

Module: Introduction

Page: Introduction

CC0.1

Introduction

Please give a general description and introduction to your organization.

American Electric Power (AEP) has been providing electric service for more than 100 years and is one of the largest electric utilities in America, serving 5.4 million customers in portions of 11 states. AEP ranks among the nation's largest generators of electricity, owning 26,000 megawatts of generating capacity in the U.S. AEP also owns the nation's largest electricity transmission system, a more than 40,000-mile network that includes more 765 kilovolt extra-high voltage transmission lines than all other U.S. transmission systems combined. AEP's transmission system directly or indirectly serves about 10 percent of the electricity demand in the Eastern Interconnection, the interconnected transmission system that covers 38 eastern and central U.S. states and eastern Canada, and approximately 11 percent of the electricity demand in ERCOT, the transmission system that covers much of Texas. AEP's utility units operate as AEP Ohio, AEP Texas, Appalachian Power (in Virginia, West Virginia), AEP Appalachian Power (in Tennessee), Indiana Michigan Power, Kentucky Power, Public Service Company of Oklahoma, and Southwestern Electric Power Company (in Arkansas, Louisiana and east Texas). AEP's headquarters are in Columbus, Ohio.

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

Fri 01 Jan 2016 - Sat 31 Dec 2016

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

United States of America

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.

USD(\$)

CC0.6

Modules

As part of the request for information on behalf of investors, companies in the electric utility sector, companies in the automobile and auto component manufacturing sector, companies in the oil and gas sector, companies in the information and communications technology sector (ICT) and companies in the food, beverage and tobacco sector (FBT) should complete supplementary questions in addition to the core questionnaire.

If you are in these sector groupings, the corresponding sector modules will not appear among the options of question CC0.6 but will automatically appear in the ORS 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 in CC0.6.

Further Information

Module: Management

Page: CC1. Governance

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

Due to the carbon intensive nature of our business, AEP's Chairman, President and CEO, Nick Akins, is directly responsible for managing AEP's response to climate change risk. As Chair of the Board of Directors, he has direct oversight over corporate strategy, structure and management.

The Committee on Directors & Corporate Governance of AEP's Board of Directors has oversight over sustainability performance reporting, which includes the company's strategy for addressing climate change, and provides input and guidance to management on selected issues. The board holds management accountable for sustainability and financial performance, as described in a board statement that we publish every year online (<http://aepsustainability.com/about/report/board.aspx>) and in our annual Corporate Accountability Report (<http://aepsustainability.com>). The board receives semi-annual updates on our progress, although discussion occurs throughout the year. AEP's Board of Directors does not have a committee specifically designated for sole oversight of climate change. The issue is regularly discussed by all board committees and the full board in the context of risk management and business strategy. Senior management reports regularly to the board on policy matters, financial risks, physical risks and mitigation.

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
All employees	Monetary reward	Emissions reduction project Emissions reduction target Energy reduction project Energy reduction target Efficiency project Efficiency target	AEP's compensation program is based on the fundamental premise of pay for performance. This compensation can come in several forms including, base pay and incentive pay. AEP offers both annual and long-term incentive programs to reward outstanding performance and achievement of business goals. AEP's business goals include achieving financial goals as well as longer-term strategic goals. Achieving annual financial goals are predicated upon successful execution of AEP's business strategy, which includes proactive deployment of emission abatement measures such as energy efficiency, highly efficient new generation and renewable energy. Furthermore, AEP includes strategic goals which are based on core commitments to AEP's business model that may have less of an immediate financial return as part of its incentive compensation plan. AEP's mission and vision include commitments to culture and business transformation as well as its voluntary emission reduction commitment (https://www.aep.com/about/mission/).
All employees	Monetary reward	Emissions reduction project Energy reduction project Efficiency project	Key Contributor Awards are annual recognition given to employees who go above and beyond their job expectations to provide a tangible benefit for AEP's business. This award comes with financial incentives and can be awarded to those who further AEP's business interests related to climate change management.
All employees	Recognition (non-monetary)	Emissions reduction project Energy reduction project Efficiency project	AEP's executives and managers have broad discretion in rewarding employees for actions which further the company's interest and image, including climate change education, communication action, public policy development and direct action.
Environment/Sustainability managers	Monetary reward	Emissions reduction project Emissions reduction target Energy reduction project Energy reduction target Efficiency project Efficiency target	AEP employees in Environmental Services, Legal, Corporate Sustainability, External Affairs, Governmental Affairs and Public Policy have specific performance goals related to climate change management written into their annual performance plans. Execution of these goals, through analysis, business development, stakeholder engagement and/or lobbying efforts directly impacts their annual compensation.

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	To whom are results	How far into the future	Comment
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monitoring	reported?	Geographical areas considered	are risks considered?
Six-monthly or more frequently	Board or individual/sub-set of the Board or committee appointed by the Board	As AEP's operations are solely within the U.S., primary consideration is given to domestic risks and opportunities. However, the global nature of climate change requires the constant monitoring of global policy initiatives, emission abatement commitments and technological developments to the extent they can/will influence our domestic response.	> 6 years

Our Enterprise Risk Management group, led by our chief risk officer, is responsible for developing the collective risk assessment of the company. This group gathers and analyzes information from functional business units at all levels of the company and reports to the Risk Executive Committee, which consists of members of the executive management team and functional unit representatives. The Risk Executive Committee makes recommendations to business unit leaders for risk mitigation, where appropriate, and monitors and reports findings/results to the Audit Committee of the AEP Board of Directors. Climate change risk is considered a major and material issue for AEP. Commensurate with risk identification and management, is opportunity identification and management. These opportunities are often directly linked to risk and are subject to similar monitoring and review.

CC2.1b
Please describe how your risk and opportunity identification processes are applied at both company and asset level

Risks and opportunities are generally identified by senior management or key subject matter experts, which can be found at all levels of the company. The risk could be as small as identification of a small generating unit (asset) issue that could lead to increased emissions or an opportunity for investment to reduce emissions. At the company level, public policy development is closely monitored because regulation of carbon emissions would have implications across our entire business. The information on these risks and opportunities flow up to through the management chain to senior executives and the Board of Directors as topics and issues that are perceived to be relevant or significant and follows the risk management processes outlined in 2.1(a).

AEP's Corporate Accountability Report development process serves as a main conduit for presenting these risks both internally and externally so that they are appropriately characterized. The Corporate Accountability Report also helps to foster collaborative discussions amongst AEP's stakeholders and help AEP shape its public image on climate and environmental issues. (www.AEPsustainability.com)

CC2.1c
How do you prioritize the risks and opportunities identified?

Risks and opportunities are prioritized based on both qualitative and quantitative analysis. Qualitative analysis includes monitoring public and political sentiment on climate change policy on the local, state and federal level as well as reviewing scientific literature related to potential climatic impacts. Quantitative analysis includes performing a variety of economic and financial analysis to assess potential future outcomes with varying levels of constraints being placed on carbon emissions. AEP has a long history of measuring and verifying its emissions as well as using a carbon price within its resource planning process to aid in quantification. These data points, coupled with sensitivity analysis and scenario exploration provide a framework for climate risk identification and mitigation. This prioritization helps both Enterprise Risk Management and Investment approvals that focus their efforts on what is most relevant to our operations. Generally speaking, the most risk is generated from coal-fired facilities which have higher CO2 emissions per unit of electrical output.

AEP's Board of Directors, on occasion, has requested management to provide additional in-depth analysis of climate-related risks as particular issues have become increasingly relevant. Key risks and opportunities associated with carbon-related impacts undergo constant evaluation by technical and policy experts within AEP.

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) Climate change is one of the most significant sustainability issues facing AEP, influencing both short- and long-term strategy. One major reason is our reliance on fossil fuels, including coal. Because of the company's proximity to the nation's coal fields, its legacy in coal-fueled generation, the expertise we developed over more than a century to improve the efficient use of coal and the huge investments we have made to reduce our environmental footprint, coal remains a vital part of AEP's fuel portfolio to insure a diversified resource base that protects reliability and security of the grid.

That being said internal teams routinely assess the risks posed from continued reliance on fossil fuels and actively manage to reduce this risk over time.

ii) Anticipated climate change regulatory policy has influence on AEP's business strategy given the carbon-intensive nature of our operations. Our strategy to diversify includes increasing our use of natural gas and renewable generation and reconfiguring the grid to support further integration of distributed energy resources, increased energy efficiency and demand response, and the growth of other customer-driven technologies. The expansion of renewable resources is a key driver of growth in our transmission business.

There is no doubt federal and state policy and society are moving toward the use of clean energy, regardless of what happens with the Clean Power Plan and because investors expect it. New and existing fossil-fueled generation resources will be expected to achieve higher efficiencies and include advanced environmental control capabilities. AEP's existing coal units are controlled or in the process of being controlled to achieve compliance with current environmental regulations. In the future, decisions to maintain these units will be driven by their ability to operate and perform economically as market conditions and environmental regulations change. Coal currently accounts for approximately 47 percent of AEP's generating capacity, but is expected to decline over time with additional investments in renewable energy and energy efficiency. (<http://aepsustainability.com/performance/>)

iii) Climate change has influenced our strategy in a number of ways. It has changed our customers' demands for energy, notably in that they increasingly expect us to integrate renewable sources into our energy mix. Additionally, the prospect of regulation, Clean Power Plan or otherwise, has impacted how we view the risk surrounding fossil fueled generating assets (<http://aepsustainability.com/performance/>).

iv & v) Climate change influences both AEP's short- and long-term business strategy. Climate change management has become increasingly integrated with our overall strategy through the use of a carbon price in corporate planning efforts and other strategic actions. In response to growing concern over climate change and the risks it presented to our business model, we took early, voluntary steps to reduce greenhouse gas emissions. These efforts included planting millions of trees and accepting a binding emission reduction requirement as a member of the Chicago Climate Exchange, to building the world's first carbon capture and storage validation facility at our Mountaineer Plant in West Virginia. Additionally, we strategically diversified our operations over the past decade and a half, integrating 4,166 MW of renewable energy and approximately 2,000 MW of energy efficiency / demand side management. Furthermore, we also have added approximately 5,000 MW of highly efficient natural gas generation to our portfolio since 2004. (<http://aepsustainability.com/performance/>)

As a result of these early actions in recognition of future risk (in addition to other factors such as low natural gas prices and coal unit retirements), AEP has reduced CO2 emissions by 44% from 2000 levels (<http://www.aepsustainability.com/environment/>). Currently, AEP's generation portfolio is 47% coal. However, coal's share of our portfolio is projected to continue to decline in the future, while energy efficiency and renewable energy shares will continue to grow. This reflects a substantial change in our operations.

vi) As the majority of AEP's utility business is in the form of regulated monopoly, AEP does not face direct "competition." However, AEP's operations are now less carbon intensive than previously, which will provide a strategic advantage in responding to future climate regulations. This will allow for future capital to be spent where it can generate the largest value to our customers and investors.

vii) During the reporting year, AEP strategically shifted capital investment from generation to transmission in part due to the recognition of the regulatory risks associated with continued investment in fossil fuels. Our investments in transmission improve reliability for all customers and enable the connection of renewable

resources to the grid, furthering emission reduction initiatives. In 2016, AEP also retired two additional coal units and increased renewable energy resources and other technologies, helping to lower AEP carbon emission profile and remove regulatory risk.

viii. The Paris Agreement has influenced AEP's strategy in so much that the U.S. commitment was partially predicated upon regulation of CO2 emissions from electric generators under the Clean Power Plan. While future of the U.S.'s continued participation in the Paris Agreement and fate of the Clean Power Plan are uncertain, AEP remains committed to transitioning to a cleaner energy future.

ix. AEP is a sponsor of the Electric Power Research Institute, which conducts the forward-looking scenario analyses on behalf of membership. These scenarios include examining the implications of various emission pathways and resources mixes. This work helps to inform AEP's internal planning processes and investment strategy.

CC2.2c

Does your company use an internal price on carbon?

Yes

CC2.2d

Please provide details and examples of how your company uses an internal price on carbon

AEP uses a carbon price within its Integrated Resource Planning (IRP) process to appropriately capture the potential future policy and regulatory risk associated with scope 1 and 2 carbon emissions. The IRP process is the fundamental pathway in which we assess and plan for providing reliable electric supply to our customers over a longer-term time horizon. The IRP is a formal process within many of our states, which involves publically disclosing a plan for future operations and resources that is subject to review by regulators and stakeholders. In most cases, it includes a robust stakeholder process to inform the plan's development. AEP's IRP process considers all available resource and market options to achieve the least-cost plan that provides the energy and capacity resources customers need and value (<https://www.appalachianpower.com/info/projects/IntegratedResourcePlans/>).

The carbon price used within the IRP process is a fundamental input that places a relative value on carbon dioxide emissions from AEP's electric generating facilities and future facilities that may be considered within the planning process. The effects of carbon pricing are further integrated into AEP's forecasts for commodity pricing, including wholesale electricity, natural gas and coal. The use of a carbon price favors investment in new zero- or low-carbon generation technologies as well as gradual retirement of older carbon-intensive generating sources.

AEP's current carbon price reflects an expected market value for carbon emissions predicated upon either legislation or regulatory action requiring carbon emission reductions in the middle of the next decade.

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
- Other

CC2.3a

On what issues have you been engaging directly with policy makers?

Focus of legislation	Corporate Position	Details of engagement	Proposed legislative solution
Cap and trade	Support with minor exceptions	AEP supported the Waxman-Markey climate bill in 2009 which would have implemented a cap-and-trade program. AEP continues to support this type of approach in lieu of regulation through the Clean Air Act. Engagement occurs through various forms of communication with regulators, policymakers and stakeholders. These discussions generally occur at the federal level given the global scope of the underlying issue. AEP also is a member of the International Emissions Trading Association (IETA) which is a vocal advocate for market-based emission reduction programs. AEP chaired IETA in 2015.	AEP will continue to advocate for this approach to climate policy as the most economical way to address the climate issue and balance cost and benefits. However, political deadlock in Washington D.C. has rendered this approach dormant for the time being.
Carbon tax	Oppose	While a carbon tax represents a potential source of revenue, its disadvantages for the economy and the electric power and energy industry in particular, and the uncertainty of the environmental benefits that would be achieved, keep it from becoming a reasonable policy solution. Engagement occurs through various forms of communication with regulators, policymakers and stakeholders, generally at the federal level, though many state regulators are also interested in our position.	AEP will continue to maintain that this type of approach does not represent a workable solution to reduce carbon emissions.
Energy efficiency	Support with minor exceptions	AEP supports federal and state policy initiatives to improve the energy efficiency of the U.S. economy. AEP supports reasonable and justified policies that do not adversely impact any individual customers or businesses, including AEP. Engagement occurs through various forms of communication with regulators, policymakers and stakeholders. This engagement occurs both at the federal level as well as the state level on energy efficiency legislation and potential regulations. Engagement is focused especially on those state officials and regulators involved in setting the required amounts of energy efficiency to be achieved by our customers.	AEP will continue to support energy efficiency policies where cost effective measures can be achieved.
Clean energy generation	Support with minor exceptions	AEP has been gradually adding various forms of lower-emitting energy to its electric system and believes that such sources can play an increasing role in the diversification of the U.S. generating mix. However, policies to support clean energy need to carefully balance long-term objectives with cost impacts. Engagement occurs through various forms of communication with regulators, policymakers and stakeholders. Seven of the states in which AEP operates have renewable or alternative energy portfolio standards and AEP continues to have dialogues with regulators and policymakers in all of its states regarding potential new or modified standards.	AEP will continue to support incentives for lower-emitting generation and appropriate fuel diversity for the U.S. electric grid.

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	Is your position on climate change	Please explain the trade association's position	How have you, or are you attempting to, influence the
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association	consistent with theirs?		position?
Edison Electric Institute	Consistent	As Congress works to address this issue, it is essential to include effective consumer protection measures that help to reduce price increases for consumers and avoid harm to U.S. industry and the economy. (www.eei.org/ourissues/the Environment/climate/Pages/default.aspx)	AEP serves on several committees and in leadership positions in EEI.
U.S. Chamber of Commerce	Consistent	A deeper understanding of the issues and developing science associated with the environment and climate change will influence national and global energy, economic, and environmental policy choices. Balancing these priorities requires greater consideration of the complex processes driving climate change and increased attention to adaptation measures. We must increase our investment in climate science, which will enable us to adjust policies as scientific understanding advances. At the federal level, we need better coordination and collaboration across agencies for policy coherence and balance. (http://www.energyxxi.org/invest-climate-science-guide-energy-economic-and-environmental-policy)	AEP is a member of the U.S. Chamber of Commerce, as are many of our customers. We believe it is important to be at the table for our views to be heard. We may not always be in a position of influence on any single issue, but we actively engage on a range of issues.
American Coalition for Clean Coal Electricity	Consistent	The American Coalition for Clean Coal Electricity (ACCCE) advocates for public policies that advance environmental improvement, economic prosperity and energy security. ACCCE believes that the wise use of coal – one of America’s most abundant, domestically produced energy resources – is essential to providing affordable, reliable electricity for millions of U.S. consumers and a growing domestic economy. Further, ACCCE is committed to continued and enhanced U.S. leadership in developing and deploying new, advanced clean coal technologies that protect and improve the environment. Finally, ACCCE closely follows issues and public policy deliberations at the federal and state levels. (http://www.americaspower.org/issues-policy)	AEP remains a funding member of ACCCE, but reduced its membership level in 2015.
International Emissions Trading Association	Consistent	The International Emissions Trading Association (IETA) composed of over 100 multi-national companies has been an advocate for cost-effective climate policies around the world. The organization is a leading business advocate for a cost-effective and workable framework for greenhouse gas emission reductions using emissions trading, offsets and other market mechanisms. However, IETA does not take positions regarding the degree of stringency of climate legislation or regulations.	AEP currently serves on the board of IETA and has been a board member for 15 years.
Business Roundtable	Consistent	Business Roundtable is an association of chief executive officers of leading U.S. companies working to promote a thriving economy and expanded opportunity for all Americans through sound public policy. Access to reliable, affordable energy undergirds U.S. national and economic security, and a clean, healthy environment is essential for economic prosperity now and for future generations. Business Roundtable supports policies that capitalize on America’s strengths in technology and energy diversity to maximize U.S. energy options and preserve environmental quality. The business community has a special obligation to step forward and help build an environmentally and economically sustainable future	In 2016 AEP chaired the Energy and Environment Committee.
Global Sustainable Electricity Partnership	Consistent	The mission of the Global Sustainable Electricity Partnership is to play an active role in addressing global electricity issues and to promote sustainable development worldwide. - Develop joint policy frameworks and implement related initiatives in both domestic and international markets. - Engage in the global debates on electricity-related issues, taking joint positions. - Provide information and expertise on the efficient generation and use of electricity to assist developing countries in strengthening their human capabilities.	AEP serves on the Board of Directors.

CC2.3d
Do you publicly disclose a list of all the research organizations that you fund?

No

CC2.3e
Please provide details of the other engagement activities that you undertake

During the last decade, AEP has cultivated a commitment to engagement and transparency by being accessible, responsive, honest and open with those with whom we engage. We seek to foster healthy, trusting relationships that turn conflict into cooperation and, ultimately, into partnership. In 2016 we expanded our engagement efforts (<http://www.aepsustainability.com/social/stakeholder/>).

There is continuing dialogue and general agreement that technology, policy, timing and collaboration are all critical to a clean energy transition plan. As a result, AEP holds periodic calls and meetings with stakeholders to keep the channels of communication open and continue information sharing as well as looking for areas of collaboration, particularly as it relates to carbon emission reductions.

Stakeholder engagement in 2016 was largely dominated by carbon and the evolving utility business model. Although we disagree on some aspects, we agreed to try to identify opportunities to work together that would benefit the states we serve.

For example, we agreed that renewable energy, energy efficiency and grid modernization initiatives will be critical for the future, regardless of what happens with the Clean Power Plan. As AEP diversifies its energy portfolio, we will be looking for opportunities to work together to seek state commission support for utility investments in options such as universal-scale solar projects that make renewable energy accessible to more customers.

Another avenue of stakeholder engagement occurs in our integrated resource planning (IRP) process. (<http://www.aepsustainability.com/energy/planning.aspx>) Most of our states have formal stakeholder processes for developing these resource plans, while others are more informal. In all cases, the intent is to be inclusive, listen to stakeholder ideas and concerns, answer their questions and consider their input as we develop resource plans for our jurisdictions. These discussions include climate risk mitigation.

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?

Memberships in all directly funded or supported organizations are regularly reviewed by the Memberships and Contributions group within AEP to ensure consistency. Additionally, executives and/or subject matter experts hold either board level or advisory positions within many of these organizations to further ensure consistency.

AEP also publicly discloses the trade association membership dues to organizations where a portion of the dues is dedicated to lobbying efforts. It is available only on the web. (<http://aep.com/investors/CorporateLeadersAndGovernance/PoliticalContributionsLobbyingActivities.aspx>)

Further Information

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

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 1	99%	10%	2010	134000000	2020	No, but we anticipate setting one in the next 2 years	The use of the term "science-based" to categorize emissions targets is misleading given the uncertainties in science, timing and apportionment of responsibilities between entities.

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	60%	100%	AEP's 2016 emissions (as tracked per the actual commitment) were 31% below 2010 levels and AEP remains on track to meet or exceed this goal by 2020.

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
Product	In some jurisdictions AEP operating companies or affiliates market 100% renewable electricity, which represents a low carbon product.	Low carbon product	Other:	0%	Less than or equal to 10%	Revenue is less than 0.5% of total revenue
Product	AEP has begun to invest in electric vehicle charging infrastructure which will allow for additional vehicle electrification and avoided transport emissions.	Avoided emissions	Other:	0%	Less than or equal to 10%	Revenue is less than 0.5% of total revenue

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	6	
To be implemented*	3	15000000
Implementation commenced*	4	681000
Implemented*	2	18000000
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
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Product design	Deployment of BOLD Transmission Technology		Scope 1 Scope 2 (location-based)	Voluntary			>25 years	Ongoing	Our new, patented BOLD transmission line design helps to more efficiently deliver power. The 345 kilovolt (kV) line design delivers up to 60 percent more power in a smaller right-of-way than conventional designs and using low-impedance bundled conductors, BOLD lines can save up to 40% of the energy that is lost during power transmission using existing lines, resulting in fewer GHG emissions. (http://www.boldtransmission.com/)
Low carbon energy installation	Community Scale Solar Photovoltaic Installation	6000	Scope 1	Voluntary	0	42400000	16-20 years	16-20 years	Indiana Michigan Power (I&M), an operating unit of American Electric Power began to add solar energy to its generation fleet in 2016 following the Indiana Utility Regulatory Commission's approval of I&M's plans for four solar facilities with a combined capacity of 14.7 megawatts. The estimated cost of the project is \$42.4 million and was completed in 2016.
Process emissions reductions	Retirement of Coal-Fired Generating Units	18000000	Scope 1	Voluntary Mandatory	0	0	4-10 years	Ongoing	AEP retired more than 6,500 MW of coal-fired generating capacity in 2015 and 2016. In their last full year of operation, these generating units emitted approximately 18 million metric tons of CO2 combined.
Energy efficiency: Building services	Implementing Energy Efficiency Programs	681000	Scope 1	Voluntary Mandatory	169000000	169000000	4-10 years	Ongoing	AEP's operating companies continue to implement measures to help reduce the energy consumption of our customers. AEP spent \$169 million on energy efficiency measures in 2016, saving more than 1 million MWh of electricity. This effort is on going.
Low carbon energy installation	Deploying Renewable Energy for our Regulated Customers	15000000	Scope 1	Voluntary			4-10 years	16-20 years	AEP's operating companies currently having integrated resource plans indicating the development of 3200 MW of new solar and 4900 MW of wind by 2030 to serve AEP customers. Based on AEP's current carbon intensity, these project could potentially displace approximately 15 million metric tons of CO2 per year by 2030. These investments are subject to regulatory approval and the amount undertaken could change over time.

CC3.3c

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

Method	Comment
Compliance with regulatory requirements/standards	Since our electric rates are regulated, we are only allowed to pass along costs to customers for activities that are deemed to be economically prudent or mandated by law. EPA regulations governing emissions from existing electric generators could drive significant investment in the future.
Employee engagement	Employees are actively engaged in forums, regular communications, contests and opportunities to identify and promote energy efficiency activities and technology development. These actions included many related to process efficiency and renewable technologies, directly reducing CO2 production.
Internal price on carbon	AEP utilizes an internal price of carbon in all generation planning decisions, which influences and encourages investment in low-carbon generation and divestment of high-carbon generation.
Partnering with governments on technology development	AEP has partnered with the government on various technology development initiatives including carbon capture and storage development and smart grid deployment. (http://www.aepsustainability.com/energy/technology/columbus.aspx)
Dedicated budget for energy efficiency	Each of AEP's subsidiaries has an Energy Efficiency Manager that has a budget dedicated to energy efficiency projects in the company's jurisdiction. Results vary by jurisdiction. In 2016, AEP invested approximately \$169 million in energy efficiency and demand response initiatives and has more than 100 energy efficiency and demand response programs in place across its service territory. As a result the AEP system reduced consumption by greater than 1 million MWh.
Financial optimization calculations	All AEP investments are optimized using a carbon price and other assumptions related to regulatory risk, including those presented by carbon.

Further Information

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 voluntary communications	Complete	http://www.aepsustainability.com/environment/climate/	https://www.cdp.net/sites/2017/89/689/Climate Change 2017/Shared Documents/Attachments/CC4.1/AEP Carbon Webpage.pdf	

In mainstream reports (including an integrated report) but have not used the CDSB Framework	Complete	pdf pgs 21, 25	https://www.cdp.net/sites/2017/89/689/Climate Change 2017/Shared Documents/Attachments/CC4.1/2016AnnualReportAppendixAtoProxy.pdf
In other regulatory filings	Complete	pdf pgs 60, 150	https://www.cdp.net/sites/2017/89/689/Climate Change 2017/Shared Documents/Attachments/CC4.1/2016 APCO VA IRP_Public_Version_04262016.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
Air pollution limits	The U.S. EPA has begun to regulate GHG emissions through the Clean Air Act (CAA) through its Prevention of Significant Deterioration / New Source Review (PSD/NSR) programs and New Source Performance Standards for GHGs for new and existing sources. Given the magnitude of the transition to a reduced carbon electric sector, AEP believes this issue should be addressed legislatively. However, absent legislation, these provisions could place additional GHG emission limitations on AEP facilities going forward.	Increased operational cost	3 to 6 years	Direct	Very likely	Medium-high	Financial implications will depend on the stringency of the standard as well as the flexibility afforded in demonstrating compliance. AEP will look to quantify this exposure once final regulations are issued and state compliance plans are developed.	AEP monitors and engages in the public debate surrounding climate change regulation. Additionally, AEP has taken numerous voluntary steps to reduce its carbon emissions profile, thus lowering risk. Furthermore, AEP incorporates a carbon price into its planning practices in anticipation of potential future climate change regulatory risk.	Minimal (<\$1mm). Part of existing management practices.
Carbon taxes	While less politically tenable than other forms of carbon regulation, enactment of a carbon tax could result in significant cost to AEP and its customers as AEP's generation portfolio is relatively carbon intensive. This would result in increased operational and capital costs, as there would	Increased operational cost	>6 years	Direct	Unlikely	High	At current CO2 emission levels of over 90 million metric tons, a hypothetical CO2 tax of \$20 per ton would cost AEP almost \$2 billion per year. However, much of this	AEP monitors and engages in the public debate surrounding climate change regulation. Additionally, AEP has taken numerous voluntary steps to reduce its carbon emissions profile, thus lowering risk.	Minimal (<\$1mm). Part of existing management practices.

	be an economic incentive to transition to a lower carbon generating mix.						cost would be a pass-through to our customers in the form of higher electric rates.	Furthermore, AEP incorporates a carbon price into its planning practices in anticipation of potential future climate change regulatory risk.	
Cap and trade schemes	In light of the failure of cap-and-trade legislation within the 111th Congress, it appears that this type of regulation will not be likely in the near term. However, longer term there is still a distinct possibility this type of program could ultimately be used to regulate carbon due to its economic advantages. There is also the possibility that cap-and-trade systems could be used as part of a State Implementation Plan or Federal Implementation Plan in response to EPA's Clean Power Plan, should the rule remain upheld by the courts. Any cap-and-trade system would likely result in increased operational and capital costs, though the magnitude could vary widely depending on the details of the program.	Increased operational cost	>6 years	Direct	More likely than not	Medium-high	Financial implications of a cap and trade system would be a function of both the emission targets and the emission allowances AEP is allocated. A free allocation of allowance would make this approach much less costly	AEP monitors and engages in the public debate surrounding climate change regulation. Additionally, AEP has taken numerous voluntary steps to reduce its carbon emissions profile, thus lowering risk. Furthermore, AEP incorporates a carbon price into its planning practices in anticipation of potential future climate change regulatory risk.	Minimal (<\$1mm). Part of existing management practices.
Emission reporting obligations	AEP is required to formally report GHG emissions for each power plant to the U.S. EPA. This is not a significant issue for AEP because we have been tracking CO2 emissions from our power plants since 1993 through the EPA's Acid Rain program and reported emissions to the EPA's Climate Leaders program and the Chicago Climate Exchange beginning in 2003. There are other smaller sources of GHGs at our facilities that have not been routinely inventoried (less than 1% of our emissions), and we have established an electronic reporting system to collect this new information.	Increased operational cost	Up to 1 year	Direct	Virtually certain	Low	No incremental cost outside of management cost.	AEP utilizes information management systems to collect CO2 data and internal staff to appropriately populate required reports.	Minimal (<\$1mm). Part of existing management practices.
Fuel/energy taxes and regulations	In 2016, AEP consumed 41 million tons of coal. Should additional coal mining regulations, such as those associated with environmental regulations, be enacted and enforced, the costs of coal production could go up and as a result AEP would be forced to pay more for coal. The same is true for the cost of new, proposed environmental regulations, which would have significant financial costs for AEP and its customers and could be viewed as a de facto tax. Likewise, environmental concerns over shale natural gas production could also lead to increased regulation and an increased	Increased operational cost	>6 years	Direct	Very unlikely	Medium	Financial implications are unknown as any impact will be depend on specific regulatory requirements. For AEP's vertically-integrated utilities, increased fuel costs are directly passed on to consumers. At current CO2 emission levels of over 90 million metric tons, a	AEP monitors and engages in the public debate surrounding climate change regulation. Additionally, AEP has taken numerous voluntary steps to reduce its carbon emissions profile, thus lowering risk. Furthermore, AEP incorporates a carbon	Minimal (<\$1mm). Part of existing management practices.

	production cost. This increased production cost would be passed on to AEP in the form of higher natural gas prices. Ultimately, these costs are mostly borne by customers.						hypothetical CO2 tax of \$20 per ton levied on fossil fuels would cost AEP almost \$2 billion per year	price into its planning practices in anticipation of potential future climate change regulatory risk.	
Product efficiency regulations and standards	AEP is subject to a number of energy efficiency requirements in several states in which it operates. These requirements direct AEP to provide services to enable customers to reduce electric consumption. These programs coupled with increasing federal efficiency mandates reduce AEP's sales.	Increased operational cost	Up to 1 year	Direct	Virtually certain	Low-medium	In 2016, AEP spent \$169 million on energy efficiency programs. Further regulations could increase this spend incrementally. In most jurisdictions cost of programs are borne by ratepayers. Some states have programs that also compensate AEP for net lost revenues. Codes or standards which reduce energy use also can reduce AEP's revenue.	AEP has staff at the corporate level which oversees consumer programs and forecasts levels of energy efficiency that may be required. Individual operating companies have direct oversight over programs implemented. AEP is actively involved in creating regulatory recovery mechanisms that are indifferent to customer usage and that compensate AEP appropriately for costs.	Cost of management is embedded within total program cost (\$169mm) and is largely recovered from customers.
Voluntary agreements	AEP has taken measurable, voluntary actions to reduce and offset our CO2 emissions. AEP participated in a number of voluntary programs to monitor, mitigate or reduce CO2 emissions, such as the U.S. EPA's Climate Leaders and The Chicago Climate Exchange, but many of these programs have been discontinued due to anticipated legislative or regulatory actions. Through the end of 2010, AEP reduced emissions by a cumulative 96 million metric tons from adjusted baseline levels in 1998 through 2001 as a result of these voluntary actions. Going forward, AEP has set a target of reducing emissions by 10% from 2010 levels by 2020. We believe most all of the CO2 reductions will occur as the result of coal unit retirements. These coal retirements are necessitated due to the increasing environmental regulations of other air emissions, solid waste and water use. Other factors include the cost competitiveness of natural gas and a continued slow economic recovery across our service territory. However, should regulations change or electricity use dramatically increase, AEP's stated CO2 reduction obligation could result in additional costs as well as increased emissions.	Increased operational cost	Up to 1 year	Direct	Virtually certain	Low	As AEP is currently ahead of its voluntary 2020 CO2 emission reduction target, it is currently projected that there will be no incremental cost.	AEP tracks this commitment and reports results in its annual Corporate Accountability Report.	Minimal (<\$1mm). Part of existing management practices.
	Until regulations are finalized, there is significant uncertainty as								

<p>Uncertainty surrounding new regulation</p>	<p>to the ultimate outcome. Additionally, in recent years, legal challenges to almost every major EPA rulemaking have added additional uncertainty and cost. This uncertainty can lead to uneconomic decisions being made during the planning process as the ultimate goals are subject to change. These uneconomic decisions will lead to increased capital and operating costs. While general environmental regulations mentioned above will have a large impact on AEP operations, the uncertainty regarding climate regulation or legislation is a more challenging risk to manage.</p>	<p>Increased capital cost</p>	<p>>6 years</p>	<p>Direct</p>	<p>Virtually certain</p>	<p>Medium</p>	<p>Financial implications of uncertainty are unknown as the implications can only be calculated retrospectively.</p>	<p>AEP uses Monte Carlo analysis and other probabilistic analysis to capture the effects of uncertainty within planning processes in an effort to reduce costs and risk.</p>	<p>Minimal (<\$1mm). Part of existing management practices.</p>
<p>Other regulatory drivers</p>	<p>Some of AEP's states have laws or commission orders that establish requirements or goals for renewable and/or alternative energy (Ohio, Michigan, West Virginia, Texas, Virginia and Oklahoma) and we are taking steps to comply with these rules in a timely fashion. AEP's operating companies have 2,897 MW of renewable energy purchase power agreements delivering energy.</p>	<p>Increased operational cost</p>	<p>Up to 1 year</p>	<p>Direct</p>	<p>Virtually certain</p>	<p>Low-medium</p>	<p>Costs of renewable energy often come at a premium to conventional energy sources. The cost of mandated renewable energy programs is generally fully recoverable from customers. However, mandates for renewable energy sources can result in depressed wholesale electric prices and reduce AEP's revenue opportunities.</p>	<p>AEP monitors and engages in the public debate surrounding renewable energy regulation to ensure that sensible policy prevails. Where mandates have required renewable energy purchases AEP often employs a competitive bidding strategy to ensure the lowest possible cost of supply. As we increase our renewable portfolio, we need to increase our knowledge of these resources as they interact with the power grid. We are doing this by participating in renewable energy trade organizations. We have been members of the American Wind Energy Association for more than a decade. AEP also has joined with the Edison Electric Institute, the World Resources Institute and the World Wildlife Fund to advocate for a set of "buyer's principles" where large customers that want</p>	<p>AEP has several internal personnel who are tasked with managing our renewable energy needs.</p>

								renewable energy and need their energy company to achieve their goal, work together to develop a solution. AEP's Key Accounts and Economic & Business Development teams are collaborating on this effort to serve current customers and as part of our strategy to attract new businesses to our service territory.	
International agreements	While international negotiations on climate change have yet to lead the U.S. into any binding commitment, progress has been made. A binding commitment from the U.S. toward a reduction pathway would not likely represent a direct risk to AEP but could lead to other risks (covered in this section) that are more likely.	Increased operational cost	>6 years	Direct	About as likely as not	Medium	No direct implications, though could increase risk of financial implications from other regulatory drivers should the U.S. sign on to a broader international accord.	AEP monitors and engages in the public debate surrounding climate change regulation. Additionally, AEP has taken numerous voluntary steps to reduce its carbon emissions profile, thus lowering risk. Furthermore, AEP incorporates a carbon price into its planning practices in anticipation of potential future climate change regulatory risk.	Minimal (<\$1mm). Part of existing management practices.
Other regulatory drivers	When AEP builds plants or retrofits a plant with emissions control equipment it must do so in such a way as to ensure that the plant is cost effective relative to alternative generation sources for a significant period of up to 30 or 40 years to recover the investment in the plant. For example, if new technology or cheaper fuel alternatives are developed then the plant may no longer be viewed as cost effective and the company could have stranded investments. This has already occurred with the new EPA regulations on SO2, NOX and hazardous air pollutants. AEP wants to invest in generation that will be cost effective for the long-term benefit of customers; however, there is risk in attempting to predict which technology and generation types will be cost effective over the long term.	Increased capital cost	>6 years	Direct	Very likely	Medium	Financial implications of this type of regulatory uncertainty are unknown as the implications can only be calculated retrospectively.	AEP monitors and engages in the public debate surrounding climate change regulation. Additionally, AEP has taken numerous voluntary steps to reduce its carbon emissions profile, thus lowering risk. Furthermore, AEP incorporates a carbon price into its planning practices in anticipation of potential future climate change	Minimal (<\$1mm). Part of existing management practices.

CC5.1b
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 mean (average) temperature	The sale of electric power is generally a seasonal business. In many parts of the country, demand for power peaks during the hot summer months, with market prices also peaking at that time. In other areas, power demand peaks during the winter heating season. The pattern of fluctuation may change due to the nature and location of AEP's facilities and the terms of power sales contracts into which AEP enters. In addition, AEP has historically sold less power and, consequently, earned less income, when weather conditions are milder. Unusually mild weather in the future could diminish AEP's need to generate electricity and may impact its financial condition.	Reduced demand for goods/services	>6 years	Direct	Unknown	Unknown	Financial implications will depend on degree of temperature departure from normal as well as its seasonality.	AEP actively engages in hedging and other activities to reduce exposure to changes in customer demand and market pricing. AEP also continually assesses trends in temperature for forecasting purposes. Furthermore, potential weather variability is one of several factors examined within AEP financial forecasting and corporate budgeting processes.	Minimal (<\$1mm). Part of existing management practices.
Change in	Electric systems are planned to ensure that supply is maintained during the highest demand periods, which will also meet needs during low and medium demand periods. The periods of highest demand typically coincide with	Increased					Extreme weather events can require use of expensive generation sources and potentially threaten grid reliability.	AEP and the Regional Transmission Organizations that it is a member of consider extreme weather conditions within reserve margin calculation and other planning constructs. AEP also continually assesses trends in	Minimal (<\$1mm). Part of

temperature extremes	periods of temperature extremes (hottest and coldest days of the year). A change in temperature extremes could increase the challenge of planning for peak demands, given the lead time required to add new generating capacity to the grid.	operational cost	>6 years	Direct	Unknown	Unknown	There are also social and financial impacts to customers due to outages and the cost of restoration.	temperature for forecasting purposes. Furthermore, potential weather variability is one of several factors examined within AEP financial forecasting and corporate budgeting processes.	existing management practices.
Change in mean (average) precipitation	AEP owns and operates 15 hydroelectric facilities and a pumped storage facility that contribute to cleaner energy resources on our system. These facilities generate approximately 1,500 gigawatt-hours of power each year, serving customers in five states. Reduced precipitation could result in less river flow and thus less electricity production. Likewise, reduced river flow in extreme situations could reduce production capacity for AEP's thermal generating units that rely on river water for cooling purposes. Increased precipitation could lead to increased river flooding, which could impact river transportation of coal and other consumables used by AEP generating facilities. For example, severe droughts in Texas raise concerns for several of our	Reduction/disruption in production capacity	>6 years	Direct	Unknown	Unknown	Assuming a hypothetical \$40/MWh incremental cost of replacement power if hydroelectric electricity needs to be replaced, a hypothetical 10% reduction in hydro generation would cost AEP approximately \$6 mm/year.	AEP produces electricity from a number of diverse sources with to allow for use of other generating sources should some become less available. Furthermore, potential weather variability is one of several factors examined within AEP financial forecasting and corporate budgeting processes.	Minimal (<\$1mm). Part of existing management practices.

	<p>plants, even though they are located on reservoirs built specifically to supply the plants. Additionally, droughts can also cause challenges to the boats and barges that deliver coal and other consumables to AEP's generating facilities.</p>								
Change in precipitation pattern	<p>Changes in precipitation patterns could result in less river flow and/or more seasonal variation which could disrupt hydroelectric electricity production. Likewise, reduced river flow in extreme situations could reduce production capacity for AEP's thermal generating units that rely on river water for cooling purposes. Increased precipitation in certain areas could lead to increased river flooding, which could impact river transportation of coal and other consumables used by AEP generating facilities.</p>	Reduction/disruption in production capacity	>6 years	Direct	Unknown	Unknown	<p>Assuming a hypothetical \$40/MWh incremental cost of replacement power if hydroelectric electricity needs to be replaced, a hypothetical 10% reduction in hydro generation would cost AEP approximately \$6 mm/year.</p>	<p>AEP produces electricity from a number of diverse sources to allow for use of other generating sources should some become less available. That is why it is so important to have a diverse resource portfolio. AEP also stockpiles fuel and other consumables to prevent against supply interruptions. Furthermore, potential weather variability is one of several factors examined within AEP financial forecasting and corporate budgeting processes.</p>	<p>Minimal (<\$1mm). Part of existing management practices.</p>
	<p>AEP owns and operates 15 hydroelectric facilities and a pumped storage facility that contribute to cleaner energy resources on our system. These facilities generate approximately 1,500 gigawatt-hours of power each year, serving customers in five states.</p>								

<p>Change in precipitation extremes and droughts</p>	<p>Reduced precipitation could result in less river flow and thus reduced electricity production. Likewise, reduced river flow in extreme situations could reduce production capacity for AEP's thermal generating units that rely on river water for cooling purposes. Also, reduced precipitation could negatively impact AEP's water rights negotiations in drought-prone areas. Increased precipitation in certain areas could lead to increased river flooding, which could impact river transportation of coal and other consumables used by AEP generating facilities. Conversely, drought situations could result in increased wildfires which could adversely affect AEP's facilities and transmission network.</p>	<p>Reduction/disruption in production capacity</p>	<p>>6 years</p>	<p>Direct</p>	<p>Unknown</p>	<p>Unknown</p>	<p>Assuming a hypothetical \$40/MWh incremental cost of replacement power if hydroelectric electricity needs to be replaced, a 10% reduction in hydro generation would cost AEP approximately \$6 mm/year.</p>	<p>AEP produces electricity from a number of diverse sources which allows the use of other generating sources should some become less available. That is why it is so important to have a diverse resource portfolio. AEP also stockpiles fuel and other consumables to prevent against supply interruptions. Furthermore, potential weather variability is one of several factors examined within AEP financial forecasting and corporate budgeting processes.</p>	<p>Minimal (<\$1mm). Part of existing management practices.</p>
<p>Snow and ice</p>	<p>Snow and ice regularly impact our operations, most notably as snow/ice build-up on tree limbs can cause them to fall onto power lines and interrupt service. Restoring service results in additional maintenance expenditures, affects customer satisfaction and can lead</p>	<p>Increased operational cost</p>	<p>Up to 1 year</p>	<p>Direct</p>	<p>Virtually certain</p>	<p>Low-medium</p>	<p>Repairs to snow and ice damaged equipment lead to increased capital and O&M costs.</p>	<p>New design criteria to strengthen, or harden, the distribution system took effect in early 2014. AEP designs new and replacement poles to withstand wind speeds and ice accumulation above and beyond the National Electrical Safety Code (NESC) requirement for our service territory. The ice build-up component has been increased to one inch of ice in the central and northern portions of AEP's service territory from a quarter- to a half-inch, respectively. In the southern portion of our territory, where high winds are the primary driver of major storm damage, we have increased the system's ability to withstand high winds from 60 mph to 90 mph. Along the Gulf coast</p>	<p>Minimal (<\$1mm). Part of existing management practices.</p>

to additional regulatory oversight.

we continue to design facilities to withstand 150 mph winds. Furthermore, potential weather variability is one of several factors examined within AEP financial forecasting and corporate budgeting processes.

CC5.1c
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
Reputation	Environmental performance is an important part of AEP's reputation. While most of our demand is met through regulated operations we do have some areas in which we operate in competitive retail markets and AEP's brand plays a role in consumer behavior.	Reduced demand for goods/services	Up to 1 year	Direct	Unlikely	Low	While the majority of AEP's business is a regulated monopoly, reputation could affect the ability of AEP's retail sales affiliate to retain or attract customers.	AEP actively positions itself as a leader in addressing climate-related issues through stakeholder outreach, transparency via the annual Corporate Accountability Report, ongoing political outreach and other forms of communication.	AEP has considerable resources dedicated to community, stakeholder, political and customer relations.
Changing consumer behavior	An increased focus on environmental performance, climate change and energy consumption by our customers could result in less demand for electricity. Another driver that could impact future demand for centrally-generated electricity is the growing adoption of self-generated electricity. As the cost of solar continues to decline, and with the extension of federal investment tax credits, customer adoption may continue to increase over time. However, we believe that installing private solar panels remains economically challenging for most residential customers.	Reduced demand for goods/services	3 to 6 years	Direct	About as likely as not	Low	Declining retail sales would require rate increases to spread AEP's operating costs over fewer kWh, which could lead to reduced earnings.	AEP is actively involved in creating regulatory recovery mechanisms that are indifferent to customer usage and that compensate AEP appropriately for costs.	Minimal
Induced changes in human and cultural environment	Customers have expressed an interest in reducing energy consumption via energy efficiency. Partially a result of input from stakeholders and support from regulators and customers, AEP has increased its commitment to energy efficiency in the last five years.	Reduced demand for goods/services	>6 years	Direct	About as likely as not	Low	Declining retail sales would require rate increases to spread AEP's operating costs over fewer kWh, could lead to reduced earnings.	AEP is actively involved in creating regulatory recovery mechanisms that are indifferent to customer usage and that compensate AEP appropriately for costs.	Minimal
Fluctuating socio-economic conditions	Account delinquencies can be a measure of economic growth or downturn which could be impacted by climate change or climate change policy as it relates to customer bills. We work with customers to help keep them from being delinquent, providing payment plans and other forms of assistance. We connect them with energy assistance programs when appropriate. AEP customers received approximately \$65	Increased operational cost	>6 years	Direct	About as likely as not	Low	Changes in socio-economic conditions could result in declining retail sales and increased needs for	AEP actively monitors economic indicators as part of its financial planning process.	Minimal

	million in energy assistance in 2016. Even though AEP's rates remain below the national average, our customers generally live in lower-income regions and are particularly sensitive to rate increases.						energy assistance		
Increasing humanitarian demands	Should climate change result in economic damages, there could be increasing humanitarian demands.	Increased operational cost	>6 years	Direct	About as likely as not	Low	AEP's 2016 total philanthropic giving was \$20.8 million. Through grants, AEP also provided approximately \$65.3 million in federal and private energy assistance in 2016. These figures could increase if funds are available and demand increases.	AEP actively monitors economic indicators as part of its financial planning process.	Minimal

Further Information

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	International agreements could lead to other climate change actions within the U.S., which would potentially provide AEP with investment opportunities in new generation, emission offsets, carbon capture and sequestration and renewable energy. Additionally, AEP holds leadership roles within international organizations committed to addressing energy, environmental and climate issues. We actively participate in the International Emissions Trading Association (IETA). IETA's mission is to establish cost-effective solutions and frameworks for trading in greenhouse gas emission reductions and developing international greenhouse gas offsets. AEP serves on the board of directors and chaired IETA's U.S. working group. AEP also chaired the 2010-	Investment opportunities	>6 years	Direct	About as likely as not	Low	AEP receives a return on equity for capital investment to compensate shareholders. Actual return to shareholders will depend on regulatory conditions and level of investment. As an example, with a capital investment of \$1 billion with a 50% debt/equity ratio and an allowed return on equity of 10%	AEP monitors and engages in the public debate surrounding climate change regulation. Additionally, AEP has taken numerous voluntary steps to reduce its carbon emissions profile, thus increasing potential opportunities. Furthermore, AEP incorporates a carbon price into its planning practices in	Minimal (<\$1mm). Part of existing management practices.

	2011 e8, now known as the Global Sustainable Electricity Partnership (GSEP). This partnership seeks to demonstrate how clean technologies can be deployed to provide affordable, reliable electricity to developing parts of the world and, at the same time, reduce risks from climate change.						AEP's annual earnings would increase by \$50 million.	anticipation of potential future climate change regulatory opportunities.	
Air pollution limits	Additional air pollution requirements, if phased in over a reasonable timeframe, could create an avenue for capital investment and potential earnings growth for AEP to retrofit some of its existing generating fleet to lower carbon-emitting sources. This could provide an opportunity for investment as well as reduce future exposure to climate change regulation or legislation. AEP anticipates spending \$8.7 billion in environmental-related capital investments between 2000 and 2017. Changes in regulations are also causing plants to retire prematurely. NSPS regulations could provide a similar opportunity for investment.	Investment opportunities	3 to 6 years	Direct	Very likely	Low-medium	AEP receives a return on equity for capital investment to compensate shareholders. Return to shareholders will depend on regulatory conditions and level of investment. As an example, with a capital investment of \$1 billion with a 50% debt/equity ratio and an allowed return on equity of 10% AEP's annual earnings would increase by \$50 million.	AEP monitors and engages in the public debate surrounding climate change regulation. Additionally, AEP has taken numerous voluntary steps to reduce its carbon emissions profile, thus increasing potential opportunities. Furthermore, AEP incorporates a carbon price into its planning practices in anticipation of potential future climate change regulatory opportunities.	Minimal (<\$1mm). Part of existing management practices.
Cap and trade schemes	Energy policy initiatives around greenhouse gas emission reductions and energy efficiency, security and reliability create technology deployment and investment opportunities in our regulated utility platform. We support a legislative approach that includes an economy-wide federal cap-and-trade system to reduce CO2 that allows us to provide reliable, reasonably priced electricity to our customers and is not harmful to the U.S. economy.	Investment opportunities	>6 years	Direct	About as likely as not	Medium	AEP receives a return on equity for capital investment to compensate shareholders. Return to shareholders will depend on regulatory conditions and level of investment. As an example, with a capital investment of \$1 billion with a 50% debt/equity ratio and an allowed return on equity of 10% AEP's annual earnings would increase by \$50 million.	AEP monitors and engages in the public debate surrounding climate change regulation. Additionally, AEP has taken numerous voluntary steps to reduce its carbon emissions profile, thus increasing potential opportunities. Furthermore, AEP incorporates a carbon price into its planning practices in anticipation of potential future climate change regulatory opportunities.	Minimal (<\$1mm). Part of existing management practices.
							An increase in wholesale pricing could	AEP monitors and engages in the public debate surrounding	

Fuel/energy taxes and regulations	Additional regulations negatively affecting natural gas or coal production could raise natural gas prices, which in turn would raise electricity prices. While this could be a positive boost to AEP's wholesale power sales revenues, it would have a negative economic impact on customers.	Premium price opportunities	>6 years	Direct	Unlikely	Medium-high	increase revenues for AEP's generation fleet but could be partially/fully offset by increased input costs. Based on 2017 earnings guidance, AEP estimated a \$1 increase in Wholesale Market Prices (Regulated) would result in an earnings per share increase of \$0.01.	climate change regulation. Additionally, AEP has taken numerous voluntary steps to reduce its carbon emissions profile, thus increasing potential opportunities. Furthermore, AEP incorporates a carbon price into its planning practices in anticipation of potential future climate change regulatory opportunities.	Minimal (<\$1mm). Part of existing management practices.
Product efficiency regulations and standards	Between 2008 and 2016, AEP achieved 2,000+ MW and 6,000,000+ MWh of demand and energy consumption reductions respectively, largely driven by regulation. Improved efficiency and demand reduction reduces AEP's exposure to any negative impacts associated with carbon regulation as serving less demand, results in fewer emissions. These reductions also supported energy efficiency mandates in several states.	Reduced operational costs	1 to 3 years	Direct	Likely	Low	The continuation of these regulations has better positioned AEP financially to address climate change regulation.	AEP has staff at the corporate level which oversee consumer programs and forecast levels of energy efficiency that may be required. Individual operating have direct oversight over programs implemented. AEP is actively involved in creating regulatory recovery mechanisms that are indifferent to customer usage and that compensate AEP appropriately for costs.	Minimal (<\$1mm). Part of existing management practices.
Voluntary agreements	Through our involvement with The Chicago Climate Exchange (CCX), we made a voluntary but legally binding commitment to reduce our GHG emissions. We reduced or offset GHGs by a cumulative 96 million metric tons – twice our commitment of 48 million metric tons – during our eight-year membership. That represents about 15 percent below 2003 levels of GHG emissions. Though our commitment ended, we	Reduced operational costs	Up to 1 year	Direct	Very unlikely	Low	AEP gained significant expertise in the area of climate change and carbon trading, providing an intangible benefit in adapting to mandatory	AEP monitors and engages in the public debate surrounding climate change regulation. Additionally, AEP has taken numerous voluntary steps to reduce its carbon emissions profile, thus increasing potential opportunities. Furthermore, AEP	Minimal (<\$1mm). Part of existing management practices.

	are hopeful that some of the emission reductions and offsets not used for compliance within CCX may someday be able to be used with a mandatory program to offset compliance costs.							regulations.	incorporates a carbon price into its planning practices in anticipation of potential future climate change regulatory opportunities.	
General environmental regulations, including planning	Additional environmental regulations, if phased in over a reasonable timeframe could create an avenue for AEP to improve the overall environmental performance of its generating fleet. This would provide an opportunity for capital investment as well as reduce future exposure to climate change regulation or legislation. AEP anticipates spending \$8.7 billion in environmental compliance-related capital between 2000 and 2017.	Investment opportunities	1 to 3 years	Direct	Very likely	Medium		AEP receives a return on equity for capital investment to compensate shareholders. Return to shareholders will depend on regulatory conditions and level of investment. As an example, with a capital investment of \$1 billion with a 50% debt/equity ratio and an allowed return on equity of 10% AEP's annual earnings would increase by \$50 million.	AEP monitors and engages in the public debate surrounding climate change regulation. Additionally, AEP has taken numerous voluntary steps to reduce its carbon emissions profile, thus increasing potential opportunities. Furthermore, AEP incorporates a carbon price into its planning practices in anticipation of potential future climate change regulatory opportunities.	Minimal (<\$1mm). Part of existing management practices.

CC6.1b
Please describe your 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 mean (average) temperature	Our peak demands are highest during the cooling season. Should climate change raise the mean (average) temperature in the summer months within our service territory, electricity demand could increase thus benefiting AEP electricity sales. However, higher peak demands will also increase AEP's electricity production to meet the demand growth.	Increased demand for existing products/services	Unknown	Direct	Unknown	Unknown	Increased heating degree days in areas with electric heating could increase sales. Increased cooling degree days also would increase sales. Based on 2017 earnings guidance, AEP estimated that a 0.5% increase in sales would result in an earnings per share increase of \$0.04.	Potential weather variability is one of several factors examined within AEP financial forecasting and corporate budgeting processes.	Minimal (<\$1mm). Part of existing management practices.
							Increases in extreme temperatures could cause increases in electricity demand pricing, boosting		

Change in temperature extremes	Hot weather in the summer and cold weather in the winter increases demand for electricity. Should climate change increase temperature extremes, AEP's units may operate more, generating more income.	Increased demand for existing products/services	Unknown	Direct	Unknown	Unknown	sales volume and margin for AEP's competitive generating fleet and off-system sales volume and margin for AEP's regulated generating fleet. Based on 2017 earnings guidance, AEP estimated a \$1 increase in Wholesale Market Prices (Regulated) would result in an earnings per share increase of \$0.01.	Potential weather variability is one of several factors examined within AEP financial forecasting and corporate budgeting processes.	Minimal (<\$1mm). Part of existing management practices.
Change in mean (average) precipitation	Lower mean (average) precipitation due to climate change could cause lower electricity production from hydroelectric facilities causing an increased demand for other types of electric generation, thus benefiting AEP which generates most of its power from non-hydro sources.	Increased demand for existing products/services	Unknown	Direct	Unknown	Unknown	Increases in extreme temperatures could cause increases in electricity demand pricing, boosting sales volume and margin for AEP's competitive generating fleet and off-system sales volume and margin for AEP's regulated generating fleet. Based on 2017 earnings guidance, AEP estimated a \$1 increase in Wholesale Market Prices (Regulated) would result in an earnings per share increase of \$0.01.	Potential weather variability is one of several factors examined within AEP financial forecasting and corporate budgeting processes.	Minimal (<\$1mm). Part of existing management practices.
Change in precipitation pattern	Lower precipitation patterns could cause lower electricity production from hydroelectric facilities causing an increase in demand from other types of electric generation, thus benefiting AEP. Higher or lower than normal precipitation could cause disruptions to coal deliveries if rivers are too high or too low, which in	Premium price opportunities	Unknown	Direct	Unknown	Unknown	Increases in extreme temperatures could cause increases in electricity demand pricing, boosting sales volume and margin for AEP's competitive generating fleet and off-system sales volume and margin for AEP's regulated generating fleet. Based on 2017	Potential weather variability is one of several factors examined within AEP financial forecasting and corporate	Minimal (<\$1mm). Part of existing management practices.

	certain situations could affect electricity pricing and earnings.							earnings guidance, AEP estimated a \$1 increase in Wholesale Market Prices (Regulated) would result in an earnings per share increase of \$0.01.	budgeting processes.	
Change in precipitation extremes and droughts	Extreme droughts or lower precipitation could cause lower electricity production from hydroelectric facilities causing an increase in demand from coal-fueled or other types of electric generation, thus benefiting AEP. Higher or lower than normal precipitation could cause disruptions to coal deliveries if rivers are too high or too low, which in certain situations could affect electricity pricing and earnings.	Increased demand for existing products/services	Unknown	Direct	Unknown	Unknown	Increases in extreme temperatures could cause increases in electricity demand pricing, boosting sales volume and margin for AEP's competitive generating fleet and off-system sales volume and margin for AEP's regulated generating fleet. Based on 2017 earnings guidance, AEP estimated a \$1 increase in Wholesale Market Prices (Regulated) would result in an earnings per share increase of \$0.01.	Potential weather variability is one of several factors examined within AEP financial forecasting and corporate budgeting processes.	Minimal (<\$1mm). Part of existing management practices.	

CC6.1c
Please describe your 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
Reputation	International agreements and collaboration underscore that climate change is a global issue that requires a global solution. No single nation, industry sector or company can address the issue alone, and it is unreasonable to expect this or attempt to do so. AEP's responsibility is to work within the framework of the regulations and policies in the United States and to collaborate internationally to share expertise, knowledge and engineering best practices. As such, we hold leadership roles within numerous domestic and international organizations committed to addressing energy and environmental issues.	Increased stock price (market valuation)	1 to 3 years	Direct	Unlikely	Low	AEP is viewed as a leader in climate change issue management and as such its stock price might be marginally higher by conveying a sense of responsibility to investors.	Management actively promotes our direct and indirect engagement on climate change issues as part of corporate branding and investor and stakeholder outreach.	Minimal (<\$1mm). Part of existing management practices.
							AEP offers		

Changing consumer behavior	Consumers wanting to reduce their carbon footprint may be inclined to purchase cleaner energy or energy efficiency services that AEP provides.	Increased demand for existing products/services	3 to 6 years	Direct	About as likely as not	Low	most energy efficiency services at cost, therefore there is likely little net profit. However, capital investment in renewable technologies could provide increased earnings for shareholders, as well as expand access to clean energy to more customers.	AEP continually looks at providing additional services to customers as their needs change.	Minimal (<\$1mm). Part of existing management practices.
Induced changes in human and cultural environments	Energy efficiency is often viewed as one of the most important resources of the future. Increasing the efficient use of energy would contribute to achieving climate change reduction targets, help delay the need to build new generation and reduce environmental impacts. AEP has increased its commitment to energy efficiency in the last ten years, partially a result of input from stakeholders as well as support from regulators and customers. We have installed, and plan continue to install, technologies such as smart meters and smart grid systems that will give customers greater ability and more information to control their energy use and costs. Should climate change increase the demands for consumer control of electricity, demand for smart meter and smart grid technology could increase.	Reduced capital costs	3 to 6 years	Direct	About as likely as not	Low	Though consumers using less electricity can negatively impact sales, it could also provide a financial benefit by reducing other operational and regulatory costs.	AEP has staff at the corporate level which oversees consumer programs and forecasts levels of energy efficiency that may be required. Individual operating companies have direct oversight over programs implemented. AEP is actively involved in creating regulatory recovery opportunities.	Minimal (<\$1mm). Part of existing management practices.
Fluctuating socio-economic conditions	Should there be regulatory or physical benefits to climate change in a given region (e.g. increased agriculture productivity, clean energy manufacturing) there could be an increased demand for electricity.	Increased demand for existing products/services	>6 years	Direct	About as likely as not	Low	Increased demand for electricity would boost power pricing, sales and profits. The magnitude is uncertain.	AEP routinely monitors macroeconomic factors and incorporates them into planning practices. Additionally, AEP has an Economic and Business Development group that focuses on developing business growth opportunities.	Minimal (<\$1mm). Part of existing management practices.

Further Information

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	Fri 01 Jan 2010 - Fri 31 Dec 2010	140917311
Scope 2 (location-based)	Fri 01 Jan 2010 - Fri 31 Dec 2010	0
Scope 2 (market-based)	Fri 01 Jan 2010 - Fri 31 Dec 2010	0

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

US EPA Mandatory Greenhouse Gas Reporting Rule

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

Over 99% of the GHG emissions reported for Scope 1 in the base year of 2010 are adapted from US EPA's Mandatory Greenhouse Gas Reporting Rule (40CFR part 98). Scope 2 was re-evaluated for 2010 but AEP was a net seller of electricity and hence had no Scope 2 emissions. Both Scope 1 & Scope 2 emissions were developed using The Greenhouse Gas Protocol standards.

CC7.3

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

Gas	Reference
CO2	IPCC Fifth Assessment Report (AR5 - 100 year)
CH4	IPCC Fifth Assessment Report (AR5 - 100 year)
N2O	IPCC Fifth Assessment Report (AR5 - 100 year)
SF6	IPCC Fifth Assessment Report (AR5 - 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
Bituminous coal	93.4	Other: kg CO2/mmBtu	EPA Table C-1 to Subpart C of 40 CFR Part 98
Distillate fuel oil No 2	73.96	Other: kg CO2/mmBtu	EPA Table C-1 to Subpart C of 40 CFR Part 98
Electricity	1426.9	Other: lb CO2e/MWh	Weighted eGRID2014 RFCW/ERCT/SPSO
Lignite	96.36	Other: kg CO2/mmBtu	EPA Table C-1 to Subpart C of 40 CFR Part 98
Motor gasoline	70.22	Other: kg CO2/mmBtu	EPA Table C-1 to Subpart C of 40 CFR Part 98
Natural gas	53.06	Other: kg CO2/mmBtu	EPA Table C-1 to Subpart C of 40 CFR Part 98
Propane	62.87	Other: kg CO2/mmBtu	EPA Table C-1 to Subpart C of 40 CFR Part 98
Sub bituminous coal	97.17	Other: kg CO2/mmBtu	EPA Table C-1 to Subpart C of 40 CFR Part 98
Diesel/Gas oil	10.21	Other: kg CO2/gallon	EPA Climate Leaders: Emission Factors for Greenhouse Gas Inventories 2014
Motor gasoline	8.78	Other: kg CO2/gallon	EPA Climate Leaders: Emission Factors for Greenhouse Gas Inventories 2014
Waste oils	74.00	Other: kg CO2/mmBtu	EPA Table C-1 to Subpart C of 40CFR Part 98

Further Information

The methodology for AEP's 2016 GHG Emissions has not changed from our 2015 report.

Attachments

[https://www.cdp.net/sites/2017/89/689/Climate Change 2017/Shared Documents/Attachments/ClimateChange2017/CC7.EmissionsMethodology/AEP 2010 System GHG Profile \(GRI\) v1.xlsx](https://www.cdp.net/sites/2017/89/689/Climate%20Change%202017/Shared%20Documents/Attachments/ClimateChange2017/CC7.EmissionsMethodology/AEP%202010%20System%20GHG%20Profile%20(GRI)%20v1.xlsx)

Page: CC8. Emissions Data - (1 Jan 2016 - 31 Dec 2016)

CC8.1

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

Equity share

CC8.2

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

99166569

CC8.3

Please describe your approach to reporting Scope 2 emissions

Scope 2, location-based	Scope 2, market-based	Comment
We are reporting a Scope 2, location-based figure	We are reporting a Scope 2, market-based figure	

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
11218113	10806165	Location-based Scope 2 emissions use operating company net purchases (net of sale-for-resale) and regional eGRID2014v2 CO2, CH4 and N2O emission rates. Market-based Scope 2 emissions account for dedicated renewable purchases and operating company emission rates for sale-for-resale.

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?

Yes

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
Kerosene fueled torpedo heaters (mobile)	Emissions are not relevant	Emissions are not relevant	Emissions are not relevant	EPA's 40 CFR Part 98 does not require that CO2e emissions be reported for mobile torpedo heaters. AEP emissions for these sources have been estimated at less than 2,000 metric tons.

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	Less than or equal to 2%	Metering/ Measurement Constraints	EPA Continuous Emission Monitoring System (CEMS) Relative Accuracy Tests Audits (RATA) procedures certify monitors to only +/- 15%. From the attached spreadsheet of individual CO2 RATA results (GHG_RATA_Test_Data 2016.xlsx), AEP CEMS averaged +/- 2.27% in 2016. See "Further Information" for section CC7 for details of AEP's monitor Availability. Also see, attached below, AEP's 2016 EPA Mandatory GHG Reporting Rule reports and receipts.
Scope 2 (location-based)	More than 5% but less than or equal to 10%	Assumptions	Operating company purchases and sales (for resale) are from FERC Form 1 reports and are considered high quality. Net purchases are converted to emissions using EPA's eGRID 2014v2 regional emission rates (two years old).
Scope 2 (market-based)	More than 5% but less than or equal to 10%	Assumptions	Operating company purchases and sales (for resale) are from FERC Form 1 reports and are considered high quality. Purchase Power Agreements for renewable sources (wind, solar and hydroelectric, net of REC sales) are removed from purchases before applying EPA's eGRID 2014v2 regional emission rates. Operating company specific emission rates are used to calculate sale-for-resale emissions which are subtracted from emissions from purchased electricity for internal use.

CC8.6
Please indicate the verification/assurance status that applies to your reported Scope 1 emissions

No third party verification or assurance – regulatory CEMS required

CC8.6b
Please provide further details of the regulatory regime to which you are complying that specifies the use of Continuous Emission Monitoring Systems (CEMS)

Regulation	% of emissions covered by the system	Compliance period	Evidence of submission
CFR 40 Part 75	89	Fri 01 Jan 2016 - Sat 31 Dec 2016	https://www.cdp.net/sites/2017/89/689/Climate Change 2017/Shared Documents/Attachments/CC8.6b/2016 GHG Documentation.zip

CC8.7
Please indicate the verification/assurance status that applies to at least one of your reported Scope 2 emissions figures

No third party verification or assurance

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

Further Information

About 89% of the 2016 GHG emissions reported for Scope 1 & 2 are adapted from US EPA's Mandatory Greenhouse Gas Reporting Rule. All the Scope 2 emissions are based on The Greenhouse Gas Protocol standards. Less than 1% of the Scope 1&2 emissions are based on EPA Climate Leaders Stationary and Mobile Reporting protocols. Spreadsheet detailing AEP's GHG emission inventory and assumptions is attached.

Attachments

[https://www.cdp.net/sites/2017/89/689/Climate_Change_2017/Shared_Documents/Attachments/ClimateChange2017/CC8.EmissionsData\(1Jan2016-31Dec2016\)/AEP_2016_System_GHG_Profile_\(GRI\)_v1.xlsx](https://www.cdp.net/sites/2017/89/689/Climate_Change_2017/Shared_Documents/Attachments/ClimateChange2017/CC8.EmissionsData(1Jan2016-31Dec2016)/AEP_2016_System_GHG_Profile_(GRI)_v1.xlsx)

Page: CC9. Scope 1 Emissions Breakdown - (1 Jan 2016 - 31 Dec 2016)

CC9.1
Do you have Scope 1 emissions sources in more than one country?

No

CC9.2
Please indicate which other Scope 1 emissions breakdowns you are able to provide (tick all that apply)

By GHG type
By activity

CC9.2c
Please break down your total gross global Scope 1 emissions by GHG type

GHG type	Scope 1 emissions (metric tonnes CO2e)
CO2	97998415
CH4	255656
N2O	445125
SF6	461122

CC9.2d
Please break down your total gross global Scope 1 emissions by activity

Activity	Scope 1 emissions (metric tonnes CO2e)
Stationary Combustion	98505939
Mobile Sources	199508
Fugitive SF6	461122

Further Information

See spreadsheet for details in section CC8-Emission Data: AEP 2016 System GHG Profile (GRI) v1.xlsx

Page: CC10. Scope 2 Emissions Breakdown - (1 Jan 2016 - 31 Dec 2016)

CC10.1
Do you have Scope 2 emissions sources in more than one country?

No

CC10.2
Please indicate which other Scope 2 emissions breakdowns you are able to provide (tick all that apply)

By activity

CC10.2c
Please break down your total gross global Scope 2 emissions by activity

Activity	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)
Electric Purchases	11218113	10806165

Further Information

See spreadsheet for details in section CC8-Emission Data: AEP 2016 System GHG Profile (GRI) v1.xlsx

Page: CC11. Energy

CC11.1
What percentage of your total operational spend in the reporting year was on energy?

More than 35% but less than or equal to 40%

CC11.2
Please state how much heat, steam, and cooling in MWh your organization has purchased and consumed during the reporting year

Energy type	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

317362454

CC11.3a

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

Fuels	MWh
Bituminous coal	164421709
Sub bituminous coal	74381812
Lignite	17032142
Natural gas	61526791

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	Emissions factor (in units of metric tonnes CO2e per MWh)	Comment
Direct procurement contract with a grid-connected generator or Power Purchase Agreement (PPA), supported by energy attribute certificates	3981239	0	PPA Wind, Solar and Hydro purchases with RECs held or retired.
Direct procurement contract with a grid-connected generator or Power Purchase Agreement (PPA), where electricity attribute certificates do not exist or are not required for a usage claim	4978626	0	PPA Wind and Hydro purchases with no RECs associated with them.

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
144893538	48515164	96378374	2417062	1111182	Total renewable electricity produced includes wind generation that was sold under PPA to external organizations.

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	No change	
Divestment	0	No change	
Acquisitions	0	No change	
Mergers	0	No change	
Change in output	3	Decrease	Reduction in delivery to customers.
Change in methodology	0	No change	
Change in boundary	0	No change	
Change in physical operating conditions	2	Decrease	Fuel switch from Coal to Natural Gas.
Unidentified	0	No change	
Other	0	No change	

CC12.1b

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
			Location-based			Reduced generation, fuel switch to

0.006839	metric tonnes CO2e	16380100000	Location-based	3	Decrease	lower emitting fuel, increased electric rates.
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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
0.7769	metric tonnes CO2e	megawatt hour (MWh)	142081464	Location-based	0.2	Decrease	Fuel switch to lower emitting fuel.

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

CC13.1b
What is your strategy for complying with the schemes in which you participate or anticipate participating?

CC13.2
Has your organization originated any project-based carbon credits or purchased any within the reporting period?

No

Further Information

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 CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Purchased goods and services	Relevant, calculated	1085153	Quantity of major consumables used in the generation of electricity entered into CDP calculation spreadsheets and raw material production emission rates from value chain partners.	0.00%	Key power generation consumables data is available. In discussions with the purchasing department, it was determined that AEP does not currently have a way to collect meaningful corporate data on goods and services other than power generation consumables.
Capital goods	Relevant, not yet calculated	0		0.00%	In discussions with the purchasing department, it was determined that AEP does not currently have a way to collect meaningful corporate data on capital good purchases.
Fuel-and-energy-related activities (not included in Scope 1 or 2)	Relevant, calculated	7213719	Quantity of fuel consumed multiplied by life cycle production emission factors from Worldwatch Institute	0.00%	Publically available life cycle analysis of delivered coal and natural gas was used to estimate upstream energy use.
Upstream transportation and distribution	Not relevant, explanation provided	0		0.00%	Fuel and material transportation is already included in the life cycle analysis used for other category.
Waste generated in operations	Relevant, calculated	0	Quantity of non-organic waste sent to landfill used in EPA's WARM model. The value is actually negative due to recycling of electronic equipment and recycling of metal.	0.00%	Hazardous waste disposed and electronic equipment recycled (producing a negative emission according to WARM model). The actual number of -30,412 metric tons CO2e could not be entered.
Business travel	Relevant, calculated	24727	Internal records of business travel were kept for air travel, rental cars, hotel stays, employee vehicle miles for business travel, and corporate jets. Travel agency emission numbers were used when supplied. Otherwise EPA Climate Leaders emission factors were used. Details are contained in the attached spreadsheet: AEP 2016 System GHG Profile (GRI) v1.xlsx.	27.00%	All forms of business travel including hotel stays. Travel agent provided CO2 emission estimates for travel booked through them.

Employee commuting	Relevant, calculated	34873	The details of data used and assumptions can be found on the "Commuting" tab of the attached spreadsheet in section CC8-Emission Data: AEP 2016 System GHG Profile (GRI) v1.xlsx	0.00%	Detailed study of average distance traveled by employees from their home address to their work address from human resource records.
Upstream leased assets	Not relevant, explanation provided	0		0.00%	Any meaningful leased equipment fuel consumption is captured by corporate fuel purchase records in scope 1.
Downstream transportation and distribution	Not relevant, explanation provided	0		0.00%	The transportation and distribution of electricity (Transmission & Distribution losses) is already captured by scope 1.
Processing of sold products	Not relevant, explanation provided	0		0.00%	Electricity is not "processed" by the customer.
Use of sold products	Not relevant, explanation provided	0		0.00%	The use of electric energy does not cause any further GHG emissions.
End of life treatment of sold products	Not relevant, explanation provided	0		0.00%	Electricity requires no end of life treatment.
Downstream leased assets	Not relevant, explanation provided	0		0.00%	Any meaningful leased equipment fuel consumption is captured by corporate fuel purchase records in scope 1.
Franchises	Not relevant, explanation provided	0		0.00%	No franchises.
Investments	Not evaluated	0			
Other (upstream)	Not evaluated	0			
Other (downstream)	Not evaluated	0			

CC14.2
Please indicate the verification/assurance status that applies to your reported Scope 3 emissions

No third party verification or assurance

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
Purchased goods & services	Emissions reduction activities	33	Increase	Increase in pollution control equipment feedstock.
Fuel- and energy-related activities (not included in Scopes 1 or 2)	Change in output	4	Decrease	Less generation of electricity.
Business travel	Change in physical operating conditions	12	Decrease	Assumed due to plant retirement.
Employee commuting	Change in physical operating conditions	12	Decrease	Fewer employees due to plant retirement.
Waste generated in operations	Change in methodology	0	Decrease	The WARM model credited Scope 3 emissions due to including the recycling of metal. This was not included in prior reports. For 2015: -164 metric tons and for 2016 -30,412. Zero was entered for "Waste generated in operations" since a negative number would not be accepted.

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
Yes, other partners in the value chain

CC14.4a
Please give details of methods of engagement, your strategy for prioritizing engagements and measures of success

AEP is actively involved in supply chain management, customer/stakeholder engagement and vendor management to ensure AEP is properly prepare to manage potential regulations. This engagement includes technology development partnerships, such as AEP's carbon capture and sequestration validation project, Smart Grid initiatives and deployment of highly efficient electrical generation equipment. Additional AEP regularly conducts stakeholder outreach efforts with customers, suppliers and partners. Furthermore, AEP is involved with a number of these entities as part of public policy initiatives. Engagement is prioritized based on the most salient issues, which in the case of AEP is the potential impact of federal climate regulation. Success is based on increasing the knowledge base of our value chain on AEP's priorities and sensible partnership where possible.

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

Type of engagement	Number of suppliers	% of total spend (direct and indirect)	Impact of engagement
Other:			AEP is unable to estimate the number of suppliers with we are engaging as they are too numerous to provide an accurate estimate.

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
John McManus	Vice President - Environmental Services	Environment/Sustainability manager

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 2021 if possible).

Year ending	Date range
2016	Fri 01 Jan 2016 - Sat 31 Dec 2016
2015	Thu 01 Jan 2015 - Thu 31 Dec 2015
2014	Wed 01 Jan 2014 - Wed 31 Dec 2014
2013	Tue 01 Jan 2013 - Tue 31 Dec 2013
2012	Sun 01 Jan 2012 - Mon 31 Dec 2012

Further Information

The scope 2 methodology for the absolute emissions changed in 2015 to include market purchases and sales of electricity. The methodology for the absolute emissions changed from 2012 to 2013 (scope 1). In 2012 only CO2 emissions were reported for power generation.

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)
2016	32854	142081464	98505939	0.693
2015	34987	149156848	107895397	0.723
2014	41704	169810869	130318824	0.767
2013	40945	148581400	120807200	0.813
2012	39594	159909900	121927400	0.763

Further Information

The scope 2 methodology for the absolute emissions changed in 2015 to include market purchases and sales of electricity. The methodology for the absolute emissions changed from 2012 to 2013 (scope 1). In 2012 only CO2 emissions were reported for power generation.

Page: EU2. Individual Country Profiles - United States of America

EU2.1
Please select the energy sources/fuels that you use to generate electricity in this country

Coal - hard
Lignite
Oil & gas (excluding CCGT)
CCGT
Nuclear
Hydro
Other renewables

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)
2016	18141	83668	81266376	0.971
2015	19139	94323	91213555	0.967
2014	24750	119914	115271043	0.961
2013	23719	106430	100277700	0.942
2012	23474	108970	104585300	0.960

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)
2016	838	5702	5834679	1.023
2015	837	5749	5906237	1.027
2014	838	5565	5669703	1.019
2013	836	5470	5714100	1.044
2012	842	2290	5619200	1.005

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)
2016	5722	3224	2097434	0.651
2015	5757	1705	1175391	0.690
2014	5721	2395	1661626	0.694
2013	5745	3840	2519900	0.657
2012	5841	6130	3808800	0.622

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)
2016	3876	24056	9307450	0.387
2015	3919	22750	9600215	0.422
2014	3914	16521	6952427	0.421
2013	3921	15530	6178800	0.398
2012	3893	20760	7914200	0.381

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)
2016	2191	15360
2015	2191	16519
2014	2191	17631
2013	2191	16280
2012	2191	17720

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)
2016	938	1103

2015	951	1184
2014	951	1046
2013	871	1072
2012	871	768

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)
2016	2659	8945
2015	2193	6926
2014	3339	6738
2013	3339	6440
2012	2171	5540

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)
2016	0	0	0	0
2015	0	0	0	0
2014	0	0	0	0
2013	0	0	0	0
2012	0	0	0	0

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)
2016	28577	116651	98505939	0.746
2015	29652	124527	107895397	0.765
2014	37414	162027	129554800	0.800
2013	36412	147550	114690500	0.721
2012	36495	159140	121927400	0.766

EU2.1l
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 CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
2016	34365	142081	98505939	0.693
2015	34987	149157	107895397	0.723
2014	41704	169811	129551800	0.763
2013	40945	148581	120807200	0.813
2012	39594	159910	121927400	0.763

Further Information

Other renewable Nameplate Capacity declined from 2014 to 2015 due to not including 488 MW of AEP owned wind capacity being sold under PPAs.

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?

Yes

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
USA state scheme – Michigan	10%	10%	2016	AEP is in compliance with its current obligation and plans to be in compliance with future obligations.
USA state scheme – Ohio	2.5%	12.5%	2026	AEP is in compliance with its current obligation and plans to be in compliance with future obligations.

USA state scheme – Texas	2.8%	2.8%	2016	AEP is in compliance with its current obligation and plans to be in compliance with future obligations.
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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	0	0.00%	The majority of AEP's renewable energy is procured through purchased power agreements which are simply a pass through of costs to consumers. AEP has been steadily increasing its renewable energy portfolio during the last several years through renewable energy power purchase agreements (REPAs). AEP currently has 2,897 MW of REPAs delivering renewable energy to its operating companies. AEP currently does not break down EBITDA by type of generation.

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	0	0.00%	2019	Between 2017 and 2019, AEP intends to invest up to \$1.5 billion in contracted and regulated renewables to provide the energy solutions customers want, which are largely technology-based, and deliver a cleaner emission profile in the process. However, AEP currently does not break down EBITDA by type of generation. The current Integrated Resource Plans suggest AEP may look to incorporate several thousand MW of wind and solar energy into the system by 2030 but AEP has not developed estimate for EBITDA attributed to these projects nor committed to either development or ownership.

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	1500000000	56.00%	2019	Between 2017 and 2019, AEP intends to invest up to \$1.5 billion in contracted and regulated renewables to provide the energy solutions customers want, which are largely technology-based, and deliver a cleaner emission profile in the process. The current Integrated Resource Plans suggest AEP may look to incorporate several thousand MW of wind and solar energy into its regulated operating companies by 2030 but AEP has not publically released a capex estimate for future projects nor committed to either development or ownership.

Further Information

CDP: [D][-,][D2]