10	Barreiro Thermal Power Plant	0	0	0	0	In 2016, there was the end of commercial operation of the Barreiro thermoelectric plant. The contract between Cemig and Vallourec to operate that plant ended in December 2016.
Facility 11	Igarapé Thermal Power Plant	0	0	7.82	0	In the TPP Igarapé, the water returns to the watercourse after being used.
Facility 12	Cemig's Headquarter and other facilities	0	0	0	92.67	In 2016 the value was 60.02 megaliters. Cemig's effluents are generated only in its administrative processes. The effluents generated in the administrative units are discharged in the public network or intended for controlled septic, not affecting, directly, any watercourse. The estimation for the volumes is based on the principles of the Brazilian standard NBR 7229.
Facility 13	Cemig Distribuição	0	0	0.02	60.82	In 2016 the value was 86.63 megaliters. Cemig's effluents are generated only in its administrative processes. The effluents generated in the administrative units are discharged in the public network or intended for controlled septic tanks, not affecting, directly, any watercourse. The estimation for the volumes is based on the principles of the Brazilian standard NBR 7229.

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

Facility reference number	Facility name	% recycled or reused	Comparison with previous reporting year	Please explain
Facility 1	Maintenance Management of West Region Generation Assets	None	About the same	Most of Cemig's power generation has non-consumptive water use. There is a low consumption in its operations, only in their thermal power plants and administrative activities, being the water recirculation rate regarded as insignificant in these operations.
Facility 2	Maintenance Management of East Region Generation Assets	None	About the same	
Facility 3	Maintenance management of the Triângulo Region Generation Assets	None	About the same	
Facility 4	Maintenance Management of North Region Generation Assets	None	About the same	
Facility 5	Maintenance management of the South Region Generation Assets	None	About the same	
Facility 6	Maintenance Management of Central-North Region Transmission Assets	None	About the same	
Facility 7	Maintenance Management of East Region Transmission Assets	None	About the same	
Facility 8	Maintenance Management of Southeast Region Transmission Assets	None	About the same	
Facility 9	Maintenance Management of Triângulo Region Transmission Assets	None	About the same	
Facility 10	Barreiro Thermoelectric Power Plant	None	About the same	The Barreiro Thermoelectric Power Plant did not operate in 2016, as the contract between Cemig and Vallourec, which operates the plant, ended in December 2016.
Facility 11	Igarapé Thermoelectric Power Plant	Less than 1%	About the same	The water used for steam production is reused and operates in closed cycle.

Facility reference number	Facility name	% recycled or reused	Comparison with previous reporting year	Please explain
Facility 12	Cemig's Headquarter and other facilities.	None	About the same	Recycling in administrative buildings is considered insignificant.
Facility 13	Cemig Distribuição	None	About the same	Most of Cemig's power generation has non-consumptive water use. There is a low consumption in its operations, only in their thermal power plants and administrative activities, being the water recirculation rate regarded as insignificant in these operations.

(W5.1d) For each of the facilities referenced in W5.1, what proportion of water accounting data has been externally verified?

Water aspect	% verified	What standard and methodology was used?
Water withdrawals – total volumes	76-100	The data was verified in the scope of the external audit of the 2017 Annual and Sustainability Report by SGS ICS Certificadora LTDA. The assurance scope, based on the methodology for assurance of the SGS Sustainability Reports, included the text and data related to the GRI G4 Sustainability Reporting Guidelines, including indicators. SGS has developed a set of Sustainability Communication Assurance protocols based on best practices.
Water withdrawals – volume by source	76-100	The data was verified in the scope of the external audit of the 2017 Annual and Sustainability Report by SGS ICS Certificadora LTDA. The assurance scope, based on the methodology for assurance of the SGS Sustainability Reports, included the text and data related to the GRI G4 Sustainability Reporting Guidelines, including indicators. SGS has developed a set of Sustainability Communication Assurance protocols based on best practices.
Water withdrawals – quality	76-100	The company has Environmental Management System (ISO 14001) and Quality Management System (ISO 9001) in which the drinking water standards for human consumption are verified.
Water discharges – total volumes	76-100	The data was verified in the scope of the external audit of the 2017 Annual and Sustainability Report by SGS ICS Certificadora LTDA. The assurance scope, based on the methodology for assurance of the SGS Sustainability Reports, included the text and data related to the GRI G4 Sustainability Reporting Guidelines, including indicators. SGS has developed a set of Sustainability

Water aspect	% verified	What standard and methodology was used?
		Communication Assurance protocols based on best practices.
Water discharges – volume by destination	76-100	The data was verified in the scope of the external audit of the 2017 Annual and Sustainability Report by SGS ICS Certificadora LTDA. The assurance scope, based on the methodology for assurance of the SGS Sustainability Reports, included the text and data related to the GRI G4 Sustainability Reporting Guidelines, including indicators. SGS has developed a set of Sustainability Communication Assurance protocols based on best practices.
Water discharges – volume by treatment method	76-100	The company has Environmental Management System (ISO 14001) and Quality Management System (ISO 9001) in which the treatment systems and the conditions of effluent releases in the company units are verified. The release conditions must comply with DN COPAM/CERH-MG nº1/2008, which provides for the classification of water bodies and environmental guidelines for their classification, as well as establishing the conditions and standards for effluent discharge, and other measures.
Water discharge quality – quality by standard effluent parameters	76-100	The company has Environmental Management System (ISO 14001) and Quality Management System (ISO 9001) in which the legal requirements are met. The release conditions must comply with DN COPAM/CERH-MG nº1/2008, which deals with the classification of water bodies and environmental guidelines for their classification.
Water discharge quality – temperature	76-100	The company has Environmental Management System (ISO 14001) and Quality Management System (ISO 9001) in which the legal requirements are met. The release conditions must comply with DN COPAM/CERH-MG nº1/2008, which deals with the classification of water bodies and environmental guidelines for their classification.
Water consumption – total volume	76-100	The data was verified in the scope of the external audit of the 2017 Annual and Sustainability Report by SGS ICS Certificadora LTDA. The assurance scope, based on the methodology for assurance of the SGS Sustainability Reports, included the text and data related to the GRI G4 Sustainability Reporting Guidelines, including indicators. SGS has developed a set of Sustainability Communication Assurance protocols based on best practices.
Water recycled/reused	<ul style="list-style-type: none"> • Not verified 	The amount of recycled water in the company is still not significant.

W6 Governance

Water policy

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

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

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

Scope	Content	Please explain
<ul style="list-style-type: none"> • Company-wide 	<ul style="list-style-type: none"> • Description of business dependency on water • Description of business impact on water • Description of water-related performance standards for direct operations • Commitment to align with public policy initiatives, such as the SDGs • Commitments beyond regulatory compliance • Commitment to water-related innovation • Commitment to stakeholder awareness and education • Commitment to water stewardship and/or collective action • Acknowledgement of the human right to water and sanitation • Recognition of environmental linkages, for example, due to climate change <ul style="list-style-type: none"> • Other, please specify: Commitment to conservation <i>(Promove ações com foco na conservação de água e preservação de mananciais. Promove a gestão segura dos seus reservatórios. Realiza monitoramento climatológico e quantitativo da água. Realiza monitoramento da qualidade da água e sedimentométrico: A Cemig se compromete a monitorar a qualidade da água, o aporte e a deposição de sedimentos nos seus reservatórios, de forma a estimar a vida útil destes e a caracterizar os rios nos quais possui empreendimentos.)</i> 	<p>Cemig, aware of the importance of water resources for the maintenance of its businesses and for society, establishes a Water Resources Policy with the objective of defining the principles that govern the Company's actions on the subject. When developing its activities, the Company undertakes to adopt integrated and sustainable practices for the rational use of water resources, prevention and defense against critical hydrological events, both of natural origin and arising from the undue use of natural resources, considering the water availability and the needs of current and future generations. This policy has the following principles: Water Resources Management, Water Resources Conservation, Participation in Public Management and compliance with Water Resources Legislation, Safe Reservoir Management, Climatological and Quantitative Water Monitoring, Water and Sediment Quality Monitoring, Relationship with Stakeholders and Research and Development.</p>

Board oversight

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

- Yes

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

Position of individual	Please explain
<ul style="list-style-type: none"> • Other, please specify: Deputy Chief Executive Officer 	<p>The person who is at the highest level of direct responsibility for water resources at Cemig is the Deputy Chief Executive Officer, who reports directly to the Presidency of the Company, and the Presidency is the highest level of the Executive Board, which in turn reports directly to the Board of Directors.</p> <p>Cemig's management is composed of the Board of Directors and the Executive Board. The members of the Board of Directors, elected by the Shareholders' Meeting, elect its Chief Executive Officer, the Deputy Chief Executive Officer and appoint the Executive Board. The Executive Board, structure in which the Deputy Chief Executive Officer is located, is considered a group belonging to the Company's management. The functional attributions of the Deputy Chief Executive Officer, defined and approved by the Board of Directors, include, among others, to promote the improvement of corporate social responsibility and sustainability policies.</p>

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

Frequency that water-related issues are a scheduled agenda item	Governance mechanisms into which water-related issues are integrated	Please explain
<ul style="list-style-type: none"> • Other, please specify: Scheduled - daily 	<ul style="list-style-type: none"> • Monitoring implementation and performance • Overseeing acquisitions and divestiture • Overseeing major capital expenditures • Reviewing and guiding annual budgets • Reviewing and guiding business plans • Reviewing and guiding major plans of action • Reviewing and guiding risk management policies • Reviewing and guiding strategy • Setting performance objectives • Reviewing and guiding corporate responsibility strategy • Reviewing innovation/R&D priorities 	<p>Cemig has indicators for the management of water resources, which are analyzed periodically, showing the tendency to meet the targets and making possible any necessary interventions. The Energy Efficiency Index of the Power Plants - IEPE (Índice de Eficiência no Planejamento Energético das Usinas), which measures the efficiency of the energy operation of Cemig's hydroelectric power plants, is the most important, comparing verified power generation with respect to optimum generation, taking into account the observed flows, the maintenance of generating units and compliance with the operating restrictions. This indicator is aligned with the corporate map of the Generation business, linked to the strategic objective "Increase operational efficiency". The higher its result means that the better the planning of the use of</p>

		water for electricity generation. As in 2016, in 2017 there were virtually no verifications at the power plants due to the low inflows in the period, contributing to the IEPE result also exceeding the target of 92.5%, reaching a result of 94.53%.
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Management responsibility

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

Name of the position(s) and/or committee(s)	Responsibility	Frequency of reporting to the board on water-related issues	Please explain
<ul style="list-style-type: none"> Chief Operating Officer (COO) 	<ul style="list-style-type: none"> Managing water-related risks and opportunities 	<ul style="list-style-type: none"> More frequently than quarterly 	<p>The person who is at the highest level of direct responsibility for the water theme at Cemig is the Chief Generation and Transmission Officer. Since water is the main raw material for power generation, the Chief Generation and Transmission Officer daily monitors the level of the Company's reservoirs and monitors weather forecasts. The most relevant information on the subject is presented weekly at Board meetings and monthly at meetings of the Board of Directors.</p>
<ul style="list-style-type: none"> Other, please specify: Risk Monitoring Committee 	<ul style="list-style-type: none"> Assessing water-related risks and opportunities 	<ul style="list-style-type: none"> More frequently than quarterly 	<p>This committee is responsible for advising the Board of Executive Board on the fulfillment of responsibilities related to corporate risk management, accompanying them and recommending mitigation actions. The following attributions can be highlighted: Promote the discussion of strategic and operational matters in the Corporate Risk Management Process; Continuously monitor the scenario in which the Company is inserted and its corporate risk matrix, aiming to identify the main risks and recommend priority mitigation actions to be proposed to the Board of Executive Officers; Continuously monitor the scenario in which the Company is inserted and its corporate risk matrix, aiming to identify the main</p>

Name of the position(s) and/or committee(s)	Responsibility	Frequency of reporting to the board on water-related issues	Please explain
			risks and recommend priority mitigation actions to be proposed to the Board of Executive Officers; Recommend, for approval by the Board of Executive Officers, guidelines and procedures to be adopted in the Corporate Risk Monitoring Process.

Employee incentives

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

- Yes

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

Type of incentives	Who is entitled to benefit from these incentives?	Indicator for incentivized performance	Please explain
Monetary reward	<ul style="list-style-type: none"> • Corporate executive team • Other C-suite Officer: Deputy Chief Executive Officer 	<ul style="list-style-type: none"> • Other, please specify Sustainability index <i>(A monetary reward is linked to the performance of the company in the Sustainability Index related to water risk.)</i> 	Indicator: Cemig's note on the Dow Jones Sustainability Index. This index assesses issues related to water risk management, among other issues related to sustainability. The variable compensation of the Deputy Chief Executive Officer, which is the second position of the Board of Executive Officers, belonging to the Company's Management, and is linked to the grade obtained by Cemig in the Dow Jones Sustainability Index.
Recognition (non-monetary)	<ul style="list-style-type: none"> • Other, please specify: Employess 	<ul style="list-style-type: none"> • Efficiency project or target – direct operations 	The employee was recognized at an event

Type of incentives	Who is entitled to benefit from these incentives?	Indicator for incentivized performance	Please explain
			attended by the Executive Board
Other non-monetary reward	<ul style="list-style-type: none"> No one is entitled to these incentives 		So far, the company does not have this kind of incentive.

Public policy engagement

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

- Yes, direct engagement with policy makers
- Yes, other

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

Cemig participates actively in all deliberative and regulatory forums for water resources at the federal and state levels, such as the National and State Water Resources Councils, River Basin Committees, Technical Chambers and Working Groups. With a focus on the State of Minas Gerais, Cemig is a member of twenty (20) state river basin committees and five (5) federal committees, and is also a member of the Brazilian Association of Electricity Generating Companies (Abrage, Associação Brasileira das Empresas Geradoras de Energia Elétrica), and in 2017 it acted as coordinator of the Working Group on Water Resources (GTRH, Grupo de Trabalho de Recursos Hídricos). With this initiative, Cemig influences the elaboration of policies and guidelines and, at the same time, monitors regulatory trends, being an important subsidy for the estimation of impacts on the Company's ventures at the local level. Further information on Cemig's institutional holdings can be found at: http://www.cemig.com.br/en-us/Company_and_Future/Sustainability/water_resources/Pages/water_resource_management.aspx

W7 Business strategy

Strategic plan

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

Aspect of strategic business plan	Are water-related issues integrated?	Long-term time horizon (years)	Please explain
Long-term business objectives	<ul style="list-style-type: none"> ● Yes, water-related issues are integrated 	<ul style="list-style-type: none"> ● 5-10 	The main drivers of Cemig's business strategy are related to balanced growth, both through new projects and through mergers and acquisitions, with sustainable commitments and shareholder value added in the long term as its main commitments. Aiming at expanding the installed capacity through a low risk portfolio. One of the guidelines is the recovery of its capacity to generate energy from renewable sources (hydroelectric, wind and solar).
Strategy for achieving long-term objectives	<ul style="list-style-type: none"> ● Yes, water-related issues are integrated 	<ul style="list-style-type: none"> ● 11-15 	<p>The company has an area dedicated to the analysis of scenarios, risks and opportunities and market trends that is responsible for the elaboration of strategic planning.</p> <p>The risks and opportunities related to water are classified and prioritized in matrixes of exposure by the Corporate Risk Monitoring Committee and presented to the Executive Board. These risk and opportunity evaluations are therefore presented to top management, who use them in the development of the Company's Strategic Planning. As Cemig's strategy is defined and approved by the Executive Board, the other Boards develop the planning of their activities. The Strategic Planning process is conducted by the Board of Directors, with the participation of the Executive Board.</p> <p>The medium and long-term strategy (2018 to 2030) includes the recovery of generation capacity through the operation of energy traders in the free market and also through participation in energy auctions.</p>
Financial planning	<ul style="list-style-type: none"> ● Yes, water-related issues are integrated 	<ul style="list-style-type: none"> ● 11-15 	There is financial planning in which water issues are integrated in order to

Aspect of strategic business plan	Are water-related issues integrated?	Long-term time horizon (years)	Please explain
			mitigate the risks of loss of hydroelectric generation capacity due to future unfavorable hydrological scenarios. One of the strategies adopted was financial planning for the purchase of renewable energy (solar and wind) through auctions (see opportunities text).

Capex/Opex

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

Water-related CAPEX (+/- % change)	Anticipated forward trend for CAPEX (+/- % change)	Water-related OPEX (+/- % change)	Anticipated forward trend for OPEX (+/- % change)	Please explain
-64	+260	-16	+975	<p>Investment data (CAPEX) in 2017 refer to the modernization of the Hydrometeorological Telemetry System (STH, Sistema de Telemetria Hidrometereológico).</p> <p>The following is the OPEX Data: hydrometeorological network operation and Financial Compensation for the Use of Water Resources (CFURH, Compensação Financeira pela Utilização de Recursos Hídricos) - additional information on financial compensation at: (http://www.cemig.com.br/en-us/Company_and_Future/Sustainability/water_resources/Pages/amounts_paid_by_cemig.aspx).</p> <p>The reduction of the CAPEX is related to the lower value invested in the modernization of the STH.</p> <p>In relation to the reduction of OPEX, one can attribute the reduction in the amount paid of financial compensation (-13%).</p> <p>An increase in investment is expected for 2018 due to the implementation of the Emergency Action Plan (Dams Security Law) and also for the continued modernization of the STH.</p>

W7.3 Scenario analysis

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

Use of climate-related scenario analysis	Comment
<ul style="list-style-type: none"> • Yes 	<p>Based on the Corporate Risk Management System, Cemig analyzes the scenarios and determines the degree of financial exposure to risks, considering the probability of occurrence and its impact and establishes control measures for the following risks: sedimentation of the reservoirs, deviations in the weather forecast, loss of physical guarantee of SHPs and reduction of water availability with impacts on commercialization.</p> <p>The company also invests in research projects and weather forecasting tools that can impact its business.</p> <p>It can be highlighted the acquisition of the meteorological radar and participation in the projects of R&D GT 0552 - Evaporation of the reservoir of the Funil Hydroelectric Power Plant: Characterization of the Water Footprint and Strategic R&D Project No. 010/2008 "Effect of Climate Change on Electric Power Generation".</p>

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

- Yes

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

Climate-related scenario(s)	Description of possible water-related outcomes	Company response to possible water-related outcomes
<ul style="list-style-type: none"> • RCP 2.6 • Other, please specify: RCPs 4.5; 6.0; 8.5 <p><i>(Cemig and other companies in the Brazilian electricity sector used the RCPs 4.5 scenarios; 6.0; 8.5, Climate models: CMIP3 and CMIP5, global climate model HadCM3, IPCC AR4 models in the development of the work "Effect of Climate Change on Power Generation." In order to determine the regional changes, the Eta model, which was developed in Serbia and became operational in the National Centers for Environmental Prediction (NCEP), was used.</i></p> <p><i>Another project developed by Cemig was the P&D GT 0552 - Evaporation of the reservoir of the Funil Hydroelectric Power Plant: Characterization of the Water Footprint. To simulate the impacts of climate change on runoff, the scenarios RCP 4.5 and RCP 8.5, simulated by the regional climatic</i></p>	<p>The result of the Strategic R&D Project No. 1010/2008 "Effect of Climate Change on Electric Power Generation" indicates an increase in air temperature in all regions of the country and reduction of rainfall, mainly in the Amazon and Northeast Region of Brazil and increase in the South Region of the country. For the simulation of hydrology, the distributed hydrological model MGB-IPH was developed to represent the processes of rainfall transformation in large-scale basins. Two generator parks were considered: Existing Generator Park (PGE, Parque Gerador Existente), which are the existing</p>	<p>The company has an area specialized in water resources management and risk management area. These two areas are responsible for the identification of water risks, qualification and quantification of impacts and definition of actions to minimize risks.</p> <p>The following control measures were established: real-time monitoring of the amount of water available in rivers and power plants through 262 telemetry stations belonging to the Telemetry and Hydrometeorological Monitoring System (STH, Sistema de Telemetria e Monitoramento</p>

Climate-related scenario(s)	Description of possible water-related outcomes	Company response to possible water-related outcomes
<p><i>models Eta-HadGEM2-Es and Eta-MIROCC5, were considered. The period evaluated was controlling (1961-2005), 2007-2040, 2041-2070, 2071-2099.)</i></p>	<p>plants and Future Generator Park (PGF, Parque Gerador Futuro) represents the set of plants planned to start operating in 2030. The calculation of Energy Assured Supply System (EASS) was made for the horizons of 2040, 2070 and 2100. Future 01 (2011 to 2040), Future 02 (2041 to 2070) and Future 03 (2071 to 2099). Another project developed by Cemig was the R&D GT 0552 - Evaporation of the reservoir of the Funil Hydroelectric Power Plant: Characterization of the Water Footprint. Three HPPs installed in cascade were evaluated and the following impacts were considered: reduction / increase of energy production potential; impact on the water footprint; interruptions of electricity production due to low water availability. To simulate the impacts of climate change on runoff, the scenarios RCP 4.5 and RCP 8.5, simulated by the regional climatic models Eta-HadGEM2-Es and Eta-MIROCC5, were considered.</p>	<p>Hidrometeorológico); monitoring of sediments in 86 stations located in its hydroelectric power plants, where water samples are collected and analyzed in an accredited laboratory; In addition, whenever Cemig evaluates the feasibility of a new enterprise, the company considers three important points to evaluate its exposure to the risks related to water availability in the study site:</p> <ul style="list-style-type: none"> ● the historical flow series; ● the rules established by the managing body of water resources for withdrawal of water in the stretch of the river; ● the priorities for the use of water resources determined in the Hydrographic Basin Master Plan, which identifies management actions, programs, projects, works and priority investments, with the participation of public agents and users.

Water pricing

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

- Yes

Please explain: The electricity generation sector has been paying, since 1990, a sectorial tax called Financial Compensation for the Use of Water Resources for the Hydroelectric Generation (CFURH, Compensação Financeira pela Utilização de Recursos Hídricos), instituted by Law No. 7.990 of 1989. Cemig, as the entire user sector of water for hydroelectric power generation, was charged for the use of the water resource defined and implemented for its hydroelectric power plants even before the River Basin Committees were set up. The charging for hydroelectric power plants with installed capacity above 30 MW was instituted and started in all the state and federal river basins in August 2000, with the publication of Law No. 9.984. It is also important to remember that it is the only sector that undergo annual readjustment of the amounts collected, through the

readjustment and revision of the Updated Reference Rate (TAR). In 2017 it was BRL 72.20 and for 2018 it was fixed at BRL 74.03.

W8 Targets

Targets and goals

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

Levels for targets and/or goals	Monitoring at corporate level	Approach to setting and monitoring targets and/or goals
<ul style="list-style-type: none"> Company-wide targets and goals Business level specific targets and/or goals Activity level specific targets and/or goals Site/facility specific targets and/or goals 	<ul style="list-style-type: none"> Targets are monitored at the corporate level Goals are monitored at the corporate level 	<p>The Corporate Sustainability Management is responsible for monitoring water consumption targets and other matters related to water issues.</p> <p>The Dam Safety Management and the Energy Planning Management are responsible for implementing the Programa Proximidade (Proximity Program) and the Emergency Response Plan.</p>

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

Target 1	
Category of target	<ul style="list-style-type: none"> Monitoring of water use
Level	<ul style="list-style-type: none"> Company-wide
Primary motivation	<ul style="list-style-type: none"> Recommended sector best practice
Description of target	<p>Reduce water consumption.</p> <p>Cemig seeks to reduce the water consumption of its facilities through campaigns to raise awareness and carry out preventive maintenance.</p>
Quantitative metric	% reduction in total water catchment
Baseline year	2011
Start year	2012
Target year	2020
% achieved	100
Please explain	<p>Cemig's water consumption occurs in the operational and administrative areas related to hydroelectric power generation, transmission and distribution of electricity, in 2017, administrative consumption represented 87% of the total and the industrial process (cooling) of Cemig's thermal power stations (Igarapé Thermal Power Stations -131 MW), this data is strongly influenced by the power generation of the thermal power station.</p> <p>It is noteworthy that the last four years Cemig reduced by 33% the water consumption in the administrative department. This result is the result of measures such as change of processes, management of the consumption of the facilities and a faster action in the correction of leaks, retrofit of Júlio Soares building in which it consists of the replacement of water pipes and the adequacy of the</p>

	building infrastructure, besides the implementation of new equipment that reduces consumption.
Target 2	
Category of target	<ul style="list-style-type: none"> Water withdrawals
Level	<ul style="list-style-type: none"> Site/facility
Primary motivation	<ul style="list-style-type: none"> Recommended sector best practice
Description of target	Reduce water consumption in the Igarapé Thermal Power Plant: reduce water consumption by at least 5%, by 2020, based on 2007 consumption of 42,081m ³ .
Quantitative metric	<ul style="list-style-type: none"> % reduction in total water consumption
Baseline year	2007
Start year	2013
Target year	2020
% achieved	100
Please explain	In recent years, Cemig has carried out a refurbishment in Igarapé Thermal Power Plant in which leaks were identified and eliminated, which led to the achievement of the target.
Target 3	
Category of target	<ul style="list-style-type: none"> Water consumption
Level	<ul style="list-style-type: none"> Business
Primary motivation	<ul style="list-style-type: none"> Recommended sector best practice
Description of target	Reduce water consumption. This objective applies to the generation, transmission and distribution of energy businesses.
Quantitative metric	<ul style="list-style-type: none"> Percentage of reduction in total water consumption
Baseline year	2011
Start year	2012
Target year	2020
% achieved	100
Please explain	<p>Cemig's water consumption occurs in the operational and administrative areas related to hydroelectric power generation, transmission and distribution of electricity, in 2017, administrative consumption represented 87% of the total and the industrial process (cooling) of Cemig's thermal power stations (Igarapé Thermal Power Stations -131 MW), this data is strongly influenced by the power generation of the thermal power station.</p> <p>It is noteworthy that the last four years Cemig reduced by 33% the water consumption in the administrative department. This result is the result of measures such as change of processes, management of the consumption of the facilities and a faster action in the correction of leaks, retrofit of Júlio Soares building in which it consists of the replacement of water pipes and the adequacy of the building infrastructure, besides the implementation of new equipment that reduces consumption.</p>

Target 4	
Category of target	<ul style="list-style-type: none"> Water use efficiency
Level	<ul style="list-style-type: none"> Business activity
Primary motivation	<ul style="list-style-type: none"> Increased revenue
Description of target	<p>Cemig has indicators for the management of water resources, which are analyzed periodically, showing the tendency to meet the targets and making possible any necessary interventions. The Energy Efficiency Index of the Power Plants - IEPE (Índice de Eficiência no Planejamento Energético das Usinas), which measures the efficiency of the energy operation of Cemig's hydroelectric power plants, is the most important, comparing verified power generation with respect to optimum generation, taking into account the observed flows, the maintenance of generating units and compliance with the operating restrictions.</p>
Quantitative metric	% of water for power generation
Baseline year	2010
Start year	2017
Target year	2017
% achieved	100
Please explain	<p>In 2017, a target of the Energy Planning Efficiency Index (IEPE, Índice de Eficiência no Planejamento Energético) was established, of Power Plants greater than 92.5%, resulting in 93.5%. As in 2016, in 2017 there were virtually no verifications at the power plants due to the low inflows in the period, contributing to the IEPE result also exceeding the target. By 2018, the target is 93%.</p>

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

Goal 1	
Goal	Promotion of water data transparency
Level	<ul style="list-style-type: none"> Company-wide
Motivation	<ul style="list-style-type: none"> Brand value protection
Description of goal	<p>Disseminate information regarding the management and use of water by Cemig. The company aims to participate in the main indices and sustainability ratings and for this purpose, it disseminates its practices in relation to the theme. Thus, it set as a target the report to CDP WATER and the scope of the evaluation in level A.</p>
Baseline year	2014
Start year	2016
End year	2020
Progress	<p>Cemig answered the CDP WATER questionnaire for two years as a training, without submitting it. As of 2016, we began to submit the questionnaire and in 2017 we were recognized in category A-.</p>

Goal 2	
Goal	Engaging with local community
Level	<ul style="list-style-type: none"> • Site/facility
Motivation	<ul style="list-style-type: none"> • Risk mitigation
Description of goal	<p>By virtue of Law No. 12.364/2010 and Resolution No. 696 of the National Electric Energy Agency - Aneel, any entrepreneur, understood as a private or governmental agent, with real right over the lands where the dam and reservoir is located or that exploits the dam for its own benefit or the community, should prepare an Emergency Action Plan (EAP).</p> <p>One of the assumptions of the Plan is that in one of the planning stages, engagement with stakeholders should be addressed, in the case of Cemig involving communities throughout the area covered by its 49 dams.</p>
Baseline year	2015
Start year	2016
End year	2020
Progress	<p>For compliance with the Law No. 12.344/2010 and ANEEL Resolution No. 696, an education and communication program on dam safety is being developed with the purpose of raising awareness of the importance of dam safety, which will include the following measures:</p> <ol style="list-style-type: none"> i. support and promotion of decentralized actions to raise awareness and development of knowledge about dam safety; ii. preparation of didactic material; iii. maintenance of a public information system on the safety of dams under its jurisdiction; iv. promotion of partnerships with educational institutions, research and technical associations related to the engineering of dams and related areas; v. annual availability of the Dams Safety Report. <p>All of these actions will be contemplated in Cemig's Dams Safety Communication Plan, which will be developed in stages over the next five years.</p>

Goal 3	
Goal	Watershed remediation and habitat restoration, ecosystem preservation
Level	<ul style="list-style-type: none"> • Business
Motivation	<ul style="list-style-type: none"> • Reduced environmental impact
Description of goal	Conduct R&D project Intelligent Monitoring of Water Quality in Hydropower Reservoirs Through the Development of a Photogrammetric Algorithm, with the objective of using satellite images to monitor the quality of the water through satellite images without going to the field. It is proposed to increase the availability and accuracy of data obtained from environmental monitoring of water quality and reservoir environment by developing algorithms for processing high resolution images obtained by unmanned aerial vehicles (VANTs) in combination with satellite images and data traditionally obtained in the field. The case of Três Marias-MG Reservoir is considered as a case study.
Baseline year	2018
Start year	2018
End year	2022
Progress	<p>The project is in the signatures stage with the research institution at the Federal University of Minas Gerais - UFMG. The progress of the project will be measured from the expected results, which are:</p> <ul style="list-style-type: none"> i) Develop algorithms to evaluate the water quality and the reservoir environment, in the study area, from multispectral images; ii) Develop methodologies for calibration and validation of algorithms for analysis of water quality and reservoir environment from multispectral images; iii) Optimize the monitoring network, considering the location of the stations, the frequency of monitoring and the most important parameters for the characterization of the water quality in the region of study, using multivariate statistical analysis; iv) Apply and validate statistical tools for the integration of historical water quality monitoring series, aiming at meeting the various purposes of the network, such as the analysis of trends in the evolution of water quality, identification of critical areas of pollution and verification of effectiveness management of water quality recovery actions; v) Develop protocols for automation and optimization of water quality monitoring processes combined with traditional methods.

W9 Linkages and tradeoffs

Managing linkages and tradeoffs

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

- Yes

(W9.1a) Describe the linkages or trade-offs and the related management policy or action.

Linkage/trade-off	Type of linkage/tradeoff	Description of linkage/trade-off	Policy or action
<ul style="list-style-type: none"> • Linkage 	<ul style="list-style-type: none"> • Other linkage, please specify: Multiple uses of water 	Multiple uses of water for all users of the basins that Cemig owns hydroelectric power plant.	<p>The operation of reservoirs that Cemig uses for hydroelectric power generation essentially implies consideration of multiple uses of water by other users of the river basin, which, in turn, leads to the need to consider a series of environmental restrictions, security, irrigation systems, human supply, waterways, bridges, among others, strictly respected by Cemig.</p> <p>Cemig uses the Water Resources Plans, with management actions, programs, projects, works, investments and priority uses to identify and estimate potential conflicts due to water use.</p> <p>For new projects, Cemig prepares the Social and Environmental Impact Study and holds public hearings with stakeholders, where suggestions are analyzed to support the assessment of potential conflicts. In the operating phase is prepared, with the participation of stakeholders, the Environmental Plan for Conservation and Use of the Surrounding of Artificial Reservoir, in order to regulate the conservation, restoration, use and environmental occupation of the reservoir and its surroundings, taking into account the legislation, the needs of the enterprise and interaction with society.</p> <p>The Programa Proximidade (Proximity Program) was prepared, with the objective of avoiding or minimizing possible conflicts with stakeholders, in this program some stakeholder needs are identified and implemented.</p>

W10 Verification

Verification of water information

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

- Yes

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

Disclosure module	Data verified	Verification standard	Please explain
W0. Introdução	The profile of Cemig was verified.	ISAE3000	<p>SGS was contracted by CEMIG to perform the independent assurance of its "2017 ANNUAL AND SUSTAINABILITY REPORT". The assurance scope, based on the methodology for assurance of the SGS Sustainability Reports, included the text and data related to the GRI G4 Sustainability Reporting Guidelines, including indicators.</p> <p>This report was secured using our protocols to assess the truthfulness of the content and its alignment with the GRI G4 Guidelines for Sustainability Reporting in accordance with the material topics identified by CEMIG through the process described in this report. In addition, the GRI G4 Electric Utilities industry supplement was also used. Based on this context, the "2017 ANNUAL AND SUSTAINABILITY REPORT" is characterized as the Essential Level.</p> <p>The assurance process comprised (i) the review of indicators, information and data present in the preliminary version of the sustainability report (ii) interviews with strategic collaborators, both to understand the data in the report and to understand the management processes involved with the material issues and (ii) revision of complementary documentation sent by CEMIG to SGS. CEMIG's accounting information contained in and/or referenced in the "2017 ANNUAL AND SUSTAINABILITY REPORT" was not evaluated as part of this assurance process.</p>
W1. Estado atual	Data on consumption of industrial water, water for administrative consumption and effluents were verified.	ISAE3000	<p>SGS was contracted by CEMIG to perform the independent assurance of its "2017 ANNUAL AND SUSTAINABILITY REPORT". The assurance scope, based on the methodology for assurance of the SGS Sustainability Reports, included the text and data related to the GRI G4</p>

Disclosure module	Data verified	Verification standard	Please explain
			<p>Sustainability Reporting Guidelines, including indicators.</p> <p>This report was secured using our protocols to assess the truthfulness of the content and its alignment with the GRI G4 Guidelines for Sustainability Reporting in accordance with the material topics identified by CEMIG through the process described in this report. In addition, the GRI G4 Electric Utilities industry supplement was also used. Based on this context, the "2017 ANNUAL AND SUSTAINABILITY REPORT" is characterized as the Essential Level.</p> <p>The assurance process comprised (i) the review of indicators, information and data present in the preliminary version of the sustainability report (ii) interviews with strategic collaborators, both to understand the data in the report and to understand the management processes involved with the material issues and (ii) revision of complementary documentation sent by CEMIG to SGS. CEMIG's accounting information contained in and/or referenced in the "2017 ANNUAL AND SUSTAINABILITY REPORT" was not evaluated as part of this assurance process.</p>
W3. Procedimentos	We verified the information of the item "Water Resources" in the scope of the verification of the 2017 Annual Sustainability Report	AA1000AS	<p>SGS was contracted by CEMIG to perform the independent assurance of its "2017 ANNUAL AND SUSTAINABILITY REPORT". The assurance scope, based on the methodology for assurance of the SGS Sustainability Reports, included the text and data related to the GRI G4 Sustainability Reporting Guidelines, including indicators.</p> <p>This report was secured using our protocols to assess the truthfulness of the content and its alignment with the GRI G4 Guidelines for Sustainability Reporting in accordance with the material topics identified by CEMIG through the process described in this report. In addition, the GRI G4 Electric Utilities industry supplement was also used. Based on this context, the "2017 ANNUAL AND SUSTAINABILITY REPORT" is characterized as the Essential Level.</p> <p>The assurance process comprised (i) the review of indicators, information and data present in the preliminary version of the sustainability report (ii) interviews with strategic collaborators, both to understand the data in the report and to understand the management processes involved with the material issues and (ii) revision of complementary documentation sent by CEMIG to SGS. CEMIG's accounting information contained in and/or referenced in the "2017 ANNUAL AND SUSTAINABILITY REPORT" was not evaluated as part of this assurance process.</p>

Disclosure module	Data verified	Verification standard	Please explain
W4. Riscos e oportunidades	The information on the item "Risk Management" was verified in the scope of the verification of the 2017 Annual Sustainability Report.	AA1000AS	<p>SGS was contracted by CEMIG to perform the independent assurance of its "2017 ANNUAL AND SUSTAINABILITY REPORT". The assurance scope, based on the methodology for assurance of the SGS Sustainability Reports, included the text and data related to the GRI G4 Sustainability Reporting Guidelines, including indicators.</p> <p>This report was secured using our protocols to assess the truthfulness of the content and its alignment with the GRI G4 Guidelines for Sustainability Reporting in accordance with the material topics identified by CEMIG through the process described in this report. In addition, the GRI G4 Electric Utilities industry supplement was also used. Based on this context, the "2017 ANNUAL AND SUSTAINABILITY REPORT" is characterized as the Essential Level.</p> <p>The assurance process comprised (i) the review of indicators, information and data present in the preliminary version of the sustainability report (ii) interviews with strategic collaborators, both to understand the data in the report and to understand the management processes involved with the material issues and (ii) revision of complementary documentation sent by CEMIG to SGS. CEMIG's accounting information contained in and/or referenced in the "2017 ANNUAL AND SUSTAINABILITY REPORT" was not evaluated as part of this assurance process.</p>
W6. Governança	We verified the information of the item "Water Resources" in the scope of the verification of the 2017 Annual Sustainability Report	AA1000AS	<p>SGS was contracted by CEMIG to perform the independent assurance of its "2017 ANNUAL AND SUSTAINABILITY REPORT". The assurance scope, based on the methodology for assurance of the SGS Sustainability Reports, included the text and data related to the GRI G4 Sustainability Reporting Guidelines, including indicators.</p> <p>This report was secured using our protocols to assess the truthfulness of the content and its alignment with the GRI G4 Guidelines for Sustainability Reporting in accordance with the material topics identified by CEMIG through the process described in this report. In addition, the GRI G4 Electric Utilities industry supplement was also used. Based on this context, the "2017 ANNUAL AND SUSTAINABILITY REPORT" is characterized as the Essential Level.</p> <p>The assurance process comprised (i) the review of indicators, information and data present in the preliminary version of the sustainability report (ii) interviews with strategic collaborators, both to understand the data in the report and to understand the management processes involved</p>

Disclosure module	Data verified	Verification standard	Please explain
			with the material issues and (ii) revision of complementary documentation sent by CEMIG to SGS. CEMIG's accounting information contained in and/or referenced in the "2017 ANNUAL AND SUSTAINABILITY REPORT" was not evaluated as part of this assurance process.
W7. Estratégia	The information on the item "Strategy" was verified in the scope of the verification of the 2017 Annual Sustainability Report	AA1000AS	<p>SGS was contracted by CEMIG to perform the independent assurance of its "2017 ANNUAL AND SUSTAINABILITY REPORT". The assurance scope, based on the methodology for assurance of the SGS Sustainability Reports, included the text and data related to the GRI G4 Sustainability Reporting Guidelines, including indicators.</p> <p>This report was secured using our protocols to assess the truthfulness of the content and its alignment with the GRI G4 Guidelines for Sustainability Reporting in accordance with the material topics identified by CEMIG through the process described in this report. In addition, the GRI G4 Electric Utilities industry supplement was also used. Based on this context, the "2017 ANNUAL AND SUSTAINABILITY REPORT" is characterized as the Essential Level.</p> <p>The assurance process comprised (i) the review of indicators, information and data present in the preliminary version of the sustainability report (ii) interviews with strategic collaborators, both to understand the data in the report and to understand the management processes involved with the material issues and (ii) revision of complementary documentation sent by CEMIG to SGS. CEMIG's accounting information contained in and/or referenced in the "2017 ANNUAL AND SUSTAINABILITY REPORT" was not evaluated as part of this assurance process.</p>
W8. Metas	The information on the item "Strategy" was verified in the scope of the verification of the 2017 Annual Sustainability Report	AA1000AS	<p>SGS was contracted by CEMIG to perform the independent assurance of its "2017 ANNUAL AND SUSTAINABILITY REPORT". The assurance scope, based on the methodology for assurance of the SGS Sustainability Reports, included the text and data related to the GRI G4 Sustainability Reporting Guidelines, including indicators.</p> <p>This report was secured using our protocols to assess the truthfulness of the content and its alignment with the GRI G4 Guidelines for Sustainability Reporting in accordance with the material topics identified by CEMIG through the process described in this report. In addition, the GRI G4 Electric Utilities industry supplement was also used. Based on this context, the "2017 ANNUAL AND SUSTAINABILITY REPORT" is characterized as the Essential Level.</p>

Disclosure module	Data verified	Verification standard	Please explain
			<p>The assurance process comprised (i) the review of indicators, information and data present in the preliminary version of the sustainability report (ii) interviews with strategic collaborators, both to understand the data in the report and to understand the management processes involved with the material issues and (ii) revision of complementary documentation sent by CEMIG to SGS. CEMIG's accounting information contained in and/or referenced in the "2017 ANNUAL AND SUSTAINABILITY REPORT" was not evaluated as part of this assurance process.</p>

W11 Signoff

Signoff

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

Cemig operates in the electricity generation, transmission and distribution business, and the latter two do not use water in the production process. In relation to the generation business, Cemig's generating facility is predominantly composed of hydroelectric power plants, with only one thermal plant that makes consultative use of water, even though it was dispatched only to meet the contingencies of the electric sector. Therefore, Cemig's operation in this area is primarily the management of water for the generation of energy in its hydroelectric power plants.

Cemig has an area dedicated to the management of water resources, which through planning adopts operational measures in its hydroelectric power plants that aim to calculate the optimal generation of each plant, guaranteeing the best use of water for generation, without impacting others uses of the river basin. For each hydroelectric power plant there is an Operational Instruction that defines its technical and operational parameters.

Cemig monitors in real time the amount of water available in rivers and its plants through 208 telemetric stations belonging to the Hydrometeorological Monitoring and Telemetry System (STH, Sistema de Telemetria e Monitoramento Hidrometeorológico).

The water quality of Cemig reservoirs is regularly monitored in a network that includes the main hydrographic basins of Minas Gerais, in 42 reservoirs and more than 180 physical, chemical and biological data collection stations such as phytoplankton, zooplankton and zoobentos. These data is stored in SISÁGUA.

Cemig concluded the R&D that evaluated the consequences of climate change on the hydrological regime of hydrographic basins and on the generation of energy. It also participates in the drafting of the Water Resources Master Plans of the hydrographic basins where it operates and monitors the installation of new users of water, as well as the evolution of the amount allocated to other uses, through the Register of Grants of the Water Resources Managing Agencies.

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

Job title	Corresponding job category
Chief Executive Officer	• Chief Executive Officer (CEO)

Water Action Hub

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

- Yes.