

Module: Introduction**Page: Introduction****CC0.1****Introduction**

Please give a general description and introduction to your organization.

Founded in 1952 by then Governor of Minas Gerais state, Juscelino Kubitschek de Oliveira, Companhia Energética de Minas Gerais (Cemig) provides public electricity generation, transmission, and distribution services; trades in power supply; provides energy solutions (through Efficientia S.A.), and distributes natural gas (through Gasmig). The group comprises: the holding Company, Companhia Energética de Minas Gerais (Cemig); wholly-owned subsidiaries of which the most important are Cemig Geração e Transmissão S.A. (Cemig GT - Generation and Transmission) and Cemig Distribuição S.A. (Cemig D - Distribution); and other entities totaling 218 companies, 18 consortia and two private equity funds (FIPs). These have assets in 23 Brazilian States (including the Federal District) and in Chile. Since its founding, the Company has contributed, in an innovative and sustainable manner, to the collective welfare of the regions where it operates. This determination has led Cemig to become Brazil's largest electricity distributor in terms of the length of its transmission lines, and one of the country's largest power generation and transmission companies. It is also involved in natural gas distribution; exploration for natural gas; and in data transmission (Cemig Telecom). Cemig owns a 26.06% stake in Light S.A., an electricity distributor with operations in 31 municipalities in the state of Rio de Janeiro, covering a region with a population of over 11 million people. It also has a 43.36% equity stake in the transmission Company Transmissora Aliança de Energia Elétrica S.A. (Taesa). Cemig's growth model focuses on increasing use of renewable energy sources: as part of this strategy in 2014 Cemig became part of the controlling stockholding block (27.4%) of Renova, a leader in Brazil's wind power market, which also has investments in solar and other renewable energy sources. The main objective in joining the controlling block of Renova was to use that Company as Cemig's vehicle for expansion in renewable sources other than hydroelectric. Cemig's controlling stockholder is the Brazilian State of Minas Gerais, with a 51% interest. It is listed in São Paulo on the BM&FBovespa S.A., in New York on the New York Stock Exchange (NYSE) and in Madrid on the Mercado de Valores Latino-Americanos (Latibex). In 2015, Cemig's consolidated net operating revenues totaled R\$ 21.29 billion, principally earned from renewable sources. Excluding power generated by Light, Cemig's generation assets have installed capacity of 7,426 MW. Of this, 97.40% is hydroelectric, 1.94% thermal generation (1.77% burning fuel oil and 0.17% burning process waste gas), and 0.66% is wind power generation. These figures make Cemig - operating 84 hydroelectric power plants, two thermoelectric facilities, and four wind farms - one of the largest power generators in Brazil. Adding the generating capacity represented by Cemig's stakes in subsidiary and affiliated companies, such as Light, Cemig's installed generation capacity totals 7,800 MW. The Company has 9,748 km of transmission lines and 16,160 km of sub-transmission lines. In distribution, it supplies approximately 8.1 million people in 774 municipalities in the State of Minas Gerais, managing Latin America's largest electricity distribution network, with distribution lines totaling more than 494,000 km. At the close of 2015 Cemig directly employed 7,860 people. Because of its commitment to social and environmental responsibility, its economic and financial strength, and its technical excellence, Cemig has become an

international benchmark for sustainability in the electricity sector, and is positioned as one of the main consolidators of the Brazilian electricity sector. It has been included in the Dow Jones Sustainability Index (DJSI World) every year since that index was created 16 years ago. It has also been included in the BM&FBovespa Corporate Sustainability Index (ISE) for the past 10 years; and last year was selected for the sixth time for inclusion in the Carbon Efficient Index (ICO2), created by BM&FBovespa and the BNDES in 2010.

Cemig has been identified as a leader in Brazil for the quality of its information related to climate change disclosed to investors and the global market through the CDP. As a result it was included in the Climate Disclosure Leadership Index, published in the CDP's 2015 edition in Latin America. In 2015, Cemig was also selected by the CDP in Latin America for best practice of internal carbon price usage; its experience will be reported as a case study. This is a pioneering CDP initiative in Latin America, which selected experiences in the subjects of Water Management Risk, Use of an Internal Carbon Price, and Natural Capital Management, among the 20 best-scoring companies. An adjudicating panel, composed of members of the CDP Technical Advisory Board, plus representatives of investors, experts, associations, business organizations and academia, evaluated these experiences.

CC0.2

Reporting Year

Please state the start and end date of the year for which you are reporting data.

The current reporting year is the latest/most recent 12-month period for which data is reported. Enter the dates of this year first.

We request data for more than one reporting period for some emission accounting questions. Please provide data for the three years prior to the current reporting year if you have not provided this information before, or if this is the first time you have answered a CDP information request. (This does not apply if you have been offered and selected the option of answering the shorter questionnaire). If you are going to provide additional years of data, please give the dates of those reporting periods here. Work backwards from the most recent reporting year.

Please enter dates in following format: day(DD)/month(MM)/year(YYYY) (i.e. 31/01/2001).

Enter Periods that will be disclosed

Thu 01 Jan 2015 - Thu 31 Dec 2015

CC0.3

Country list configuration

Please select the countries for which you will be supplying data. If you are responding to the Electric Utilities module, this selection will be carried forward to assist you in completing your response.

Select country
Brazil

CC0.4

Currency selection

Please select the currency in which you would like to submit your response. All financial information contained in the response should be in this currency.

BRL(R\$)

CC0.6

Modules

As part of the request for information on behalf of investors, electric utilities, companies with electric utility activities or assets, companies in the automobile or auto component manufacture sub-industries, companies in the oil and gas sub-industries, companies in the information technology and telecommunications sectors and companies in the food, beverage and tobacco industry group should complete supplementary questions in addition to the main questionnaire.

If you are in these sector groupings (according to the Global Industry Classification Standard (GICS)), the corresponding sector modules will not appear below but will automatically appear in the navigation bar when you save this page. If you want to query your classification, please email respond@cdp.net.

If you have not been presented with a sector module that you consider would be appropriate for your company to answer, please select the module below. If you wish to view the questions first, please see <https://www.cdp.net/en-US/Programmes/Pages/More-questionnaires.aspx>.

Further Information

CC0.1 – Complement for this question: Cemig's MISSION: "To operate in the energy sector with profitability, quality and social responsibility." Cemig's VISION: "To consolidate Cemig's position, over the course of this decade, as the largest group in the Brazilian electricity sector by market value, with a presence in the natural gas market, and as a global leader in sustainability, admired by its clients and recognized for its solidity and performance."

Module: Management

CC1.1

Where is the highest level of direct responsibility for climate change within your organization?

Board or individual/sub-set of the Board or other committee appointed by the Board

CC1.1a

Please identify the position of the individual or name of the committee with this responsibility

The person at the highest level of direct responsibility for climate change issues in Cemig is the Deputy CEO, who reports directly to the CEO. The office of CEO is the highest instance of the Executive Board, which in turn reports directly to the Board of Directors.

Cemig's management comprises: its Board of Directors, and Executive Board. Members of the Board of Directors, who are elected at the Annual General Meeting, elect the firm's CEO and Deputy CEO, and appoint the Executive Board, which is part of the company's management. The Deputy CEO is part of the Executive Board. His/her duties, as defined and approved by the Board of Directors, include: (i) replacing the CEO when s/he is absent, on leave, temporarily disabled, has resigned or the position is vacant; (ii) working to improve the Company's social responsibility and sustainability policies; (iii) setting policies and guidelines related to the environment, technological development, alternative energy sources and technical standardization; (iv) coordinating Cemig's strategy in relation to social responsibility, the environment, and technological processes for the strategic management of technology; (v) coordinating the implementation and maintenance of quality systems; (vi) implementing the Company's technological development programs; and (vii) monitoring the management of plans for compliance with environmental, technological and quality improvement guidelines.

CC1.2

Do you provide incentives for the management of climate change issues, including the attainment of targets?

Yes

CC1.2a

Please provide further details on the incentives provided for the management of climate change issues

Who is entitled to benefit from these incentives?	The type of incentives	Incentivized performance indicator	Comment
Board/Executive board	Monetary reward	Other: Sustainability index related to climate change	Indicator: Cemig's score in the Dow Jones Sustainability World Index. This index evaluates issues related to climate change, among other sustainability-related issues. The variable remuneration of the Deputy CEO, who is the second ranked individual on the Executive Board, which is part of the Company's management, is linked to Cemig's score in the Dow Jones Sustainability World Index.
Director on board	Monetary reward	Efficiency target	Indicator: Energy losses index in the electricity system Energy losses in the electricity system are responsible for 99% of Cemig's Scope 2 emissions. To achieve the goal of reducing these measurable losses (i.e., Scope 2 emissions), the Company has established the Total Distribution Losses Index (IPTD), with multi-year targets validated annually and monitored monthly. The variable remuneration of the Chief Distribution and Sales Officer and the staff of the Revenue Protection Unit is linked to this loss rate. It should be noted that a CO2 emissions target cannot be established here, as the emissions factor of the interconnected system varies annually. Therefore, the target is defined in terms of MWh.
Corporate executive team	Monetary reward	Other: Sustainability index related to climate change	Indicator: inclusion of Cemig in the portfolio of the Carbon Efficient Index (ICO2). Developed by BM&FBovespa and the Brazilian Development Bank (BNDES), the ICO2 is an indicator based on the IBrX-50 portfolio, which takes into account, in the weighting of participating shares, the ratio between a company's gross revenues and its greenhouse gas (GHG) emissions, thus evaluating GHG emissions efficiency. The variable remuneration of the team that is subordinated to the Deputy CEO is linked to Cemig's position in the ICO2.
Corporate executive team	Monetary reward	Other: Sustainability index related to climate change	Cemig's score in the environmental dimension of the Dow Jones Sustainability World Index. This measurement assesses issues related to climate change, among other questions related to sustainability. This team is also responsible for achieving Cemig's sustainability goals on all climate change-related matters directly linked to these goals. The variable remuneration of the team that is subordinated to the Deputy CEO is directly linked to Cemig's score in the environmental dimension of the Dow Jones Sustainability Index.

Further Information

Page: **CC2. Strategy**

CC2.1

Please select the option that best describes your risk management procedures with regard to climate change risks and opportunities

Integrated into multi-disciplinary company wide risk management processes

CC2.1a

Please provide further details on your risk management procedures with regard to climate change risks and opportunities

Frequency of monitoring	To whom are results reported?	Geographical areas considered	How far into the future are risks considered?	Comment
Six-monthly or more frequently	Board or individual/sub-set of the Board or committee appointed by the Board	Brazil	> 6 years	Cemig uses a corporate risk management tool that identifies strategic and process/operational risks, providing information to senior management for decision-making in managing the most significant risks. The Executive Board has a Risk Management Steering Committee, focused on efficient management of Cemig's operational, commercial, financial and regulatory risks – especially industry issues related to tariff adjustments and hydrological constraints. Strategic risks are related to the Company's vision and objectives, or strategic decisions that bear the risk of not achieving planned outcomes. Process/operational risks arise in the course of business functions associated with people, systems and processes upon which their operations depend. Cemig has a decentralized structure for the identification and management of climate change-related opportunities, which focuses on renewable energy and energy efficiency.

CC2.1b

Please describe how your risk and opportunity identification processes are applied at both company and asset level

Cemig defines strategic risks/opportunities as those that can directly affect the Company's business or are associated with senior management decision-making that could materially affect the Company's economic value. Process risks/opportunities are considered to be those that can negatively or positively affect meeting the goals and implementing guidelines established in the Company's Strategic Plan, identified in all processes in each business division – Sales/Trading, Generation, Transmission, Distribution, and Corporate.

Therefore, Cemig treats corporate level risks/opportunities as strategic risks/opportunities. This extends to subsidiaries and individual plants (i.e., asset level), since they encompass both strategic and process risks/opportunities.

Cemig continuously maps risks/opportunities, since updating the information in the Company's management tool and monitoring and evaluating controls and action

plans are part of the scheduled routines for all involved in risk management – meaning each agent has predetermined roles and responsibilities. This recently adopted tool raises the hierarchy level at which approval is required for the information gathered; previously, approval was at the Division (General Manager) level. Now, it is made at the Executive Board level.

In addition, the system enables risks/opportunities to be managed at the process level, which permits a direct link to risks under evaluation at the strategic level.

CC2.1c

How do you prioritize the risks and opportunities identified?

Cemig uses scales to classify risks and opportunities according to their financial impact, intangible impact, probability of occurrence and relevance to the Company, allocating percentage estimates to each of the points for each scale. From these scales, Cemig prioritizes each risk, creating a hierarchy of risks within a risks/opportunities exposure matrix, which includes risks/opportunities surveyed throughout the process.

In addition, for the ‘financial impact’ variable referenced above – used to define the position of a risk/opportunity in the exposure matrix – information is fed into the system on the financial implications of risks/opportunities, controls and measurements. The system then calculates the cost/return of an inherent risk/opportunity (i.e., without management action), the residual risk/opportunity (after implementation of controls) and planned residual risk/opportunity (after implementation of measures). This allows decision-making on priorities based on robust financial analyses of scenarios with and without the management of risks/opportunities.

In terms of opportunities, the major focus has been on the acquisition of renewable source assets. To this end, Cemig has adopted a structure for acquisitions to be effected through partnerships with investment funds and strategic partners. This establishes a growth vehicle that allows the Company, even with a minority stake, to establish a strategic and competitive position with those assets, combining its expertise with the partners’ financial capacity.

When Cemig undertakes a merger or acquisition, it regards due diligence for assessment, identification, measurement and management of each risk or contingency as a wholly essential part of the process.

CC2.1d

Please explain why you do not have a process in place for assessing and managing risks and opportunities from climate change, and whether you plan to introduce such a process in future

Main reason for not having a process	Do you plan to introduce a process?	Comment
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CC2.2

Is climate change integrated into your business strategy?

Yes

CC2.2a

Please describe the process of how climate change is integrated into your business strategy and any outcomes of this process

- i. The Corporate Risk Monitoring Committee classifies and prioritizes risks and opportunities related to climate change, according to exposure matrices, and presents them to the Executive Board. These risk and opportunity assessments are thus presented to senior management, which uses them to develop the Company's strategic plan. The Executive Board defines and approves the Company's strategy; other executive departments then plan the activities. The Board of Directors conducts the Strategic Planning process with the participation of the Executive Board. During the last annual cycle of Cemig's Strategic Planning process, the Board of Directors approved an update to the Corporate Strategic Plan, defining the strategic objectives over the short term and until 2035. The main drivers of Cemig's business strategy are related to balanced growth through new projects, as well as mergers and acquisitions, with the main commitment being to sustainable growth and adding shareholder value over the long term. In terms of the aim to expand installed capacity through a low-risk portfolio, the Company's expansion in renewable sources has been particularly noteworthy.
- ii. Aspects of climate change that have influenced Cemig's strategy:
Development of low carbon businesses: Cemig has identified opportunities for business, and for achieving market advantages, arising from its low carbon energy matrix. Key directions are: (i) use of Cemig's expertise to build and renovate renewable power plants; and (ii) investment in new energy sources.
Regulatory changes: Cemig identifies regulatory risks related to climate change. These are very seriously considered as part of its strategic decision-making process. Cemig conducts environmental due diligence for assessment of carbon risk prior to acquisition of any asset, to evaluate the possible financial impact of any increase in GHG emissions from such assets, vis-à-vis the possibilities for internalizing emission costs, as a result of new regulations.
Need to mitigate climate change: Cemig's GHG emissions are already low, but it strives to reduce them even further by setting targets for reduction of emissions, electricity consumption and electricity losses.
Need to adapt to climate change: Cemig has generating capacity with low GHG-emission intensity, because it is predominantly hydroelectric, but this same capacity is specifically subject to consequences of climate change. As a result Cemig invests in improving weather forecasting systems; in enhancing the infrastructure of its power plants, transmission lines and distribution network, to deal with these consequences; and in improving the forecasting of availability of water for its generation assets. It has also sought to diversify sources by increasing wind power generation, through Renova Energia.
- iii. Components of strategy that are influenced by climate change in the short term (up to 5 years): Cemig invests in state-of-the-art techniques and equipment that provide a high degree of accuracy in forecasting intensity and location of storms. It has established a corporate goal of reducing Scope 1 GHG emissions (tCO₂e) by 8% from 2008 to 2015. It also has set a corporate goal of reducing electricity losses to below 10.68% in 2017. A new target took effect in 2016 to reduce direct emissions by 8% from 2014 to 2021.
- iv. Components of strategy that are influenced by climate change in the long term (over 10 years): The need to increase low carbon energy supply sources has guided R&D projects on technologies that Cemig would be able to deploy on a large scale in the future. These include (i) the second edition of the Minas Gerais solar radiation atlas, and (ii) electricity generation by solar plants connected to the power grid. Cemig's recent acquisitions show its focus on expansion in renewable sources (see Acquisitions in 2015 in item (vi) of this question).
With these strategic actions, Cemig is expanding its power generation in the short term, and investing in a diversified matrix of renewable energy sources for the long term.
The climate change scenario opens new business opportunities for Cemig, with expectations of high demand over the long term. Cemig owns Efficientia S.A., which

implements technological solutions for efficient use of energy for non-residential consumers.

v. By maintaining a predominantly renewable matrix and conducting carbon risk assessments, Cemig is able to take positions in advance of the risks associated with increased electricity generation costs.

At the same time, development of new technologies, especially solar generation, puts Cemig in the vanguard of the electricity industry – incorporating new technologies into its supply matrix and enabling it to diversify its businesses.

vi. More substantial strategic decisions made by Cemig in 2015, which were influenced by business opportunities made more feasible as a result of climate change, include the following:

- Investment in electricity distribution network loss management: Control of electricity losses is one of Cemig's strategic goals. Among other benefits, it reduces the emissions factor of the national grid, thus has potential for mitigation of climate change effects.
- Activities to minimize physical risk from extreme weather events:
 - o Improvement in distribution networks: Establishment of the Protected Distribution Network (Rede de Distribuição Protegida - RDP), with shielded lines and networks, and fully structured distribution line pathways, as a minimum standard for urban supply.
 - Actions that expand opportunities for low-carbon business:
 - o Cemig's entry into the controlling stockholder block of Renova (transaction begun in 2013, completed in 2014) - Cemig GT now has a 27.4% interest in Renova.
 - o Agreement with Renova relating to a 50% equity interest in the Jacobina Project - for construction of 25 wind farms in the county of Jacobina (Bahia state), with total installed capacity of 676.2 MW. Commercial startup is scheduled for September 2018. Cemig's total direct and indirect interest totals 32.5%;
 - o Contracting of 150.4 MW of installed capacity at the 2014 Reserve Supply Auction (the '2014 LER'), in three wind complexes (43.5 MW) and four solar farms (106.9 MWp) for supply to start in October 2017; and 108 MW of installed capacity in the 2014 A-5 Auction, in five wind farms (scheduled for supply from January 2019). These complexes are all in the state of Bahia. Cemig's total direct and indirect ownership interest is 32.5%.
 - o Four complexes, of a total of nine that placed supply contracts at the 2011 auction, started commercial operation in 2015: the Ametista, Pilões, Maron and Dourados wind farms, with installed capacity of 117.6 MW, were connected to the same transmission line that serves the Igaporã II wind farms. The other five were connected to the Igaporã III line, and started operating on January 1, 2016.

CC2.2b

Please explain why climate change is not integrated into your business strategy

CC2.2c

Does your company use an internal price of carbon?

Yes

CC2.2d**Please provide details and examples of how your company uses an internal price of carbon**

- i. Scope of the emissions: Scope 1
- ii. Rationale for employing a price: First, it is important to note that in Brazil there is no set price for carbon. However, when assessing acquisition of a project using fossil fuels, Cemig carries out internal analyses of carbon risk and its financial impact on the Company, i.e., the potential financial risk to the Company if a price is set on GHG emissions in Brazil in the future. Cemig's most recent assessment evaluated a range of mixes of sources in Brazilian power generation. Cemig's calculation of the financial impact of carbon pricing on a project involved establishing the potential power output in each scenario, and the GHG emissions produced by it, and multiplication of the expected GHG emissions by the internal carbon price. The results were included in the financial feasibility analysis of each project and were incorporated as operating costs. These assessments were based on the average prices of Voluntary Carbon Standard (VCS) credits.
- iii. Actual price used: The value used in carbon pricing of acquisition prospects using fossil fuel is the mean value of annual averages of Voluntary Carbon Units (VCUs) – currently equivalent to R\$ 3.56.
- iv. Variations in price over time and across geographic areas: These were not considered.
- v. Person/entity responsible for determining the price: For each assessment, Cemig contracts a specialized firm in carrying out carbon risk assessments, which is responsible for determining the price of carbon, according to the methodology described in items (ii) and (iii) above.
- vi. An example of how carbon pricing affects investment decisions: For any acquisition of a project using fossil fuel, Cemig conducts environmental due diligence and sensitivity analyses (carbon risk assessment) to evaluate the potential financial impact of increases in its GHG emissions from these assets, in view of the possibility of internalizing emission costs under new regulations. This diligence helps the Company make decisions on expansion of its business.

CC2.3**Do you engage in activities that could either directly or indirectly influence public policy on climate change through any of the following? (tick all that apply)**

- Direct engagement with policy makers
- Trade associations
- Funding research organizations

CC2.3a**On what issues have you been engaging directly with policy makers?**

Focus of legislation	Corporate Position	Details of engagement	Proposed legislative solution
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Focus of legislation	Corporate Position	Details of engagement	Proposed legislative solution
Other: Mitigating and adapting to climate change	Support	Given the importance of the subject of Climate Change, Cemig was invited to participate in the Minas Gerais Energy and Climate Change Plan (PEMC), a cross-referenced, medium-long-term policy instrument (2020-2030) created through a participatory process that is designed to promote the transition to a low carbon economy, reduce vulnerability to climate change in Minas Gerais state and coherently coordinate the various initiatives already undertaken and planned through an integrated territorial strategy.	Cemig supports this legislation without reservations.

CC2.3b

Are you on the Board of any trade associations or provide funding beyond membership?

Yes

CC2.3c

Please 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, or are you attempting to, influence the position?
Brazilian Business Council for Sustainable Development (Conselho Empresarial Brasileiro para o Desenvolvimento Sustentável – CEBDS)	Consistent	Cemig sits on the CEBDS's Energy and Climate Change Chamber (Câmara Temática de Energia e Mudanças do Clima – CTClima). CTClima represents the views of the CEBDS's member companies on issues related to climate change, in debates, and in formulation of public policies together with governments and other interest groups. CTClima's mission is "to provide a suitable forum for companies to understand their role in relation to climate change, assisting them to develop strategies that take advantage of opportunities, minimize risks, and prepare for a world with restrictions on greenhouse gas emissions." The CEBDS is	Cemig's representative on the Energy and Climate Change Chamber (CTClima) participates in its meetings, discussions and debates and, when applicable, contributes with suggestions for the formulation of public policies.

Trade association	Is your position on climate change consistent with theirs?	Please explain the trade association's position	How have you, or are you attempting to, influence the position?
		involved in various activities associated with this issue that could contribute to the development and improvement of public policies on the subject. For example, in 2015 CEBDS launched the fourth edition of a carbon value chain management project that has, since 2012, trained 312 suppliers of the participating companies since 2012 to prepare their own greenhouse gas inventories. The project's goal is to prepare the supply chain for possible regulatory changes on the subject, to achieve a positive emission reduction result while ensuring business continuity with no loss in market competitiveness.	

CC2.3d

Do you publicly disclose a list of all the research organizations that you fund?

Yes

CC2.3e

Please provide details of the other engagement activities that you undertake

CC2.3f

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 the public policy makers on climate change is conducted by the offices of the General Managers responsible for management of each specific strategy objective and of the corporate risk associated with each theme. These General Managers and their staff receive annual updating on

strategies adopted, and on Cemig's Long-Term Strategic Plan, during the annual Strategic Planning cycle.

As described in section CC1.1, the person finally responsible for Cemig's global climate change strategy is the Deputy CEO. After approval of any proposal by the Chief Officer responsible for a specific area, it is, thus, the Deputy CEO's team which ultimately assesses all direct and indirect activities in which the Company participates in relation to development of public policies.

Underlying all decisions on institutional activities are the basic principles of policy stated in Cemig's document "10 Initiatives For The Climate".

CC2.3g

Please explain why you do not engage with policy makers

Further Information

CC2.2a – Complement for this question: o In May 2015 Renova announced a transaction with TerraForm Global to sell some of its operating assets, as a strategy to boost its competitiveness, value creation and growth capacity. o In August 2015 the consortium formed by Renova, SunEdison Brasil Energia Ltda. and Sune Solar B.V., in which Renova holds a 50% interest, placed contracts for supply of 15.0 MW in the 2015 Reserve Energy Auction (the 2015 LER Solar Auction), corresponding to solar power installed capacity of 59.7 MW. o In 2016 Renova is continuing works on phase A of Alto Sertão III – 411.1 MW of wind power capacity for planned delivery in late 2016-early 2017. CC2.3d – Complement for this question: Cemig publishes all of the research projects it carries out, organized by topic; the details of these projects are available at: http://www.cemig.com.br/pt-br/A_Cemig_e_o_Futuro/inovacao/pesquisa_e_desenvolvimento/Paginas/pesquisa_e_desenvolvimento.aspx.

Page: CC3. Targets and Initiatives

CC3.1

Did you have an emissions reduction or renewable energy consumption or production target that was active (ongoing or reached completion) in the reporting year?

Absolute target
Intensity target

CC3.1a

Please provide details of your absolute target

ID	Scope	% of emissions in scope	% reduction from base year	Base year	Base year emissions covered by target (metric tonnes CO2e)	Target year	Is this a science-based target?	Comment
Abs1	Scope 2 (location-based)	0.8%	4%	2011	5831	2020	No, and we do not anticipate setting one in the next 2 years	The Company has established a goal of reducing the combined electricity consumption of Cemig GT and Cemig D by 4% from 2011 to 2020. In 2011, Cemig GT and D consumed 46,876 MWh of electricity, representing 0.8% of the Company's Scope 2 emissions in the year (the other 99.2% was due primarily to electricity losses, plus a small portion arising from electricity consumption by Efficientia and Cemig Telecom). In that year, the emission factor of the national grid was 0.0292 tCO2/MWh, so that emissions associated with electricity consumption were 1,368 tCO2. However, to allow comparison with emissions from electricity consumption in 2015, the base year emissions have been reported (in the 6th column from left of this table) using the 2015 national grid emission factor, which was 0.1244 tCO2/MWh, resulting in a value of 5,831 tCO2. Note that the Scope 2 emission factor is given for emission factors developed by using the coefficient of fossil fuel use in electricity for Brazil's National Grid system, primarily through thermoelectric plant activities. This emission factor is used to calculate emissions from electricity generation acquired from the national grid (Scope 2), which in 2015 was 0.1244 tCO2/MWh (as above), calculated from data collected by the Brazil's National Electric System Operator (ONS) using a procedure developed in partnership with the Brazilian Science, Technology and Innovation Ministry (MCTI). The methodology adopted is the "Tool to calculate emission factor for an electricity system," approved by the United Nations Framework Convention on Climate Change (UNFCCC).
Abs2	Scope 1	100%	8%	2014	617717	2021	No, and we do not anticipate setting one in	This goal refers to a reduction in Scope 1 emissions and takes into consideration all activities in which the Company has operational control.

ID	Scope	% of emissions in scope	% reduction from base year	Base year	Base year emissions covered by target (metric tonnes CO2e)	Target year	Is this a science-based target?	Comment
							the next 2 years	

CC3.1b

Please provide details of your intensity target

ID	Scope	% of emissions in scope	% reduction from base year	Metric	Base year	Normalized base year emissions covered by target	Target year	Is this a science-based target?	Comment
Int1	Scope 1	100%	8%	Metric tonnes CO2e per megawatt hour (MWh)*	2008	0.007801	2015	No, and we do not anticipate setting one in the next 2 years	This target refers to reduction of Scope 1 emissions in relation to electricity generated by Cemig; thus it is expressed as tCO2e/MWh produced. The intensity of Cemig's direct emissions in 2015 was 0.008665 tCO2e/MWh, exceeding the Company-established target by 11%. This was mainly due to the fact that 33,412,535 MWh were generated in 2008 compared to 18,989,539 MWh in 2015.

CC3.1c

Please also indicate what change in absolute emissions this intensity target reflects

ID	Direction of change anticipated in absolute Scope 1+2 emissions at target completion?	% change anticipated in absolute Scope 1+2 emissions	Direction of change anticipated in absolute Scope 3 emissions at target completion?	% change anticipated in absolute Scope 3 emissions	Comment
Int1	Decrease	36.87			The target expiry date was the end of 2015: the % expressed in the column to the left is based on the comparison between Scope 1 emissions for the base year for the target (2008) and the emissions target for the reporting year (2015). In 2008, Scope 1 emissions were 260,641 tCO ₂ e; and in 2015 they were 164,537 tCO ₂ e. The intensity of Scope 1 emissions evolved from 0.007801 in 2008 to 0.008665 in 2015.

CC3.1d

Please provide details of your renewable energy consumption and/or production target

ID	Energy types covered by target	Base year	Base year energy for energy type covered (MWh)	% renewable energy in base year	Target year	% renewable energy in target year	Comment
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CC3.1e

For all of your targets, please provide details on the progress made in the reporting year

ID	% complete (time)	% complete (emissions or renewable energy)	Comment
Abs1	50%	100%	In 2015, Cemig GT and Cemig D consumed 44,460 MWh of electricity, 5.15% less than recorded for 2011 (base year for the target) – thus Cemig has achieved and exceeded its goal of reducing its electricity consumption by 4% from 2011.
Abs2	25%	100%	In 2015, Scope 1 emissions were 164,537 tCO ₂ e compared to 617,717 tCO ₂ e in 2014, representing a decrease of 73.36%, surpassing the 8% target.
Int1	100%	0%	Scope 1 absolute emissions in 2015 (164,537 tCO ₂ e) decreased in comparison to 2008 (287,307 tCO ₂ e), achieving in 2015 an intensity value of 0.008665 tCO ₂ e / MWh. However, Cemig did not achieve its target of reducing emissions intensity by 8% from 0.007801 in 2008 (the base year) to 0.007177 tCO ₂ e/MWh in 2015. Cemig's emissions intensity was 11% higher than in 2008 - since 33,412,535 MWh were generated in 2008, and 18,989,539 MWh in 2015. It is important to note that the amount of energy generated is the denominator of this target calculation.

CC3.1f

Please explain (i) why you do not have a target; and (ii) forecast how your emissions will change over the next five years

CC3.2

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

CC3.2a

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 you reporting low carbon product/s or 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	% R&D in low carbon product/s in the reporting year	Comment
Group of products	Renewable source power generation: Over 98% of Cemig's installed power generation capacity is from renewable sources. When generating renewable energy, Cemig is replacing power generation that otherwise would likely have come from fossil sources. This fact enables the Scope 2 emissions of all consumers connected to the national grid to be reduced.	Avoided emissions	Other: Internal classification	32.7%	Less than or equal to 10%	Generation from renewable sources: i. Generation from renewable sources enables the Scope 2 emissions of all consumers connected to the national grid to be reduced. ii. Considering this, injecting energy from renewable sources into the grid reduces the system's overall emission factor – thus benefiting all power consumers connected to the system. In 2015, 18,768 GWh of energy was generated from renewable sources (hydro + wind). iii. It is estimated that renewable power generation in 2015 prevented emission of 2.335 million tCO2. iv. As a logical point, renewable power generation by Cemig eliminates a need, in the national grid system, for the same amount of power to be generated from thermal sources. For our calculations of emission reductions, we used the national grid emission factor for 2015, calculated for GHG inventories by the Science, Technology and Innovation Ministry (MCTI), which is then multiplied by the amount of electricity generated from renewable sources. v. 11 projects involved Certified Emission Reductions (CERs) under the Clean Development

Level of aggregation	Description of product/Group of products	Are you reporting low carbon product/s or 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	% R&D in low carbon product/s in the reporting year	Comment
						Mechanism (CDM), representing expected total reduction of 4,870,580 tCO ₂ e.
Group of products	Energy efficient services: Efficientia S.A. is a wholly-owned subsidiary of Cemig which develops and implements energy efficiency and power cogeneration projects, and offers consulting services to optimize the energy mix of industrial companies. This enables non-Cemig parties to reduce Scope 2 emissions since it reduces consumption by its clients of electricity from the national grid.	Avoided emissions	Other: Internal classification		Less than or equal to 10%	Energy efficiency services: Efficientia S.A. i. The operations of Efficientia – provided to any companies that contract them – reduce Scope 2 emissions by parties other than Cemig because they reduce consumption by clients of electricity from the national grid. ii. Over recent years Efficientia has consistently enabled clients to reduce electricity consumption. A recent case in point is the sugarcane industry, in which Efficientia has improved electricity consumption for companies installing new plant or expanding existing plant, in Minas Gerais. The works to connect the Santa Vitória thermoelectric power plant to the national grid were completed under the supervision of Efficientia. This is a sugarcane bagasse-fired cogeneration facility with potential generation capacity of up to 20 MW. iii. Another example: in 2015, Efficientia signed energy efficiency performance contracts with the following clients in industry and services for lighting modernization projects using LED technology: 1. Esdeva Indústria Gráfica:

Level of aggregation	Description of product/Group of products	Are you reporting low carbon product/s or 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	% R&D in low carbon product/s in the reporting year	Comment
						<p>Modernization of industrial lighting system using LED technology – planned saving of 485 MWh/year, for investment of R\$ 779,669.41. 2. Prosegur Brasil: Modernization of headquarters lighting system using LED technology – planned saving of 275 MWh/year, for investment of R\$ 358,534.62. 3. Minas Tênis Clube: Modernization of headquarters lighting system using LED technology – planned saving of 745 MWh/year, for investment of R\$ 1,933,629.51. iv. It is estimated that the reductions of emissions corresponding to the contracts signed in 2015 will total 187.28 tCO₂/year; v. These corresponding reduction of electricity consumption that these contract are expected to receive is an estimated 1,505 MWh/year. These figures for reductions of emissions are the result of multiplying the national grid emission factor for 2015, calculated for GHG inventories by the Science, Technology and Innovation Ministry (MCTI), by the amount of electricity saved or generated. vi. These projects and their calculations did not take into account any generation of Certified Emission Reductions (CERs) under the Clean Development Mechanism (CDM).</p>

Level of aggregation	Description of product/Group of products	Are you reporting low carbon product/s or 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	% R&D in low carbon product/s in the reporting year	Comment
Product	<p>Natural gas: Gasmig, a Cemig subsidiary, is the exclusive distributor of piped natural gas throughout Minas Gerais. It has developed the Inovagás project, which offers energy efficient solutions to customers. This initiative helps to reduce Scope 1 emissions by non-Cemig parties, as it allows them the option of consuming a fossil fuel with a lower GHG emission factor.</p>	Low carbon product	Other: Internal classification	6.6%	Less than or equal to 10%	<p>Natural gas: Gasmig i. Supply of gas to consumers by Gasmig helps reduce their Scope 1 emissions, since it allows them the option of consuming a fuel with lower greenhouse gas emissions. ii. In 2015, Gasmig built 51.4 km of gas pipelines in greater Belo Horizonte, in the South of Minas (Sul de Minas) and in Juiz de Fora, to serve needs of commercial and industrial consumers. To serve urban residential consumers, Gasmig continued implementation of its South Ring Project (Projeto Anel Sul), completing the Vale do Aço ('Steel Valley') ring with 18 km of pipeline; while also continuing to build out the distribution network in some neighborhoods of Belo Horizonte and Nova Lima. iii. By bringing natural gas infrastructure to strategic areas of the state, Gasmig allows more carbon-intensive fossil fuels to be replaced in manufacturing industries. iv. In 2015, consumption of natural gas distributed by Gasmig was estimated to avoid emissions totaling 1,039,515 tCO_{2e}. v. In 2015 Gasmig sold 1,440 billion m³ of gas to the sectors it serves. The estimate of the volume of emissions avoided was the result of subtracting the emissions from this volume of natural gas (real-world</p>

Level of aggregation	Description of product/Group of products	Are you reporting low carbon product/s or 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	% R&D in low carbon product/s in the reporting year	Comment
						<p>scenario) from a calculation of the emissions that would have resulted from use of fuel oil, gasoline and diesel (baseline scenario) instead. – The emissions from combustion of natural gas were estimated using the emission factors, lowest calorific values and densities of the Brazil GHG Protocol. – The calculation for the other fuels assumed that: industry (which consumed 61.54% of Gasmig's natural gas in 2015) would consume fuel oil; vehicles (2.36%) would consume gasoline; thermoelectric power plants (33.78%) would use diesel; and general purpose consumers (commercial, residential, cogeneration and generation: 2.32%) would use diesel or fuel oil from a stationary source. vi. These calculations did not take into account any generation of Certified Emission Reductions (CERs) under the Clean Development Mechanism (CDM).</p>

CC3.3

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

Yes

CC3.3a

Please identify the total number of projects at each stage of development, and for those in the implementation stages, the estimated CO2e savings

Stage of development	Number of projects	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	591	41416404
To be implemented*	55	1566683
Implementation commenced*	36	864493
Implemented*	91	3306337
Not to be implemented	0	

CC3.3b

For those initiatives implemented in the reporting year, please provide details in the table below

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/ Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
Energy	Nature of the activity: Includes	64233	Scope 2	Voluntary	162534	735000000	11-15	>30 years	-

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/ Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
efficiency: Processes	initiatives focused on increasing power transmission capacity, the reliability of the national grid system, useful lives and user connections – resulting in reduction of energy losses in the distribution system.		(location-based)				years		
Energy efficiency: Processes	Nature of the activity: Includes initiatives focused on reducing technical electricity losses in the distribution system. These losses are inherent in transmission of electricity as it passes through equipment, transmission lines and distribution. Actions taken in 2015 to control and minimize technical losses include: <ul style="list-style-type: none"> • - Medium voltage reactive compensation project: Preparation of a reactive compensation plan for installation of 225 automatic capacitor banks by 2016, for expected investment of R\$ 9.0 million and the associated reduction of technical losses valued at R\$ 2 million/year, corresponding to 9.4 GWh/year. • - Investments of R\$ 65.8 million in strengthening the medium/low voltage electrical system and R\$ 219.4 million to expand/strengthen the sub-transmission system (69 kV to 230 kV). • - Acquisition and installation of amorphous core technology 	1169	Scope 2 (location-based)	Voluntary	5070000	28520000	4-10 years	16-20 years	-

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/ Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
	<p>distribution transformers, which reduce no load losses by approximately 80%, and strengthen the related low voltage circuits. Other initiatives include investigations of new grid and conductor technologies, studies to increase the operating efficiency of the electrical system (circuit reconfiguration) and establishment of criteria to limit technical loss levels in low and medium voltage circuits. The Company's Scope 2 emissions were reduced (emissions associated with technical electricity losses are recorded under Scope 2 in Cemig's inventory; these losses are considered as power consumption because they require generation of this electricity). In relation to external regulators, this initiative is voluntary. There is a 10.68% target for technical losses, established by the Brazilian electricity regulator (Aneel), which makes it a mandatory goal for Cemig. However, the initiatives described here have been adopted voluntarily by the Company to achieve this goal.</p>								
Low carbon energy installation	In 2015, four wind farms (out of a total of nine for which the supply contract was placed at the 2011 auction)	3687	Scope 1	Voluntary				16-20 years	-

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/ Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
	<p>began commercial operation. The Ametista, Pilões, Maron and Dourados farms, with installed capacity of 117.6 MW, were connected to the same transmission line that serves the Igarorã II farms. The other five parks were connected to the Igarorã III line, for start of operation on January 1, 2016. In May 2015, Renova announced a transaction with TerraForm Global, for exchange of certain operational assets. The goal is to increase competitiveness, value adding and growth capacity. In August 2015, the consortium formed by Renova, SunEdison Brasil Energia Ltda. and Sune Solar BV (in which Renova holds a 50% stake), sold supply of 15.0 MW average at the 2015 Solar Reserve Energy Auction ('LER 2015 Solar'), which corresponds to 59.7 MW of installed solar power capacity. In 2016, Renova continues with construction of Phase A of Alto Sertão III, with installed capacity of 411.1 MW – planned for completion in late 2016 or early 2017. Only 27.4% of the reductions of emissions associated with the implementation of Renova wind farms in 2015 were considered in the scope of Cemig's CDP report,</p>								

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/ Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
	<p>since Cemig's ownership interest in Renova is 27.4%. Cemig's Scope 1 emissions have been reduced since, by increasing its generation from low carbon plants, Cemig has reduced its Scope 1 emissions per MWh produced (to calculate the reduction of emissions – shown in the column on the right – we used the Scope 1 tCO2 emission factor per MWh produced by Cemig in 2015, which is equal to 0.008665 tCO2e/MWh produced). If Scope 2 emissions reductions of Cemig's consumers were considered, using the emission factor of the Brazilian electrical system, the resulting emissions reduction would be 193,212 tCO2e, but the reductions shown in the column on the right are for Cemig's Scope 1 emissions. In relation to external regulators, this initiative is voluntary.</p>								
Transportation: fleet	<p>Nature of the activity: In 2015, Cemig's fleet consumed 558,981 fewer liters of fuel. This was mainly due to Cemig's fleet management practices, which, since 2010, have optimized the vehicle fleet through the Company's Fleet Replacement Program. This represented a saving of approximately R\$ 1.8 million. This</p>	1317	Scope 1	Voluntary	1800000	7200000	4-10 years	3-5 years	-

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/ Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
	optimization was possible because all vehicles replaced since 2010 came installed with an Electronic Management System. From 2011 to 2015, this tool has allowed for vehicle use to be constantly monitored, making it possible to reduce the fleet by 628 units in that period. The Company's Scope 1 emissions have been reduced by reduction of fossil fuel use in fleet vehicles. In relation to external regulators, this initiative is voluntary.								

CC3.3c

What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Compliance with regulatory requirements/standards	Federal Law 9991/2000 requires 1% of the organization's net operational revenues to be invested in R&D funding and energy efficiency programs. Cemig has created the Intelligent Energy (Energia Inteligente – IE) program, focused on energy efficiency. It involves several multi-year socio-environmental projects, which execute energy-efficient action and assistance in low-income communities (in compliance with Article 1, section V of Law 9991, as amended by Law 12212/2010), and in non-profit and philanthropic organizations.

Method	Comment
Internal finance mechanisms	The replacement of the fleet is funded by the Company's Investment Programs. Cemig's guidelines call for vehicles to be renewed annually so that the average age of vehicles does not exceed five (5) years, the legal depreciation period set by the concession-granting power.
Dedicated budget for low carbon product R&D	Cemig's Research and Development (R&D) Program aims to motivate a constant quest for innovation to meet the technological challenges of the power sector. Brazilian Law 9991/2000 requires holders of electricity distribution, generation and transmission concessions and permissions to invest part of each year's net operational revenues under the Electricity Sector Research and Development Program, regulated by Aneel. To ensure implementation of this requirement, each year Cemig issues tenders for projects in various fields of research. The types of project related to climate change include: alternative energy sources; distributed and decentralized generation; thermal generation and energy efficiency; water basin management and energy planning; metering, billing and commercial losses; and the environment.
Dedicated budget for other emissions reduction activities	There is a dedicated budget in the Company's Distribution Development Program (PDD) for reduction of Cemig's power losses in the electricity system, and for initiatives to reduce Cemig's own emissions and those related to the national grid.
Internal price of carbon	Cemig's environmental due diligence and sensitivity analyses in relation to any acquisition include assessment of the risk of increased carbon emissions from the totality of its energy sources, and the financial impact of any such increase. This helps the Company make decisions related to any expansion of its business.

CC3.3d

If you do not have any emissions reduction initiatives, please explain why not

Further Information

CC3.3b - Complement for this question: The fields "Annual monetary savings (R\$)"; "Investment required (R\$)"; "Payback period" were not filled for the line "Low carbon energy installation", because Cemig considers these information as confidential.

Page: CC4. Communication

CC4.1

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	Page/Section reference	Attach the document	Comment
In mainstream reports (including an integrated report) but have not used the CDSB Framework	Complete	Page 122 / Environment section Climate Change sub-section	https://www.cdp.net/sites/2016/85/3285/Climate Change 2016/Shared Documents/Attachments/CC4.1/Annual and Sustainability Report 2015.pdf	
In other regulatory filings	Complete	Form 20F: Page 70 – "The Carbon Market" section	https://www.cdp.net/sites/2016/85/3285/Climate Change 2016/Shared Documents/Attachments/CC4.1/Form 20F.pdf	
In voluntary communications	Complete	Throughout the document (GHG Emissions Inventory)	https://www.cdp.net/sites/2016/85/3285/Climate Change 2016/Shared Documents/Attachments/CC4.1/RELATÓRIO INVENTARIO CEMIG 2015 INGLES.PDF	

Further Information

Module: Risks and Opportunities

Page: CC5. Climate Change Risks

CC5.1

Have you identified any inherent climate change risks that have the potential to generate a substantive change in your business operations, revenue or expenditure? Tick all that apply

- Risks driven by changes in regulation
- Risks driven by changes in physical climate parameters
- Risks driven by changes in other climate-related developments

CC5.1a

Please describe your inherent risks that are driven by changes in regulation

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
General environmental regulations, including planning	Through its National Climate Change Policy, the Brazilian government has set a voluntary target for Brazil to reduce its greenhouse gas emissions by between 36.1% and 38.9% by 2020. As a result of COP 21, the Brazilian government assumed new targets to reduce emissions by 37% by 2025, and 43% by 2030, from 2005 as base year for the comparison. The risk associated with this commitment is an increase in operating costs due to possible electricity sector agreements, mainly related to	Increased operational cost	>6 years	Direct	Likely	Low-medium	Less than 1% of net operational revenues	Management methods include setting goals to reduce GHG emissions and, for new acquisitions, evaluation of carbon risk when carrying out due diligence, immediately minimizing probability and magnitude of the risk. Cemig has sought opportunities to increase power generation using renewable energy, minimizing the magnitude of risk over a five-year time horizon.	Less than R\$ 400,000.00. Costs are annual and related to maintaining the environmental team, and will continue as long as the risk persists.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	the creation of a tax on carbon emissions.								
Carbon taxes	Despite its low-carbon energy matrix, Cemig operates one fossil-fuel thermal power plant whose operations could be affected if a carbon tax is enacted in Brazil. This tax also is a risk if Cemig expands its fossil fuel thermal electricity generation business in the future.	Increased operational cost	>6 years	Direct	About as likely as not	Low-medium	Less than 1% of Net operational revenue	Cemig evaluates carbon risk when carrying out due diligence; registers corporate GHG emissions through the Company's emissions inventory; and sets targets for reducing GHG emissions intensity. We expect these initiatives to reduce the scale of risk to the Company when new regulations are implemented.	Less than R\$ 400,000.00 Costs are annual and associated with maintaining the thermal plant's environmental team and conducting the Company's emission inventories. The costs will exist as long as the risk persists.
Cap and trade schemes	Establishment of a GHG emissions market of the cap-and-trade type in Brazil might result in a need for greater planning by Cemig as regards compliance with	Increased operational cost	>6 years	Direct	About as likely as not	Low-medium	Less than R\$ 2 million	Cemig has trained professionals capable of identifying projects that generate carbon credits and has long-term contracts with	Less than R\$ 300,000.00. The costs are those related to monitoring and audits required for validation and sale or trading of credits. The costs are not

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	specific market regulations, especially in relation to monitoring and verification of emissions.							testing and certification companies, thereby already reducing the probability that this risk will materialize. Cemig already has CDM emissions reduction projects registered with the UNFCCC.	annual and occur only when audits are conducted.
Uncertainty surrounding new regulation	To inventory its GHG emissions, Cemig uses the ISO 14064-1 and the GHG Protocol standards to ensure reliability of data collected. If an emissions trading market, carbon tax or other tools to reduce emissions are established, adoption of other methodologies and/or standards might be required in preparing corporate inventories. Cemig	Increased operational cost	1 to 3 years	Direct	Unlikely	Low	Less than R\$ 100,000.00	To produce an inventory of its GHG emissions, Cemig uses the ISO 14064-1 and GHG Protocol standards to ensure data collection reliability, as well as having a third party validate the data. These actions are designed to reduce the magnitude of risks and the probability that they will materialize.	Less than R\$50,000.00. The costs associated with this activity are annual and related to conducting an emissions inventory and a third party audit. These costs will continue as long as the Company continues to prepare an emissions inventory that is verified by third parties.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	would then have to adjust its current procedures, which are already well established, to comply with new regulations that might be adopted.								
Other regulatory drivers	Brazil's Mining and Energy Ministry has published a National Energy Efficiency Plan (PNEF) to propose measures to promote energy efficiency in the country. It uses the National Climate Change Plan as one of its benchmarks, and states climate change mitigation to be one of its goals. The PNEF has set a target of reducing electricity reduction by 10% from 2004 to 2030 period.	Reduced demand for goods/services	1 to 3 years	Direct	More likely than not	Low-medium	Less than R\$ 10 million	Cemig monitors legal debate at federal, state and municipal levels. It also operates both residential and industrial energy efficiency programs. These programs are described in the Annual and Sustainability Report.	A total of R\$ 39 million was invested in energy efficiency programs in 2015.

Please describe your inherent risks that are driven by changes in physical climate parameters

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Change in precipitation pattern	Climate change may cause changes in seasonal patterns of rainfall, with extreme rainfall events and more pronounced drought, as well as changes in its geographical distribution. In addition, there may be change in the average amount of precipitation, changing the amount of water that reaches the reservoirs of the hydroelectric power plants. As the electricity production of Cemig is basically hydraulic, these changes may cause reduction in its generation capacity.	Reduction/disruption in production capacity	>6 years	Direct	More likely than not	Low-medium	About 15% of the revenue obtained with their own power generation	Cemig has a specific organizational structure and devoted entirely to the subject and supports the decisions of existing risk management committees in the Company, which aims to efficiently handle corporate risks involving operational, commercial, financial and regulatory aspects of the companies of Cemig Group, particularly in sectorial adjustment scenario of tariffs and hydrological constraints. It also has the Energy Risk Management Committee - CGRE aiming at minimizing the	Whereas currently the management of this risk is carried out within the historical pattern of climate changes, the current management cost is the cost for contracting hedge for short-term price protection. For example, in 2016, this cost is estimated at approximately R\$ 128 million (cost of purchase and maintenance of energy for hydrological risk, considering its liquidation to the value expected in the spot price). If confirmed in future expected impacts, the

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								<p>risks in the contracts for energy purchase and sale, and mitigates the risk of exposure to short-term due to bad hydrological conditions. Cemig also participates in the Energy Reallocation Mechanism, with the purpose of sharing of hydrological risks: plants in situation of high inflows and power generation transfer energy to the plants in situation of low inflows and power generation. This participation gives freedom to the ONS (National System Operator) to dispatch the plants and help ensure compliance with energy sales</p>	<p>cost will be equivalent to 15% to 25% of sales coming from our own generation.</p>

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								commitments entered into by Cemig. Moreover, Cemig diversifies its portfolio by investing in wind power companies such as Renova, main generator of this type of source in the country, of which we have 27.4% of the voting capital.	
Change in precipitation extremes and droughts	Climate changes may cause undesirable impacts to reservoirs due to silting, which could occur faster or (in an optimistic scenario) more slowly, depending on how the change in rainfall and hydrological levels occurs at each reservoir. This could reduce reservoir useful life and boost	Reduction/disruption in production capacity	>6 years	Direct	Unlikely	Medium	Less than 0.5% of net operational revenues	Cemig monitors reservoir silting closely in a number of ways, including: mapping changes in the shape of reservoir beds due to sedimentary deposits; monitoring reduction in volume of reservoirs; studies of reservoir useful life; and sedimentation volume monitoring.	Less than R\$2 million. These are annual costs associated with: maintenance of equipment and of the meteorology, dam safety and risk management teams; and investments in R&D and new sources of alternative generation of energy. These costs will continue as long as the risk

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	maintenance costs.							Cemig also participates in the Energy Reallocation Mechanism to share hydrological risk: plants with high water flows and generation transfer energy to plants with low water flows. This sharing system enables the National System Operator (ONS) to be more flexible in dispatching, and ensures Cemig's compliance with energy sales commitments. These actions also help reduce the probability and magnitude of the risk.	continues.
Change in mean (average) temperature	Climate change may cause an increase in average temperatures, or alter rainfall and drought	Reduction/disruption in production capacity	3 to 6 years	Direct	About as likely as not	High	Less than 1% of net operational revenues	Cemig continuously inspects and clears transmission line pathways to maximize	Less than R\$2 million. Costs are annual and associated with the process of clearing transmission

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	patterns, indirectly leading to increased risks to the Power Transmission System because prolonged drought conditions maximize fire risk. Fires within or near transmission line pathways could cause transmission line unavailability.							transmission line safety and availability.	line pathways.
Change in precipitation extremes and droughts	Excessive rainfall can cause structural problems in dams, resulting in generation not being available.	Reduction/disruption in production capacity	>6 years	Direct	Very likely	High	Less than 1% of net operational revenues	The annual dam safety monitoring cycle consists of field inspections, collection and analysis of instrumentation data, planning and monitoring of maintenance services, analysis of results, and inspection of civil structures. The vulnerability of each dam is calculated automatically and	Less than R\$2 million. Costs are annual and associated with, maintenance of equipment, and of maintaining meteorology, dam safety and risk management teams. These costs will continue as long as the risk persists.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								<p>continuously, and monitored by the 'Inspector' Dam Control, Monitoring and Safety System, which was developed in an R&D project. It incorporates tools for georeferencing of deterioration, enabling comprehensive analysis of the behavior of each dam. Cemig was a pioneer in Brazil in the preparation of emergency plans for dam breaks, making its initial studies on the subject in 2003. Specific emergency plans are currently available for each dam. These initiatives are currently underway and contribute to reducing the likelihood of this</p>	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								risk in the short term.	
Change in precipitation extremes and droughts	Heavy rainfall over a short period, accompanied by high winds and lightning, can cause physical damage to power transmission facilities, leading to their unavailability. This can increase Cemig's costs, due to compensation of consumers for power supply interruptions. These phenomena are increasingly associated with the effects of adverse microclimates, typical of large urban centers.	Reduction/disruption in production capacity	Up to 1 year	Direct	Very likely	High	Less than 1% of net operational revenues	Cemig's management methods seek to reduce the magnitude of this risk in the medium term by preventive measures, such as: pruning urban trees; operation of weather and meteorological radar stations that provide more precise forecasts of occurrence and intensity of storms; and an emergency plan assigning maintenance crews to quickly restore power.	Less than R\$2 million. Costs are annual and associated with maintaining the teams that contain this type of risk.

Please describe your inherent risks that are driven by changes in other climate-related developments

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Changing consumer behaviour	Consumers might reduce their consumption of electricity, motivated by discussions or incentive programs for mitigation of climate change or due to the use of other energy sources, such as substituting electricity for solar thermal energy to heat residential showers.	Reduced demand for goods/services	>6 years	Direct	Unlikely	Medium	Cemig does not know the potential financial implications of this possible change in behavior.	Because Cemig does not know the potential financial implications of the possible change in behavior, no methods have been established for management of this risk.	Because Cemig does not know the potential financial implications of the possible change in behavior, no methods have been established for management of this risk.
Changing consumer behaviour	High temperatures might lead to greater electricity consumption and overload the electricity distribution system in the more sensitive areas in Minas Gerais, possibly	Reduction/disruption in production capacity	Up to 1 year	Direct	About as likely as not	High	Less than 1% of net operating revenue	This risk is managed by: <ul style="list-style-type: none"> • Diagnosing the electrical system to assess the need for expansion; • Monitoring operational conditions; and • Revising project works priorities. These actions help to reduce both the	Less than R\$ 400,000. Costs are annual, for maintaining a team for the planned actions to minimize the risk of blackouts in the distribution system. These costs will

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	reducing the supply of electricity to consumers in the region.							probability and magnitude of the impact, in the immediate short term.	continue as long as the risk persists.
Reputation	If Cemig needs to increase its energy supply by using fossil-fuel thermoelectric plants, it may be criticized by society, impacting the value of the brand.	Reduced stock price (market valuation)	>6 years	Direct	Unlikely	Medium	Less than 1% of net operating revenue	One of the methods Cemig uses to assess its image/reputation with stakeholders as to its role in climate change is to measure public esteem, admiration, trust and empathy for the Company, measured by RepTrak™ Deep Dive methodology, which results in the Pulse overall index of the Company's reputation. Cemig formed its Brand and Reputation Committee in 2011 to examine action to be taken to improve the Company's score in this area. This approach enables Cemig to reduce the probability and scale of any risk, if it materializes, in	Less than R\$ 1 million – associated with the cost of contracting the brand value research. This cost will continue for as long as the research is carried out.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								the immediate short term.	
Changing consumer behaviour	If Cemig has to increase supply by using its thermoelectric plant (Igarapé) to meet a significant short-term increase in demand from industry, this would increase its emissions.	Reduction/disruption in production capacity	3 to 6 years	Direct	About as likely as not	High	Less than 1% of net operating revenue	This risk is managed by dynamic modulation and rate adjustment programs responding to season and time of the day). The goal is to ensure demand is met even at peak times, delaying need for expansion of generation capacity and addition of further thermal plants.	Less than R\$ 400,000. Annual costs for maintaining a team for the planned actions to minimize the risk of blackouts in the distribution system. These costs will continue while the risk persists.

CC5.1d

Please explain why you do not consider your company to be exposed to inherent risks driven by changes in regulation that have the potential to generate a substantive change in your business operations, revenue or expenditure

CC5.1e

Please explain why you do not consider your company to be exposed to inherent risks driven by physical climate parameters that have the potential to generate a substantive change in your business operations, revenue or expenditure

CC5.1f

Please explain why you do not consider your company to be exposed to inherent risks driven by changes in other climate-related developments that have the potential to generate a substantive change in your business operations, revenue or expenditure

Further Information

CC5.1b - Complement for this question: The field "Management method"; line "Change in precipitation pattern": ANEEL, Brazilian National Electric Energy Agency, through the Strategic R&D Project 010 - "Climate change effects on the hydrological regime of river basins and assured energy from hydroelectric projects," proposed the study of these issues. Cemig was part of the consortium of companies that funded the project. Through simulations with climate models, as well as considering the effects of the evolution of land use and consumptive uses of water, they evaluated variations in rainfall and the consequences for the generation of hydroelectric power in 2041, 2071 and 2100. In conclusion, to confirm the emissions scenario A1B of the IPCC for 2010-2100, from climatological simulations and physical safeguards calculation, there may be a reduction in the availability of hydroelectric generation in Brazil from 15% to 25%. However, the study shows possibilities of reduction from 2041, and yet there is no evidence that it is happening. Thus, currently, the management of hydrological risk is made considering the randomness of weather phenomena.

Page: CC6. Climate Change Opportunities

CC6.1

Have you identified any inherent climate change opportunities that have the potential to generate a substantive change in your business operations, revenue or expenditure? Tick all that apply

- Opportunities driven by changes in regulation
- Opportunities driven by changes in physical climate parameters
- Opportunities driven by changes in other climate-related developments

CC6.1a

Please describe your inherent opportunities that are driven by changes in regulation

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
International agreements	Compliance with regulatory requirements and the emergence of new international agreements may create opportunities for Cemig, because it has an energy matrix of predominantly renewable and low-carbon sources, and appears more prepared than its competitors to adapt to this scenario. The establishment of a cap-and-trade-type emissions trading market in Brazil or internationally in the CDM format, for example, might lead Cemig to position itself	Premium price opportunities	>6 years	Direct	Very likely	Medium	Less than 1% of net operational revenues	Cemig has professionals trained to identify carbon credit generating projects and has long-term contracts with testing and certification companies, thus raising the possibility of taking advantage of this opportunity. Cemig already has established CDM emission reduction projects, registered with the UNFCCC.	Less than R\$ 1 million. The costs are related to the monitoring and audits required for validation and sale or trading of credits. The costs are not annual and occur only when audits are conducted.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	as a major supplier of emission reduction certificates. This could lead to revenue-increasing opportunities for Cemig.								
Emission reporting obligations	Cemig's current generation matrix is predominantly from renewable sources. The existence of emissions reporting requirements will bring Cemig's energy matrix of low greenhouse gas emissions into evidence, which may attract more investors to the Company, and enhance its reputation.	Increased stock price (market valuation)	>6 years	Direct	About as likely as not	Low	Less than 1% of net operating revenue	In terms of emissions reporting, Cemig already prepares its GHG inventory annually – it is available on the Company website. That is to say, the Company is well prepared for dealing with this opportunity.	Less than R\$ 50,000.00 – annual costs of preparation of the emission inventory and third party audit. This cost will occur whenever the emissions inventory audit is carried out.
Product labelling regulations and standards	If regulations are introduced that reward the acquisition of renewable (green) energy, Cemig will benefit	Premium price opportunities	>6 years	Direct	Likely	Low	Less than 1% of net operating revenue	The Company's energy trading area, together with the sustainability area, have been monitoring	Less than R\$ 10 million. The estimated costs are for certification of renewable energy when

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	because it already has mainly renewable sources – and this is already recognized as one of its strategic distinguishing factors.							green energy marketing possibilities. Cemig will take advantage of all the real possibilities it identifies.	the subject is regulated in Brazil (in the future).
Other regulatory drivers	To increase the supply of low emissions electricity in the Brazilian electrical system, the government might encourage the offer of more attractive financing lines for generation from renewable sources. Lower spreads for example, might provide an opportunity to reduce the Company's capital costs.	Reduced capital costs	1 to 3 years	Direct	Likely	Low	The degree and scale of financial impact has not yet been analyzed.	Because Cemig does not know the possible financial implications, methods of managing this opportunity have not been established.	Because Cemig does not know the possible financial implications, methods of managing this opportunity have not been established.

Please describe the inherent opportunities that are driven by changes in physical climate parameters

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Change in precipitation extremes and droughts	The 4th IPCC report identifies possible scenarios of changes in world rainfall patterns and indicates that in the Southeast, where the majority of Cemig's reservoirs are located, and South of Brazil there may be variations between stable and increased water availability. As a result, Cemig may request an increase in physical guarantees, especially for its Small Hydro Power Plants (SHPs).	Increased production capacity	>6 years	Direct	About as likely as not	High	Less than 1% of net operating revenue	Cemig has meteorology and hydrology specialists who can estimate future rainfall and water flows by using mathematical models. Operation of plants is optimized based on the current availability and projections of future availability. Cemig's Hydrometeorological Telemetry System (STH) has 168 stations for real time collection of weather and hydrological data at strategic locations in the state of Minas Gerais, which is then fed into a software system for analysis and storage, and presentation. The STH gives Cemig constant access to updated rainfall, river and reservoir level data, enabling advantage to be taken of fluctuations in water availability for electricity generation.	Less than R\$ 1 million. Costs are annual and associated with equipment maintenance and weather teams. These costs will continue while the risk persists.

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Change in mean (average) temperature	The higher average temperatures that we believe are probable would cause changes in consumption patterns – such as increased use of ventilation and cooling systems – resulting in increased energy demand. A study by Rodriguez et al. (2013) assessed the possible impact of climate change on residential electricity demand, based on projections of increasing quarterly average temperatures according to the GHG emissions scenario in the	Increased demand for existing products/services	>6 years	Direct	About as likely as not	High	Less than 1% of net operational revenues	In order to prepare for the increased electricity demand, Cemig has been increasing the availability of electricity distribution infrastructure to serve the growth in this market, by reinforcing distribution substations, networks and lines. These actions help make it more likely that Cemig will benefit, more, from this opportunity.	Less than R\$ 400,000.00. Costs are annual and associated with maintaining the team responsible for carrying out the planned actions to minimize the risk of blackouts in the electricity distribution system. These costs will continue while the risk persists.

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	4th IPCC Report. The results suggest that residential demand for electricity in Brazil could increase in response to the projected increases in temperature.								

CC6.1c

Please describe the inherent opportunities that are driven by changes in other climate-related developments

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Other drivers	The power generated by biomass has been able to supply energy not only for industrial consumption, but also for sale of a surplus in the government's New Energy auctions.	Increased demand for existing products/services	3 to 6 years	Direct	Very likely	Low	Less than 1% of net operating revenue	Efficientia manages this project and focuses on the optimization of project results and meeting the budgeted deadlines and cost limitations. Efficientia's	Less than R\$ 500,000.00. The costs are annual and represent the expense of maintaining the Efficientia team. These costs will continue as

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>According to the Mining and Energy Ministry's Energy Expansion Ten-Year Plan to 2023, the inclusion of biomass cogeneration has proven to be a competitive alternative in the Brazilian electricity market. But there is still great potential to be explored. Cemig, through its wholly owned subsidiary Efficientia, develops projects for cogeneration using waste from industrial processes, through performance contracts, thus identifying one more opportunity to increase its revenue.</p>							<p>projects follow the basic concepts of PMBOK and the International Measurement and Results Verification Protocol. This structure has enabled Cemig to be prepared to boost the magnitude of this opportunity, even in the short term.</p>	<p>long as this opportunity exists.</p>
Other drivers	<p>In a corporate scenario of increased investment in energy efficiency to reduce electricity</p>	<p>Increased demand for existing products/services</p>	<p>1 to 3 years</p>	<p>Direct</p>	<p>Very likely</p>	<p>Low</p>	<p>Less than 1% of net operating revenue</p>	<p>Efficientia manages this project and focuses on the optimization of project results</p>	<p>Less than R\$ 500,000.00. The costs are annual and represent the expense of</p>

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	consumption and GHG emissions, there might be increased demand for the services of Cemig's subsidiary Efficientia, including installation of energy-saving lighting projects using LED technology. These projects are carried out under performance contracts, through which Efficientia invests the necessary funds and recovers its investment from savings achieved in the project.							and meeting the budgeted deadlines and cost limitations. Efficientia's projects follow the basic concepts of PMBOK and the International Measurement and Results Verification Protocol. This structure has enabled Cemig to be prepared to boost the magnitude of this opportunity, even in the short term.	maintaining the Efficientia team. These costs will continue as long as this opportunity exists.
Other drivers	Efficiency in the use of electricity is an important factor in meeting demand, contributing to energy security: it fosters power supply security, competitiveness of the economy and reduction of GHG emissions. In this context of reduction	Increased demand for existing products/services	1 to 3 years	Direct	Very likely	Low	Less than 1% of net operating revenue	Efficientia manages this project and focuses on the optimization of project results and meeting the budgeted deadlines and cost limitations. Efficientia's projects follow the basic	Less than R\$ 500,000.00. The costs are annual and represent the expense of maintaining the Efficientia team. These costs will continue as long as this opportunity

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	of demand from the consumer side, Efficientia, a wholly owned Cemig subsidiary, is in the market to provide energy solutions – including installation of photovoltaic energy, especially in industrial facilities. These projects are implemented under performance contracts, through which Efficientia makes the investment of required funds and recovers its investment from savings achieved in the project.							concepts of PMBOK and the International Measurement and Results Verification Protocol. This structure enables Cemig to be prepared to increase the magnitude of this opportunity even in the short term.	exists.
Reputation	In a low-carbon energy market, Cemig has a good reputation with its stakeholders, due to its renewable matrix and its R&D programs in energy alternatives and energy efficiency. In a scenario of climate change,	Increased stock price (market valuation)	1 to 3 years	Direct	Very likely	Medium	Less than 1% of net operating revenue	One of the methods that Cemig uses to assess its image and reputation with its stakeholders on its role in climate change is to evaluate the general public's esteem,	Less than R\$ 1 million. The cost is associated with the contracting of Company brand value research. This cost will arise whenever the research is carried out.

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	these features will help to boost the value of its brand.							admiration, trust and empathy for the Company, using the RepTrak™ Deep Dive methodology, resulting in a score on the Pulse overall reputation index. Cemig's Brand and Reputation Committee was formed in 2011 to examine the actions to be taken to improve the Company's performance in this area. This approach makes Cemig well-placed to make the most of this opportunity, if it arises, even in the short term.	
Other drivers	If companies increase investments in energy efficiency to reduce electricity consumption and, as a result, reduce GHG emissions,	Increased demand for existing products/services	1 to 3 years	Direct	Very likely	Low	Less than R\$ 1 million	Efficientia is a wholly owned subsidiary of Cemig that has operated since 2002 to implement energy efficiency projects	Less than R\$ 500,000.00. The costs are annual and represent the expense of maintaining the Efficientia

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>there could be an increase in demand for the services of Cemig's subsidiary Efficientia.</p>							<p>for Cemig's clients. It provides advisory services and technical and financial feasibility studies of energy efficiency projects, and implements projects for cogeneration and utilities centers. It also offers consulting services to optimize the energy matrix at companies and for ISO 50001 energy efficiency certification; and live and distance training in energy management. Cemig is therefore well prepared to take advantage of this opportunity if and when it arises, even in the short term.</p>	<p>team. These costs will continue as long as this opportunity exists.</p>

CC6.1d

Please explain why you do not consider your company to be exposed to inherent opportunities driven by changes in regulation that have the potential to generate a substantive change in your business operations, revenue or expenditure

CC6.1e

Please explain why you do not consider your company to be exposed to inherent opportunities driven by physical climate parameters that have the potential to generate a substantive change in your business operations, revenue or expenditure

CC6.1f

Please explain why you do not consider your company to be exposed to inherent opportunities driven by changes in other climate-related developments that have the potential to generate a substantive change in your business operations, revenue or expenditure

Further Information

Module: GHG Emissions Accounting, Energy and Fuel Use, and Trading

Page: CC7. Emissions Methodology

CC7.1

Please provide your base year and base year emissions (Scopes 1 and 2)

Scope	Base year	Base year emissions (metric tonnes CO2e)
Scope 1	Tue 01 Jan 2008 - Wed 31 Dec 2008	261155
Scope 2 (location-based)	Tue 01 Jan 2008 - Wed 31 Dec 2008	282439
Scope 2 (market-based)		

CC7.2

Please give the name of the standard, protocol or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions

Please select the published methodologies that you use
Brazil GHG Protocol Programme
IPCC Guidelines for National Greenhouse Gas Inventories, 2006
The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)

CC7.2a

If you have selected "Other" in CC7.2 please provide details of the standard, protocol or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions

CC7.3

Please give the source for the global warming potentials you have used

Gas	Reference
CO2	IPCC Fourth Assessment Report (AR4 - 100 year)
CH4	IPCC Fourth Assessment Report (AR4 - 100 year)
N2O	IPCC Fourth Assessment Report (AR4 - 100 year)
SF6	IPCC Fourth Assessment Report (AR4 - 100 year)

CC7.4

Please give the emissions factors you have applied and their origin; alternatively, please attach an Excel spreadsheet with this data at the bottom of this page

Fuel/Material/Energy	Emission Factor	Unit	Reference
Liquefied petroleum gas (LPG)	2.93248	metric tonnes CO2e per metric tonne	Brazilian GHG Program
Natural gas	0.00207	metric tonnes CO2e per m3	Brazilian GHG Program
Other: Diesel oil (stationary combustion)	0.00263	metric tonnes CO2e per liter	Brazilian GHG Program
Other: Pure automotive gasoline	0.00224	metric tonnes CO2e per	Brazilian GHG

Fuel/Material/Energy	Emission Factor	Unit	Reference
		liter	Program
Other: Anhydrous ethanol (mobile combustion)	0.00154	metric tonnes CO2e per liter	Brazilian GHG Program
Other: Biodiesel B100 (stationary and mobile combustion)	0.00235	metric tonnes CO2e per liter	Brazilian GHG Program
Residual fuel oil	2.94666	metric tonnes CO2e per metric tonne	Brazilian GHG Program
Jet kerosene	0.00252	metric tonnes CO2e per liter	Brazilian GHG Program
Other: Gasoline C (road transportation)	0.00221	metric tonnes CO2e per liter	Brazilian GHG Program
Other: Ethanol (road transportation)	0.00146	metric tonnes CO2e per liter	Brazilian GHG Program
Other: Diesel oil (road transportation)	0.00260	metric tonnes CO2e per liter	Brazilian GHG Program
Other: Gasoline (waterway transportation)	0.00221	metric tonnes CO2e per liter	Brazilian GHG Program
Other: Air travels (long haul)	0.14443	Other: kgCO2 per passenger per km	Brazilian GHG Program
Other: Air travels (medium haul)	0.08229	Other: kgCO2 per passenger per km	Brazilian GHG Program
Other: Air travels (short haul)	0.09605	Other: kgCO2 per passenger per km	Brazilian GHG Program
Electricity	0.1244	metric tonnes CO2e per MWh	MCTI, Brazil

Further Information

Page: CC8. Emissions Data - (1 Jan 2015 - 31 Dec 2015)

CC8.1

Please select the boundary you are using for your Scope 1 and 2 greenhouse gas inventory

Operational control

CC8.2

Please provide your gross global Scope 1 emissions figures in metric tonnes CO₂e

164537

CC8.3

Does your company have any operations in markets providing product or supplier specific data in the form of contractual instruments?

No

CC8.3a

Please provide your gross global Scope 2 emissions figures in metric tonnes CO₂e

Scope 2, location-based	Scope 2, market-based (if applicable)	Comment
809583		In Brazil it is not possible to account for emissions based on the market.

CC8.4

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

CC8.4a

Please provide details of the sources of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure

Source	Relevance of Scope 1 emissions from this source	Relevance of location-based Scope 2 emissions from this source	Relevance of market-based Scope 2 emissions from this source (if applicable)	Explain why the source is excluded

CC8.5

Please estimate the level of uncertainty of the total gross global Scope 1 and 2 emissions figures that you have supplied and specify the sources of uncertainty in your data gathering, handling and calculations

Scope	Uncertainty range	Main sources of uncertainty	Please expand on the uncertainty in your data
Scope 1	More than 2% but less than or equal to 5%	Data Gaps Data Management	Emission sources that were classified as “low assurance” are (i) consumption of LPG (liquefied petroleum gas) by forklifts and (ii) use of fertilizers. Both sources have low uncertainty associated with the emission factors used, equal to +/- 5.0%, but have high uncertainty associated with activity data, with +/- 15.0% values.
Scope 2 (location-)	More than 5% but less than or equal to	Other: Estimation of the emission factor	Activity data have low associated uncertainty of +/- 1.0%. The emission factor used also has low associated uncertainty, equal to +/- 5.0%; this factor was calculated by the Brazilian Ministry of

Scope	Uncertainty range	Main sources of uncertainty	Please expand on the uncertainty in your data
based) Scope 2 (market-based)	10%		Science, Technology & Innovation.

CC8.6

Please indicate the verification/assurance status that applies to your reported Scope 1 emissions

Third party verification or assurance process in place

CC8.6a

Please provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements

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 Scope 1 emissions verified (%)
Annual process	Complete	Reasonable	https://www.cdp.net/sites/2016/85/3285/Climate Change 2016/Shared Documents/Attachments/CC8.6a/GHGEmissionsCemig2015_Verification.pdf	Entire document	ISO14064-3	100

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 Scope 1 emissions verified (%)
Annual process	Complete	Reasonable assurance	https://www.cdp.net/sites/2016/85/3285/Climate Change 2016/Shared Documents/Attachments/CC8.6a/GHGEmissionsCemig2015_TemplateCDP.pdf	Entire document	ISO14064-3	100

CC8.6b

Please provide further details of the regulatory regime to which you are complying that specifies the use of Continuous Emissions Monitoring Systems (CEMS)

Regulation	% of emissions covered by the system	Compliance period	Evidence of submission

CC8.7

Please indicate the verification/assurance status that applies to at least one of your reported Scope 2 emissions figures

Third party verification or assurance process in place

CC8.7a

Please provide further details of the verification/assurance undertaken for your location-based and/or market-based Scope 2 emissions, and attach the relevant statements

Location-based or market-based figure?	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 Scope 2 emissions verified (%)
Location-based	Annual process	Complete	Reasonable assurance	https://www.cdp.net/sites/2016/85/3285/Climate Change 2016/Shared Documents/Attachments/CC8.7a/GHGEmissionsCemig2015_Verification.pdf	Entire document	ISO14064-3	100
Location-based	Annual process	Complete	Reasonable assurance	https://www.cdp.net/sites/2016/85/3285/Climate Change 2016/Shared Documents/Attachments/CC8.7a/GHGEmissionsCemig2015_TemplateCDP.pdf	Entire document	ISO14064-3	100

CC8.8

Please identify if any data points have been verified as part of the third party verification work undertaken, other than the verification of emissions figures reported in CC8.6, CC8.7 and CC14.2

Additional data points verified	Comment
No additional data verified	

CC8.9

Are carbon dioxide emissions from biologically sequestered carbon relevant to your organization?

No

CC8.9a

Please provide the emissions from biologically sequestered carbon relevant to your organization in metric tonnes CO2

Further Information

CC8.9 - Complement for this question: In 2015, emissions from biomass combustion totaled 2,705 tCO2e, of which 1,411 tCO2e in Scope 1 and 1,294 tCO2e in Scope 3.

Page: CC9. Scope 1 Emissions Breakdown - (1 Jan 2015 - 31 Dec 2015)

CC9.1

Do you have Scope 1 emissions sources in more than one country?

No

CC9.1a

Please break down your total gross global Scope 1 emissions by country/region

Country/Region	Scope 1 metric tonnes CO2e

CC9.2

Please indicate which other Scope 1 emissions breakdowns you are able to provide (tick all that apply)

- By business division
- By GHG type
- By activity

CC9.2a

Please break down your total gross global Scope 1 emissions by business division

Business division	Scope 1 emissions (metric tonnes CO2e)
Cemig GT	136576
Cemig D	17821
Rosal Energia	6
Sá Carvalho	5
Efficientia	5
Usina Térmica do Barreiro S.A.	10098
Cemig Telecomunicações S.A.	26

CC9.2b

Please break down your total gross global Scope 1 emissions by facility

Facility	Scope 1 emissions (metric tonnes CO2e)	Latitude	Longitude
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CC9.2c

Please break down your total gross global Scope 1 emissions by GHG type

GHG type	Scope 1 emissions (metric tonnes CO2e)
CO2	151196
CH4	1355
N2O	2472
SF6	9514

CC9.2d

Please break down your total gross global Scope 1 emissions by activity

Activity	Scope 1 emissions (metric tonnes CO2e)
Stationary combustion	144595
Mobile combustion	10371
Fugitive emissions	9514
Fertilizer consumption	57

Further Information

CC10.1

Do you have Scope 2 emissions sources in more than one country?

No

CC10.1a

Please break down your total gross global Scope 2 emissions and energy consumption by country/region

Country/Region	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low carbon electricity, heat, steam or cooling accounted in market-based approach (MWh)
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CC10.2

Please indicate which other Scope 2 emissions breakdowns you are able to provide (tick all that apply)

By business division
By activity

CC10.2a

Please break down your total gross global Scope 2 emissions by business division

Business division	Scope 2 emissions, location based (metric tonnes CO2e)	Scope 2 emissions, market-based (metric tonnes CO2e)
Cemig GT	881	
Cemig D	808669	
Rosal Energia	0	
Sá Carvalho	0	
Efficientia	0	
Usina Térmica do Barreiro S.A.	0	
Cemig Telecomunicações S.A.	33	

CC10.2b

Please break down your total gross global Scope 2 emissions by facility

Facility	Scope 2 emissions, location based (metric tonnes CO2e)	Scope 2 emissions, market-based (metric tonnes CO2e)

CC10.2c

Please break down your total gross global Scope 2 emissions by activity

Activity	Scope 2 emissions, location based (metric tonnes CO2e)	Scope 2 emissions, market-based (metric tonnes CO2e)
Electricity purchased	5565	
System technical losses	804018	

Further Information

Page: CC11. Energy

CC11.1

What percentage of your total operational spend in the reporting year was on energy?

More than 55% but less than or equal to 60%

CC11.2

Please state how much heat, steam, and cooling in MWh your organization has purchased and consumed during the reporting year

Energy type	Energy purchased and consumed (MWh)
Heat	0
Steam	0
Cooling	0

CC11.3

Please state how much fuel in MWh your organization has consumed (for energy purposes) during the reporting year

591224

CC11.3a

Please complete the table by breaking down the total "Fuel" figure entered above by fuel type

Fuels	MWh
Other: Biodiesel (B100)	2258.68
Liquefied petroleum gas (LPG)	321.49
Natural gas	50004.22
Other: Automotive gasoline	5673.80
Jet kerosene	2526.36
Residual fuel oil	494973.67
Diesel/Gas oil	32145.07
Other: Anhydrous ethanol	1421.65
Other: Hydrous ethanol	1898.75

CC11.4

Please provide details of the electricity, heat, steam or cooling amounts that were accounted at a low carbon emission factor in the market-based Scope 2 figure reported in CC8.3a

Basis for applying a low carbon emission factor	MWh consumed associated with low carbon electricity, heat, steam or cooling	Comment
Grid-connected electricity generation owned, operated or hosted by the company, where electricity attribute certificates do not exist or are not required for a usage claim	0	Only 1.2% of the electricity generated by Cemig does not come from a low-carbon power plant. This non-low carbon electricity is generated by the Igarapé thermal plant from fuel oil. In addition, in 2015 the electricity generated by the Barreiro thermal plant could not be considered low-carbon since this plant, located within the industrial facilities of Vallourec to generate electricity from process gases, consumed natural gas for its operation in 2015 due to the reduction of Vallourec's output. Thus, 98.8% of Cemig's electricity is generated from hydro and wind power plants; in 2015, these plants exported 18,767,919 MWh of green energy to the Brazilian grid. As noted, these plants are connected to the electrical system, but the electricity has not been certified for low emissions. This volume of electricity is exported to the grid not having been consumed by the Company, and therefore the GHG emissions it generates are not ascribed to Cemig. Thus, since this electricity generation does not enter Cemig's Scope 2 emission calculations, the value entered in the center column is zero and not equal to the 18,767,919 MWh of low carbon electricity produced by Cemig in 2015. All electricity consumed by Cemig in the reporting year was accounted as purchased in the electricity system, and the national grid emission factor was used in accounting for it in the GHG emissions inventory.

CC11.5

Please report how much electricity you produce in MWh, and how much electricity you consume in MWh

Total electricity consumed (MWh)	Consumed electricity that is purchased (MWh)	Total electricity produced (MWh)	Total renewable electricity produced (MWh)	Consumed renewable electricity that is produced by company (MWh)	Comment
44721.24	44721.24	18989539	18767919	0	This amount of renewable electricity produced (18,767,919 MWh) is exported to the

Total electricity consumed (MWh)	Consumed electricity that is purchased (MWh)	Total electricity produced (MWh)	Total renewable electricity produced (MWh)	Consumed renewable electricity that is produced by company (MWh)	Comment
					grid, thus not having been consumed by the Company, and therefore there is no generation of GHG emissions by Cemig associated with its consumption. Therefore, since this electricity generation does not enter Cemig's Scope 2 emission calculations, the value in the adjacent column is zero and not equal to 18,767,919 MWh of low-carbon electricity produced by Cemig in 2015. All the electricity consumed by Cemig in the reporting year (44,721.24 MWh) was accounted for as purchased in the electricity system; the national grid emission factor was used for its calculation in the GHG emissions inventory.

Further Information

Page: CC12. Emissions Performance

CC12.1

How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to the previous year?

Decreased

CC12.1a

Please 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	Emissions value (percentage)	Direction of change	Please explain and include calculation
Emissions reduction activities	0.40	Decrease	Opportunities for optimizing logistics through better transportation management led to a reduction of 1,118 tCO ₂ e in 2015. Also in 2015, technical electricity losses management was responsible for cutting emissions by 1,169 tCO ₂ e. In addition, the entry into operation of the Renova wind farms and solar plants allowed Scope 1 emissions reduction of 3,687 tCO ₂ e. These initiatives are detailed in question CC3.3b - total annual emissions were reduced by 5,974 tCO ₂ e.
Divestment	0.00	No change	Cemig made no business divestments that altered Scope 1 and 2 emissions within the inventory limits.
Acquisitions	0.00	No change	Cemig made no business acquisitions that altered Scope 1 and 2 emissions within the inventory limits.
Mergers	0.00	No change	Cemig made no mergers that altered Scope 1 and 2 emissions within the inventory limits.
Change in output	57.89	Decrease	Emissions associated with operation of the Igarapé thermal plant in 2015 totaled 134,305 tCO ₂ e; in 2014, these emissions totaled 577,458 tCO ₂ e. The decrease of operations accounted for a 30.03% reduction in Scope 1 + 2 emissions in 2015, compared to 2014. Cemig's electricity production decreased from 26,323.243 GWh in 2014 to 18,989.539 GWh in 2015. If all other conditions were to remain unchanged between the two years and assuming a linear reduction of emissions by reducing the generation of electricity, this decrease in production would lead to a 27.86% reduction of Scope 1 + 2 emissions. These two factors together led to a 57.89% emissions reduction from 2014 to 2015.
Change in methodology	4.76	Decrease	The reduction of Scope 2 emissions was due to the reduction of the emission factor of the National Grid (SIN), from 0.1355 tCO ₂ /MWh in 2014 to 0.1244 tCO ₂ /MWh in 2015, with Scope 2 emissions in 2014 representing 58.14% of the Scope 1 + 2 emissions.
Change in boundary	0.00	No change	There was no change in the inventory boundaries of Scope 1 and 2 emissions.
Change in physical operating conditions	0.00	No change	No changes in physical conditions of Cemig's operation were examined from the perspective of changes in emissions from Scopes 1 and 2 in 2015 in relation to 2014.
Unidentified	29.06	Increase	The 29.06% in Scope 1 and 2 emissions in 2015 in relation to 2014 cannot be properly tracked, and therefore their causes were not identified. All other items in this table together represent 63.05% of the reduction in emissions, with a total reduction of 33.99%.
Other	0.00	No change	No other change in Cemig's operations was examined from the perspective of changes in Scopes 1 and 2 emissions for 2015 in relation to 2014.

Is your emissions performance calculations in CC12.1 and CC12.1a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Location-based

CC12.2

Please describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tonnes CO2e per unit currency total revenue

Intensity figure =	Metric numerator (Gross global combined Scope 1 and 2 emissions)	Metric denominator: Unit total revenue	Scope 2 figure used	% change from previous year	Direction of change from previous year	Reason for change
0.0000457505	metric tonnes CO2e	21292000000.00	Location-based	39.42	Decrease	This reduction in emissions per unit of revenue in 2015 compared to 2014 resulted mainly from the reduction in Scope 1 and 2 emissions in 2015. This reduction in emissions was due mainly to the reduction of the GHG emission factor for the Brazilian power system, and the lower electricity generation by the Igarapé Thermal Plant, which uses fuel oil as energy source. Cemig has no control over these factors, since dispatch of electricity generation in the system is decided by the ONS – National System Operator. Cemig’s net operational revenue increased 8.97% in this period. The value for the column “Metric numerator (Gross global combined Scope 1 and 2 emissions)” is 974,120 tCO2e.

CC12.3

Please provide any additional intensity (normalized) 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 from previous year	Reason for change
0.0512977163	metric tonnes CO2e	Other: MWh produced	18989539	Location-based	8.50	Decrease	Cemig's reduction of emissions per unit of electricity produced from 2014 to 2015 is primarily due to lower Scope 1 and 2 emissions in 2015 – which in turn was due mainly to the reduction of GHG emission factor for the Brazilian electricity system, and the lower electricity generation by the Igarapé Thermal Plant, which uses fuel oil as energy source. Cemig has no control over these factors, since dispatching of electricity generation in the system is decided by the ONS – National System Operator. Also, the volume of electricity produced in 2015 was 27.86% lower. The value for the column “Metric numerator (Gross global combined Scope 1 and 2 emissions)” is 974,120 tCO2e.

Further Information

Page: CC13. Emissions Trading

CC13.1

Do you participate in any emissions trading schemes?

No, but we anticipate doing so in the next 2 years

CC13.1a

Please complete the following table for each of the emission trading schemes in which you participate

Scheme name	Period for which data is supplied	Allowances allocated	Allowances purchased	Verified emissions in metric tonnes CO2e	Details of ownership

CC13.1b

What is your strategy for complying with the schemes in which you participate or anticipate participating?

Brazil's National Climate Change Policy (PNMC) has created the Brazilian Emissions Reduction Market (Mercado Brasileiro de Reduções de Emissões, or MBRE), to be one of the instruments to reduce GHG emissions. It is not yet an operating reality, but is expected to be in the near future. The PNMC does not set sector targets; rather, it states that to achieve the voluntary target set by Law 12187/2009 of reducing Brazil's projected emissions by between 36.1% and 38.9% by 2020, actions will be implemented that include (a) expansion of: supply from hydroelectric and other renewable sources – particularly wind farms, small hydro plants and bio-electricity and biofuels; and (b) higher energy efficiency targets. As a result of COP 21, the Brazilian government has assumed new targets: to reduce emissions, from 2005 as base year, by 37% by 2025, and by 43%, by 2030.

Cemig's generation expansion plans are strategically formed to expand capacity generating from low-carbon sources. Cemig invests in implementing new hydroelectric plants, both SHPs - small hydroelectric plants (from 1 MW to 30 MW) and standard hydroelectric plants (over 30 MW), and in wind farms; and has worked hard to acquire knowhow in photovoltaic solar generation, aiming to make this source a significant proportion of its total sources. Specifically to create a growth model for increasing its proportion of new renewable sources, in 2013 and 2014 Cemig increased its stake in Renova (to 27.4%), to make that Company its main driver of growth in non-hydroelectric renewable sources. Renova has been active in initiatives to increase the opportunities for development of low-carbon business:

- Agreement between Cemig and Renova for 50% participation in the production of the Zeus Project, a development of 25 wind farms in the municipality of Jacobina (Bahia), with installed capacity of 676.2 MW – planned to start commercial operation in September 2018. Cemig has a total direct and indirect ownership interest of 32.5% in the project.
- Contracting of supply from installed capacity of 150.4 MW in the 2014 Reserve Supply ('LER') Auction, from three wind farms (43.5 MW) and four solar farm complexes (106.9 MWp), for start of operation October 2017, and installed capacity of 108 MW in the 2014 A-5 Auction, for supply to start January 2019. All these facilities are in the state of Bahia; Cemig's total direct and indirect ownership interest is 32.5%.
- Four of the nine Renova wind farms contracted for construction and supply in the 2011 auction started commercial operation in 2015: Ametista, Pilões, Maron and Dourados, with installed capacity of 117.6 MW. They were connected to the same transmission line serving the Igaporã II wind farms. The other five were connected to the Igaporã III transmission line, and started operating on January 1, 2016;
- In May 2015 Renova announced a transaction with TerraForm Global, including exchange of certain assets, with an agenda of increasing competitiveness, value creation and growth.
- At the August 2015 solar reserve energy auction ('LER 2015-solar') a consortium of Renova, SunEdison Brasil Energia Ltda. and Sune Solar B.V., in which Renova holds a 50% stake, won a contract for solar generation to supply 15.0 MW average, from 59.7 MW of solar generation installed capacity.
- In 2016, Renova continues to build Phase A of the Alto Sertão III project, with installed capacity of 411.1 MW, for delivery in late 2016 or early 2017.

As well as these investments in generation from renewable sources, Cemig has made significant investments in boosting efficiency to minimize electricity losses in

the distribution system. Technical losses are those inherent in electricity transmission through all equipment and transmission and distribution lines, and represent Cemig's largest source of GHG emissions. In 2015 Cemig took the following action to reduce them:

- Preparation of a medium voltage reactive compensation plan – for installation of 225 banks of automatic capacitors by 2016: planned investment of R\$ 9.0 million will aim to reduce technical losses by R\$ 2 million (corresponding to 9.4 GWh) per year.
- Investments of R\$ 65.8 million in projects to strengthen the medium and low voltage electricity system, and R\$ 219.4 million in investments to expand and strengthen the system of sub-transmission lines (69 kV to 230 kV).
- Acquisition and installation of distribution transformers with amorphous core technology, which reduce no-load losses by about 80%; and strengthening of related low-voltage circuits.

Other actions included: prospecting for new network and conductor technologies; studies to increase the operating efficiency of the electricity system (circuit reconfiguration); and establishment of criteria to limit technical losses in medium and low voltage circuits. These contribute to Cemig's readiness to participate in an emissions trading market if one is established in Brazil.

CC13.2

Has your organization originated any project-based carbon credits or purchased any within the reporting period?

No

CC13.2a

Please provide details on 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	Number of credits (metric tonnes of CO2e)	Number of credits (metric tonnes CO2e): Risk adjusted volume	Credits cancelled	Purpose, e.g. compliance

Further Information

CC13.1b - Complement for this question: Recent international negotiations have greatly impacted the carbon market. In December 2012, the first Kyoto Protocol commitment period ended and it was decided at the Conference of the Parties that the agreement would be renewed, though configured differently. The agreement ended up quite a lot weaker, the value of credits declined substantially and, registering projects in the program is now not as advantageous as it used to be. The unstable international economic climate has contributed to a reduction in the productivity of industrial companies, including carbon-intensive ones and, consequently, reduced demand for carbon credits. Cemig has 11 projects registered under the Kyoto Protocol's Clean Development Mechanism (CDM), which are specified as providing an overall reduction of 4,870,580 tCO₂e. Despite the current uncertainty about the value of its credits under the Kyoto Protocol, these projects show that Cemig has voluntary and additional actions to reduce emissions and is, thus, preparing for a scenario of participation in an emissions trading scheme. Other strategies for preparation for such participation are in the document "Cemig – 10 Initiatives for the Climate", a statement of Cemig's commitment to addressing climate change issues. The initiatives of greatest importance are: generation from renewable sources; energy conservation and efficiency projects; operations in natural gas; investments in new low carbon energy sources; improvements in process efficiency; and the reduction of emissions in transport. CC13.2- Complement for this question: There are eleven low-carbon electricity generation projects connected to the Brazilian electric system, registered under the Clean Development Mechanism (CDM) either controlled 100% by Cemig or in which Cemig has a stake. These have the potential to generate 4,870,580 in carbon credits annually, representing an annual reduction of emissions of 4,870,580 tCO₂. However, in 2015 these plants did not request the issuance of carbon credits by the UNFCCC. Therefore, although operations of these plants have led to reductions in emissions, there was no generation of carbon credits by Cemig in the reporting year.

Page: CC14. Scope 3 Emissions

CC14.1

Please account for your organization's Scope 3 emissions, disclosing and explaining any exclusions

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO ₂ 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				In 2012 Cemig began to quantify emissions from the vehicles of contractors that operate and maintain the distribution services. This item is discussed under "downstream transport and distribution".

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Capital goods	Not evaluated				
Fuel-and-energy-related activities (not included in Scope 1 or 2)	Not evaluated				The following were not evaluated: (i) upstream emissions from fuel and electricity purchased by Cemig; (ii) electricity losses in the transmission and distribution of electricity consumed by Cemig; and (iii) the generation emissions of electricity purchased by Cemig for resale. Please note, however, that emissions due to losses in the transmission and distribution systems of electricity produced by Cemig are accounted in Scope 2. Also, emissions from transport of fossil fuels from refineries to Cemig's thermal plant were recorded; this transport is by tanker trucks, and was posted under "upstream transport and distribution."
Upstream transportation and distribution	Relevant, calculated	373.38	i) Data type and sources used, emission factors and GWP values (global warming potential of gas): – For outsourced trucks that transport freight and for trucks transporting fuel to the Igarapé Thermal Plant: data for total distance travelled. – The emission factors for fuel consumed (diesel) and GWP values were obtained from the calculation tool of the GHG Brazil Protocol. ii) Description of the quality of reported emissions data: – Data were obtained directly from Cemig suppliers for all vehicles that transported cargo to Cemig in 2015. iii)	100.00%	

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			Description of the methodologies, assumptions and allocation methods used to calculate the emissions: – The calculations were made using the calculation tool of the GHG Brazil Protocol (version 2016.1.1).		
Waste generated in operations	Not relevant, explanation provided				The Reverse Logistics and final waste disposal are carried out by a department certified by the Environmental Management System (SGA) at SGA Level 1, which receives the waste properly identified, sorted and packed from the areas that generated it. In 2015, approximately 48,300 tonnes of industrial waste were forwarded to environmentally appropriate disposal facilities; 48,200 tonnes were sold, recycled or regenerated (99.8%); and 120 tonnes (0.2%) were co-processed, incinerated or disposed of as landfill. The waste disposed of consists mainly of cables and wires, scrapped transformers, scrap metal, scrapped meters, poles, cross arms, wood chips and wood residue, that is to say inert materials.
Business travel	Relevant, calculated	1138.1	i) Data type and sources, emission factors and GWP values (global warming potential of gas): – Data for total distance covered by Cemig employees in air travel on business. The emission factors and GWP values were obtained using the tool of the Brazil GHG Protocol. ii) Description of the quality of reported emissions data: – The distances for	100.00%	

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			all business air travel made by all Cemig employees in 2015 were calculated. iii) Description of the methodologies, assumptions and allocation methods used to calculate the emissions: – The calculations were made using the tool in the Brazil GHG Protocol (version 2014.1.1); – Data from the site www.gcmap.com were used to calculate distances between airports.		
Employee commuting	Relevant, calculated	599.91	i) Data type and sources, emission factors and GWP values (global warming potential of gas): – Data were used for total distance travelled by employees by bus. The emission factors and the GWP values were obtained through the GHG Brazil Protocol tool. ii) Description of the quality of reported emissions data: – Data for the distances traveled by all Cemig employees in 2015, as well as the type of vehicle used in the commute (home-work). iii) Description of the methodologies, assumptions and allocation methods used to calculate the emissions: – The calculations were made through the GHG Brazil Protocol tool (version 2016.1.1).	100.00%	
Upstream leased assets	Not relevant, explanation provided				Cemig has no leased assets.
Downstream transportation and distribution	Relevant, calculated	12851.25	i) Data type and sources used, emission factors and values of GWP (global warming potential of gas): – For vehicles used by contractors	100.00%	In 2012 Cemig began to quantify emissions from vehicles of contractors providing distribution operation and maintenance

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			<p>providing services in Cemig's distribution of electricity: data for total fuel consumption. The emission factors and the GWP values were obtained through the Brazil GHG Protocol tool.</p> <p>ii) Description of the quality of reported emissions data: – The data were provided by the contractors whose vehicles are used to provide operation and maintenance services in the electricity distribution network. Twenty-six of the 30 contractors provided data for calculation of GHG emissions for that source. iii) Description of methodologies, assumptions and allocation methods used to calculate emissions: – The calculations were using the tool of the GHG Brazil Protocol (version 2016.1.1).</p>		<p>services. In 2015, of the 30 contractors providing this type of service, 26 responded with information (86.67% of the total). Their participation and their contribution of information is voluntary.</p>
Processing of sold products	Not relevant, explanation provided				<p>The product Cemig sells (electricity) is not processed as an intermediate product for production of a final consumer product. More precisely, electricity is an input in production processes, not an intermediate good. Thus, this emission source does not apply to Cemig.</p>
Use of sold products	Relevant, calculated	9614752	<p>i) Data type and sources used, emission factors and values of GWP (global warming potential of gas): – Data for consumption of the electricity generated by Cemig for final consumers was used. The emission factor of the Brazilian electricity system and the GWP values were obtained using the tool of the Brazil GHG Protocol. ii) Description of the quality of reported</p>	100.00%	<p>The main source of Cemig's Scope 3 emissions is the consumption of electricity sold by the Company to end users, whether industrial, commercial or residential. Since the energy sold by Cemig is part of the National Grid System, the emission factor of this system is used to calculate these emissions.</p>

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			emissions data: – Data for consumption of electricity by clients is precisely monitored by the Company. iii) Description of methodologies, assumptions and allocation methods used to calculate emissions: – The calculations were made using the tool of the GHG Brazil Protocol (version 2016.1.1).		
End of life treatment of sold products	Not relevant, explanation provided				The product sold by Cemig (electricity) does not require end-of-life treatment, since it does not generate residue or waste to be treated or disposed of. Thus, this source is not applicable to Cemig.
Downstream leased assets	Not relevant, explanation provided				Cemig does not lease assets. Thus, this source of emissions is not applicable to the Company.
Franchises	Not relevant, explanation provided				Cemig does not have franchises. Thus, this source of emissions is not applicable to the Company.
Investments	Not relevant, explanation provided				The investments do not cause an increase in emissions.
Other (upstream)					
Other (downstream)					

Please indicate the verification/assurance status that applies to your reported Scope 3 emissions

Third party verification or assurance process in place

CC14.2a

Please provide further details of the verification/assurance undertaken, and attach the relevant statements

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 Scope 3 emissions verified (%)
Annual process	Complete	Reasonable assurance	https://www.cdp.net/sites/2016/85/3285/Climate Change 2016/Shared Documents/Attachments/CC14.2a/GHGEmissionsCemig2015_Verification.pdf	The whole document	ISO14064-3	100
Annual process	Complete	Reasonable assurance	https://www.cdp.net/sites/2016/85/3285/Climate Change 2016/Shared Documents/Attachments/CC14.2a/GHGEmissionsCemig2015_TemplateCDP.pdf	The whole document	ISO14064-3	100

CC14.3

Are you able to compare your Scope 3 emissions for the reporting year with those for the previous year for any sources?

Yes

CC14.3a

Please identify the reasons for any change in your Scope 3 emissions and for each of them specify how your emissions compare to the previous year

Sources of Scope 3 emissions	Reason for change	Emissions value (percentage)	Direction of change	Comment
Upstream transportation & distribution	Emissions reduction activities	101.69	Decrease	The distance travelled by outsourced trucks hauling cargo decreased from 910,016 km in 2014 to 687,840 km in 2015. This reduction was due to logistics optimization initiatives. The total distance covered by fuel tanker trucks to the Igarapé Thermal Plant decreased from 285,795 km in 2014 to 66,510 km in 2015. This was due to lower output from the plant in 2015.
Employee commuting	Emissions reduction activities	1.33	Decrease	Cemig analyzed the routes of the (urban, diesel) buses that transport employees in Belo Horizonte. This resulted in a reduction of 3.54% in total distance traveled by employees – equivalent to 7,218 fewer kilometers traveled in 2015 than in 2014. This transportation class represented 37.45% of the 'employee transportation' Scope 3 emissions in 2014. Thus this reduction in distance traveled reduced the total of GHG emissions resulting from 'employee transportation' by 1.33% in 2015.
Employee commuting	Change in output	1.77	Increase	From 2014 to 2015, there was an increase of 6,794 km in the distance traveled for transportation of employees within the state of Minas Gerais by diesel-powered highway buses. This represented a 0.76% increase in GHG emissions in this transportation category. This category of transport represented 43.97% of Scope 3 emissions from 'employee transportation' in 2014. Thus this increase in distance traveled led to an increase of 0.96% in total GHG emissions resulting from 'employee transportation' in 2015. In transportation of employees by gasoline fueled light vehicles, the distance traveled was 27,170 km greater in 2015 than in 2014, representing a 2.25% increase in GHG emissions in this transportation category. This category accounted for 18.58% of Scope 3 emissions from 'employee transportation' in 2014; thus the increase in distance traveled led to an increase of 0.81% in total GHG emissions from 'employee transportation' 2015.
Downstream transportation and distribution	Other: greater participation in data reporting	124.34	Increase	The data provided by the contractors responsible for downstream transportation indicated a 77.23% increase in fuel consumption: 1,924.91% in the consumption of ethanol and 135.97% of diesel. One of the reasons was increased participation in the reporting of emission data; another was changes in Cemig's demand for the services these companies provide. Note that reporting of these data is voluntary; in 2015, 86.67% of contractors involved gave information. This increase in fuel consumption led to a reduction of 124.34% in Scope 3 emissions for transportation and distribution (downstream).
Business travel	Emissions	16.40	Decrease	Total distance flown in business-related air travel was reduced by 20.46% from 2014 –

Sources of Scope 3 emissions	Reason for change	Emissions value (percentage)	Direction of change	Comment
	reduction activities			reducing emissions in this category by 16.40%.
Use of sold products	Change in output	15.10	Decrease	The total of electricity generated and sold by Cemig in 2015 was 7.52% less than in 2014 (reduction from 83,574,000 MWh to 77,289,000 MWh). There was also a reduction in the emission factor of the National Grid System (SIN) from 0.1355 tCO2/MWh in 2014 to 0.1244 tCO2/MWh in 2015, which meant that the same amount of electricity for consumption generated by Cemig in each of these two periods would represent fewer emissions by consumers of this electricity in 2015 than in 2014. The combination of these two factors generated a 15.10% reduction in emissions from 2014 to 2015. Electricity consumption emissions by Cemig's clients accounted for 99.84% of the Company's Scope 3 emissions in 2015.

CC14.4

Do you engage with any of the elements of your value chain on GHG emissions and climate change strategies? (Tick all that apply)

- Yes, our suppliers
- Yes, our customers

CC14.4a

Please give details of methods of engagement, your strategy for prioritizing engagement and measures of success

Engagement with suppliers: Cemig now includes the GHG emission inventories of its clients in its own information base. This was helped by the Fourth Carbon Value Chain Management Program of the Thematic Energy and Climate Change Chamber (CTClima) of the Brazilian Business Council for Sustainable Development (CEBDS), Brazil's representative for the World Business Council for Sustainable Development (WBCSD) since 2012. The purpose of this program is to engage suppliers, especially those with the highest impact on Cemig's emissions, to prepare and publish GHG inventories, raising awareness and training selected suppliers. Since its inception, the Carbon Value Chain Management Program already has involved and trained 312 suppliers of its affiliated companies in how to prepare their own GHG emissions inventories. Cemig was one of the Program's sponsors in 2015 edition, together with three other CEBDS member companies. In

this Fourth cycle of the program, the percentage of suppliers participating in the awareness and training process increased from 35% in (2014) to 46% in 2015. A total of 62 suppliers were trained; of these, 14 completed their emission inventories and another nine are in process of preparing theirs.

Engagement methods: The selected suppliers were invited to participate in workshops (held in May 2015 at two locations) which primarily aim to raise participants' awareness about the need to adapt how they manage their businesses to cope with climate change. They also aimed to provide technical training to enable preparation of GHG inventories, introducing the calculation tool of the GHG Brazil Protocol and how to use it. Priority competencies taught included setting of operating limits, identification and classification of the main emission sources, and categorization of emissions between the three scopes.

Strategy for prioritizing engagements: 50 companies were invited to participate in the program. Priority was given to small- and medium-sized suppliers who needed help in preparing their GHG inventory.

Measures of success: Considering all suppliers to all the companies participating in the fourth edition of the Program, 46% (62 companies) participated in the workshops held in 2015 – or 11% more than in the third edition, in 2014 (Cemig's first participation was in the second edition). In terms of evaluation: 56% graded the workshops "very good", and 44% "good." 89% said they intended to prepare GHG inventories. Of the 55 companies confirming interest, 25% have completed them.

The percentage of Cemig suppliers who participated in the awareness raising and training process increased by 13% from the previous period. Of the 50 Cemig suppliers invited to participate in the program, 18 were trained, and five have completed their emission inventories.

In the three years of Cemig's participation in the program, 50 suppliers have been trained and made more aware of the program, and 17 inventories completed, corresponding to 34% of the suppliers who were trained.

CC14.4b

To give a sense of scale of this engagement, please give the number of suppliers with whom you are engaging and the proportion of your total spend that they represent

Number of suppliers	% of total spend (direct and indirect)	Comment
50	12.91%	Cemig invited 50 suppliers to participate in the fourth edition of the Carbon Value Chain Management Program, giving priority to the small and medium-sized suppliers who need help in preparing their GHG inventories.

CC14.4c

If you have data on your suppliers' GHG emissions and climate change strategies, please explain how you make use of that data

How you make use of the data	Please give details
Other	Cemig uses the data from these inventories to assess the scope of the Carbon Value Chain Management Program. In 2015, data from some suppliers already had been incorporated in Cemig's GHG emissions inventory. Suppliers were invited to participate in Cemig's Carbon Value Chain Management Program in 2015. Cemig trains these suppliers to boost awareness about climate change and the need to make GHG inventories, and teaches them to conduct this quantification process.

CC14.4d

Please explain why you do not engage with any elements of your value chain on GHG emissions and climate change strategies, and any plans you have to develop an engagement strategy in the future

Further Information

Module: Sign Off

Page: CC15. Sign Off

CC15.1

Please provide the following information for the person that has signed off (approved) your CDP climate change response

Name	Job title	Corresponding job category
Mateus de Moura Lima Gomes	Deputy CEO (Vice president)	Other: Deputy CEO

Further Information

Module: Electric utilities

Page: EU0. Reference Dates

EU0.1

Please enter the dates for the periods for which you will be providing data. The years given as column headings in subsequent tables correspond to the "year ending" dates selected below. It is requested that you report emissions for: (i) the current reporting year; (ii) one other year of historical data (i.e. before the current reporting year); and, (iii) one year of forecasted data (beyond 2020 if possible).

Year ending	Date range
2008	Tue 01 Jan 2008 - Wed 31 Dec 2008
2015	Thu 01 Jan 2015 - Thu 31 Dec 2015
2021	Fri 01 Jan 2021 - Fri 31 Dec 2021

Further Information

Page: EU1. Global Totals by Year

EU1.1

In each column, please give a total figure for all the countries for which you will be providing data for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emission intensity (metric tonnes CO2e/MWh)
2008	6572	33413	239275	0.0072
2015	7426	18990	144595	0.0076
2021	22452	76382	589647	0.0077

Further Information

EU1.1 - Complement for this question: The projects in operation, with signed contracts and in development were taken into account.

Page: EU2. Individual Country Profiles - Brazil

EU2.1

Please select the energy sources/fuels that you use to generate electricity in this country

Oil & gas (excluding CCGT)
 Hydro
 Other renewables
 Other

EU2.1a

Coal - hard

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
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EU2.1b

Lignite

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
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EU2.1c

Oil & gas (excluding CCGT)

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
2008	131	205	239275	1.1672
2015	131	168	134305	0.7994
2021	1131	2476	589647	0.2381

EU2.1d**CCGT**

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO₂e)	Emissions intensity (metric tonnes CO₂e/MWh)
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EU2.1e**Nuclear**

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)
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EU2.1f**Waste**

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
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EU2.1g

Hydro

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)
2008	6387	32777
2015	7233	18610
2021	19696	69015

EU2.1h

Other renewables

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)
2008	1	0
2015	49	158
2021	1326	3859

EU2.1i**Other**

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
2008	53	430	0	0.0000
2015	13	54	10098	0.1870
2021	13	91	9738	0.1016

EU2.1j**Solid biomass**

Please complete for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
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EU2.1k

Total thermal including solid biomass

Please complete for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
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EU2.1i

Total figures for this country

Please enter total figures for this country for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes in CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
2008	6572	33413	239275	0.0072
2015	7426	18990	144595	0.0076
2021	22452	76382	589647	0.0077

Further Information

EU2.1h - Complement for this question: "Other renewables" refers to wind and solar. EU2.1i - Complement for this question: "Other" refers to blast furnace gases, tar and other waste gases generated in steel industrial processes. - The field "Nameplate capacity (MW)", line "2015" : As of 2015, the Ipatinga S.A. thermal plant will no longer be part of Cemig's Greenhouse Gas Inventory scope, because the contract with Usiminas ended in December 2014. This fact directly impacted the installed capacity of the Cemig group's process gas power plants.

Page: EU3. Renewable Electricity Sourcing Regulations

EU3.1

In certain countries, e.g. Italy, the UK, the USA, electricity suppliers are required by regulation to incorporate a certain amount of renewable electricity in their energy mix. Is your organization subject to such regulatory requirements?

No

EU3.1a

Please provide the scheme name, the regulatory obligation in terms of the percentage of renewable electricity sourced (both current and future obligations) and give your position in relation to meeting the required percentages

Scheme name	Current % obligation	Future % obligation	Date of future obligation	Position in relation to meeting obligations

Further Information

Page: EU4. Renewable Electricity Development

EU4.1

Please give the contribution of renewable electricity to your organization's EBITDA (Earnings Before Interest, Tax, Depreciation and Amortization) in the current reporting year in either monetary terms or as a percentage

Please give:	Monetary figure	%	Comment
Renewable electricity's contribution to EBITDA		80.00%	The EBITDA of the holding in 2015 fell to 2013 level, while the EBITDA of Generation segment maintained a growth curve since 2013. As a result, the ratio between both numbers grew

Please give:	Monetary figure	%	Comment
			substantially in 2015.

EU4.2

Please give the projected contribution of renewable electricity to your organization's EBITDA at a given point in the future in either monetary terms or as a percentage

Please give:	Monetary figure	%	Year ending	Comment
Renewable electricity's contribution to EBITDA		40.00%	2021	Cemig expect to maintain the percentage proportion of renewable power in the organization's generation mix.

EU4.3

Please give the capital expenditure (capex) planned for the development of renewable electricity capacity in monetary terms and as a percentage of total capex planned for power generation in the current capex plan

Please give:	Monetary figure	%	End year of capex plan	Comment
Capex planned for renewable electricity development	1270767000	76.00%	2017	The current Capex plan includes substantial investments in generation, in which 98% of electricity generated is from renewable sources.

Further Information

CDP

