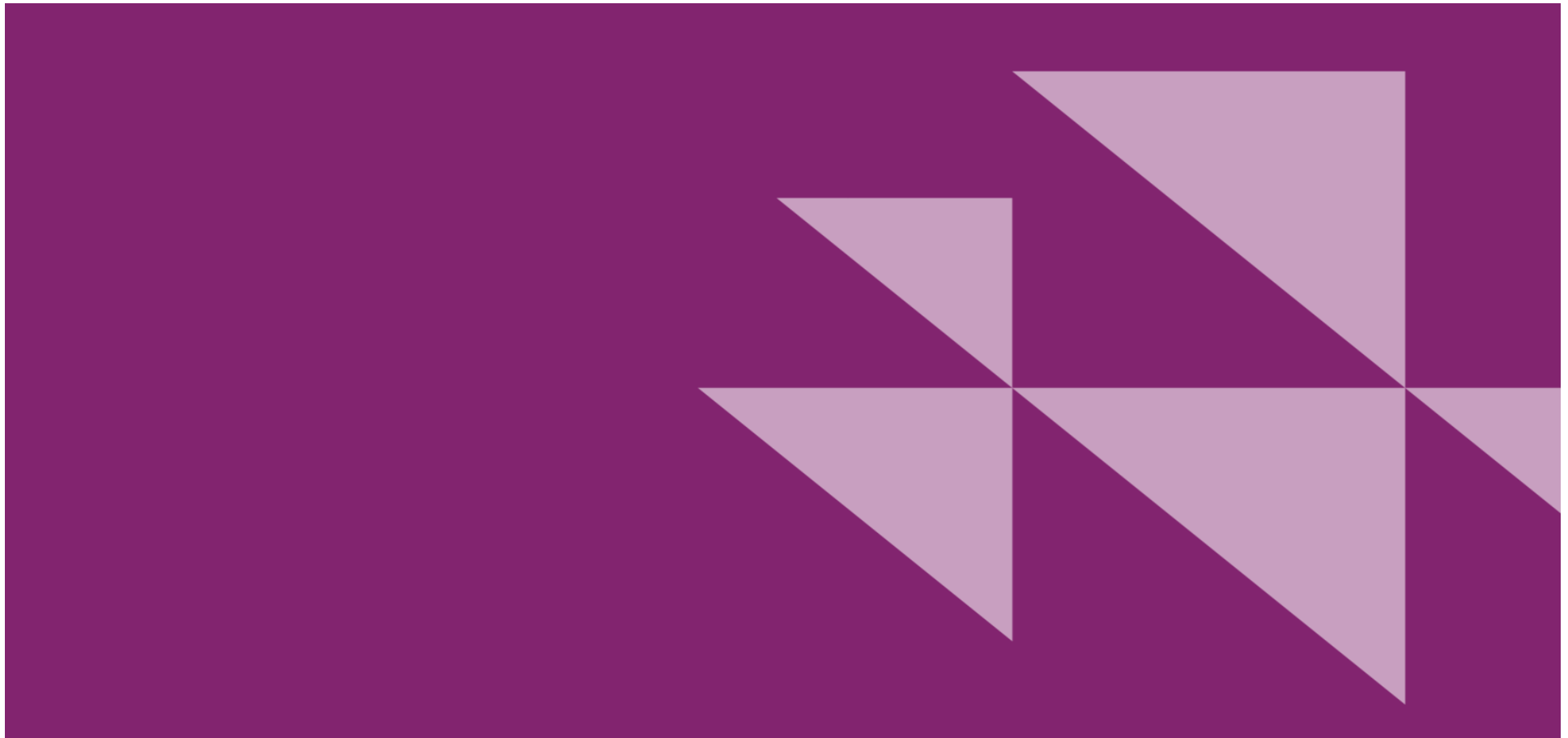


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## CDP Climate Change Questionnaire 2018

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# C0 Introduction

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## Introduction

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### **(C0.1) Give a general description 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 innovatively and sustainably. This determination led to its position as the most significant 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% stake in Transmission Company Aliança de Energia Elétrica S.A. (Taesa), which gives it control of this company, and 34.15% of total capital, in addition to 6.8% indirectly through Light, of Renova Energia S.A.

Cemig is a publicly traded company controlled by the Government of the State of Minas Gerais (51%), and its shares are traded in São Paulo, at B3 S.A. (Brasil, Bolsa, Balcão), in New York, at New York Stock Exchange (NYSE) and in Madrid, at Latin American Stock Market (Latibex). Consolidated net operating revenue of the Company reached R\$ 21.71 billion in 2017, based on a matrix, which the primary source of energy is 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 primary consolidation vectors of the Brazilian electricity industry. Cemig has been part of the Dow Jones Sustainability Index (DJSI World) for 18 years since its implementation. For the 13th consecutive year, it also participated in the B3 Corporate Sustainability Index (ISE) and was selected for the 8th time to compose the Carbon Efficient Index (ICO2), created in 2010 by B3 and BNDES.

In 2017, Cemig was listed among the leading companies in climate change management in Latin America by the Climate Change Program, by the quality of the information disclosed to investors and the global market. CDP Latin America granted the recognition. It is the sixth consecutive year that CDP rewards the Company. The selection took into account the level of detail of the responses to criteria such as risk management, commitment to mitigation and initiatives to reduce greenhouse gas emissions. The best results indicate a high level of transparency in the disclosure of information related to the topic, providing investors with consistent content on climate change management.

### **MISSION**

"Acting in the energy sector with profitability, quality, and social responsibility."

**VISION**

"Consolidate, in this decade, as the largest domestic electric industry group in market value, with a presence in gas, a world leader in sustainability, admired by the client and recognized by the strength and performance."

**(C0.2) 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

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

Country
Brazil

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

Currency
BRL (R\$) - Reais

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

**Operational control.**

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## Organizational activities: Electric utilities

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**(C-EU0.7) Which parts of the electric utilities value chain does your organization operate in?**

**Electric utilities value chain**

- Electricity generation
- Transmission
- Distribution

**Other divisions**

- Gas storage, transmission and distribution
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# C1 Governance

## Board oversight

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

**Yes.**

**(C1.1a) Identify the position(s) of the individual(s) on the board with responsibility for climate-related issues.**

Position of individual(s)	Please explain
Board/Executive board	<p>The person who is in the highest level of direct responsibility for the issue of climate change in 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 Board of Executive Officers, which in turn reports directly to the Board of Directors.</p> <p>Cemig's management is composed of the Board of Directors and the Board of Executive Officers. 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 Board of Executive Officers, a 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: i) replacing the Chief Executive Officer in their absences, licenses, temporary impediments, resignation or vacancy; ii) promote the improvement of the Company's social responsibility and sustainability policies; iii) define policies and guidelines for the environment, technological development, energy alternatives and technical standardization; iv) coordinate Cemig's strategy of action in relation to social responsibility, the environment, the technological process and the strategic management of technology; v) coordinate the implementation and maintenance of quality systems; vi) promote the implementation of programs aimed at the technological development of the Company; and vii) monitor the implementation of the plans for compliance with environmental, technological and quality improvement guidelines.</p> <p>It should be emphasized that all attributions of the Deputy Chief Executive Officer related to the environment issue include issues related to climate change.</p>

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

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Please explain
<p>Scheduled – some meetings</p>	<p>Reviewing and guiding strategy</p> <p>Reviewing and guiding major plans of action</p> <p>Reviewing and guiding annual budgets</p> <p>Monitoring implementation and performance of objectives</p>	<p><b>Reviewing and guiding strategy</b> - Since 2006, there are committees composed of members of the Board of Directors to analyze and discuss in advance the matters to be deliberated in that forum. The attributions of each committee are available on the website of the Company (<a href="http://ri.cemig.com.br/static/enu/regint_cons_adminis_tracao.asp?idioma=enu#11">http://ri.cemig.com.br/static/enu/regint_cons_adminis_tracao.asp?idioma=enu#11</a>). Among these committees, we highlight the Corporate Governance and Sustainability Committee, in which economic, environmental and social topics are discussed and considered by the Senior Management, including climate change related questions.</p> <p>Cemig considers in the formulation of its strategy the principles contained in the document "Commitment to Climate Change," which includes the guidelines of the Company's action on the subject. This document is undergoing an update and revision to become the Climate Change Policy of Cemig to be published soon. Besides, in the Company's risk management process, the climate variable is always considered.</p> <p><b>Reviewing and guiding major plans of action</b> - As a result of the strategy, actions that require the Board approval or action are discussed at these meetings and are always guided by the guidelines contained in the document "Commitment to Climate Change," to achieve the goals and targets related to climate change.</p> <p><b>Reviewing and guiding annual budgets</b> - In a logical sequencing, the Board considers the budgetary requirements for the implementation of action plans that ensure the effective implementation of the strategy on climate change - objectives, targets and programs - and promotes its periodic monitoring.</p> <p><b>Monitoring implementation and performance of objectives</b> - In addition to monitoring action plans and budgets, these meetings monitor the achievement of the proposed goals and targets for climate change.</p>

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

Name of the position(s) and/or committee(s)	Responsibility	Frequency of reporting to the board on climate-related issues
Other C-Suite Officer, please specify – Deputy Chief Executive Officer	Both assessing and managing climate-related risks and opportunities	More frequently than quarterly

**(C1.2a) Describe where in the organizational structure this/these position(s) and/or committees lie, what their associated responsibilities are, and how climate-related issues are monitored.**

The Deputy Chief Executive Officer leads the Corporate Sustainability area, which is the area responsible for managing the Climate Change issue within the Company, giving the guidelines and validating actions related to this topic. This position confers the necessary autonomy to the Corporate Sustainability area in the development of Cemig's guidelines and in the interaction with other areas of the Company that contribute to the management of this topic. The following are among the primary responsibilities and attributions of the Corporate Sustainability area:

- **Propose sustainability policies and guidelines, social responsibility, environment and quality improvement;**
- **Monitor corporate and institutional changes related to sustainability, social and environmental responsibility and quality management models;**
- **Propose the Company's strategy pertaining to sustainability, taking care of aspects related to social and environmental responsibility and quality systems;**
- **Monitor the performance of the Company's sustainability and social and environmental responsibility, also promoting the development of appropriate methodologies for such monitoring;**
- **Propose the exchange and cooperation with entities, agencies, society, and companies in aspects related to sustainability, social and environmental responsibility and quality;**
- **Support the development of researches, methodologies, and technologies to improve the Company's sustainability;**
- **Guide the relationship strategy with entities, agencies, society and companies concerning sustainability, social and environmental performance and the Company's quality management actions;**
- **Monitor the execution of social and environmental plans and targets and improve the quality of products and services;**
- **Coordinate special social and environmental projects of a strategic and corporate nature, including prospecting new opportunities in environmental businesses, such as the issuance of carbon reduction certificates.**

It should be emphasized that all responsibilities of the Corporate Sustainability area related to the environment theme include issues related to climate change.

The Corporate Sustainability area surveys and assesses Cemig's risks and opportunities regarding the climate change, as well as its monitoring of these risks and opportunities, always co-operating with the Risk Management Area and other related areas in all phases of the process, through the integrated approach that guides Cemig's risk management. For example, energy efficiency initiatives are under the responsibility of the Energy Efficiency Management, the initiatives to reduce energy losses are coordinated by the area of Management and Control of Measurement and Commercial Losses of Distribution, the strategy to reduce GHG emissions and set goals and targets are under the command of the Corporate Sustainability area in partnership with the areas involved, actions related to meteorology, energy planning, and water management are under the responsibility of the Energy Planning and Water Resources Management, the Corporate Risk Management coordinates the risk management process.

## Employee incentives

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

Yes.

**(C1.3a) Provide further details on the incentives provided for the management of climate-related issues.**

Who is entitled to benefit from these incentives?	Types of incentives	Activity incentivized	Comment
Board/Executive board	Monetary reward	Other: Sustainability index related to climate change	<p>Indicator: Cemig's note on the Dow Jones Sustainability Index. This index assesses issues related to climate change, among other topics related to sustainability.</p> <p>The variable remuneration of the Deputy Chief Executive Officer, which is the second position of the Board of Executive Officers, belonging to the Company's Management, is linked to the grade obtained by Cemig in the Dow Jones Sustainability Index.</p>
Director on board	Monetary reward	Efficiency target	<p>Indicator: Index of energy losses in the electrical system.</p> <p>Energy losses in the electrical system account for 99.4% of Cemig's Scope 2 emissions. To make measurable, the objective of reducing these losses, in other words, the Scope 2 emissions, the</p>



			<p>Total Distribution Losses Index (IPTD) was implemented, with multi-annual targets validated annually and monitored monthly. This losses index is linked to the variable remuneration of the Distribution and Trading Director and the Office of Revenue Protection team. It is noteworthy that it is not possible to set a target concerning CO<sub>2</sub> emissions, since the emission factor of the interconnected system varies annually and, for this reason, the target is defined in MWh.</p>
Corporate executive team	Monetary reward	Other: Sustainability index related to climate change	<p>Indicator: Cemig's participation in the Carbon Efficient Index (ICO2) portfolio.</p> <p>Developed by B3 and BNDES, ICO2 is an indicator based on the IBrX-50 portfolio, which takes into account, in the weighting of the participating actions, the ratio between gross revenue and Greenhouse Gas Emissions (GHG) of the Companies, thus evaluating the efficiency in GHG emissions. The variable remuneration of the team subordinated to the Deputy Chief Executive Officer is linked to Cemig's participation in ICO2.</p>
Corporate executive team	Monetary reward	Other: Sustainability index related to climate change	<p>Indicator: Cemig's note on the environmental dimension of the Dow Jones Sustainability Index. This index assesses issues related to climate change, among other topics related to sustainability.</p> <p>This team is also responsible for achieving Cemig's sustainability targets, with climate change issues being directly linked to these targets. The variable remuneration of the subordinate team to the Deputy Chief Executive Officer is linked to the grade obtained by Cemig in the environmental dimension of the Dow Jones Sustainability Index.</p>

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## C2 Risks and opportunities

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### Time horizons

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

Time horizon	From (years)	To (years)	Comment
Short-term	0	2	In this time horizon, the risks that are already occurring are classified. For example: - Chronic: Rising mean temperatures.
Medium-term	2	10	In this time horizon, the risks that may arise are classified. For example: - Chronic: Changes in precipitation patterns and extreme variability in weather patterns; - Acute: Increased severity of extreme weather events such as cyclones and floods; - Policy and legal: Other (Carbon Tax).
Long-term	10	30	In this time horizon, the risks that the studies indicate that may arise, based on the scenarios of climate change, are classified.

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### Management processes

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

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

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

Frequency of monitoring	How far into the future are risks considered?	Comment
Six-monthly or more frequently	More than 6 years	<p>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.</p> <p>This program consists of a tool integrated into multidisciplinary processes, which allows the mapping and evaluation of both risks and strategic opportunities and process/operational risks.</p> <p>Strategic risks are related to the Company's objectives and vision, or strategic decisions that risk not achieving the planned success.</p> <p>Process/operational risks arise in the exercise of business functions, being associated with people, systems, and processes.</p> <p>The opportunities identified are focused on renewable energy and energy efficiency businesses.</p> <p>Concerning the risks and opportunities related to climate change, these are considered strategic; they are identified and monitored by the process described above.</p>

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

Cemig adopts a time horizon classification for the strategic risks identified - including risks related to climate change:

- short-term: from 0 to 2 years;
- medium term: from 2 to 10 years;
- long-term: from 10 to 30 years;

The definition of this classification presented herein took into account that in the short-term the risks that are already occurring are considered, those most likely to happen in up to 2 years, for example: Chronic: Rising mean temperatures; in the medium-term, the risks that can occur in up to 10 years are considered, for instance: - Chronic: Changes in precipitation patterns and extreme variability in weather patterns; - Acute: Increased severity of extreme weather events such as cyclones and floods; - Policy and legal: Other (Carbon Tax); and in the long-term, the risks that the studies indicate may occur, based on the scenarios of climate change, that is, those likely to happen within 10 years.

Cemig considers as a measure of the substantial financial impact of the risks related to climate change if there is a loss in the Company's net operating revenue above 1%. This metric is valid throughout the Company.

The Corporate Sustainability area is responsible for identifying and evaluating these risks related to climate change, conducting this process in an integrated manner to areas related to those risks and/or having responsibility for actions related to prevention, mitigation, and monitoring of these identified risks.

These risks are monitored periodically at meetings of the Corporate Risk Management Committee. The most relevant risks are reported to the Board of Directors (and/or Executive Board) where decisions are made regarding the re-evaluation of these risks or control actions associated with them. In turn, these revisions and defined updates are made in the SAP R3 system that contains all the risks of the Company, strategic and process risks.

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

Risk type	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	<p><b>Regulatory changes:</b> Through the National Policy on Climate Change, the Brazilian government has set a voluntary target to reduce between 36.1% and 38.9% of the Brazilian GHG emissions projected for 2020. The Brazilian government ratified the Paris agreement in 2016 and entered into a Nationally Determined Contribution (NDC) commitment to reduce greenhouse gas emissions by 37% below 2005 levels by 2025 with a subsequent indicative contribution of reduce greenhouse gas emissions by 43% below 2005 levels by 2030. The Company considers the increase in operating costs as the main potential impact of this risk and seeks to implement measures to mitigate this impact, looking for opportunities to expand the generation of energy in low carbon renewable sources. Another way to reduce this risk is through participation in sectoral associations with CEBDS (Brazilian Business Council for Sustainable Development), which promotes discussions on the risks associated with new regulations in Brazil.</p> <p><b>Other regulatory risks:</b> To propose measures to stimulate energy efficiency in the country, the Ministry of Mines and Energy published the National Energy Efficiency Plan (PNEf). The PNEf adopts the goal of reducing 10% of electricity consumption for 2030, referring to the consumption scenario, based on 2004. It could cause Cemig to reduce electricity supply to its customers, influencing the Company's business. The Company's action to mitigate this risk is by participating in forums for legal discussion, both at the federal, state and municipal levels. Besides, it</p>

		promotes Energy Efficiency Programs, both residential and industrial.
Emerging regulation	Relevant, always included	<u>Carbon tax:</u> Cemig practices a low-carbon energy matrix, but operates a fossil fuel-fired thermal plant, which may have its operations impacted in the case of establishing carbon taxation in Brazil. As a measure to mitigate this risk, the Company promotes measures to reduce Scope 1 emissions, since it evaluates that the tax would affect these emissions. These expenses would represent R\$ 20.2 million per year (worst case scenario).
Technology	Relevant, always included	Cemig invests in Technology and Innovation always seeking to continuously improve its processes, reduce its emissions and prepare for the effects of climate change - considering energy alternatives and energy efficiency.
Legal	Not relevant, included	In Brazil there is no specific applicable legislation, however, if the emission limits become part of the environmental licensing obligations, this could be a risk for Cemig. However, since Cemig has only one thermal plant (Igarapé Thermal Plant) the risk is not relevant.
Market	Relevant, always included	<u>Cap-and-trade schemes:</u> The establishment of a market for the commercialization of GHG emissions of the cap-and-trade type in Brazil may entail the need for greater planning by Cemig, regarding compliance with specific market regulations, especially concerning emission monitoring and verification. To mitigate this risk, Cemig seeks to identify projects that generate carbon credits and long-term contracts with verification and certification companies, thus reducing the likelihood of materialization of this risk for the Company. Furthermore, when assessing the acquisition of enterprises that use fossil fuels, Cemig conducts internal analyzes regarding the carbon risk and its financial impact on the Company, i.e., the financial risk of the enterprise in a possible future pricing scenario of GHG emissions in Brazil. Another way to mitigate this risk is by participating in the Emissions Trading System Simulation project, an initiative of the Center for Sustainability Studies (

		GVces) of the Escola de Administração de Empresas de São Paulo (School of Business Administration of São Paulo), of Getúlio Vargas Foundation (EAESP / FGV).
Reputation	Relevant, always included	<p><b>Reputation:</b> If Cemig needs to expand its energy supply through fossil fuel-fired thermal plants, it could be criticized by society, impacting on the brand's value.</p> <p>This impact can be even more significant if the increase in the generation through fossil fuel plants occurs, as it leads to the worsening of Cemig's sustainability indicators, leads to the reduction of the Company's score in questionnaires such as ISE (Corporate Sustainability Index of B3) and DJSI (Dow Jones Sustainability Index). In an extreme case, this risk could lead to non-inclusion of Cemig in the portfolios of these sustainability indices in a given year, resulting in a decline in market value and deterioration of the Company's reputation before investors.</p>
Acute physical	Relevant, always included	<p>The occurrence of intense rains in a short period of time, accompanied by wind and lightning, can cause physical damages to the facilities that transmit and distribute energy, leading to its unavailability and to the increase in Cemig's costs, caused by reimbursement to consumers due to interruptions in power supply (SAIDI and SAIFI indicators). These phenomena are increasingly associated with the effects of an unfavorable microclimate, typical of large urban centers. Management methods aim to reduce the magnitude of this risk in the medium term by means of preventive adaptation measures, such as the management of urban forestation by means of pruning, the operation of weather stations and the meteorological radar, which more accurately predicts the occurrence and intensity of storms, and the emergency plan with allocation of maintenance teams for the rapid restoration of energy supply. Moreover, Cemig also promotes work in its distribution system (expansion, reinforcement, renovation, and renovation of assets such as substations and distribution lines). The five-year cycle of investments, according to sector regulation, covers the period from 2013 to 2017, having been approved for the period</p>

		<p>more than R\$ 5 billion. In 2017, R\$ 968 million were invested.</p>
<p>Chronic physical</p>	<p>Relevant, always included</p>	<p><b><u>Change in precipitation pattern:</u></b> Climate change can cause changes in seasonal rainfall patterns, with more pronounced extreme rainfall and drought events, as well as changes in geographic distribution. Also, there may be a change in the average amount of precipitation, changing the amount of water that reaches the reservoirs of the hydroelectric power plants. Since the electricity production of Cemig is primarily hydraulic, these changes may cause a reduction in the generation capacity. The management of hydrological risk is done considering the randomness of climatic phenomena without considering the effects of climate change. In order to do so, Cemig has a specific organizational structure that is entirely dedicated to the subject and supports the decisions of the Company's risk management committees, whose purpose is to efficiently handle corporate risks involving operational, commercial, financial and regulatory aspects of the companies of Cemig Group, particularly in the sectoral scenario of tariff adjustment and hydrological restrictions. Cemig also participates in the Energy Reallocation Mechanism (MRE), whose purpose is to share the hydrological risks of power plants with high inflows and generations, which transfer energy to power plants with low flows and generations. Other forms of mitigation of this risk are available at 2017 Cemig's CDP.</p> <p><b><u>Changes in average temperature:</u></b> Climate change may cause increased average temperatures and changes in rainfall and drought regimes and, indirectly, increase some risks to the Energy Transmission System, as prolonged drought conditions maximize the risk of fires. Fires, within or adjacent to easement ranges, may cause occurrences of unavailability of transmission lines. To mitigate this risk, Cemig continually inspects and cleans its transmission lines to maximize the safety and availability of the transmission functions (always limited to minimal removal of vegetation, avoiding cutting in places where there is no interference with the transmission lines).</p> <p><b><u>Changes in extremes of precipitation and droughts:</u></b></p>

		<p>The occurrence of intense rains in a short period of time, accompanied by wind and lightning, can cause physical damages to the facilities that transmit and distribute energy, leading to its unavailability and to the increase of costs of Cemig, caused by reimbursement to consumers due to interruptions in energy supply. These phenomena are increasingly associated with the effects of an unfavorable microclimate, typical of large urban centers. Management methods aim to reduce the magnitude of this risk in the medium term by means of preventive adaptation measures, such as the management of urban forestation by means of pruning, the operation of weather stations and the meteorological radar, which more accurately predicts the occurrence and intensity of storms, and the emergency plan with allocation of maintenance teams for the rapid restoration of energy supply.</p>
Upstream	Not relevant, included	<p>Cemig has an ample supply chain and therefore is not dependent on a single geographic region or a single type of supplier. For this reason, the Company considers that this risk is not relevant.</p>
Downstream	Relevant, always included	<p><b>Changes in consumer behavior:</b> High temperatures can cause an increase in electricity consumption and overload the electricity distribution system in the most critical regions of the State of Minas Gerais, and may cause less availability of energy supply to consumers in these regions. This risk is managed by the realization of the electrical system diagnosis for the need for expansion works; monitoring operational conditions and for the reprioritization of works.</p>

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

The process of identifying risks/opportunities are continuously carried out at the Company, since updating the information in the management tool used by Cemig and monitoring and evaluating the controls and action plans are scheduled tasks to be performed by the managers, making all agents involved in risk management have defined roles and responsibilities. These professionals responsible for the risks related to climate change are from many different areas of the Company. The Board of Directors does the approval of the information raised at a strategic level.

The system enables that a risk/opportunity managed in a process level has a direct link with a risk that is being assessed at the strategic level.

Besides, there is a flow performed by an independent area (Compliance area) to periodically evaluate the controls to audit the effectiveness of the process.



In a new update of the Company's risk management policy, in 2016 a holding bias was given to the document, which now guides not only the companies Cemig D and Cemig GT, but also all of the wholly-owned subsidiaries. It is also worth mentioning the new version of the policy, the fact that the risk appetite to be followed by the Company is explicit, guided by principles that reflect best market practices, and primarily, have defined roles and responsibilities.

The next steps in the risk management process involve the consolidation of the model, continuous awareness of employees, including senior management, and improvement of risk monitoring tools, ensuring further progress in the process.

Cemig uses scales to classify risks and opportunities according to their financial impacts, intangible impacts, the 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.

Besides, information on the financial implications of risks/opportunities, their controls and measures are explicitly fed 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), residual risk/opportunity (after implementation of controls) and planned residual risk/opportunity (after implementation of measures). It allows prioritized decision making based on sound financial analyzes of scenarios with and without risk/opportunity management.

Concerning the opportunities, the primary focus has been on the acquisition of assets with renewable sources. To this end, Cemig adopts an acquisitions structure that occurs through partnerships with investment funds and strategic partners, establishing a growth vehicle that allows the Company, even with a minority interest, to assume a strategic and competitive position in those assets, associating their expertise with the financial capacity of the partners.

In mergers and acquisitions processes undertaken by Cemig, the due diligence is essential for the evaluation, identification, measurement, and treatment of each risk or contingency.

Examples of how risk management is applied:

**Physical Risk:** The occurrence of intense rains in a short period of time, accompanied by wind and lightning, can cause physical damages to the facilities that transmit and distribute energy, leading to its unavailability and to the increase in Cemig's costs, caused by reimbursement to consumers due to interruptions in power supply (SAIDI and SAIFI indicators). Management methods aim to reduce the magnitude of this risk in the medium term by means of preventive adaptation measures, such as the management of urban forestation by means of pruning, the operation of weather stations and the meteorological radar, which more accurately predicts the occurrence and intensity of storms, and the emergency plan with allocation of maintenance teams for the rapid restoration of energy supply. Moreover, Cemig also promotes work in its distribution system (expansion, reinforcement, renovation, and renovation of assets such as substations and distribution lines). The five-year cycle of investments, according to sector regulation, covers the period from 2013 to 2017, having been approved for the period more than R\$ 5 billion. In 2017, R\$ 968 million were invested.

**Transition Risk: Carbon tax -** Cemig practices a low-carbon energy matrix, but operates a fossil fuel-fired thermal plant (Igarapé Thermal Plant), which may have its operations impacted in the case of establishing carbon taxation in Brazil. As a measure to mitigate this risk, the Company promotes measures to reduce emissions of Scope 1, since it evaluates that the tax would affect these emissions. These expenses would represent R\$ 20.2 million (worst case scenario).

**Transition Risk: Cap-and-trade schemes -** The establishment of a market for the commercialization of GHG emissions of cap-and-trade type in Brazil may entail the need for greater planning by Cemig, regarding compliance with specific market regulations, especially concerning emission monitoring and verification. To mitigate this risk, Cemig seeks to identify projects that generate carbon credits and long-term contracts with verification and certification companies, thus reducing the likelihood of materialization of this risk for the Company. Furthermore, when assessing the acquisition of enterprises that use fossil fuels (due diligence), Cemig conducts internal analyzes regarding the carbon risk and its financial impact on the Company, i.e., the financial

risk of the enterprise in a possible future pricing scenario of GHG emissions in Brazil. Another way to mitigate this risk is by participating in the Emissions Trading System Simulation project, an initiative of the Center for Sustainability Studies, GVces, of the Escola de Administração de Empresas de São Paulo (School of Business Administration of São Paulo), of Getúlio Vargas Foundation (EAESP / FGV).

## Risk disclosure

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

Yes.

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

Identifier	Where in the value chain does the risk driver occur?	Risk type	Primary climate-related risk driver	Type of financial impact driver	Company- specific description	Time horizon
R1	Direct operations	Physical risk	Chronic: Changes in precipitation patterns and extreme variability in weather patterns	Increased operating costs (e.g., inadequate water supply for hydroelectric plants or to cool nuclear and fossil fuel plants)	Adverse hydrological situations / Rationing may affect short-term exposure.  Climate changes may cause changes in seasonal patterns of rainfall, with extreme rainfall events and more pronounced drought, as well as changes in its geographical distribution. Besides, there may be a change in the average amount of precipitation, changing the amount of water that reaches the reservoirs of the hydroelectric power plants. As Cemig's	Medium-term

					electricity production is primarily hydraulic (97.48% of installed capacity in 2017), these changes may lead to a reduction in our generation capacity.	
Likelihood	Magnitude of impact	Potential financial impact	Explanation of financial impact	Management method	Cost of management	Comment
R1 About as likely as not	High	R\$ 3,882,330,000.00	The frustration of the expected results, due to the increase in CCEE spending and, in extreme cases, the reduction of revenue from bilateral contracts. The calculation of the financial impact was made considering the sum of the contracts related to CCEE (Chamber of Commercialization of Electric Energy).	Cemig has a specific organizational structure, entirely dedicated to the management of energy purchase and sale, which supports the decisions of the Company's risk management committees, whose purpose is to efficiently handle corporate risks involving operational, commercial, financial and regulatory aspects of the companies of Cemig Group, particularly in the sectoral scenario of tariff adjustment and hydrological restrictions. It also has the Energy Risk Management Committee (CGRE) with the objective of minimizing risks in energy purchase and sale contracts, as well as mitigate the risk of short-term exposure due to bad hydrological	R\$ 3,060,252.00	In order to estimate the management cost, the personnel costs of the teams: Meteorology, and the Energy Commercialization Planning, were calculated.

				<p>conditions.</p> <p>As an example of this action, Cemig also participates in the Energy Reallocation Mechanism, with the purpose of sharing of hydrological risks: power plants in a situation of high inflows and generation, which transfer energy to power plants with low inflows and generations. This participation gives freedom to the ONS (National System Operator) to dispatch the power plants and help ensure compliance with energy sales commitments entered into by Cemig.</p> <p>The Energy Reallocation Mechanism (MRE) aims to reduce the exposure of hydraulic generators, like our generation companies, to the uncertainties of hydrology. It functions as a pool of generators, in which the generation of all plants participating in the MRE is shared to meet the pool requirement. When all power plants generate below the requested value, the mechanism reduces</p>		
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				<p>the available energy of the power plants causing a negative exposure in the short term market and, consequently, the need to purchase energy at the Settlement Price of Differences (PLD). Similarly, when all power plants generate above the requested value, the mechanism increases the available energy of the power plants leading to a positive exposure, which allows the liquidation of energy to the PDL. In years of very critical hydrology, the available energy reduction factor can reduce the available energy of hydroelectric power plants by 20% or more. In 2015, the federal government proposed to renegotiate the hydrological risk through a voluntary process. This process allowed the generation company to pass on to consumers their costs and revenues related to the hydrological risk in exchange for the payment of a 'risk premium', to be deposited in the so-called "Tariff Flag</p>		
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				<p><b>Resources Centralizing Account" (the surcharges tariffs are deposited in this account and transfers to the distribution utility companies are made on this account as well) and be indemnified for the losses incurred in 2015, though, among other measures, an extension of its power generation concessions (concessions or permissions, as the case may be) for up to 15 years. In other words, hydroelectric power plants recover costs incurred with GSF deficits retroactively through January 2015, and such a recovery should form a "regulatory asset" to be amortized over the concession term with a postponement of the risk premium. If the remaining concession / authorization period is insufficient (i.e., there is not enough time to pay off the regulatory asset), then the generator has an extension of the concession / permit (limited to 15 years).</b></p>		
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Identifier	Where in the value chain does the risk driver occur?	Risk type	Primary climate-related risk driver	Type of financial impact driver	Company- specific description	Time horizon
R2	Direct operations	Physical risk	Acute: Increased severity of extreme weather events such as cyclones and floods	Other – increase in operating costs	<p>The occurrence of intense rains in a short period, accompanied by wind and lightning, can cause physical damages to the facilities that transmit and distribute energy, leading to its unavailability and the increase in Cemig's costs, caused by reimbursement to consumers due to interruptions in power supply. These phenomena are increasingly associated with the effects of an unfavorable microclimate, typical of large urban centers.</p> <p>This type of event can lead to the elevation of the quality indicators in the energy supply.</p> <p>In Cemig's concession contract, there is a requirement to comply with efficiency criteria related to the continuity of supply and economic and financial management for maintenance of the concession,</p>	Medium-term

					respecting the right to ample defense and contracting in case of noncompliance, considering that: (i) for a period of five years as from January 1, 2016, any non-compliance for two consecutive years, or any of the conditions at the end of the five-year period, will result in the termination of the concession; (ii) as from January 1, 2021, eventual non-compliance for three consecutive years for the criteria of efficiency in the continuity of supply.	
Likelihood	Magnitude of impact	Potential financial impact	Explanation of financial impact	Management method	Cost of management	Comment
R2 Very likely	Medium-low	R\$ 150,000,000.00	Increase in operating costs, Compensation costs (Aneel penalty) due to violation of system continuity indicators (DIC, FIC and DMIC indicators), Cost of indemnization (loss of profit, loss of production, burning of equipment, etc.), Cemig image / brand negative exposure and customer dissatisfaction, Quality indicators related assessments due to increased company exposure to the inspection	Management methods aim to reduce the magnitude of this risk in the medium term by means of preventive adaptation measures, such as the management of urban forestation by means of pruning, the operation of weather stations and the meteorological radar, which more accurately predicts the occurrence and intensity of storms, and the emergency plan with allocation	R\$ 35,000,000.00	Cemig D defines, through the Distribution Development Plan - "PDD", the prioritization of the investments to be made by the Distributor, referring to BRR - Regulatory Remuneration Base, and the respective prudent management of resources in the current tariff cycle, with the objective of increasing the availability of electricity in a continuous way, with



			agency.	of maintenance teams for the rapid restoration of energy supply. Moreover, Cemig carries out the Distribution Development Plan - PDD, which consists of the realization of projects related to the electric power system, associated with the expansion, reinforcement, and renovation of Cemig D's assets, such as substations and distribution lines.		quality, safety and quantity required by Clients, promoting social and economic development in the concession area of Cemig D.
<b>Identifier</b>	<b>Where in the value chain does the risk driver occur?</b>	<b>Risk type</b>	<b>Primary climate-related risk driver</b>	<b>Type of financial impact driver</b>	<b>Company- specific description</b>	<b>Time horizon</b>
<b>R3 Carbon taxation</b>	<b>Direct operations</b>	<b>Transition risk</b>	<b>Policy and legal: Other (Carbon taxation)</b>	<b>Policy and legal: Increased operating costs</b>	<b>Despite having a low-carbon energy matrix, Cemig operates the Igarapé Thermal Plant (131 MW installed capacity) powered by fossil fuel, which may have its operations impacted in the case of establishment of carbon taxation in Brazil. This taxation also poses a risk if Cemig plans to expand its electricity generation business through fossil fuel-fired thermals in the future.</b>	<b>Medium-term</b>
<b>Likelihood</b>	<b>Magnitude of impact</b>	<b>Potential financial impact</b>	<b>Explanation of financial impact</b>	<b>Management method</b>	<b>Cost of management</b>	<b>Comment</b>

<p>R3 About as likely as not</p>	<p>Medium-low</p>	<p>R\$ 20,211,030.00</p>	<p>Data coverage provided to the risks arising from changes in legislation comprises the business area for Generation, once in case of establishing emissions taxation, it will be charged, probably, exclusively in thermal plants, not affecting other business of the Company. Currently, Cemig has only one thermal power plant with an installed capacity of 131 MW, representing 1.82% of total installed capacity and operates only when there is the need to meet contingencies of the Brazilian Interconnected Power System.</p> <p>To calculate the potential financial impact, a tax estimate of US\$ 10/tCO<sub>2</sub>e was used, considering the US dollar quotation as R\$ 3.50 and the most massive issuance of Igarapé Thermoelectric Plant in recent years (which occurred in 2014): 577,458 tCO<sub>2</sub>e.</p>	<p>Cemig assesses carbon risk in due diligence operations, accounts for corporate GHG emissions through the Company's emissions inventory, and sets emission reduction targets for GHG.</p> <p>In 2016, for example, the Board of Executive Officers decided to approve the target of reducing greenhouse gas emissions by 8% until 2021, based on the emissions established in 2014. This target has been active ever since.</p> <p>Furthermore, when assessing the acquisition of enterprises that use fossil fuels, Cemig conducts internal analyzes regarding the carbon risk and its financial impact on the Company, i.e., the financial risk of the enterprise in a possible future pricing scenario of GHG emissions in Brazil. In the last assessment made by Cemig, different scenarios of power generation in the Brazilian electrical matrix were considered. To calculate the financial</p>	<p>R\$ 350,000.00</p>	<p>The costs are annually associated with the maintenance of the environment team of Igarapé Thermal Plant and implementation of Company's emission inventories. The costs will exist as long as the risk persists.</p>
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				<p>impact of the carbon pricing in these assessed projects, the energy to be generated and the GHG emissions were calculated considering each of the scenarios, with the GHG emissions multiplied by the internal carbon price. The results were included in the financial feasibility analysis of the project and included as operating costs. The value used in carbon pricing for potentially fossil fuel-consuming enterprises is R\$ 10/tCO<sub>2</sub> (from the Report of the High-Level Commission on Carbon Prices).</p> <p>With these actions, it is expected that the magnitude of the risk of taxation for the Company will be reduced when implementing the new regulations.</p>		
Identifier	Where in the value chain does the risk driver occur?	Risk type	Primary climate-related risk driver	Type of financial impact driver	Company- specific description	Time horizon
R4 Changes in average temperature	Direct operations	Physical risk	Chronic: Rising mean temperatures	Other: interruption in power supply	Climate change may cause an increase in average temperatures and changes in rainfall and drought regimes and,	Medium-term

					indirectly, may lead to some risks to the Energy Transmission System, as prolonged drought conditions maximize the risk of fire. Fires, within or adjacent to easement ranges, may cause occurrences of unavailability of transmission lines. The areas that could be most affected by forest fires would be the Triângulo Mineiro and the metropolitan regions in the Minas Gerais state.	
Likelihood	Magnitude of impact	Potential financial impact	Explanation of financial impact	Management method	Cost of management	Comment
R4 About as likely as not	Low	R\$ 451,463.01	<p>Aneel Normative Resolution number. 729/16, which establishes the provisions regarding the quality of the public electricity transmission service, associated to the availability and operational capacity of the facilities, establishes variable rate discounts caused by fires that cause shutdowns in transmission lines.</p> <p>In 2017, the amount of R\$ 451,463.01 was discounted in respect of discounts for variable portion caused by fires that</p>	<p>Cemig continually inspects and cleans the easement ranges (limited to minimum removal of vegetation, avoiding cutting where there is no interference with transmission lines) of its transmission lines to maximize the safety and availability of transmission functions. For example, in 2017 easement areas were cleaned in a total area of 24,312,056 m<sup>2</sup> along Cemig's structures and transmission lines.</p> <p>Also, it creates firebreaks at the foot</p>	R\$ 2,306,573.97	<p>Management costs are annual and associated with the process of cleaning the easement range of the transmission lines. The cost of management is greater than the financial impact because it refers to the maintenance of Cemig's entire transmission system. The reported financial impact refers only to the disconnection of a line from the various lines belonging to Cemig.</p>

			<p>cause shutdowns in transmission lines.</p> <p>There are defenses of 02 discounts related to 2017 with ONS - National System Operator, which, if accepted, will rebalance R\$ 150,532.50 in 2018.</p>	<p>of the towers and makes the application of anti-flame painting in wooden posts located in places of risk.</p>		
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## Opportunity disclosure

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

**Yes.**

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

Identifier	Where in the value chain does the opportunity occur?	Opportunity type	Primary climate-related opportunity driver	Type of financial impact driver	Company-specific description	Time horizon
O1 - International Agreements	Direct operations	Products and services	Other: Sale of CER (Certified Emissions Reduction) in a cap-and-trade system	Increased revenue through new solutions to adaptation needs (e.g., insurance risk transfer products and services)	Compliance with regulatory requirements and the emergence of new international agreements may create opportunities for Cemig since the Company has a predominantly renewable energy matrix (installed capacity 2017: 97.48% hydro and 0.70% totaling wind	Long-term

					and solar) and low carbon, is better prepared than its competitors to suit this scenario. Establishing an emission marketing market of cap-and-trade type in Brazil or internationally, in the form of CDM, for example, could cause Cemig to position itself as a significant supplier of emission reduction certificates. This opportunity could lead to an increase in revenue at Cemig.	
Likelihood	Magnitude of impact	Potential financial impact	Explanation of financial impact	Strategy to realize opportunity	Cost to realize opportunity	Comment
O1 Very likely	Medium	R\$ 5,567,392.90	Cemig has 449,860 credits issued under the CDM. If these credits are traded at US\$ 3.79/ton CO <sub>2</sub> , considering the US dollar quotation at R\$ 3.50.  ( <a href="https://www.rggi.org/sites/default/files/Uploads/Auction-Materials/39/Auction_39_Market_Monitor_Report.pdf">https://www.rggi.org/sites/default/files/Uploads/Auction-Materials/39/Auction_39_Market_Monitor_Report.pdf</a> )	Cemig has professionals trained in the identification of projects that generate carbon credits and has long-term contracts with verification and certification companies, thus increasing the possibility of taking advantage of this opportunity. Cemig already has CDM emission reduction projects registered with the UNFCCC.  In 2017, these projects were monitored (449,860 carbon	R\$ 60,000.00	The associated costs are those related to the monitoring and auditing required for the validation and commercialization of the credits. The costs are not annual and will occur at the time of the audits.

Identifier	Where in the value chain does the opportunity occur?	Opportunity type	Primary climate-related opportunity driver	Type of financial impact driver	Company-specific description	Time horizon
O2 – Changes in average temperature	Direct operations	Markets	Other: Increased energy consumption due to the increase in average temperature	Other: Revenue increase	<p>The likely rise in average temperatures will lead to a change in consumption patterns, such as increased use of ventilation and cooling systems, which will result in increased demand for energy. A study conducted by Rodrigues <i>et al.</i> (2013) evaluated the possible impact of climate change on the residential demand for electricity, based on projections of average quarterly temperature increase according to the GHG emission scenario of the 4th IPCC Report. The results suggest that residential electricity demand in Brazil may increase in response to the projected increase in temperature.</p> <p>Considering that Cemig has more than R\$ 6.75 million</p>	Medium-term

					residential consumers in the State of Minas Gerais, the use of this opportunity will bring a substantial increase in the Company's revenue.	
Likelihood	Magnitude of impact	Potential financial impact	Explanation of financial impact	Strategy to realize opportunity	Cost to realize opportunity	Comment
O2 About as likely as not	High	R\$ 7,929,470,021.20	According to this study, the increase in residential energy demand will be approximately 27% by 2050. Considering the sale of Cemig to residential customers was 10,009 GWh in 2017, with the increase in the additional sale will be 2,702.43 GWh. Using the average value of the current tariff of R\$ 0.58684/kWh, the additional revenue will be R\$ 1,585,894,021.20 per year.	In order to prepare for increasing energy demand, Cemig has been expanding the availability of electricity distribution infrastructure to meet the growth of this market, through reinforcement works in substations, lines and distribution networks. These actions contribute both to increase the probability of taking advantage of this opportunity and to its magnitude. The investment cycle is five-yearly, according to sector regulation.  In the 2013-2017 cycle the investments were made in the following projects:  - Expansion and reinforcement in high voltage;  - Customer and accessory service (Cemig's	R\$ 5,910,000,000.00	Cemig Distribuição defines, through the Distribution Development Plan (PDD), the prioritization of the investments to be made by the Distributor, referring to BRR (Regulatory Remuneration Base), and the respective prudent management of resources in the current tariff cycle, with the objective of increasing the availability of electricity in a continuous way, with quality, safety and quantity required by Clients, promoting social and economic development in the concession area of Cemig D.  The PDD consists in the realization of investments related to the electric power system, associated to the expansion,



				<ul style="list-style-type: none"> <li>Participation);</li> <li>- Reform of the high voltage system;</li> <li>- Operation and maintenance in high voltage;</li> <li>- Assistance to the urban market in medium and low voltage;</li> <li>- Complementary Program (Cemig's Participation) in low and high voltage;</li> <li>- Security of Third Parties (Cemig's Participation);</li> <li>- Reform of medium and low voltage networks;</li> <li>- Operation and Maintenance in medium and low voltage;</li> <li>- Change of Measurement / Border Measurement;</li> <li>- Environment; and</li> <li>-Telecommunications.</li> </ul>		<p>reinforcement, reform and renovation of Cemig D's assets, such as substations and distribution lines.</p> <p>The value of the next column is the sum of all investments made in the PDD in the 2013-2017 cycle.</p>
Identifier	Where in the value chain does the opportunity occur?	Opportunity type	Primary climate-related opportunity driver	Type of financial impact driver	Company-specific description	Time horizon
O3 – Other opportunities	Direct operations	Resource efficiency	Other: Sale of energy efficiency projects	Other: Revenue increase and postponement of investments	In a scenario of increased business investments in energy efficiency, aimed at reducing electricity consumption and	Short-term

					<p>reducing GHG emissions, Cemig's subsidiary Efficientia will have a possible increase in demand for its services, among them the implementation of lighting use projects, using LED technology, cogeneration, distributed generation and other energy solutions services. It should be noted that these projects are executed under performance contracts in which Efficientia makes the necessary resources and recovers its investment through the savings obtained in the project. In this context, Efficientia may also have increased demand in the consulting service for the implementation of Energy Management Systems based on ISO 50001.</p>	
Likelihood	Magnitude of impact	Potential financial impact	Explanation of financial impact	Strategy to realize opportunity	Cost to realize opportunity	Comment
O3 Very likely	Low	R\$ 10,000,000.00	The figure represents the estimated revenue for Efficientia with the realization of energy	The management of these energy solutions projects is done by the Efficientia team, whose focus is	6,000,000.00	The costs are annual and associated with the maintenance of the Efficientia team, not including the

			solutions services.	the optimization of project results and adherence to the term and costs stipulated in the respective budgets. For more details, visit the Efficientia website, which lists several of the projects carried out and the portfolio of services: <a href="http://www.efficientia.com.br/SitePages/P%C3%A1gina%20Inicial.aspx">http://www.efficientia.com.br/SitePages/P%C3%A1gina%20Inicial.aspx</a>		costs of investing in energy efficiency projects. These costs will exist where this opportunity exists.
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## Business impact assessment

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

Area	Impact	Description
Products and services	Impacted	<p>With the production of electric power being basically hydraulic, Cemig recognizes that the risks inherent to climate changes can reduce generation capacity and have a significant impact on energy supply. In this way, Cemig, with other risks, acts preventively, monitoring:</p> <p><b>- Change in precipitation pattern:</b> In order to do so, Cemig has a specific organizational structure that is entirely dedicated to the subject and supports the decisions of the Company's risk management committees, whose purpose is to efficiently handle corporate risks involving operational, commercial, financial and regulatory aspects of the companies of Cemig Group, particularly in the sectoral scenario of tariff adjustment and hydrological restrictions. Cemig also participates in the Energy Reallocation Mechanism (MRE), whose purpose is to share the hydrological risks of power plants with high inflows</p>

		<p>and generations, which transfer energy to power plants with low flows and generations. Other forms of mitigation of this risk are available at 2017 Cemig's CDP.</p> <p><b>- Changes in average temperature:</b> To mitigate this risk, Cemig continually inspects and cleans its transmission lines to maximize the safety and availability of the transmission functions (always limited to minimal removal of vegetation, avoiding cutting in places where there is no interference with the transmission lines).</p> <p><b>- Changes in extremes of precipitation and droughts:</b> Management methods aim to reduce the magnitude of this risk in the medium term by means of preventive adaptation measures, such as the management of urban forestation by means of pruning, the operation of weather stations and the meteorological radar, which more accurately predicts the occurrence and intensity of storms, and the emergency plan with allocation of maintenance teams for the rapid restoration of energy supply.</p> <p><b>- Change in consumer behavior:</b> This risk is managed by the realization of the electrical system diagnosis for the need for expansion works; monitoring operational conditions and for the reprioritization of works.</p>
<p><b>Supply chain and/or value chain</b></p>	<p><b>Not yet impacted</b></p>	<p>Possible damages resulting from increased wind, flood and drought intensity may indirectly affect the operation of Cemig's energy business, as they impact on the supply chain, especially those directly involved in the implementation/maintenance of infrastructure (transmission and distribution).</p> <p>In this way, Cemig continually monitors its supplier chain maintaining a high degree of demand and care based on the mapping of potential risks and probabilities of occurrence, and the tangible and intangible impacts, calculated in financial amounts and being strategic to the Company.</p> <p>Moreover, Cemig seeks to align suppliers and contractors with its sustainability vision, commitments, and business values. Among these corporate values, Cemig integrates into its Supply Policy the Commitment to Climate Change.</p>

<p>Adaptation and mitigation activities</p>	<p>Not yet impacted</p>	<p>Cemig promotes a series of initiatives that enable the accurate management of the possible impacts on its business, among which we have:</p> <ul style="list-style-type: none"> <li>- <u>Hydrometeorological monitoring</u>: Preventively, it invests in practices that place it in a situation of greater security in the face of the various possible scenarios, using modern techniques and equipment, such as the Storm Location System, Telemetry System and Hydrometeorological Monitoring, mathematical models of hydrological simulation and weather and climate forecasting.</li> <li>- <u>Safety of Dams</u>: The process to ensure the safety of the dams operated and maintained by Cemig uses, in all its stages, a methodology based on national and international best practices, also taking into account Federal Law No. 12.334/2010, which establishes the National Safety Policy for Dams, and their associated regulations (Normative Resolution No. 696/2015 of the National Electric Energy Agency - Aneel). In this context, the procedures for field inspection, collection, and analysis of instrumentation data, elaboration and updating of dams security plans, planning and monitoring of maintenance services, analysis of results and classification of civil structures are contemplated. Based on the rating of structures, the frequency of safety inspections and monitoring routine are established. The vulnerability of each dam is automatically calculated continuously and monitored by the Dam Safety Specialist System (Inspector).</li> <li>- <u>Distribution Development Plan</u>: The PDD consists in the realization of projects related to the electric power system, associated with the expansion, reinforcement, reform, and renovation of Cemig D's assets, such as substations and distribution lines.</li> <li>- <u>Energy Alternatives</u>: In Cemig's view, the term "Energy Alternatives" covers the entire energy chain, including transportation, transformation, technology routes, supply and storage, energy efficiency and end-use energy. Because they are integral and mutually dependent elements in the energy matrix, energy alternatives make up the new sources and technologies, distributed generation, smart grids, electric vehicles, energy efficiency and the best use of traditional energy resources. Given its expertise in the</li> </ul>
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		<p>topic in question, the Company has participated in committees and groups. More information can be found in the Energy Alternatives section in the website <a href="http://www.cemig.com.br">www.cemig.com.br</a>.</p>
Investment in R&D	Not yet impacted	<p>As a measure of its innovation effort, the Company has an indicator called INOV, which represents the ratio of investments made in R&amp;D projects and other investments in innovation in the current year, compared to its net operating revenue. Last year this indicator was 0.49%, higher than the 0.32% obtained in 2016 and 0.33% in 2015. The target for 2017 was 0.30%.</p> <p>The development of innovations in products and processes is responsible for the creation of goods and services capable of increasing the availability of assets, reducing the time of final customer service, agility and mobility in accessing the concessionaire and its services, increasing personal security and of the system, to develop new tools of work and more modern equipment, among other benefits. This type of innovation typically occurs in the technical areas of Cemig using the methodology of Strategic Technology Management - GET.</p> <p>Cemig's Research and Development (R&amp;D) program can be highlighted as one of the primary vectors for Cemig's innovation. Within this program, initiatives have developed that range from incremental technology projects, responsible for bringing operating efficiency gains and reducing costs, to those of a radical or disruptive nature, capable of delivering radically new products, including the market.</p> <p>The following R&amp;D projects on climate change - low carbon energy:</p> <ul style="list-style-type: none"> <li>i. Development of PVT solution (photovoltaic-thermal) to increase the efficiency of solar plants;</li> <li>ii. Development of models, methods and computational system for the prediction of wind speed in short and long-term horizons;</li> <li>iii. Development of a system for calculating the potential of energy generation through biomass in the state of Minas Gerais.</li> </ul>

<p><b>Operations</b></p>	<p><b>Impacted</b></p>	<p>The risks inherent to changes in the climate, especially those related to the rainy season and long periods of drought, directly affect Cemig's business, reducing its capacity to generate electricity. Aiming to act in a preventive manner, Cemig has sought strategies for the sustainability of its business, listed below:</p> <ul style="list-style-type: none"> <li>• <b>Development of low-carbon businesses:</b> Cemig has identified business opportunities and opportunities for obtaining market advantages from its low-carbon energy matrix, which are primarily directed to: i) the implementation and renewal of power plants from renewable sources in which Cemig already has expertise; and ii) by investing in new energy sources, primarily by participating in the company Renova Energia.</li> <li>• <b>Carbon risk assessment and the need to adapt to regulatory changes:</b> Cemig adopts the environmental due diligence practice for the acquisition of new assets, to evaluate the possible financial impact of the increase of its GHG emissions in this asset, against the possibility of internalizing the costs of emissions as a result of the new regulations.</li> <li>• <b>Need to mitigate climate change:</b> Cemig, despite already presenting low intensity of GHG emissions, strives to reduce its emissions, including by setting targets for reducing emissions, electricity consumption and electricity losses.</li> <li>• <b>Performance as a marketer of renewable energies (wind and solar), strategy in progress,</b> as Solar and Wind Incentivized Energy Purchase Auction - Cemig Notice GT LP 03/2018, held on 06/06/2018, where 431.49 average MW were acquired in contracts with the beginning of supply in January/2022 and duration of 20 years. The winning enterprises of the bidding process totaled 1,240 MW of installed capacity.</li> </ul> <p><b>Need to adapt to climate change:</b> Cemig has a generator park with a low GHG emission intensity, being predominantly hydraulic (installed capacity 2017: 97.48% hydro), but subject to the consequences of climate change. It, therefore, invests in the improvement of weather forecasting systems,</p>
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		improvement of the infrastructure of its power plants, transmission lines and distribution networks to deal with the consequences of these events and improvement of the forecast of the availability of water in its generation park.
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## Financial planning assessment

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

Area	Relevance	Description
Revenues	Impacted	<p><b>Risks:</b> As Cemig's electricity generation is primarily hydraulic, the risks inherent to climate changes (mainly the reduction in the rate of rainfall, affecting the volume of water stored in the reservoirs and, consequently, reducing the capacity of energy generation in the hydroelectric power plants) can cause a significant reduction in energy supply, directly affecting the Company's revenues, and even allowing the possibility of legal actions for possible damages caused to customers and consumers due to the lack of energy. Accidental interruptions of transmission lines, due to extreme climatic conditions, can cause a reduction in energy supply, with a direct impact on revenue.</p> <p><b>Opportunity:</b> the increase in average temperatures can lead to an increase in the use of electric equipment for air conditioning and food refrigeration, with an impact on energy demand and growth in revenue.</p>



<p><b>Operating costs</b></p>	<p><b>Impacted</b></p>	<p><b>Risks:</b> The possible reduction in the average rainfall volume due to climate change can affect the volume of water stored in the reservoirs and, consequently, reduce the capacity of power generation in the hydroelectric power plants, which determines the need of Cemig to use/increase the power generation by means of thermoelectric plants, whose operational cost is higher, in order to ensure the compliance with the energy demand of its customers.</p> <p>Besides, extreme weather conditions can cause accidents in transmission lines and substations, leading to additional equipment maintenance/rebuilding costs.</p> <p>Regulatory changes may result in increased costs if they determine an increase in taxes on generation, transmission and/or distribution activities.</p> <p><b>Opportunity:</b> the use of wind and/or photovoltaic generation can increase the capacity of generation of energy by clean sources and are independent of the hydraulic component, reducing the need of dispatch of power employing thermoelectric plants by Cemig.</p>
<p><b>Capital expenditures/capital allocation</b></p>	<p><b>Impacted</b></p>	<p><b>Risk:</b> Climate changes determine the Company's need to make additional investments to maintain and improve the distribution network. The Distribution Development Program (PDD) contributes to the mitigation of this risk, as well as providing service to the increased demand resulting from the population's vegetative growth.</p>
<p><b>Acquisitions and divestments</b></p>	<p><b>Impacted</b></p>	<p><b>Opportunity:</b> Uncertainty regarding the level of rainfall and, consequently, reduction of the capacity to guarantee generation by Cemig's hydroelectric power plants, lead to the need to diversify the Company's generating capacity and stimulate the construction/acquisition of wind or photovoltaic ventures, technologies in which Cemig already has expertise.</p>
<p><b>Access to capital</b></p>	<p><b>Not yet impacted</b></p>	<p><b>Opportunity:</b> Cemig participates in several sustainability indexes and rankings (DJSI, ISE, Oekom, CDP, Sustainalytics, among others), which contributes to the Company's sustainability practices, including its actions to mitigate the effects of climate</p>

		change, to the market and thus facilitate access to investors' capital and the financial market.
<b>Assets</b>	<b>Impacted for some suppliers, facilities, or product lines</b>	<p><b>Risk:</b> Extreme weather events can result in overloading of Cemig water reservoirs and even damage to generating units. They can also damage transmission lines. Cemig seeks to mitigate this risk with investments in dam safety (prevention) and also with the installation of a weather radar (disaster prevention).</p> <p><b>Opportunity:</b> To reduce the impact of climate change, Cemig has as its strategic guide the search for diversification of its energy matrix; As a result, the Company has developed expertise in renewable energy generation (mainly wind and photovoltaic) and is continually evaluating new technologies through its Research and Development program. This expertise constitutes an asset that may be traded in the form of sale of operating units already installed or even the provision of services.</p>
<b>Liabilities</b>	<b>Impacted</b>	<b>Risk:</b> Cemig's activities are capital-intensive. The incorporation of generation assets to minimize the impact of climate change may cause the Company to incur indebtedness.

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## C3 Business strategy

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### Business strategy

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

Yes.

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

Yes, qualitative and quantitative.

**(C-EU3.1b) Indicate whether your organization has developed a low-carbon transition plan to support the long-term business strategy. :**

Yes.

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

- i. Risks and opportunities related to climate change are classified and prioritized in exposure matrixes by the Committee for Monitoring Corporate Risk and presented to the Board of Executive Officers. 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 Board of Executive Officers.

- ii. Aspects of climate change that have influenced Cemig's strategy:

**Low-carbon business development:** Cemig has identified business opportunities and obtaining market advantages from its low-carbon energy matrix, which are directed primarily by i) implementation and renewal of renewable energy plants in which Cemig already has the expertise and ii) investment in new energy sources.

**Regulatory changes:** Cemig identifies regulatory risks related to climate change, which are seriously considered in the Company's strategic decision-making. In particular, it recognizes the commitments attributed to the energy sector in Brazil's nationally determined contribution (NDC) and manages the associated risks through participation in business associations, monitoring of international negotiations and their unfolding at the national level. Cemig makes environmental due diligence for the acquisition of new assets (assessment of carbon risk), to assess the potential financial impact of the increase of its greenhouse gas emissions in this asset, regarding the possibility of internalization of costs of emissions as a result of new regulations.

**Need to mitigate climate change:** Cemig, despite already presenting low intensity of GHG emissions, strives to reduce its emissions, including by setting targets for reducing emissions, electricity consumption and electricity losses, because of the commitments were given in the NDC to the energy sector. Moreover, the use of an internal price for carbon in investment assessments for fossil fuel-based enterprises is in line with global trends in the use of carbon pricing tools as a mechanism to promote climate change mitigation.

**Need to adapt to climate change:** Cemig has generating facility with low GHG emission intensity because it is predominantly hydraulic but subject to the consequences of climate change. It, therefore, invests in the improvement of weather forecasting systems, improvement of the infrastructure of its power plants, transmission lines and distribution networks to deal with the consequences of these events and improvement of the forecast of the availability of water in its generating facility. Also, it has been seeking the diversification of its matrix by participating in the generation of power from wind and solar source, through Renova Energia.

- iii. **Components of the strategy influenced by short-term climate change (up to five years):** Cemig invests in state-of-the-art techniques and equipment that allow better forecasting of storm intensity and location. Besides, it established its corporate goal of reducing emissions to reduce the GHG intensity of Scope 1 (tCO<sub>2</sub>e) by 8% by 2021, based on the emissions of 2014. It also defined its goal of reducing electricity losses, committing itself to have total losses in 2018 lower than 10.92%.
- iv. **Components of the strategy influenced by long-term climate change (over ten years):** the need to consolidate low-carbon energy matrices has guided R&D projects that can be implemented by Cemig on a large scale in the future. The following are among these projects: i) the elaboration of the second version of the solarimetric atlas of Minas Gerais and ii) the generation of electricity in solar plants connected to the electric system. The climate change scenario opens opportunities for new business for the Company, with the expectation of high demand in the long term. Cemig has the company Efficientia S.A. (ESCO), which is involved in the development and feasibility of technological solutions that promote the efficient use of energy in non-residential customers. Besides, Cemig has taken into account in its investment decisions the expectation of a progressive increase in the ambition of nationally determined contributions to the Paris Agreement - which, for Brazil, should be reflected in stricter emission reduction targets to energy after 2025.
- v. **Maintaining a predominantly renewable matrix and assessing carbon risk allow Cemig to anticipate the risks associated with increasing the cost of generating electricity.**

Moreover, the development of new technologies, especially the generation of electricity from solar sources, places Cemig in the forefront of the electricity sector, allowing the incorporation of new technologies in its matrix and the diversification of its businesses.

- vi. **More substantial strategic decisions made in 2017 by Cemig, influenced by business opportunities, fueled by climate change:**
  - **Actions that minimize the physical risks resulting from extreme weather events:**
    - **Improvement in distribution networks:** establishment of the Protected Distribution Network, with shielding of lines and networks and regularization of the easement range, as a minimum standard of urban service;
    - **Participation in auctions for the purchase of energy from renewable sources of wind and solar power.**
  - **Actions that increase the opportunities for developing low carbon businesses:**
  - **Equity in Renova:** Cemig currently owns 34.15% of Renova's total capital and 6.8% indirectly through Light. In the last two years, given its challenging financial situation, Renova based its strategy on three main points: focus on the execution of projects under construction, capital structure adequacy, and business plan review.
  - **In this same period, Renova implemented a robust capital restructuring with the sale of several assets and began searching for a new partner with investment capacity. Assets sale:**
    - **Alto Sertão II Wind Complex, with 386 MW of installed capacity and 181.6 average MW, for AES Tietê Energia S.A. for R\$ 600 million;**

- 19,535,004 shares of TerraForm Global, for Brookfield Asset Management, Inc, for US\$ 4.75/share, totaling US\$ 92.8 million;
- Umburanas I and II project (226 average MW) for Engie Brasil Energia, for approximately R\$ 300 million, of which R\$ 15 million for the sale of the Project, R\$ 64 million referring to the debt reduction with General Electric, R\$ 38 million reduction of the cancellation of the contract for Alto Sertão-3 Phase B with Seta, R\$ 180 million in Net Present Value due to the reduction of the purchase and sale of energy from BTG and Votorantim PPAs (R\$ 69 million) and Cemig GT and Light II PPAs (R\$ 111 million), provided by Renova Comercializadora.
- Also in 2017, Renova revoked the grants of the four solar projects, Caetité I, Caetité II, Caetité IV and Caetité V, which sold energy in the Reserve Energy Auction No. 08/2014 (LER 2014), avoiding a potential maximum loss of R\$ 101.2 million, but that resulted in the ban of Renova and SPEs involved in participating in new reserve auctions (LER, Leilões de Reserva) for two years. It was also canceled, through the Clearing and Depletion Mechanism – MCSD, the contracts for the New Energy Auction - LEN A-5 2012 (10.2 average MW) of the Alto Sertão-3 project and the LEN A-5 2013 (178 average MW) of the Umburanas project.

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

Climate-related scenarios	Details
RCP 2.6	Scenarios: RCPs 4.5; 6.0; 8.5 and Climate models: CMIP3 and CMIP5, global climate model HadCM3. The IPCC AR4 models were used in the development of the project "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.
Other: internal analysis	The result of the Strategic R&D Project 010/2008 "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 plants and Future Generator Park (PGF, Parque Gerador Futuro), which 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). EASS represents the amount that a generating plant can produce with a 5% risk of energy deficit; represents also the maximum amount of energy allowed to generation agents to market in electricity purchase and sale contracts. EASS has been replaced by the physical guarantee (GF - Garantia Física) to perform the commercial function. EASS can be defined systemically as the maximum energy that can be generated in an electric power system, according to a statistical criterion of guarantee of supply. The EASS definition is the result of simulations with two different generation dispatch models. The NEWAVE model is responsible for the definition of hydroelectric

supply and thermoelectric supply. These offerings define the critical load (represents the overall system offer guaranteed at 95%) and consequently the EASS of the system. The MSUI model defines the firm energy (EF – Energia Firme) of the individualized SIN for each HPU serving as a valuation parameter for EASS. The EF of an HPP corresponds to the maximum continuous production of energy that can be obtained, assuming the occurrence of the driest sequence recorded in the history of the natural inflows of the river where it is installed.

The assured energies calculated from the climate model information reflect trends observed for inflows. In this calculation, two PGE and PGF generating stations were used. The average energy reduction assured for members of the Eta model considering the existing park reaches 15%, while for the future park it reaches 25% for 2041 onwards.

The result of the work indicates a possible decrease trend of the energy assured (2041 onwards) in the case of the evolution of the planet according to scenario A1B of greenhouse gas emissions.

It can be concluded that the Brazilian generator base has been reducing its capacity to regularize the energy demand of the system over the last decades and are increasingly sensitive to variations in rainfall and consequently to natural inflows.

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. The period evaluated was controlling (1961-2005), 2007-2040, 2041-2070, 2071-2099.

Considering Eta-HadGEM2-ES, the most significant reductions of monthly mean flows were observed in the period 2007-2040 under RCP 4.5 and during the period 2071-2099 under RCP 8.5.

Considering Eta-MIROC5, the most significant reductions of mean monthly flows were observed in the period 2071-2099 under RCP 4.5 and during 2007-2040 under RCP 8.5.

The projection of impact on the most critical power generation potential is expected during the period 2071-2099 at the Itutinga hydroelectric power plant, considering Eta-HadGEM2-ES under the influence of RCP 8.5.

The results indicate the plant should not operate in 69.1% of the time since the minimum generation (9.7 MW) should not be reached.

Considering Eta-MIROC5, the most critical projection is expected at the Itutinga power plant during 2071-2099 under RCP 4.5.

The results indicate the plant should not operate in 10.5% of the time since the

	<p>minimum generation (9.7 MW) should not be reached.</p> <p>The results indicate severe problems of water availability in the region.</p> <p>If the reduction trends for the entire Rio Grande basin are maintained, the production capacity of the basin can be significantly reduced.</p>
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**(C-EU3.1e) Disclose details of your organization’s low-carbon transition plan.**

Cemig's Low Carbon Transition Plan contemplates 07 lines of action:

1. **Prioritization of renewable energy sources:** Maintain or increase the composition of its renewable energy matrix.
  - 1.1 Diversify the energy matrix free of GHG emissions.
  - 1.2 Evaluate the carbon risk of new projects and acquisitions and mergers of assets.
  
2. **Adapting to climate change:** Establish adaptation plans that minimize the effects of climate change on electricity generation, transmission and distribution activities (in the short and medium term).
  - 2.1 Invest in the modernization of electricity generation, transmission and distribution infrastructure services to minimize climatic risks.
  - 2.2 Make investments in dams’ safety, operational measures of reservoirs.
  - 2.3 Carry out investments in a meteorological forecast system.
  - 2.4 Monitor regulatory changes.
  
3. **Reduction of greenhouse gas emissions:** Identify the processes that contribute most to GHG emissions and enable the most effective actions to reduce these emissions.
  - 3.1 Promote conservation and energy efficiency.
  - 3.2 Develop solutions to reduce energy losses in the electrical system.
  - 3.3 Optimize and adapt the fleet of vehicles and the logistics of its services to reduce fuel consumption.
  - 3.4 Improve SF<sub>6</sub> gas management.
  - 3.5 Perform continuous monitoring of its emissions.

**KPIs**

  - Target Scope 1: Reduce direct GHG emissions (in tCO<sub>2</sub>/MWh) by 8% based on emissions verified in 2014 and target year 2021.
  - Target Scope 2: Reduce energy consumption by 4% using as the base year, the consumption in 2011 and target year 2021.

4. **Participation in discussion forums, Communication, and Engagement with Stakeholders:** Participate in business or government discussion forums on the subject, collaborating in the formulation of policies and measures to combat climate change. Develop awareness activities, aiming to change the behavior of its employees, contractors, and other stakeholders.
  - 4.1 Participate in climate change committees.
  - 4.2 Participate in initiatives on cap-and-trade.
  - 4.3 Disseminate the sustainable development objective 13 (ODS 13).KPI:
  - Number of participation
  
5. **Risk and opportunity management:** Identify the principal risks and opportunities arising from climate change for its business and develop monitoring and control measures, especially concerning Cemig's possible vulnerabilities to climate change.
  
6. **Promotion of Research, Development, and Innovation**
  - 6.1 Conduct research related to smart grids and low carbon technologies.
  - 6.2 Encourage the development of projects to adapt to climate change in the generation, transmission and distribution business.
  - 6.3 Conduct R&D projects to identify the vulnerabilities of electricity distribution and transmission lines as a result of climate change scenarios.
  
7. **Supplier Development:** Develop awareness initiatives and action plans with suppliers related to the climate issue.



# C4 Targets and performance

## Targets

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

Select one of the following options:

- Absolute target**
- Intensity target
- Both absolute and intensity targets
- No target

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

Target reference number	Scope	% emissions in Scope	% reduction from base year	Base year	Start year	Base year emissions covered by target (metric tons CO <sub>2</sub> e)
Abs-1	Scope 2 (location-based)	0.8%	4%	2011	2014	168,189
Target year	Is this a science-based target?	% achieved (emissions)		Target status	Please explain	
2020	No, and we do not anticipate setting one in the next 2 years	100%		Underway	<p>The Company set a target of reducing electricity consumption of Cemig GT and Cemig D, together, with 4% in 2020, compared to the total consumed in 2011.</p> <p>In 2011, Cemig GT and Cemig D consumed 46,876 MWh of electricity, representing 0.8% of Company Scope 2 emissions in the year in question. The</p>	

				<p>remaining 99.2% were mainly due to electricity losses, in addition to a small portion due to the electricity consumption of Efficientia and Cemig Telecom.</p> <p>In that year (2011), the emission factor of the national electricity system was 0.0292 tCO<sub>2</sub> /MWh, so the emissions associated with the electricity consumption were 1,368 tCO<sub>2</sub>. However, to allow comparison with emissions from electricity consumption in 2017, base year emissions were reported in the next column using the national electricity system emission factor for 2017, which was 0.0927 tCO<sub>2</sub>/MWh, resulting in a value of 4,345 tCO<sub>2</sub>.</p> <p>In 2017, Cemig GT and Cemig D consumed 43,552 MWh of electricity, 7.1% lower than in 2011 (base year of the target). Therefore, Cemig has already reached and surpassed its target of reducing its consumption of electricity, which is 4% concerning 2011.</p> <p>It should be noted that the emission factor of Scope 2 is given by emission factors developed by the coefficient of use of fossil fuels in the electricity production of the National Interconnected Electric System (SIN), mainly due to the activity of thermoelectric plants.</p> <p>This emission factor is used to calculate emissions from the electric power generation acquired from SIN (Scope 2),</p>
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						having in 2017 presented the value of 0.0927 tCO <sub>2</sub> /MWh, as mentioned above, calculated based on the data collected by the National Electric System Operator (ONS), the calculation being developed together with the MCTI (Brazilian Ministry of Science, Technology, and Innovation). The methodology adopted is the "Tool to calculate emission factor for an electricity system," approved by the UNFCCC (United Nations Framework Convention on Climate Change).
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Target reference number	Scope	% emissions in Scope	% reduction from base year	Base year	Start year	Base year emissions covered by target (metric tons CO <sub>2</sub> e)
Abs-2	Scope 1	100%	8%	2014	2016	617,717
Target year	Is this a science-based target?	% achieved (emissions)		Target status	Please explain	
2021	No, and we do not anticipate setting one in the next 2 years	100%		Underway	This target refers to the reduction of Scope 1 emissions, considering all activities in which the Company has operational control. In 2017, direct emissions accounted for 48,849 tCO <sub>2</sub> e, which means a reduction of 92.1% concerning the direct emissions of 2014.	

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

Target	KPI – Metric numerator	KPI – Metric denominator (intensity targets only)	Base year	Start year	Target year	
R&D investments	To invest 0.30% of the Net Operating Revenue (ROL) in Research and Development.	-	2015	2015	2022	
KPI in baseline year	KPI in target year	% achieved in reporting year	Target Status	Please explain	Part of emissions target	Is this target part of an overarching initiative?
0.33%	0.30%	100%	Underway	<p>Cemig has among its strategic objectives the continuous search for innovation, with a view to achieving long-term sustainability.</p> <p>To follow up on its innovation effort, the Company has established an indicator titled INOV, which represents the ratio of investments made in R &amp; D projects and other investments in innovation in the current year, in relation to its net operating revenue. In 2017 this indicator was 0.49%, higher than the 0.32% obtained in 2016.</p> <p>The amounts invested contribute to the reduction of greenhouse gases emissions, because the subjects are: low carbon energy sources, distributed generation, electric vehicles, energy efficiency.</p>	-	No, it's not part of an overarching initiative

# Emissions reduction initiatives

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

Yes.

(C4.3a) Identify the total number of projects at each stage of development, and for those in the implementation stages, the estimated CO<sub>2</sub>e savings.

Stage of development	Number of projects	Total estimated annual CO <sub>2</sub> e savings in metric tons CO <sub>2</sub> e (only for rows marked *)
Under investigation	0	-
To be implemented*	5	6,984
Implementation commenced*	56	415
Implemented*	2	5,739
Not to be implemented	0	-

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

Activity type	Description of activity	Estimated annual CO <sub>2</sub> e savings (metric tons CO <sub>2</sub> e)	Scope	Voluntary / Mandatory
Energy efficiency: Processes	Other: Regenerative air heaters (LUVOS)	1,906	Scope 1	Voluntary
Annual monetary savings (unit currency, as specified in C0.4)	Investment required (unit currency, as specified in C0.4)	Payback period	Estimated lifetime of the initiative	Comment

1.235 million	9.513 million	4-10 years	16-20 years	<p>Nature of the activity: In 2016, Cemig installed refurbished equipment, called LUVOS (regenerative air heaters) in Igarapé Thermal Power Plant, to recover the operational efficiency of the plant to the project characteristics, with a consequent saving of the amount of fuel used/MWh generated by the plant. The LUVOS heat the combustion air by harnessing the residual heat from the gases in the chimney, reducing the temperature of the gases released into the atmosphere, increasing the efficiency of the boiler. The reform included replacing all baskets, replacing and improving soot sealing and blowing systems, among other improvement services.</p> <p>The Company's Scope 1 emissions are reduced due to the reduction in the burning of fossil fuels (fuel oil).</p> <p>This initiative is voluntary concerning external regulators.</p>
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Activity type	Description of activity	Estimated annual CO <sub>2</sub> e savings (metric tons CO <sub>2</sub> e)	Scope	Voluntary / Mandatory
Other: Transport (fleet)	Other: Transport (fleet)	3,833	Scope 1	Voluntary
Annual monetary savings (unit currency, as specified in C0.4)	Investment required (unit currency, as specified in C0.4)	Payback period	Estimated lifetime of the initiative	Comment
5.2 million	3,641,127.00	4-10 years	4-10 years	Nature of the activity: In 2017, Cemig stopped consuming 1,835,801 liters of fuel in its fleet reducing consumption by 4% when compared to 2016,

				<p>representing savings of approximately R\$ 5.2 million for the Company. Comparing 2012 and 2017, Cemig decreased its annual consumption by approximately 15%, that is, there was a reduction in the use of more than half a million liters. This reduction in consumption is due to the updating of the vehicles fleet, resulting from the "Fleet Optimization Program," made in 2016/2017. The optimization of the fleet was possible because all vehicles replaced in 2010 were manufactured with Electronic Management System installed. This tool has been allowing constant monitoring in the use of vehicles. Between 2012 and 2017 there was a reduction of 644 units of the fleet. In addition, the Company adopted Diesel S10 as the main fuel used, instead of the Common Diesel (S500), previously used. All the pickup trucks (Cemig's and leased pickup trucks), which used the Common Diesel, were replaced by pickup trucks that use the S10 Diesel. In total, 1,112 pickup trucks went into operation in this condition. Nowadays, Cemig has 1,115 vehicles powered by Diesel S10.</p> <p>The Company's Scope 1 emissions are reduced due to the reduction in the burning of fossil fuels in its vehicles fleet.</p> <p>This initiative is voluntary concerning external regulators.</p> <p>In the value of the investment were considered the cost of</p>
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				operation and maintenance of the Electronic Management System installed in light vehicles and pickup trucks to control their use. The fleet of light vehicles and pickup trucks used by Cemig is all leased from third parties. This fleet lease is valid from September/2016 to September/2021.
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**(C4.3c) What methods do you use to drive investment in emissions reduction activities?**

Method	Comment
Compliance with regulatory requirements/standards	Federal Law number 9.991/2000: this Law states that 1% of the organization's net operating revenue should be directed to R&D funding and energy efficiency programs. Thus, Cemig has created Smart Energy (EI), a program focused on energy efficiency. It is made up of several multiyear and social-environmental projects that develop energy efficiency actions in communities with low purchasing power (in compliance with article 1, item V, of Law number 9.991/2000, included by Law number 12.212/2010) and in non-profit and philanthropic institutions.
Internal finance mechanisms	The replacement of the vehicles fleet uses resources from the Company's Investment Programs. Cemig is required to renew its vehicles fleet annually so that the average age of vehicles does not exceed five years, a legal depreciation period set by the granting authority.
Dedicated budget for low-carbon product R&D	<p>The Research and Development (R&amp;D) Program at Cemig aims to encourage the constant search for innovation and face the technological challenges of the electricity sector. In this context, Law number 9.991/2000 establishes that power utility companies and permit holders for distribution, generation, and transmission of electricity annually apply part of their net operating revenue in Research and Development Program of the Electricity Sector, regulated by the Brazilian National Electric Energy Agency (Aneel).</p> <p>To guarantee the application of this resource, Cemig periodically publishes notices to attract projects in various lines of action. The following are among the lines of projects related to climate change: Alternative energy sources, distributed and decentralized generation, thermoelectric generation and energy efficiency; Watershed management and energy planning; Measurement, billing and</p>



	commercial losses; and Environment.
Dedicated budget for other emissions reduction activities	Within the Distributor Development Program (PDD), there is a budget dedicated to reducing Cemig's electric losses in the system and initiatives to reduce emissions from Cemig and the national electricity system.
Internal price on carbon	Cemig assesses the risk of increased carbon emissions in its energy matrix and the financial impact of this increase by performing environmental due diligence and sensitivity analyzes relating to the acquisition of new enterprises, which is assisting the Company in the decision-making regarding the expansion of its businesses.
Other: Distributed Generation)	<p>In 2012, Aneel Normative Resolution number 482/2012 came into force, which establishes the general conditions for the access of distributed microgeneration and mini-generation to the electric energy distribution systems through the electrical energy compensation modalities. Thus, the Brazilian consumer was capable of generating its electricity from renewable sources and provide the surplus to the electricity grid of its locality. These are innovations that combine the financial economy, social-environmental awareness and self-sustainability.</p> <p>In general, the presence of small generators near to the loads can provide several benefits for the electrical system and utility companies, among which the following should be mentioned:</p> <ol style="list-style-type: none"> <li>1. the postponement of investments in expansion in the distribution and transmission systems;</li> <li>2. the low environmental impact;</li> <li>3. the improvement of the network voltage level in the heavy load period;</li> <li>4. the increase of energy efficiency of the source by reducing production and electricity transmission losses;</li> <li>5. the diversification of the energy matrix; and</li> <li>6. favoring the creation of new business models applicable to the electricity sector.</li> </ol> <p>Cemig, the precursor in the process, and aligned with the development of the technology, connected the first electric micro-generation unit of Brazil in September 2012, the same year that Aneel created the Electricity Compensation System. Since then, it has been leading the market of distributed generation connections in Brazil.</p> <p>Since the publication of Resolution 482 in 2012 until December 2017, 4,217 power plants have already been installed, of which 4,157 (98.55%) were solar photovoltaic, 43 (1.02%) fueled by biogas, and 01 fueled by biomass and 17 hydraulic (0.40%). It represents an installed capacity of 67.5MW as Distributed Generation, which represents approximately 1.2% of Cemig's current generation</p>

	<p>installed capacity.</p> <p>In 2017, 2,640 power plants were installed, being 2,600 solar, 23 biogas, 01 biomass, and 17 hydraulic.</p>
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## Low-carbon products

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

**Yes.**

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

Level of aggregation	Description of product/ Group of products	Are these low-carbon product(s) or do they enable avoided emissions?	Taxonomy, project, or methodology used to classify product(s) as low-carbon or to calculate avoided emissions	% revenue from low-carbon product(s) in the reporting year	Comment
Group of products	<b>Renewable energy source generation:</b> Cemig has more than 98.2% of its installed capacity to generate energy from renewable sources. By producing renewable energy, Cemig replaces the generation of power that would probably occur from fossil sources. This initiative allows the reduction of Scope 2 of all consumers connected to the national electric system.	Avoided emissions	Other - internal classification	33.1%	<p><b>Renewable energy source generation:</b></p> <p><b>1 - This initiative allows the reduction of Scope 2 of all consumers connected to the national electric system.</b></p> <p><b>2 - By injecting renewable energy into the national electric system, Cemig promotes the decline of the emission factor of this system, benefiting all the energy consumers connected to the system. In 2017, 19,693 GWh of energy was generated by</b></p>

					<p>renewable sources (hydraulic + wind + solar).</p> <p>3 - It is estimated that the generation of renewable energy in 2017 prevented the emission of 1,8266 million tCO<sub>2</sub>.</p> <p>4 - It was assumed that the generation of renewable energy by Cemig avoided the generation of power by a thermal source in the grid of the National Interconnected System. To calculate emission reductions, the emission factor of the National Interconnected System (SIN) for 2017 was used, calculated for GHG inventories by the Brazilian Ministry of Science, Technology, and Innovation (MCTI), multiplied by the electricity generated by renewable sources.</p> <p>5 - The generation of CERs (Certified Emissions Reductions) under the scope of the CDM was considered in 7 projects, with a total reduction of 4,216,809 tCO<sub>2</sub>e expected.</p>
Group of products	<u>Energy efficiency services</u> : Efficientia S.A. is a wholly owned subsidiary that operates in the development and implementation of energy efficiency projects, cogeneration of energy	Avoided emissions	Other - internal classification	0	<p>Energy efficiency services - Efficientia S.A.</p> <p>1 - This initiative allows the reduction of Scope 2 of third parties since it reduces the consumption of electricity of the national electric system</p>

	<p>and offers consultancy to optimize the energy matrix of industries. This initiative allows the reduction of Scope 2 of third parties since it reduces the consumption of electricity of the national electric system of its customers.</p>				<p>of its customers.</p> <p><b>2 - In 2017 Efficientia presented energy efficiency projects for the public call of three concessionaires among them Cemig D, Eletropaulo and EDP Espírito Santo, making a total of 11 projects, and 4 of which were exclusive of Cemig D:</b></p> <p><b>2.1 - Baleia Hospital: Modernization of the hospital's lighting system, using LED technology (expected savings of about 272.9 MWh/year); Investment: R\$ 305,092.30.</b></p> <p><b>2.2 - Evangelical Hospital: Modernization of the lighting system, using LED technology, solar pool heating and photovoltaic generation in unit II, with an estimated saving of about 26.9 MWh/year; Investment: R\$ 214,302.00.</b></p> <p><b>2.3 - Mário Penna Hospital: Installation of a solar heating system in the showers of the building, with an estimated saving of 31.84 MWh/year; Investment: R\$ 104,984.00.</b></p> <p><b>2.4 - Risoleta Neves Hospital: Modernization of the lighting system, using LED technology, with an estimated saving of about 357,084</b></p>
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					<p><b>MWh/year; Investment: R\$ 340,929.45.</b></p> <p><b>It is estimated that the contracts signed in 2017 will lead to an economy in the consumption of electricity in the order of 688.72 MWh/year.</b></p> <p><b>3 - In 2017, the works of the cogeneration plant using biomass at Bem Brasil company in Araxá, Minas Gerais state, were completed. This plant has an installed capacity of 7,500 kW and generation of 54,000 MWh/year. The cost of implementing the plant is R\$ 42,000,000.00. An annual emission reduction of approximately 5,005.8 tCO<sub>2</sub>e is estimated (considering the emission factor of the SIN for 2017 - 0.0927 tCO<sub>2</sub>e/MWh).</b></p> <p><b>The generation of CERs (Certified Emissions Reductions) under the CDM scope was not considered in any project implemented.</b></p> <p><b>It should be noted that these projects of Efficientia use performance contracts in which Efficientia makes the necessary resources contribution and recovers its investment through the savings obtained in the projects. For this reason, the value of the next column is zero.</b></p>
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<p><b>Product</b></p>	<p><b>Natural gas:</b> Gasmig, subsidiary of Cemig, is the exclusive distributor of natural gas channeled throughout the territory of Minas Gerais state. Also, Gasmig develops the Inovagás project, which aims to serve customers with efficient energy solutions. This initiative allows the reduction of Scope 1 of third parties since it will enable its customers the consumption of fossil fuel with lower GHG emission factor.</p>	<p><b>Low carbon products</b></p>	<p><b>Other - internal classification</b></p>	<p><b>6.8%</b></p>	<p><b>Natural Gas - Gasmig</b></p> <p><b>1 - This initiative allows the reduction of Scope 1 of third parties since it will enable its customers the consumption of fossil fuel with lower GHG emission factor.</b></p> <p><b>2 - Gasmig's investment in infrastructure in 2017 was R\$ 54.8 million: R\$ 23.5 million in the expansion of the Natural Gas Distribution Network (RDGN) in the Minas Gerais state; R\$ 22.7 million in Operation and Maintenance of gas pipelines; R\$ 7.1 million in Telecommunication / IT and Infrastructure; R\$ 944 thousand in Environmental Management; and R\$ 493 thousand in the NGV (Natural Gas for Vehicles) and in the acquisition of assets. Besides, during 2017, R\$ 928 thousand were invested in the preparation of executive projects that make up the Company's project portfolio, ensuring the realization of future investments. Executive projects were carried out for the residential expansion in the city of Belo Horizonte, as well as the projects of several clients in the regions served by the Company. Throughout the year, executive projects were created, totaling approximately 32.8 km in</b></p>
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					<p>length. Gasmig increased its customer base by 102%, jumping from 15,490 in 2016 to 31,355 consumer units in 2017.</p> <p>3 - The Company takes natural gas infrastructure to strategic regions of Minas Gerais state, enabling more intensive fossil fuels to be replaced in the manufacturing industries.</p> <p>4 - In 2017, the consumption of natural gas distributed by Gasmig prevented the emission of 949,420 tCO<sub>2</sub>e.</p> <p>5 - Gasmig monitors the amount of natural gas supplied to the sectors it serves, with the Company selling 1.3 billion m<sup>3</sup> in 2017. The emission reduction estimate was based on the assumption that, in case there was no natural gas distribution, the industry would consume fuel oil (corresponding to 66.9% of the natural gas consumed in 2017), the vehicles would consume gasoline (2.53%), thermoelectric plants would use diesel (27.42%) and general use (commercial, residential, cogeneration, and generation) would use diesel or fuel oil at a stationary source (3.15%). Using the emission factors, lower</p>
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					<p>heating values and densities of the GHG Protocol Brazil, emissions were calculated with natural gas (the real scenario) and emissions in case of using fuel, gasoline, and diesel (baseline scenario). By subtracting the real scenario emissions from the baseline scenario emissions, the emissions avoided were defined.</p> <p>Gas mig did not consider the generation of CERs (Certified Emissions Reductions) under the scope of the CDM.</p>
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## Methane reduction efforts

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

Cemig does not generate methane emissions in its electricity generation process, since the emission of methane in hydroelectric plants is irrelevant, as has been pointed out in the specialized literature. The Igarapé Thermal Plant (131MW) uses fuel oil and this fuel also does not emit methane.



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## C5 Emissions methodology

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### Base year emissions

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

Scope	Base year start	Base year end	Base year emissions (metric tons CO <sub>2</sub> e)	Comment
Scope 1	01/01/2014	12/31/2014	617,717	The historical base year is chosen and referenced for the calculations, including for the establishment of the corporate emission reduction target of Scope 1, was 2014, since it presented power generation at the Igarapé Thermoelectric Plant.
Scope 2 (location-based)	01/01/2014	12/31/2014	858,014	For Scope 2, the same base year of Scope 1 was used.
Scope 2 (market-based)	Not applicable to Cemig.	Not applicable to Cemig.	Not applicable to Cemig.	Not applicable to Cemig.

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### Emissions methodology

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

- Brazil GHG Protocol Programme
- IPCC Guidelines for National Greenhouse Gas Inventories, 2006
- The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)

## C6 Emissions data

### Scope 1 emissions data

(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO<sub>2</sub>e?

Gross global Scope 1 emissions (metric tons CO <sub>2</sub> e)	Comment
48,849	<p>The Igarapé Thermoelectric Plant (installed capacity 131 MW) operates to meet the contingencies of the Brazilian Interconnected Electric System and, in 2017, accounted for 69.3% of Cemig's Scope 1 emissions.</p> <p>To better compare the data, it should be noted that Scope 1 emissions in 2016 did not account for the Igarapé Thermoelectric Plant consumption since the plant was not dispatched. It is important to note that the energy dispatch decision in Brazil (composition of hydrothermal generation every week) is made by the National Electric System Operator (ONS) based on prospective analyzes forecast of future inflows scenarios, the expected growth of energy consumption and definition of expansion schedule of new power plants. In periods of favorable hydrology and high levels of water storage in the reservoirs of the system, the decision of generation in thermal power plants is minimized, giving priority to the hydroelectric generation.</p> <p>Due to the above exposed, there was a 215.93% increase in total Scope 1 emissions between 2016 (15,462 tCO<sub>2</sub>e) and 2017 (48,849 tCO<sub>2</sub>e).</p>

### Scope 2 emissions reporting

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

Scope 2, location-based	Scope 2, market-based	Comment
We are reporting a Scope 2, location-based figure.	We have no operations where we are able to access electricity supplier emission factors or residual emission factors, and are unable to report a Scope 2, market-based figure.	For companies in the electricity sector that own generation and distribution businesses, such as Cemig, it is not possible to buy energy from other suppliers, therefore it is not possible to account for emissions based on the market.

## Scope 2 emissions data

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

Scope 2, location-based	Scope 2, market-based (if applicable)	Comment
664,413	Not applicable to Cemig.	For companies in the electricity sector that own generation and distribution businesses, such as Cemig, it is not possible to buy energy from other suppliers, therefore it is not possible to account for emissions based on the market.

## Exclusions

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

No.

## Scope 3 emissions data

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

Sources of Scope 3 emissions	Evaluation status	Metric tons CO <sub>2</sub> e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Purchased goods and services	Not relevant, explanation provided	-	-	-	Since 2012, Cemig started to quantify emissions from the vehicles of the contractors that provide

					<p>services of operation and maintenance for distribution services. This item is presented in the "Downstream transportation and distribution" line.</p>
Capital goods	Relevant, not yet calculated	-	-	-	<p>The Brazilian electricity sector does not have reliable tools to calculate emissions from the acquisition of capital goods.</p>
Fuel-and-energy-related activities (not included in Scope 1 or 2)	Not relevant, explanation provided	-	-	-	<p>The upstream emissions of the fuels and electricity purchased by Cemig were not assessed, nor were the losses of electricity in the transmission and distribution of the electricity consumed by Cemig. Also, the emissions from the electricity generation purchased by Cemig for resale were not assessed.</p> <p>It is important to note, however, that emissions due to losses in the transmission and distribution systems of electricity produced by Cemig were accounted for in Scope 2. Besides, emissions from the transportation of fossil fuels (oil) from the refineries to Igarapé Thermal Plant were accounted. This transportation takes place by tank trucks, having been counted in</p>

					"Upstream transportation and distribution" line.
Upstream transportation and distribution	Relevant, calculated	574.59	<p>i) Types and sources of data used, emission factors and GWP values (Global Warming Potential of gas): total distance traveled by third-party freight trucks and by trucks that transported fuel to Igarapé Thermoelectric Plant. The emission factors of the fuel consumed (diesel) and GWP values were obtained through the <i>GHG Protocol Brazil</i> calculation tool.</p> <p>ii) Description of the quality of the reported emissions data: data were obtained directly from Cemig's suppliers of all vehicles that carried cargo to Cemig in 2017.</p> <p>iii) Description of methodologies, assumptions and allocation methods used to calculate emissions: calculations were made using the <i>GHG Protocol Brazil</i> tool (version 2018.1.4).</p>	100%	-
Waste generated in operations	Not relevant, explanation provided	-	-	-	Reverse Logistics and the final destination of waste are made by an Environmental Management System (EMS) Level 1 certified area, which receives the waste adequately

					<p>identified, separated and conditioned by the areas that generated them. In the period from January to December 2017, 39.8 thousand tons of industrial wastes were sent to environmentally adequate destination: 98.6% of this waste was sold or recycled; 0.4% regenerated, reused or decontaminated; and 1.0% co-processed, incinerated, sent for treatment (effluents and sludges) or disposed in an industrial landfill.</p> <p>Sold waste consists mainly of cables and wires, transformer scrap, metal scrap, meter scrap, poles, crosses, trimmings and waste wood, i.e., inert materials.</p>
Business travel	Relevant, calculated	821.62	<p>i) Types and sources of data used, emission factors and GWP values (Global Warming Potential of gas): the data of total distance traveled by Cemig employees for business air travels were used. The emission factors and the GWP values were obtained through the GHG Protocol Brazil tool.</p> <p>ii) Description of the quality of the reported emissions data: the distances of all business air travels made by all Cemig employees in 2017</p>	100%	-

			<p>were computed.</p> <p>iii) Description of the methodologies, assumptions and allocation methods used to calculate emissions: calculations were made using the GHG Protocol Brazil tool (version 2018.1.4); besides, data from the website <a href="http://www.gcmmap.com">www.gcmmap.com</a> were used to calculate the distances between airports.</p>		
Employee commuting	Relevant, calculated	494.40	<p>i) Types and sources of data used, emission factors and GWP (Global Warming Potential of gas) values: the total distance traveled by the employees using buses was used. The emission factors and the GWP values were obtained through the GHG Protocol Brazil tool.</p> <p>ii) Description of the quality of the reported emissions data: the displacement distances of all buses of Cemig employees in 2017, as well as the type of vehicle used in this commuting (home-work), were computed.</p> <p>iii) Description of methodologies, assumptions and allocation methods used to calculate emissions: calculations were made using the GHG Protocol</p>	100%	-

			Brazil tool (version 2018.1.4).		
Upstream leased assets	Not relevant, explanation provided	-	-	-	There are no assets leased by Cemig.
Downstream transportation and distribution	Relevant, calculated	19,871.03	<p>i) Types and sources of data used, emission factors and GWP (Global Warming Potential of gas) values: total fuel consumption data by vehicles of contractors providing electricity distribution services for Cemig were considered. The emission factors and the GWP values were obtained through the GHG Protocol Brazil tool.</p> <p>ii) Description of the quality of the reported emissions data: the data were provided by the contractors, whose vehicles provide services of operation and maintenance of the electricity distribution network. 29 out of 40 contractors provided data to calculate the GHG emissions from this source.</p> <p>iii) Description of methodologies, assumptions and allocation methods used to calculate emissions: calculations were made using the GHG Protocol Brazil tool (version 2018.1.4).</p>	100%	<p>Since 2012, Cemig started to quantify emissions from the vehicles of the contractors that provide services of operation and maintenance for electricity distribution.</p> <p>In 2017, out of 40 companies with contracts in force that provide this type of service, 29 answered with information, equivalent to 72.5% of the total. It is important to emphasize that the participation and the contribution with information by the contractors are voluntary.</p>



Processing of sold products	Not relevant, explanation provided	-	-	-	The product sold by Cemig (electricity) is not processed as an intermediate product for the production of final consumption goods; the electricity is input into production processes, not an intermediary good. Therefore, this source of emissions is not applicable to Cemig.
Use of sold products	Relevant, calculated	6,985,686.60	<p>i) Types and sources of data used, emission factors and GWP (Global Warming Potential of gas) values: data on the consumption of electricity generated by Cemig by final consumers were used. The emission factor of the Brazilian grid and the GWP values were obtained through the GHG Protocol Brazil tool.</p> <p>ii) Description of the quality of the reported emissions data: the Company precisely monitors the electricity consumption data by its customers.</p> <p>iii) Description of methodologies, assumptions and allocation methods used to calculate emissions: calculations were made using the GHG Protocol Brazil tool (version 2018.1.4).</p>	100%	The main source of emissions of Cemig's Scope 3 is the consumption of electricity commercialized by the Company for the final consumers, whether they are industrial, commercial or residential. As the energy sold by Cemig is part of the National Interconnected System, the emission factor of this system was used to calculate these emissions.
End of life treatment of	Not relevant, explanation	-	-	-	The product sold by

<b>sold products</b>	<b>provided</b>				<b>Cemig (electricity) does not have an end-of-life treatment, as it does not generate waste to be treated or disposed. Therefore, this source is not applicable to Cemig.</b>
<b>Downstream leased assets</b>	<b>Not relevant, explanation provided</b>	-	-	-	<b>Cemig does not lease assets. Therefore, this source of emissions is not applicable to the Company.</b>
<b>Franchises</b>	<b>Not relevant, explanation provided</b>	-	-	-	<b>Cemig has no franchises. Thus, this source of emissions is not applicable to the Company.</b>
<b>Investments</b>	<b>Not relevant, explanation provided</b>	-	-	-	<b>Investments made do not imply an increase in emissions.</b>
<b>Other (upstream)</b>	<b>Not relevant, explanation provided</b>	-	-	-	<b>No other relevant source was identified upstream.</b>
<b>Other (downstream)</b>	<b>Not relevant, explanation provided</b>	-	-	-	<b>No other relevant source was identified downstream.</b>

## Carbon dioxide emissions from biologically sequestered carbon

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

No<sup>1</sup>.

## Emissions intensities

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

Intensity figure	Metric numerator (Gross global combined Scope 1 and 2 emissions)	Metric denominator	Metric denominator: Unit total	Scope 2 figure used	% change from previous year	Direction of change	Reason for change
0.0000328515	tCO <sub>2</sub> e	Unit total revenue	R\$ 21,711,690,000	Location-based	8.52	Increased	This increase in emissions per unit of revenue in 2017 compared to 2016 is due, for the most part, to the increase in the emissions of Scope 1 and 2 in 2017. This increase in emissions was mainly due to the increase in the GHG emission factor of the Brazilian grid and the dispatch of the Igarapé Thermoelectric Plant for the

<sup>1</sup> In 2017, emissions from combustion of biomass totaled 3,208 tCO<sub>2</sub>, being 1,140 tCO<sub>2</sub> in Scope 1 and 2,068 tCO<sub>2</sub> in Scope 3.

							<p>generation of energy in 2017, which uses fuel oil as energy source. On these factors, Cemig has no control, since the dispatch of electricity in the system depends on the decisions of the ONS - National Electric System Operator.</p> <p>Cemig's net operating revenue increased by 15.66% in this period.</p> <p>The value for the "Metric numerator (Gross global combined Scope 1 and 2 emissions)" column is 713,261 tCO<sub>2</sub>e.</p>
0.0361481098	tCO <sub>2</sub> e	Megawatt hour generated (MWh)	19,731,632	Location-based	48.09	Increased	<p>This increase in emissions by electricity produced by Cemig in 2017 compared to 2016 is due, in large part, to the increase in the emissions of Scope 1 and 2 in 2017. This increase in emissions was mainly due to the dispatch of Igarapé Thermoelectric Plant by ONS and</p>

							<p>the increase of the GHG emission factor of the Brazilian electricity system. On these factors, Cemig has no control, since the dispatch of electricity in the system depends on the decisions of the ONS - National Electric System Operator.</p> <p>The value for the "Metric numerator (Gross global combined Scope 1 and 2 emissions)" column is 713,261 tCO<sub>2</sub>e.</p>
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## C7 Emissions breakdown

### Scope 1 breakdown: GHGs

(C7.1) Does your organization have greenhouse gas emissions other than carbon dioxide?

Yes.

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

Greenhouse gas	Scope 1 emissions (metric tons in CO <sub>2</sub> e)	GWP Reference
CO <sub>2</sub>	42,902	IPCC Fourth Assessment Report (AR4 - 100 year)
CH <sub>4</sub>	367	IPCC Fourth Assessment Report (AR4 - 100 year)
N <sub>2</sub> O	799	IPCC Fourth Assessment Report (AR4 - 100 year)
SF <sub>6</sub>	4,781	IPCC Fourth Assessment Report (AR4 - 100 year)

(C-EU7.1b) Break down your total gross global Scope 1 emissions by greenhouse gas type, provide the global warming potential (GWP) used, and the source of each GWP.

Emissions sources	Gross Scope 1 carbon dioxide emissions (metric tons CO <sub>2</sub> )	Gross Scope 1 methane emissions (metric tons CH <sub>4</sub> )	Total gross Scope 1 GHG emissions (metric tons CO <sub>2</sub> e)
Fugitives	4,781	0	4,781
Combustion (Electric utilities) <sup>2</sup>	43,990	0	43,990

<sup>2</sup> This value includes mobile combustion and stationary combustion.

Combustion (Gas utilities)	0	0	0
Combustion (Other)	0	0	0
Emissions not elsewhere classified <sup>3</sup>	78	0	78

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

Country/Region	Scope 1 emissions (metric tons CO <sub>2</sub> e)
Brazil	48,849

## Scope 1 breakdown: business breakdown

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

- By business division
- By activity

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

Business division	Scope 1 emissions (metric tons CO <sub>2</sub> e)
Cemig GT	36,279
Cemig D	12,509
Rosal Energia	9
Sá Carvalho Energia	6
Efficientia	3

<sup>3</sup> This value includes industrial processes and, agricultural emissions and removals.

Cemig Telecomunicações S.A.	43
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**(C7.3c) Break down your total gross global Scope 1 emissions by business activity.**

Activity	Scope 1 emissions (metric tons CO <sub>2</sub> e)
Stationary combustion	33,941
Mobile combustion	10,048
Fugitive emissions (SF <sub>6</sub> of electrical equipment)	4,781
Fertilizer consumption (planting and cultivation of seedlings)	78
Industrial processes (Na <sub>2</sub> CO <sub>3</sub> consumption for water treatment in TPP Igarapé)	1

**Scope 1: sector production activities**

**(C-EU7.4) Break down your organization's total gross global Scope 1 emissions by sector production activity in metric tons CO<sub>2</sub>e.**

Sector production activity	Gross Scope 1 emissions, metric tons CO <sub>2</sub> e
Electric utility generation activities	48,849



## Scope 2 breakdown: country

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

Country/Region	Scope 2, location-based (metric tons CO <sub>2</sub> e)	Scope 2, market-based (metric tons CO <sub>2</sub> e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low-carbon electricity, heat, steam or cooling accounted in market-based approach (MWh)
Brazil	664,413	Not applicable to Cemig.	Not applicable to Cemig.	Not applicable to Cemig.

## Scope 2 breakdown: business breakdowns

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

- By business division
- By activity

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

Business division	Scope 2 emissions (metric tons CO <sub>2</sub> e)
Cemig GT	562
Cemig D	663,831
Rosal Energia	0
Sá Carvalho Energia	0
Efficientia	0
Cemig Telecomunicações S.A.	20

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

Activity	Scope 2, location-based (metric tons CO <sub>2</sub> e)	Scope 2, market-based (metric tons CO <sub>2</sub> e)
Purchased electricity	4,059	Not applicable to Cemig.
Technical losses in the system	660,354	Not applicable to Cemig.

## Emissions performance

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

**Increased.**

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

Reason	Change in emissions (metric tons CO <sub>2</sub> e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	0	No change	0	The energy produced by Cemig in 2017 was 99.8% from renewable sources and exported to the grid. The energy consumed by Cemig is considered to be all purchased from the grid and thus it is not possible to account for the share from renewable sources.
Other emissions reduction activities	5,739	Decreased	1.01	In 2016, the installation of LUVOS in the Igarapé Thermal Power Plant allowed the emissions reduction of 1,906 tCO <sub>2</sub> e each year. In addition, in 2017, transportation management initiatives found optimization opportunities in

				<p>logistics, which resulted in a reduction of 3,833 tCO<sub>2</sub>e. These initiatives are detailed in question CC4.3b. The total annual emissions reduction was 5,739 tCO<sub>2</sub>e.</p> <p>In order to calculate the percentage of 1.01% of the column next to this one, the total estimated annual savings of tCO<sub>2</sub>e of the initiatives implemented by Cemig in 2017 are added (they are listed in question CC4.3b), the result of this sum is divided by the sum of the Scopes 1 + 2 of 2016.</p> $X = - (1,906 + 3,833) / (15,462 + 552,805)$ $X = - 5,739 / 568,267$ $X = - 0.0100 * 100 = - 1.01\%$
<b>Divestment</b>	<b>0</b>	<b>No change</b>	<b>0</b>	<p>There were no divestments in Cemig's businesses that changed the emissions of Scopes 1 and 2 within the limits established for its inventory.</p> <p><b>Note: São Simão, Jaguará, Miranda and Volta Grande HPP.</b></p> <p>On September 27, 2017, the Federal Government auctioned the concessions of the São Simão, Jaguará, Miranda and Volta Grande hydroelectric plants. The new Concession Agreements were signed on November 10, 2017, at which time the extension of the Assisted Operation periods was also formalized, maintaining Cemig Geração e Transmissão as responsible for providing the power generation service of the plants until the</p>

				following dates: Volta Grande Plant: until November 30, 2017; Jaguara Plant and Miranda Plant: until December 28, 2017; São Simão Plant: until May 09, 2018.
Acquisitions	0	No change	0	There were no acquisitions in Cemig's businesses that changed the emissions of Scopes 1 and 2 within the limits established for its inventory.
Mergers	0	No change	0	There were no mergers in Cemig's businesses that changed the emissions of Scopes 1 and 2 within the limits established for its inventory.
Change in output	34,392	Decreased	9.29	<p>The emissions associated with the operation of Igarapé TPP in 2017 were 33,846 tCO<sub>2</sub>e, and in 2016 these emissions were zero tCO<sub>2</sub>e, due to the non-dispatch of the power plant. The increase in its operation was responsible for a 5.96% increase in Scope 1 + 2 emissions in 2017, compared to 2016.</p> <p>In order to calculate the percentage of 5.96%, the Scope 1 emissions related to TPP Igarapé in 2017 are subtracted from those of 2016, and the result is divided by the sum of the Scopes 1 + 2 of 2016.</p> $X = (33,846-0) / (15,462 + 552,805)$ $X = 33,846 / 568,267$ $X = 0.0595 * 100 = 5.96\%$

				<p>Cemig's production of electricity decreased from 23,280,118 GWh in 2016 to 19,731,632 GWh in 2017. If all other conditions were maintained unchanged between the two years and assuming a linear reduction of emissions with the reduction of electricity generation, this reduction would lead to a reduction of Scope 1 + 2 emissions by 15.24%.</p> <p>In order to calculate the percentage of 15.24%, Cemig's electricity production in 2017 is subtracted from that of 2016, and the result is divided by the electricity production of 2016.</p> $X = (19,731,632 - 23,280,118) / 23,280,118$ $X = - 3,548,486 / 23,280,118$ $X = - 0.1524 * 100 = - 15.24\%$ <p>These two factors together led to a 9.29% reduction in emissions in 2017 compared to 2016.</p> $X = 5,96\% + (- 15,24\%) = - 9,29\%$
Change in methodology	0.0110	Increased	13.11	<p>The increase in Scope 2 emissions is due to the increase of the National Interconnected System (SIN) emission factor, from 0.0817 tCO<sub>2</sub> / MWh in 2016 to 0.0927 tCO<sub>2</sub> / MWh in 2017. The Scope 2 emissions in 2016 represented 97.28% of Scope 1 + 2 emissions.</p> <p>In order to calculate the percentage of 13.11% presented in the next column, the emission factor of the</p>

				<p>National Interconnected System (SIN) of 2017 is subtracted from that of 2016, and the result is divided by the emission factor of the National Interconnected System of 2016 multiplied by the result of the expression of Scope 2 of 2016 divided by the Scope 1 + 2 of 2016.</p> $X = (0.0927 - 0.0817) / (0.0817 * (552,805 / (15,462 + 552,805)))$ $X = 0.0110 / 0.0817 * 0.9728$ $X = 0.1311$ $X = 0.1311 * 100 = 13.11\%$
Change in boundary	0	No change	0	There was no change in the inventory limits for the Scopes 1 and 2 emissions.
Change in physical operating conditions	0	No change	0	No change in Cemig's physical operating conditions was assessed from the viewpoint of changes in the emissions of Scopes 1 and 2 in 2017 compared to 2016.
Unidentified	117,434	Increased	22.71	<p>22.71% of Scope 1 + 2 emissions in 2017 compared to 2016 could not be properly screened and thus had no identified causes - they are small and occasional variations in several sources. All other items in this table together represent 2.81% of the increase in emissions, with a total increase of 25.52%.</p> <p>In order to calculate the percentage of 22.71% shown in the next column, firstly the Scope 1 + 2 emissions of 2016 are subtracted from the Scope</p>

				<p>1 + 2 emissions of 2017 and the result is divided by the Scope 1 + 2 emissions of 2016. From the result obtained is subtracted the sum of the percentages found in the lines above.</p> $X = - ((568,267 - 713,262) / 568,267) * 100 - (- 1.01 + (- 9.29) + 13.11)$ $X = - (- 25.52) - (2.81)$ $X = 22.71\%$
Other	0	No change	0	No other change in Cemig's operations was assessed from the viewpoint of emissions changes for Scopes 1 and 2 of 2017 compared to 2016.

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

**Location-based emissions.**

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## C8 Energy

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### Energy spend

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

**Between 60 and 65%.**

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### Energy-related activities

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

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



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

Energy carrier	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total MWh
Consumption of fuel	LHV (lower heating value)	4,461	163,363	167,824
Consumption of purchased or acquired electricity	Not applicable	43,552	0	43,552
Consumption of purchased or acquired heat	Not applicable	0	0	0
Consumption of purchased or acquired steam	Not applicable	0	0	0
Consumption of purchased or acquired cooling	Not applicable	0	0	0
Consumption of self-generated non-fuel renewable energy <sup>4</sup>	Not applicable	0	0	0
<b>Total energy consumption</b>	<b>Not applicable</b>	<b>48,013</b>	<b>39,325</b>	<b>87,338</b>

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

Fuel application	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	Yes
Consumption of fuel for the generation of steam	No
Consumption of fuel for the generation of cooling	No

<sup>4</sup> The amount of renewable electricity produced (19,692,982 MWh) is exported to the national grid, then not being consumed by the Company, thus not generating GHG emissions from Cemig associated with its consumption. All the electricity consumed by Cemig in the reporting year (43,552 MWh) was accounted for as purchased in the national grid, using the emission factor of the National Electric System in the inventory of GHG emissions.

Consumption of fuel for co-generation or tri-generation	No
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**(C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.**

Fuels	Heating value	Total MWh consumed by the organization	MWh consumed for the generation of electricity
Other: Biodiesel (B100)	LHV (lower heating value)	2,384	0
Liquefied Petroleum Gas (LPG)	LHV (lower heating value)	281	0
Natural Gas (dry)	LHV (lower heating value)	29	0
Natural Gas Liquids (NGL)	LHV (lower heating value)	6	0
Biogasoline (Automotive Gasoline)	LHV (lower heating value)	7,808	0
Jet kerosene	LHV (lower heating value)	1,158	0
Residual Fuel Oil	LHV (lower heating value)	124,038	0
Diesel	LHV (lower heating value)	30,042	0
Other: anhydrous ethanol	LHV (lower heating value)	1,998	0
Other: hydrous ethanol	LHV (lower heating value)	79	0
Lubricants	LHV (lower heating value)	0.11	0

MWh consumed for the generation of heat	MWh consumed for the generation of steam	MWh consumed for the generation of cooling	MWh consumed for cogeneration or trigeneration
0	0	0	0

The value is zero for these columns for all fuels listed above.

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

Fuels	Emission factor	Unit	Emission factor source	Comment
Other: Biodiesel (B100)	0.00246	metric tons CO <sub>2</sub> per liter	Brazil GHG Protocol Programme	This emission factor was used for the calculation of mobile combustion emissions.
Other: Biodiesel (B100)	0.00243	metric tons CO <sub>2</sub> per liter	Brazil GHG Protocol Programme	This emission factor was used for the calculation of stationary combustion emissions.
Liquefied Petroleum Gas (LPG)	2.93093	metric tons CO <sub>2</sub> per metric ton	Brazil GHG Protocol Programme	This emission factor was used for the calculation of stationary combustion emissions.
Natural Gas (dry)	0.00207	metric tons CO <sub>2</sub> per m3	Brazil GHG Protocol Programme	This emission factor was used for the calculation of stationary combustion emissions.
Natural Gas Liquids (NGL)	0.00233	metric tons CO <sub>2</sub> per m3	Brazil GHG Protocol Programme	This emission factor was used for the calculation of stationary combustion emissions.
Biogasoline (Automotive Gasoline) (the values are of pure automotive gasoline)	0.00224	metric tons CO <sub>2</sub> per liter	Brazil GHG Protocol Programme	This emission factor was used for the calculation of stationary combustion emissions.
Biogasoline (Automotive Gasoline) (the values are of pure automotive gasoline)	0.00221	metric tons CO <sub>2</sub> per liter	Brazil GHG Protocol Programme	This emission factor was used for the calculation of mobile combustion emissions.
Jet kerosene	0.00252	metric tons CO <sub>2</sub> per liter	Brazil GHG Protocol Programme	This emission factor was used for the calculation of mobile combustion emissions.
Diesel	0.00260	metric tons CO <sub>2</sub> per liter	Brazil GHG Protocol Programme	This emission factor was used for the calculation of mobile combustion emissions.

Diesel	0.00263	metric tons CO <sub>2</sub> per liter	Brazil GHG Protocol Programme	This emission factor was used for the calculation of stationary combustion emissions.
Other: anhydrous ethanol	0.00153	metric tons CO <sub>2</sub> per liter	Brazil GHG Protocol Programme	This emission factor was used for the calculation of mobile combustion emissions.
Other: hydrous ethanol	0.00146	metric tons CO <sub>2</sub> per liter	Brazil GHG Protocol Programme	This emission factor was used for the calculation of mobile combustion emissions.
Lubricants	0.00272	metric tons CO <sub>2</sub> per liter	Brazil GHG Protocol Programme	This emission factor was used for the calculation of stationary combustion emissions.
Residual Fuel Oil	2.94666	metric tons CO <sub>2</sub> per metric ton	Brazil GHG Protocol Programme	This emission factor was used for the calculation of stationary combustion emissions.

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

Energy Carrier	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity <sup>5</sup>	19,731,632	0	19,692,982	0
Heat	0	0	0	0
Steam	0	0	0	0
Cooling	0	0	0	0

<sup>5</sup> The amount of renewable electricity produced (19,692,982 MWh) is exported to the national grid, then not being consumed by the Company, thus not generating GHG emissions from Cemig associated with its consumption. All the electricity consumed by Cemig in the reporting year (43,552 MWh) was accounted for as purchased in the national grid, using the emission factor of the National Electric System in the inventory of GHG emissions.

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

Power generation source	Nameplate capacity (MW)	Gross generation (GWh)	Net generation (GWh)	Absolute emissions (metric tons CO <sub>2</sub> e)	Emissions intensity (metric tons CO <sub>2</sub> e per GWh)	Comment
Other non renewable	131	38.750	38.650	33,846	875.705	The emissions intensity was calculated by dividing the Scope 1 emissions of Igarapé TPP by the net generation of energy by the same TPP. In 2016, the Igarapé TPP was not dispatched, however, in 2017 it generated 38,650 MWh. The Igarapé TPP is powered by residue fuel oil.
Hydroelectric	7,012	20,160.390	19,592.950	15,003	0.76573	The emissions intensity was calculated by dividing Scope 1 emissions (vehicles fleet, boats and aircrafts, fugitive emissions of SF <sub>6</sub> gas, use of emergency generators, use of forklifts and autoclaves, use of fertilizers, and use of sodium carbonate, i.e., the total Scope 1 emissions except Scope 1 emissions of TPP Igarapé) by Cemig's net generation (hydroelectric).
Wind	49	100.800	98.380	-	-	It is not possible to calculate the

						emissions intensity by type of generating source, since the only source of emissions related to wind energy is the vehicles fleet that serves this unit, however, it is outsourced and we do not have the data.
Solar	1	1.690	1.652	-	-	It is not possible to calculate the emissions intensity by type of generating source, since the only source of emissions related to solar energy is the vehicle that serves this unit, however, the value of this vehicle is accounted in conjunction with the vehicles fleet that serves the hydroelectric plants.
Total	7,193	20,301.630	19,731.632	48,849	2.47566	The direct emissions intensity is calculated by dividing the total Scope 1 emissions by Cemig's net generation of energy. This intensity is influenced directly by the dispatch or not of the Igarapé Thermoelectric Plant and by the SIN emission factor (Brazilian grid emission factor), as well as by Cemig's net generation of energy. In 2016,

						<p>Igarapé TPP was not dispatched, however, in 2017 it generated 38,650 MWh; the SIN emission factor went from 0.0817 tCO<sub>2</sub>/MWh in 2016 to 0.0927 tCO<sub>2</sub>/MWh in 2017; Cemig's net generation decreased from 23,280,118 MWh in 2016 to 19,731,632 MWh in 2017. The emissions intensity of Scope 1 in 2016 was 0.00066417 tCO<sub>2</sub>/MWh (15,462 tCO<sub>2</sub> divided by 23,280,118 MWh). The emissions intensity of Scope 1 in 2017 was 0.00247564 tCO<sub>2</sub>/MWh (48,849 tCO<sub>2</sub> divided by 19,731,632 MWh). These factors explain the significant increase in this metric.</p>
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**(C8.2f) Provide details on the electricity, heat, steam, and/or cooling amounts that were accounted for at a low-carbon emission factor in the market-based Scope 2 figure reported in C6.3.**

Basis for applying a low-carbon emission factor	Low-carbon technology type	MWh consumed associated with low-carbon electricity, heat, steam or cooling	Emission factor (in units of metric tons CO <sub>2</sub> e per MWh)	Comment
No purchases or generation of low-carbon electricity, heat, steam or cooling accounted with a low-carbon emission factor	Solar PV Wind Hydropower	0	0	In 2017, 99.8% of the electricity generated by Cemig came from low-carbon hydroelectric, wind and solar power plants that exported 19,692,982 MWh of green energy to the Brazilian grid. These plants are

				<p>connected to the grid, but the electricity is not certified as of low emissions.</p> <p>This amount of electricity is exported to the grid and is not consumed by the Company, thus not generating GHG emissions at Cemig, associated with its consumption. Therefore, because this electricity generation does not enter into the calculations of Cemig's Scope 2 emissions, the value inserted in the third column is equal to zero, not equivalent to the 19,692,982 MWh of low-carbon electricity produced by Cemig in 2017. All electricity consumed by Cemig in the reporting year was accounted for as purchased in the grid, and the emission factor of the Brazilian grid was used in the inventory of GHG emissions.</p> <p>It is important to note that non-low carbon electricity is generated in the Igarapé Thermoelectric Plant, powered by fuel oil.</p> <p>The emission factor shown in the next column was zero because the ORS system does not allow text input. In fact, this emission factor is not applicable to Cemig, since the Company reports the Scope 2 emissions based on location only.</p>
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## Transmissions and distribution

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

Yes.

(C-EU8.4a) Disclose the following information about your global transmission and distribution business.

Country	Voltage level	Annual load (GWh)	Scope 2 emissions (basis)	Scope 2 emissions (metric tons CO <sub>2</sub> e)
Brazil	Transmission (high voltage)	-	Location-based	47,091.6
Annual energy losses (% of annual load)	Length of network (km)	Number of connections	Area covered (km <sup>2</sup> )	Comment
1.61	6,673	-	567,478	<p>Companhia Energética de Minas Gerais (Cemig) operates in generation, transmission, sale and distribution of electricity, energy solutions (Effcientia S.A.), and distribution of natural gas (Gasmig). The Cemig Group comprises: the holding company (Companhia Energética de Minas Gerais – Cemig), its wholly-owned subsidiaries Cemig Geração e Transmissão S.A. (Cemig GT) and Cemig Distribuição S.A. (Cemig D) – and other interests, comprising a total of 175 companies, 15 consortia and 2 FIPs (Equity Investment Funds), resulting in assets in 22 Brazilian states, and the nation’s capital, the Federal District.</p> <p>Cemig also has operations in data transmission (Cemig</p>

				Telecom) and interests in Light S.A. where it is part of the controlling stockholding group through a direct holding of 26.06% and an indirect interest of 22.80%. Light is the power distributor in 31 cities/counties in Rio de Janeiro state, with 11 million consumers. Cemig also has a controlling stockholding interest of 36.79% in the transmission company Transmissora Aliança de Energia Elétrica S.A. – Taesa.
<b>Country</b>	<b>Voltage level</b>	<b>Annual load (GWh)</b>	<b>Scope 2 emissions (basis)</b>	<b>Scope 2 emissions (metric tons CO<sub>2</sub>e)</b>
<b>Brazil</b>	<b>Distribution (low voltage)</b>	<b>55,276.770</b>	<b>Location-based</b>	<b>613,025.1</b>
<b>Annual energy losses (% of annual load)</b>	<b>Length of network (km)</b>	<b>Number of connections</b>	<b>Area covered (km<sup>2</sup>)</b>	<b>Comment</b>
<b>8.98</b>	<b>512,572</b>	<b>-</b>	<b>567,478</b>	Companhia Energética de Minas Gerais (Cemig) operates in generation, transmission, sale and distribution of electricity, energy solutions (Effcientia S.A.), and distribution of natural gas (Gasmig). The Cemig Group comprises: the holding company (Companhia Energética de Minas Gerais – Cemig), its wholly-owned subsidiaries Cemig Geração e Transmissão S.A. (Cemig GT) and Cemig Distribuição S.A. (Cemig D) – and other interests, comprising a total of 175 companies, 15 consortia and 2 FIPs (Equity Investment Funds), resulting in assets in 22 Brazilian states, and the nation's capital, the Federal

				<p><b>District.</b></p> <p><b>Cemig also has operations in data transmission (Cemig Telecom) and interests in Light S.A. where it is part of the controlling stockholding group through a direct holding of 26.06% and an indirect interest of 22.80%. Light is the power distributor in 31 cities/counties in Rio de Janeiro state, with 11 million consumers. Cemig also has a controlling stockholding interest of 36.79% in the transmission company Transmissora Aliança de Energia Elétrica S.A. – Taesa.</b></p>
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## C9 Additional metrics

### Other climate-related metrics

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

Description	Metric value	Metric numerator	Metric denominator (intensity metric only)	% change from previous year	Direction of change	Please explain
Other: Scope 1 emissions intensity per MWh produced (tCO <sub>2</sub> /MWh)	0.00247564	Direct emissions (Scope 1)	Net energy generation measured in MWh	273	Increased	The direct emissions intensity is calculated by dividing the Scope 1 emissions by Cemig's net energy generation. This intensity is influenced directly by the dispatch or not of the Igarapé Thermoelectric Plant and by the SIN (Brazilian grid) emission factor, as well as by Cemig's net energy generation. In 2016, Igarapé Thermoelectric Plant was not dispatched, however, in 2017 it generated 38,650 MWh; the SIN emission factor went from 0.0817 tCO <sub>2</sub> /MWh in 2016 to 0.0927 tCO <sub>2</sub> /MWh in 2017; Cemig's net generation decreased from 23,280,118 MWh in 2016 to 19,731,632



				<a href="#">ontro%20Anual 2017 Guidanc e.pdf</a>
Wind	R\$ 7,000,000.00	3%	2022	<p>The main investments made in 2017 refer to the company Renova Energia, to fulfill the commitments of construction of the wind farms.</p> <p>For additional information, please access:</p> <p><a href="http://cemig.infoinvest.com.br/ptb/16043/CEMIG%20GT%204T17%20final.pdf">http://cemig.infoinvest.com.br/ptb/16043/CEMIG%20GT%204T17%20final.pdf</a></p> <p><a href="http://cemig.infoinvest.com.br/ptb/15037/Apresentao_%20Encontro%20Anual 2017 Guidanc e.pdf">http://cemig.infoinvest.com.br/ptb/15037/Apresentao_%20Encontro%20Anual 2017 Guidanc e.pdf</a></p>

## CAPEX: products and service

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

Products and services	Description of product/service	CAPEX planned for product/service	Percentage of total CAPEX planned products and services	End year of CAPEX plan
Other: Capex planned for development of renewable electric energy	<p>In the current Capex plan (2018-2022) substantial investments are foreseen in the Generation business, in which renewable sources generate 98% of the electricity.</p> <p>Source: APIMEC Presentation - Guidance 2018, available at:</p> <p><a href="http://cemig.infoinvest.com.br/ptb/16384/Balano%20de%20energia%20e%20Guidance%20-">http://cemig.infoinvest.com.br/ptb/16384/Balano%20de%20energia%20e%20Guidance%20-</a></p>	R\$ 1,506,000,000.00	19%	2022

	<a href="#">%202018.pdf</a>			
Other: Capex planned for improvement in distribution services	<p>In the current Capex plan (2018-2022) substantial investments are foreseen in the Distribution business, in the following products and services:</p> <ul style="list-style-type: none"> <li>- Distributed generation</li> <li>- Information campaigns</li> <li>- Energy management services</li> <li>- Smart grid</li> </ul> <p>Source: APIMEC Presentation - Guidance 2018, available at:  <a href="http://cemig.foinvest.com.br/ptb/16384/Balano%20de%20energia%20e%20Guidance%20-%202018.pdf">http://cemig.foinvest.com.br/ptb/16384/Balano%20de%20energia%20e%20Guidance%20-%202018.pdf</a></p>	R\$ 6,059,000,000.00	83%	2022

## Low-carbon investments: Coal / Electric utilities / Oil & gas

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

Investment start date	Investment end date	Investment area	Technology area	Investment maturity	Investment figure	Low-carbon investment percentage	Please explain
01/2017	12/2017	R&D	Electric Utilities Renewable energy	Applied research and development	1,758,632.92 USD 534,214.13 (dollar quotation for 2017 = R\$3.292)	23%	The following are the topics researched and developed: Gasification of Urban Solid Waste (R&D 418); PVT system - Thermal photovoltaic (R&D 498); Information

							<p>Science applied to renewable energy decision making (R&amp;D 553); Cogeneration in the cement industry (R&amp;D 554); Wind forecast models (R&amp;D 555); Optimization of the energy matrix (R&amp;D 556); Atlas of biomass (R&amp;D 557); and Prospecting in the electrical sector (R&amp;D 578). More details on the projects can be found at: <a href="https://sgpd.cemig.com.br/index.php">https://sgpd.cemig.com.br/index.php</a></p> <p>The % reported in the next column refers to the total invested in R&amp;D for renewable energy concerning the total invested in R&amp;D by Cemig.</p>
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# C10 Verification

## Verification

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

Scope	Verification/assurance status
Scope 1	Third-party verification or assurance process in place
Scope 2 (location-based or market-based)	Third-party verification or assurance process in place
Scope 3	Third-party verification or assurance process in place

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

Scope	Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/section reference	Relevant standard	Proportion of reported emissions verified (%)
Scope 1	Annual process	Complete	Reasonable assurance	<i>GHGEmissionsCe mig2017_VerificationStatement</i> <i>GHGEmissionsCe mig2017_Template CDP</i>	The entire document	ISO 14064-3	100%
Scope 2 (location-based)	Annual process	Complete	Reasonable assurance	<i>GHGEmissionsCe mig2017_VerificationStatement</i> <i>GHGEmissionsCe mig2017_Template</i>	The entire document	ISO 14064-3	100%

				CDP			
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**(C10.1b) Provide further details of the verification/assurance undertaken for your Scope 3 emissions and attach the relevant statements.**

Scope	Verification or assurance cycle in place	Status in the current reporting year	Attach the statement	Page/ section reference	Relevant standard
Scope 3 (all relevant categories)	Annual process	Complete	<i>GHGEmissionsCemig2017_VerificationStatement</i> <i>GHGEmissionsCemig2017_Template CDP</i>	The entire document	ISO 14064-3

## Other verified data

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

Yes.

**(C10.2a) Which data points within your CDP disclosure have been verified, and which verification standards were used?**

Disclosure module verification relates to	Data verified	Verification standard	Please explain
C4. Targets and performance	Progress against emissions reduction target	The independent annual verification of the Cemig Greenhouse Gas Emissions Inventory is based on ISO 14063-4.	The progress of emission reduction targets is reported, and their performance is justified. This information is part of the Greenhouse Gas Emissions Inventory of Cemig that undergoes independent third-party verification conducted by Bureau Veritas.
C7. Emissions breakdown	Year on year change in emissions (Scope 1)	The independent annual verification of the Cemig Greenhouse Gas Emissions Inventory is based on ISO	The Scope 1 emissions data (totals and detailed) are compared to the previous year, and the variation in performance is justified. This information is part of the Greenhouse Gas Emissions Inventory of Cemig that undergoes independent third-party

		14063-4.	verification conducted by Bureau Veritas.
C7. Emissions breakdown	Year on year change in emissions (Scope 2)	The independent annual verification of the Cemig Greenhouse Gas Emissions Inventory is based on ISO 14063-4.	The Scope 2 emissions data (totals and detailed) are compared to the previous year, and the variation in performance is justified. This information is part of the Greenhouse Gas Emissions Inventory of Cemig that undergoes independent third-party verification conducted by Bureau Veritas.
C7. Emissions breakdown	Year on year change in emissions (Scope 3)	The independent annual verification of the Cemig Greenhouse Gas Emissions Inventory is based on ISO 14063-4.	The Scope 3 emissions data (totals and detailed) are compared to the previous year, and the variation in performance is justified. This information is part of the Greenhouse Gas Emissions Inventory of Cemig that undergoes independent third-party verification conducted by Bureau Veritas.
C8. Energy	Year on year emissions intensity figure	The independent annual verification of the Cemig Greenhouse Gas Emissions Inventory is based on ISO 14063-4.	The emissions intensity of Scope 1 is compared to the previous year, and the variation in performance is justified. This information is part of the Greenhouse Gas Emissions Inventory of Cemig that undergoes independent third-party verification conducted by Bureau Veritas.
C1. Governance	Other: Climate change management	The independent annual verification of Cemig's Annual and Sustainability Report is based on the GRI-G4 methodology, the GRI-G4 Electric Utilities industry supplement, and ISAE 3000 assurance standard.	The Climate Change theme is a material theme in Cemig's 2017 Annual and Sustainability Report. Therefore, management of the theme Climate Change, including governance, risks and opportunities, CDM projects, emission reduction activities, was verified in the scope of the third party independent verification carried out by SGS do Brazil in Cemig's 2017 Annual and Sustainability Report.

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# C11 Carbon pricing

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## Carbon pricing systems

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

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

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

In Brazil, there is no carbon tax system, but Cemig is taking part in the Emissions Trading System Simulation project, an initiative of the Sustainability Studies Center (GVces) of São Paulo Business School of the Getúlio Vargas Foundation (EAESP / FGV). The purpose of this project is to generate knowledge from the business sector about the operation of an emissions trading system, one of the leading economic instruments of greenhouse gas emission mitigation policies already implemented in several countries. With this project, Cemig has the opportunity to act in the Simulation, based on defined rules and parameters, operating through an online platform from the Rio de Janeiro Environmental Stock Exchange (BVRio). For additional details, visit: <http://www.gvces.com.br/sistema-de-comercio-de-emissoes>

Cemig monitors the matter in order to prepare for the entry into force of a carbon tax regulation.

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## Project-based carbon credits

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

Yes.

**(C11.2a) Provide details of the project-based carbon credits originated or purchased by your organization in the reporting period.**

Credit origination or credit purchase	Project type	Project identification	Verified to which standard
Credit origination	Hydro	Project 3922 : Baguari Hydropower Plant CDM Project Activity  Cemig has a portfolio of 7 low-carbon electricity generation projects	CDM (Clean Development Mechanism)

		connected to the Brazilian grid, registered under the CDM (Clean Development Mechanism), considering Cemig's plants and plants in which Cemig has a stake. This portfolio has the potential for annual 4,216,809 carbon credits generation, representing a yearly reduction in emissions of 4,216,809 tCO <sub>2</sub> . In 2017, 1,401,997 carbon credits were issued to the UNFCCC, in the projects HPP Baguari, SHP Cachoeirão and HPP Santo Antônio.	
<b>Number of credits (metric tons CO<sub>2</sub>e)</b>	<b>Number of credits (metric tons CO<sub>2</sub>e): Risk adjusted volume</b>	<b>Credits cancelled</b>	<b>Purpose, e.g. compliance</b>
176,971	176,971	No	Voluntary offsetting
<b>Credit origination or credit purchase</b>	<b>Project type</b>	<b>Project identification</b>	<b>Verified to which standard</b>
<b>Credit origination</b>	<b>Hydro</b>	<b>Project 4788: Cachoeirão CDM Project (JUN1092)</b>  Cemig has a portfolio of 7 low-carbon electricity generation projects connected to the Brazilian grid, registered under the CDM (Clean Development Mechanism), considering Cemig's plants and plants in which Cemig has a stake. This portfolio has the potential for annual 4,216,809 carbon credits generation, representing a yearly reduction in emissions of 4,216,809 tCO <sub>2</sub> . In 2017, 1,401,997 carbon credits were issued to the UNFCCC, in the projects HPP Baguari, SHP Cachoeirão and HPP Santo Antônio.	<b>CDM (Clean Development Mechanism)</b>
<b>Number of credits (metric tons CO<sub>2</sub>e)</b>	<b>Number of credits (metric tons CO<sub>2</sub>e): Risk adjusted volume</b>	<b>Credits cancelled</b>	<b>Purpose, e.g. compliance</b>
167,097	167,097	No	Voluntary offsetting

Credit origination or credit purchase	Project type	Project identification	Verified to which standard
Credit origination	Hydro	<p><b>Project 9282 : Santo Antonio Hydropower Project</b></p> <p>Cemig has a portfolio of 7 low-carbon electricity generation projects connected to the Brazilian grid, registered under the CDM (Clean Development Mechanism), considering Cemig's plants and plants in which Cemig has a stake. This portfolio has the potential for annual 4,216,809 carbon credits generation, representing a yearly reduction in emissions of 4,216,809 tCO<sub>2</sub>. In 2017, 1,401,997 carbon credits were issued to the UNFCCC, in the projects HPP Baguari, SHP Cachoeirão and HPP Santo Antônio.</p>	CDM (Clean Development Mechanism)
Number of credits (metric tons CO <sub>2</sub> e)	Number of credits (metric tons CO <sub>2</sub> e): Risk adjusted volume	Credits cancelled	Purpose, e.g. compliance
1,057,929	1,057,929	No	Voluntary offsetting

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## Internal price on carbon

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

**Yes.**

**(C11.3a) Provide details of how your organization uses an internal price on carbon.**

Objective for implementing an internal carbon price	GHG Scope	Application	Actual price(s) used (Currency /metric ton)	Variance of price(s) used	Type of internal carbon price	Impact & implication
<ul style="list-style-type: none"> <li>• Navigate GHG regulations</li> <li>• Drive low-carbon investment</li> <li>• Identify and seize low-carbon opportunities</li> </ul>	Scope 1	<p>The rationale to use a price: first, it is important to point out that in Brazil there is no established price for carbon. However, when assessing the acquisition of enterprises that use fossil fuels, Cemig conducts internal analyzes regarding the carbon risk and its financial impact on the Company, i.e., the financial risk of the enterprise in a possible future pricing scenario of GHG emissions in Brazil. In the last assessment made by Cemig, different scenarios of power generation in the Brazilian electrical matrix were considered. In order to calculate the financial impact of the carbon pricing in these assessed projects, the energy to be generated and the GHG emissions were calculated considering each of the scenarios, with the GHG emissions multiplied by the internal carbon price.</p>	R\$ 14.13	<p>Real price used: the value used in carbon pricing in potentially acquired ventures using fossil fuels is the value suggested by The Regional Greenhouse Gas Initiative (RGGI) from the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont, available at: <a href="https://www.rggi.org/sites/default/files/Uploads/Auction-Materials/39/Auction_39_Market_Monitor_Report.pdf">https://www.rggi.org/sites/default/files/Uploads/Auction-Materials/39/Auction_39_Market_Monitor_Report.pdf</a>.</p> <p>Variations in price over time and between geographical areas: price variation over time and between geographical areas was not considered.</p>	Shadow price	<p>Example of how carbon pricing affects investment decisions: Cemig does environmental due diligence and sensitivity analyzes for acquiring new assets using fossil fuels (carbon risk assessment) to assess the possible financial impact of the increase of its GHG emissions in this asset, against the possibility of internalizing the costs of emissions as a result of the new regulations. This assessment is carried out by environmental due diligence and sensitivity analyzes related to the acquisition of new fossil-sourced enterprises, assisting the Company in making decisions regarding the expansion of its business.</p>

		<p>The results were included in the financial feasibility analysis of the project and included as operating costs. These assessments were based on the prices of carbon credits of Regional Greenhouse Gas Initiative (RGGI) from the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont.</p>				
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# C12 Engagement

## Value chain engagement

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

Yes, our customers

Yes, other partners in the value chain

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

Engagement category	Engagement type	Size of engagement	% Scope 3 emissions as reported in C6.5	Please explain the rationale for selecting this group of customers and scope of engagement	Impact of engagement, including measures of success
Collaboration & innovation	Other – please provide information in column 5	1.12%	0.20%	Cemig seeks to engage its customers in reducing energy consumption to reduce GHG emissions associated with this consumption. This engagement takes place through its Energy Efficiency Program (PEE, Programa de Eficiência Energética), which uses resources from Aneel's (National Electric Energy Agency) program with the same name. The specific legislation in force, regulated by Aneel, establishes the application by the distributor of a minimum percentage of net	<p>Strategies for prioritizing engagements:</p> <p>Cemig makes the selection of projects based on the criteria described in the next column. Cemig engages its clients on both fronts as it identifies opportunities for the presentation of energy efficiency projects and provides the necessary technical support in the preparation of these projects.</p> <p>Measurement of success:</p> <p>1- Energy Efficiency Program (Smart Energy)</p>

				<p>operating revenue in energy efficiency projects. Besides, the distribution company must annually make a Public Call for Projects, with the society having the opportunity to present proposals to be executed with the energy efficiency feature.</p> <p>The scoring criteria for the selection of the proposals presented in the Public Call and additional information about the selection criteria can be obtained at:</p> <p><a href="http://www.cemig.com.br/pt-br/A_Cemig_e_o_Futuro/sustentabilidade/nossos_programas/Eficiencia_Energetica/Paginas/CHAMA_DA-P%C3%A9BLICA-2017.aspx">http://www.cemig.com.br/pt-br/A_Cemig_e_o_Futuro/sustentabilidade/nossos_programas/Eficiencia_Energetica/Paginas/CHAMA_DA-P%C3%A9BLICA-2017.aspx</a></p> <p><a href="http://www.aneel.gov.br/programa-eficiencia-energetica/-/asset_publisher/94kK2bHDLPmo/content/chamadas-publicas/656831?inheritRedirect=false">http://www.aneel.gov.br/programa-eficiencia-energetica/-/asset_publisher/94kK2bHDLPmo/content/chamadas-publicas/656831?inheritRedirect=false</a></p> <p>The projects selected by Cemig based on these criteria described above are implemented. Cemig operates on two distinct fronts, based on the type of customer to which the chosen project is associated:</p> <p>1- Energy Efficiency</p>	<p>Cemig's success as a customer engagement method is measured by the amount invested in the energy efficiency projects developed under this Program. From 2008 to date, R\$ 500 million has been invested in the implementation of new technologies and strengthening the culture of rational energy use through the awareness and use of more efficient equipment. For example, in 2017, Cemig made R\$ 40 million available for the Public Call and invested R\$ 69.3 million in energy efficiency projects.</p> <p>Besides, the energy efficiency gains (MWh/year) and the GHG emissions reductions (tCO<sub>2</sub>e/year) promoted by the projects are used as indicators of the success of this method of engagement.</p> <p>See additional information on the Smart Energy Program at <a href="http://www.cemig.com.br/pt-br/A_Cemig_e_o_Futuro/sustentabilidade/nossos_programas/Eficiencia_Energetica">http://www.cemig.com.br/pt-br/A_Cemig_e_o_Futuro/sustentabilidade/nossos_programas/Eficiencia_Energetica</a></p> <p>2- Energy efficiency services provided by Efficientia (ESCO)</p> <p>The energy efficiency gains (MWh/year) and the</p>
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				<p><b>Program (Smart Energy) - serves low-income residential customers and philanthropic institutions by replacing obsolete and energy-intensive equipment, such as light bulbs, refrigerators, and showers, for more efficient and economic ones; installation of photovoltaic panels, among other consumption reduction measures. Thus, the reduction of GHG emissions associated with the energy consumption by these customers is promoted.</b></p> <p><b>2- Energy efficiency services provided by Efficientia (ESCO) - Cemig's wholly-owned subsidiary. Efficientia serves clients in the industrial and commercial segments by designing and implementing innovative projects that offer energy solutions focused on end-use improvement services: lighting, air conditioning, compressed air, motors, pumping, etc. Besides, it provides consultancy in the implementation of ISO 50001 - Energy Management System and develops cogeneration projects, using waste from industrial processes, through performance contracts.</b></p>	<p><b>GHG emissions reductions (tCO<sub>2</sub>e/year) promoted by the projects are used as indicators of the success of this method of engagement.</b></p> <p><b>The incentive projects implemented by Efficientia in 2017 prevented the emission of 5,005.8 tCO<sub>2</sub>e/year in industrial and commercial customers. To calculate emissions reductions, the emission factor of the National Electricity System (SIN) for 2017 was used, calculated for GHG inventories by the Brazilian Ministry of Science, Technology, and Innovation (MCTI), multiplied by the amount of electricity saved.</b></p> <p><b>Among the developed cogeneration projects, the biomass-powered electricity and steam cogeneration plant of Bem Brasil Alimentos, a company located in Perdizes city, in Triângulo (Minas Gerais state), started the operation in November 2016 and had R\$ 30 million in PEE resources. The biomass power plant is responsible for serving more than 60% of the energy demand of the Bem Brasil plant, with an installed capacity of 9 MW for the cogeneration plant and 7.5 MW for the average generation</b></p>
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					<p>power. Production is estimated at 54,000 MWh/year, enough to meet the annual consumption of a city of 138 thousand inhabitants. The project will also avoid the emission of 7,200 tCO<sub>2</sub>/year, equivalent to the emission of approximately 10,000 passenger cars. This project was completed in 2017.</p> <p>Additional information about Efficientia and its projects can be obtained at:  <a href="http://www.efficientia.com.br">www.efficientia.com.br</a></p>
Education/information sharing	Run an engagement campaign to educate customers about the climate change impacts of (using) your products, goods, and/or services	100%	99.69%	Cemig promotes several awareness campaigns with its customers about the efficient use of electricity. These campaigns are run on a variety of media - television, radio, newspapers, the Internet, social networks, and also on energy bills sent to customers.	The results are measured through the positive feedback received from clients, reporting the savings obtained from the information received about the rational use and environmental benefits of this initiative.

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

Cemig promotes the engagement of its employees (Cemig and third parties employees) through internal campaigns on the rational use of energy within the Company's facilities, correlating energy efficiency with the reduction of GHG emissions, in the same line of the approach adopted with its customers.

In 2017, Cemig promoted the Illuminated Idea (Ideia Iluminada) Contest, which aimed to encourage solutions aimed at reducing fuel consumption, energy efficiency, water efficiency and reduction in waste generation. 44 projects were written by employees (Cemig and third parties employees), with four selected winners, one in each category. The winning projects will be implemented throughout 2018.

The project chosen in the fuels category is Project 2C - Vehicle Sharing - Ride-sharing (Carona) System. This project aims at the sharing and optimization of vehicles in use by passengers with the same origin and destination, contributing mainly to the reduction of fuel consumption.

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## Public policy engagement

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

**Direct engagement with policy makers**

**Trade associations**

**Funding research organizations**

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

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
Other: Climate change mitigation and adaptation	Support	In view of the importance of the Climate Change theme, Cemig has been participating in the Energy and Climate Change Plan (PEMC) of Minas Gerais, a medium-long-term transversal policy (2020-2030), built through a participatory process, with the objective of promoting the transition to the low-carbon economy, reducing vulnerability to climate change in the territory of Minas Gerais state, and coherently articulating the different initiatives already developed and planned within an integrated territorial strategy.	Cemig supports this legislation with no exceptions.

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

Yes.

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

Trade association	Is your position on climate change consistent with theirs?	Please explain the trade association's position	How have you influenced, or are you attempting to influence the position?
Brazilian Business Council for Sustainable Development (CEBDS)	Consistent	<p>Within the CEBDS, there is the Thematic Chamber on Energy and Climate Change (CTClima), in which Cemig has a chair. CTClima represents the vision of CEBDS member companies in matters related to climate change, in debates and formulation of public policies with governments and other interest groups. CTClima's mission is "to be an appropriate forum for Companies to understand their role in the context of climate change, helping them to develop strategies that take advantage of opportunities and minimize risks and prepare them for a world with restrictions on greenhouse gas emissions."</p> <p>CEBDS promotes several activities related to the theme, which can contribute to the preparation and improvement of public policies regarding this theme.</p>	Cemig's representative at the Thematic Chamber on Energy and Climate Change (CTClima) participates in meetings, discussions, debates and contributes, when applicable, with suggestions for the formulation of public policies.

**(C12.3d) Do you publicly disclose a list of all research organizations that you fund?**

Yes<sup>6</sup>.

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

Cemig's institutional relationship with public policy makers regarding climate change is conducted under the approval of the Board of Executive Officers, by the Offices managing the specific strategic objective and corporate risk associated with the topic. These Offices are updated on the strategy and the Company's Master Plan during the annual Strategic Planning cycle. As described in question C1.1a, the person directly responsible for Global Climate Change Strategy at Cemig is the Deputy Chief Executive Officer. Therefore, all direct and indirect activities in which the Company participates in relation to the development of public policies are assessed ultimately by its staff, after the approval of the respective Officer of the subject area. In

<sup>6</sup> Cemig publishes all the research projects that are carried out, organized by theme; details of the projects are available at: [http://www.cemig.com.br/en-us/Company\\_and\\_Future/innovation/Research\\_and\\_Development/Pages/research\\_and\\_development.aspx](http://www.cemig.com.br/en-us/Company_and_Future/innovation/Research_and_Development/Pages/research_and_development.aspx)

August 2016, representatives of member companies of the CEBDS (Brazilian Business Council for Sustainable Development) Leaders' Board met with member of the BNDES (state-owned Brazilian Economic and Social Development Bank) to address the issue of energy efficiency and financing of renewable energies. Its Deputy Chief Executive Officer represented Cemig. Among other issues, questions were raised about exchange hedge, green bonds and the formation of the Energy Efficiency Front. As a basic assumption, the conduct of all Cemig's institutional activities follows the guidelines of the document "10 climate initiatives". This document is undergoing an update and revision to become the Climate Change Policy of Cemig to be published soon.

## Communications

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

Publication	Status	Attach the document	Content elements
In mainstream reports, in line with CDSB framework	Complete	<a href="http://www.cemig.com.br/2017Report/Paginas/index.html">http://www.cemig.com.br/2017Report/Paginas/index.html</a> Annual and Sustainability Report 2017; Climate Change chapter	Governance Strategy Risks & Opportunities Emissions figures Emission targets Other metrics
In other regulatory filings	Complete	<a href="http://cemig.infoinvest.com.br/ptb/16269/Cemig%20Form%2020F%202017.pdf">http://cemig.infoinvest.com.br/ptb/16269/Cemig%20Form%2020F%202017.pdf</a> Form 20-F of SEC from USA; The Carbon Market item, page 81	Governance Strategy Risks & Opportunities Other metrics
In voluntary communications	Complete	<a href="http://www.cemig.com.br/en-us/Company_and_Future/Sustainability/Programs/climate_changes/Documents/Greenhouse%20Gases%20Inventories/RELATORIO_INVENTARIO_2017_FINAL_ING.pdf">http://www.cemig.com.br/en-us/Company_and_Future/Sustainability/Programs/climate_changes/Documents/Greenhouse%20Gases%20Inventories/RELATORIO_INVENTARIO_2017_FINAL_ING.pdf</a> Inventory of Greenhouse Gases – Year 2017; the entire document	Emissions figures Emission targets Other metrics

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# C14 Signoff

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## Signoff

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

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