

Module: Introduction**Page: Introduction**

CC0.1**Introduction**

Please give a general description and introduction to your organization.

Pinnacle West is a holding company that conducts business primarily through our wholly owned subsidiary, Arizona Public Service Company (APS), with approximately \$3.5 billion in annual revenues. APS' corporate vision is to create a sustainable energy future for Arizona. APS achieves this vision by operating as a vertically integrated electric utility that provides retail and wholesale electric service to most of the state of Arizona. APS generates safe, affordable and reliable electricity for nearly 1.2 million retail and residential customers in 11 of Arizona's 15 counties.

FORWARD-LOOKING STATEMENTS

This report contains forward-looking statements based on current expectations. These forward looking statements are often identified by words such as "estimate," "predict," "may," "believe," "plan," "expect," "require," "intend," "assume" and similar words. Because actual results may differ materially from expectations, we caution you not to place undue reliance on these statements. A number of factors could cause future results to differ materially from historical results, or from outcomes currently expected or sought by us. A discussion of some of these risks and uncertainties is contained in our annual report on Form 10-K and is available on our website at pinnaclewest.com, which you should review carefully before placing any reliance on our forward-looking statements, financial statements or disclosures. We assume no obligation to update any forward-looking statements, even if our internal estimates change, except as may be required by applicable law.

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

(i) Chairman of the Board, President and Chief Executive Officer of Pinnacle West and Arizona Public Service Company - Donald Brandt. Mr. Brandt provides the vision and leadership to execute the Company's strategy and create shareholder value. Additionally, Mr. Brandt has overarching responsibility for managing risk including climate change and greenhouse gas risk that directly or indirectly affects our company's mission and vision.

(ii) The Chairman of the Board, President and CEO is the highest ranking executive in charge of the company. He chairs the Board of Directors and as an experienced leader with extensive knowledge of the Company and our industry, serves as a highly effective conduit between the board and management.

(iii) The board's oversight of the company's risk management function is designed to provide assurance that the company's risk management processes are well adapted to, and consistent with, the company's business and strategy, and are functioning as intended. The board focuses on fostering a culture of risk awareness and risk-adjusted decision-making and ensuring that an appropriate, "tone at the top" is established. The board regularly discusses and updates a listing of areas of

risk and a suggested allocation of responsibilities for such risks among the board and the board committees.

(iv) The Executive Risk Committee is comprised of senior level officers of the company and is chaired by the Chief Financial Officer. Among other responsibilities, this committee is responsible for ensuring that the Board receives timely information concerning the Company's material risks and risk management processes. The Executive Risk Committee provides the board with a list of the company's top risks on an annual basis.

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
Corporate executive team	Monetary reward	Emissions reduction target Behavior change related indicator	Our executive compensation programs focus on transparency with an emphasis on incentivizing performance. APS's compensation philosophy incorporates multiple business performance metrics including nuclear capacity factor to assess executive performance. For example, the Palo Verde Nuclear Generation Station's (Palo Verde) capacity factor. Palo Verde is the country's largest source of carbon-free energy. In 2016, Palo Verde's capacity factor target was set at 91.5% and we exceeded this target with a capacity factor of 93.2%. As a result, Palo Verde generated 32.2 million megawatt-hours, and it remains the only U.S. generating station to produce more than 30 million megawatt-hours in a year, a milestone the plant has achieved eight consecutive years and a total of 12 times. This corresponds to avoiding almost 13.2 million metric tons of carbon emissions had this energy been generated from our fossil fleet. This also demonstrates improved nuclear capacity factors which increases our non-emitting electric generation. In addition, executive compensation is tied to consumer choices that impact climate change such as

Who is entitled to benefit from these incentives?	The type of incentives	Incentivized performance indicator	Comment
			paperless billing adoption. Paperless billing adoption helps the environment by reducing paper waste. Executive annual cash incentive plans are 100% tied directly to business unit performance which are based on value-driving business metrics.
Business unit managers	Monetary reward	Emissions reduction target Behavior change related indicator	Business Unit Managers receive annual cash incentive bonuses based on the achievement of performance of metrics that are related to climate change issues, for example, nuclear capacity factor and paperless billing adoption, which were designated as incentivized metrics in the Business Unit/Corporate Resource business plans.
All employees	Monetary reward	Emissions reduction target Behavior change related indicator	Employees receive annual cash incentive bonuses based on achievement of performance of metrics that are related to climate change issues, for example, nuclear capacity factor and paperless billing adoption, which were designated as incentivized metrics in the Business Unit/Corporate Resource business plans.

Further Information

Page: CC2. Strategy

CC2.1

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

Integrated into multi-disciplinary company wide risk management processes

CC2.1a

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

Frequency of monitoring	To whom are results reported?	Geographical areas considered	How far into the future are risks considered?	Comment
Six-monthly or more frequently	Board or individual/sub-set of the Board or committee appointed by the Board	All geographic locations of the corporation	> 6 years	Company risks are reviewed on a quarterly basis by executive management and the Audit Committee of the Board of Directors via the SEC reporting process. In addition, select board committees are updated on climate change risks by a Vice President of a given business area on an annual basis. The Executive Risk Committee also provides the Board of Directors with a list of the company's top risks on an annual basis. For APS, climate change risks include drought, frequency and intensity of monsoon storms, and forest fires. APS evaluates risks on a longer term horizon (>10 yrs.) with relation to regulatory drivers such as carbon regulation.

CC2.1b

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

(i) Company level - The Enterprise Risk Management (ERM) Department facilitates the establishment and implementation of committee(s) and process (es) for the identification and reporting of material risks inherent to the company's business to executive management. Risks are identified, defined, assessed, and prioritized based on the likelihood and impact of their occurrence. An Enterprise Risk is a risk event which, if it occurs, will have financial, operational, or reputational impacts of significance at the company level and will threaten meeting the company's risk management objectives and obligations.

(ii) Asset Level - Due to the complexity of its operating, financial, and regulatory environment, the company has numerous risk objectives and obligations, which are addressed by policies and controls, processes, and programs at both the company and the asset level. Risks are identified, defined, assessed, and minimized at an asset level. Business areas maintain an inventory of their most significant risks and associated Risk Response plans, in support of the ERM Process. Annually, business areas record this information in a prescribed format, which allows analysis, categorization, and prioritization of risks to support development of an enterprise risk management profile.

(iii) APS uses a Planning Committee to identify and evaluate opportunities, including possible opportunities associated with climate change, both at the company and asset level. The Planning Committee is comprised of senior company executives that identify, evaluate and plan strategic direction recommendations that are presented to the Chief Executive Office and Board of Directors. The Planning Committee uses input from informed stakeholders and subject matter experts to formulate strategic business planning and management methods. In addition, the Planning Committee directs corporate strategic initiatives to help identify opportunities consistent with strategic business direction.

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

Risk prioritization begins with ranking risks according to the outcome of the likelihood and impact assessment. Each risk is then assessed against further criteria to develop a true prioritization. Risk prioritization can include an assessment of likelihood, risk direction, velocity, external evidence, and feasibility and cost of new mitigation. For business risks, quantitative correlation analysis is used for company projects and business scenarios to provide probability distributions of cost contingencies and schedule uncertainties for multiple risk drivers. This type of sensitivity analysis is used to illuminate factors affecting the budget and timing of Company projects, leading to more effective and efficient mitigation strategies. The company is in the early stages of developing a process to quantitatively determine risk correlation of key high-level risks at an enterprise level, as well as a qualitative complexity assessment tool for project risk management.

The Planning Committee reviews company metrics, financial performance and business plans on a quarterly basis to ensure corporate targets are being met. Any identified opportunities are prioritized based on the opportunity's ability to assist in meeting or exceeding corporate targets.

CC2.1d

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

Main reason for not having a process	Do you plan to introduce a process?	Comment
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CC2.2**Is climate change integrated into your business strategy?**

Yes

CC2.2a

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

Climate change is integrated into our business strategy through our Integrated Resource Plans (IRP). The plan serves as an official forecast of how APS will meet customers' energy needs through the company's 15-year resource planning period and fulfill regulatory targets.

i.) APS's executive team recognizes the importance of having a carbon strategy because it is a key factor in mitigating financial, physical, and operational risks. Climate change issues, particularly carbon costs and water resources, are a critical parameter in long-range resource planning process. Following a look at the broad trends affecting the energy industry, the resource planning process evaluates what quantity of resources APS needs and the timing of these needs, existing and future resources, and major risks in the APS service territory. Analytical models are implemented to produce a series of resource portfolios for further evaluation. APS set a long-term carbon emission goals based on carbon intensity, as measured by the pounds of carbon emission per megawatt-hour of energy. By 2032, APS expects their carbon-emission rate to decrease to less than 600 lb/MWh.

ii.) In the formulation of the IRP, uncertainties regarding environmental regulation and the evolving nature of the electric industry significantly influenced the plan. As a result, understanding current and potential future environmental regulations is an important part of the planning process. Environmental regulations are promulgated on the federal, state, and county levels. In response to the uncertainty around environmental regulations, APS focuses on the following: utilizing a combination of market-based solutions, updating conventional generation resources, expansion of renewable generation, adding transmission resources, evaluating our remaining coal fleet, and investing in advanced grid technologies.

iii.) In 2016, APS commissioned a new solar plant in Red Rock, Arizona. The 40-MW plant, which is one of the largest solar photovoltaic power plants in the state, is owned and operated by APS in partnership with Arizona State University and PayPal. In May 2016, APS surpassed 1 gigawatt (GW) of overall solar energy capacity. Prior to last year, no other utility outside of California had achieved such a milestone. For the 25th consecutive year, Palo Verde was the nation's largest power producer, generating 32.2 million MWh of carbon-free electricity in 2016.

iv.) For APS, short-term (annual) carbon emissions from generation sources are predominantly a function of energy demand due to weather and variations in generation resources due to fuel prices. Carbon emissions from APS gas-fired fleet increased by about 27 percent; however, the carbon emissions from APS coal-fired fleet decreased by more than 40 percent. For 2016, the cumulative effect was a 26 percent decrease in total carbon emissions. To measure APS's overall carbon reduction, a carbon avoidance metric is used. This reflects actions taken throughout the company, including retiring coal units, installing renewable generation, energy efficiency incentives for customers, increasing building and operating efficiencies, and fleet electrification. The 2016 carbon-avoidance goal was 3.5 million metric tons. APS ended the year with a carbon avoidance of 4.9 million metric tons.

v.) The most important component of our IRP is providing the most reasonable combination of overall economic performance, and flexibility in the generation fleet to support grid reliability, integrating renewable energy and managing uncertainties. The IRP process enables APS to develop long-term plans and evaluate which resource options may be appropriate given today's forecasts of future energy needs, resource costs and associated uncertainties. Important for APS is the growth of solar generation, requiring a responsive, supportive electric grid and additional flexible resources to balance the system in order to continue meeting customers' energy needs reliably. Natural gas will play an increasingly important role in transforming the resource portfolio into one that is more flexible and responsive.

vi.) Our regulated electric business does not face direct competition from other utility companies. However, it is imperative to ensure that customers in our service territory are provided with safe, reliable and affordable electricity into the foreseeable future. To ensure we continue to provide the same quality of service, a diverse fuel mix is critical to effectively manage overall price volatility for our customers, and to insulate against risks in commodity supply chains such as price spikes or infrastructure issues.

vii.) Substantial business decisions made during the reporting year that address climate change include 1) an additional 97 megawatts of clean solar energy that

was added to our generation mix, 2) investing \$3.5 billion in Arizona's electricity infrastructure through 2018, 3) rate review proposed that would enable APS to: Invest \$3.6 billion over the next three years in upgrades and maintenance for the energy grid; Complete a \$500 million investment to modernize the Ocotillo Power Plant with more efficient generation that reduces emissions and water use; Support a \$400 million investment to reduce emissions at the Four Corners Power Plant and comply with more stringent federal environmental standards.

viii.) APS's executive team recognizes the importance of having a carbon strategy because it is a key factor in mitigating financial, physical, and operational risks. Climate change issues, particularly carbon costs and water resources, are a critical parameter in our long-range resource planning process which is developed in conjunction with the ACC. APS's climate change strategy includes participation in legislative and regulatory actions related to carbon management, stakeholder engagement, identification of physical, financial, and regulatory risks of climate change, decarbonization of generation resources, and extensive carbon emission monitoring. APS consistently tracks the regulatory landscape as it relates to climate change, including various internal full time employees and external legislative liaisons, networks of governmental relations experts and subscriptions and memberships in industry trade groups that alert APS to proposed legislation and help APS understand any potential impacts.

CC2.2b

Please explain why climate change is not integrated into your business 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

Carbon prices are challenging to forecast because, despite numerous efforts, the federal government has not reached a national policy consensus on the magnitude, timing, or need for a carbon tax. Public support for less carbon intensive resource options has garnered strength over the years and that momentum is

expected to continue. Therefore, in a 15-year forecast, robust planning suggests the potential for some level of carbon pricing or regulation. It is difficult to forecast what final form that regulation may take; nonetheless, APS has included in its analysis the potential for carbon pricing. APS is incorporating assumed carbon costs based on the actual trading price of CO2 allowances in the California market as of September 24, 2013. For this analysis, it is assumed that federal legislation will occur in 2021 that requires utilities to acquire carbon allowances. Carbon prices are then escalated at the rate of inflation.

CC2.3

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

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

CC2.3a

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

Focus of legislation	Corporate Position	Details of engagement	Proposed legislative solution
Other: Energy Policy	Support	In 2013, APS and the Arizona Corporation Commission (ACC) stepped to the forefront of an emerging policy issue: how to ensure utility rate design keeps pace with the modernization of the electricity grid and the changing ways customers are using electricity. The most urgent aspect of this issue was to determine how customers with rooftop solar panels on their homes should be compensated for the energy they generate, while ensuring those customers also pay their fair share to maintain the electric grid. This engagement continued throughout 2016. The initial step toward modernizing electric rate structures in Arizona was taken in December of 2016, when the ACC established a method to value the energy received by a utility from rooftop solar panels. This method was established in the first fully litigated proceeding to value excess energy from rooftop solar in the nation, and has served as a template for other states who are working through the same issues.	It is important to understand that this is not just an Arizona issue. Many states are changing retail rate designs to address changes in how customers use electricity. As rooftop solar continues to increase around the U.S., these changes in rate design are necessary to make this emerging technology sustainable. Ultimately, our industry needs to tackle the broader problem of modernizing how electric utilities price their services. Great strides were made addressing this issue in 2016, and APS will continue to work with the ACC to modernize rate structures and adopt new and emerging technologies. By tackling this issue, we can ensure electric rates represent a truer reflection of fixed grid-related costs, while incorporating greater rate flexibility, enabling technological innovations that improve reliability and the customer experience, and maintaining affordability and transparency for all customers

Focus of legislation	Corporate Position	Details of engagement	Proposed legislative solution
Energy efficiency	Support	<p>The APS State and Local Affairs team works closely with state legislators to address public policy discussions affecting climate change. Making these connections requires building consensus on complex issues. The Government Affairs team works tirelessly to represent Pinnacle West's best interests, as well as the best long-term interests of our customers, our shareholders and the state while establishing sound public policy.</p>	<p>We will continue to promote energy efficiency programs that reduce the energy needed by our customers during hours of the highest energy use on our system. In 2016, APS continued to meet the energy efficiency standard (EES) goal required by the Arizona Corporation Commission (ACC). In 2016, APS focused on targeted marketing of programs based on data analytics, adding smart thermostat rebates, a no-cost schools pilot program and expanding programs like behavioral conservation.</p>
Cap and trade	Neutral	<p>The APS State and Local Affairs team works closely with state legislators to address issues important to APS. Making these connections requires building consensus on complex issues. The Government Affairs team works tirelessly to represent Pinnacle West's best interests, as well as the best long-term interests of our customers, our shareholders and the state.</p>	<p>There have been no recent attempts by Congress to pass legislation that would establish a cap and trade approach to regulate greenhouse gas (GHG) emissions, and it is unlikely the 115th Congress will consider a climate change regulation. In the event cap and trade legislation ultimately is passed, the actual economic and operational impact of such legislation on APS depends on a variety of factors, none of which can be fully known until a law is enacted and the specifics of the resulting program are established. These factors include the terms of the legislation with regard to allowed GHG emissions; the cost to reduce emissions; whether any permitted emissions allowances will be allocated to source operators free of cost or auctioned (and, if so, the cost of those allowances in the marketplace) and whether offsets and other measures to moderate the costs of compliance will be available; and, in the event of a carbon tax, the amount of the tax per pound of carbon dioxide (CO₂e) equivalent emitted.</p>
Carbon tax	Neutral	<p>The APS State and Local Affairs team works closely with state legislators to address issues important to APS. Making these connections requires building consensus on complex issues. The Government Affairs team works tirelessly to represent Pinnacle West's best interests, as well as the best long-term interests of our customers, our shareholders and the state.</p>	<p>There have been no recent attempts by Congress to establish a carbon tax legislation to regulate greenhouse gas (GHG) emissions, and it is unlikely the 115th Congress will consider a climate change bill. In the event carbon tax legislation ultimately is passed, the actual economic and operational impact of such legislation on APS depends on a variety of factors, none of which can be fully known until a law is enacted and the specifics of the resulting program are established. These factors include the terms of the legislation with regard to allowed GHG emissions prior to a tax rate; the cost of the carbon tax; whether offsets and other measures to moderate the costs of compliance.</p>
Other: AZ Senate Bill 1417	Support	<p>The APS State and Local Affairs team works closely with state legislators to address issues important to APS. Making these connections requires building consensus on complex issues. The Government Affairs team works tirelessly to represent</p>	<p>AZ Senate Bill 1417 establishes new protections for consumers who buy or lease rooftop solar systems. Building on legislation (SB1465) adopted by the state legislature in 2015, this bill prescribes installation, interconnection and energizing processes</p>

Focus of legislation	Corporate Position	Details of engagement	Proposed legislative solution
		Pinnacle West's best interests, as well as the best long-term interests of our customers, our shareholders and the state.	for distributed generation systems and makes changes to the warranty and consumer disclosure requirements for the sale, lease or finance of a system. The legislation seeks to ensure that consumers are provided with an accurate estimate of the amount they are likely to save by purchasing or leasing a rooftop solar system and prohibits leasing companies from installing a system until an application for interconnection has been submitted to and approved by the utility.

CC2.3b

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

Yes

CC2.3c

Please enter the details of those trade associations that are likely to take a position on climate change legislation

Trade association	Is your position on climate change consistent with theirs?	Please explain the trade association's position	How have you, or are you attempting to, influence the position?
WEST Associates	Consistent	Recognizes the potential impact of climate change on electric utilities and works to integrate the unique western conditions into viable solutions.	Serving on the board and providing technical support and funding to the organization.
Edison Electric Institute (EEI)	Consistent	Global climate change presents one of the biggest current energy and environmental policy challenges. EEI member companies are committed to addressing the challenge of climate change and have undertaken a wide range of initiatives over the last 30 years to reduce, avoid or sequester GHG emissions. Policies to address climate change should seek to	Participating on committees.

Trade association	Is your position on climate change consistent with theirs?	Please explain the trade association's position	How have you, or are you attempting to, influence the position?
		ensure energy reliability, minimize impacts on consumers and avoid harm to U.S. industry and the economy.	
Nuclear Energy Institute	Consistent	Reducing carbon dioxide emissions, while fostering sustainable development, is a major global challenge of the 21st century. Nuclear energy is a vital source of electricity that can meet the nation's growing energy needs with a secure, domestic energy supply that also protects our air quality. The Nuclear Energy Institute supports federal action or legislation to reduce greenhouse gas (GHG) emissions. Any such federal initiative should: - involve all sectors of the economy and all sources of greenhouse gas; - assure stable, long-term public/private funding to support the development and deployment of needed technology solutions; - assure compliance timelines are consistent with those of expected development and deployment of needed technologies; - employ market mechanisms to secure cost-effective GHG reductions, and provide a reasonable transition and an effective economic safety valve; - establish a long-term price signal for carbon that is moderate, does not harm the economic competitiveness of U.S. industry; and stimulates future investments in zero- or low-carbon technologies and processes; - address regulatory or economic barriers to the use of carbon capture and storage, and increased nuclear, wind or other zero- or low-GHG technologies; - minimize economic disruptions or disproportionate impacts; - recognize early actions/investments made to mitigate GHG emissions; - provide for the robust use of a broad range of domestic and international GHG offsets; - provide certainty and a consistent national policy; and - recognize the international dimensions of the challenge and facilitate technology transfer.	APS's Chairman and CEO serves as the chairman of the Nuclear Energy Institute.
Nature Conservancy	Consistent	Climate change is one of the world's most urgent challenges and an immediate risk to our communities, economies, and to our conservation mission. The Nature Conservancy is promoting practical, innovative solutions to create a prosperous, low-carbon future that is cleaner, healthier, and more secure for everyone.	APS's Chairman and CEO serves on the board of the Nature Conservancy in Arizona.
Center for Climate and Energy Solutions (C2ES)	Consistent	C2ES, the Center for Climate and Energy Solutions, is an independent, nonpartisan, nonprofit organization working to forge practical solutions to climate change. C2ES has a mission to advance strong policy and action to reduce greenhouse gas emissions, promote clean energy, and strengthen resilience to climate impacts. A key objective is a national market-based program to reduce emissions cost-effectively. They believe a sound climate strategy is essential to ensure a strong, sustainable economy. C2ES is the successor to the Pew Center on Global Climate Change, and is widely recognized as an influential and pragmatic voice on climate issues.	Participating on the C2ES's Business Environmental Leadership Council (BELC)
Electric Power	Consistent	The Electric Power Research Institute (EPRI) conducts research, development, and	Members of Sector Councils

Trade association	Is your position on climate change consistent with theirs?	Please explain the trade association's position	How have you, or are you attempting to, influence the position?
Research Institute (EPRI)		demonstration projects for the benefit of the public in the United States and internationally. As an independent, nonprofit organization for public interest energy and environmental research, they focus on electricity generation, delivery, and use in collaboration with the electricity sector, its stakeholders and others to enhance the quality of life by making electric power safe, reliable, affordable, and environmentally responsible. EPRI'S Energy and Climate Policy Analysis program provides public- and private-sector decision makers with analyses and information on the potential costs and benefits of domestic and international policy proposals and regulations. The program's modeling and analyses provide crucial information needed to make economically and environmentally sound climate and energy policy decisions, and also inform power companies of the possible near-, mid-, and long-term implications of different policy approaches, helping them to make better decisions. Program research focuses on estimating the economic costs of climate policy proposals against the backdrop of other energy, environmental, and economic policies; identifying cost-effective strategies and policy principles for reducing these costs, including evaluating adaptation and mitigation strategies for managing climate change risk; and comparing potential costs with the potential avoided risks of lower GHG concentrations.	and Working Groups.
Arizona Forward	Consistent	Arizona Forward brings business and civic leaders together to promote cooperative efforts to improve the environmental sustainability and economic vitality of Arizona and local regions. The organization is working to understand the perceptions of Arizona residents about climate change to fill the gaps on educating people about the topic. The intent is to publish statewide editorial opinion pieces and/or stories about climate change to advocate for ways to mitigate the impacts.	Serving on the board.

CC2.3d

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

Yes

CC2.3e

Please provide details of the other engagement activities that you undertake

CC2.3f

What processes do you have in place to ensure that all of your direct and indirect activities that influence policy are consistent with your overall climate change strategy?

APS's Vice President of Federal Affairs is responsible for developing positions and policy on issues related to energy, utilities, nuclear power, the environment, natural resources, conservation and taxes. The Public Policy business unit is responsible for developing coordinated internal relationships and business positions in order to pursue positive regulatory and legislative outcomes that support corporate and business unit objectives, and address important evolving regulatory, political, and economic issues that are key to the company's business. Our company public policy representatives are also actively engaged in advocacy on a range of legislation – from climate change to nuclear power to healthcare that would impact our business and our industry. In addition, our Chief Sustainability Officer is involved at the executive level to ensure consistent policy related to environmental matters including climate change.

CC2.3g

Please explain why you do not engage with policy makers

Further Information

2017 Integrated Resource Plan

Attachments

[https://www.cdp.net/sites/2017/83/14783/Climate Change 2017/Shared Documents/Attachments/ClimateChange2017/CC2.Strategy/2017IntegratedResourcePlan.pdf](https://www.cdp.net/sites/2017/83/14783/Climate%20Change%202017/Shared%20Documents/Attachments/ClimateChange2017/CC2.Strategy/2017IntegratedResourcePlan.pdf)

Page: CC3. Targets and Initiatives

CC3.1

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

Absolute target
Intensity target
Renewable energy consumption and/or production 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+2 (market-based)	100%	53%	2014	2291716	2016	No, and we do not anticipate setting one in the next 2 years	APS measure their overall carbon reduction—not just decreasing emissions from generation but also it's operations—using a carbon avoidance metric. This reflects actions taken throughout the company, including retiring coal units, installing renewable generation, energy efficiency incentives for customers, increasing building and operating efficiencies, and pursuing fleet electrification. APS's 2016 carbon-avoidance goal was 3.5 million metric tons and the base year was 2.3 million metric tons.

CC3.1b

Please provide details of your intensity target

ID	Scope	% of emissions in scope	% reduction from base year	Metric	Base year	Normalized base year emissions covered by target	Target year	Is this a science-based target?	Comment
Int1	Scope 1	99.5%	49%	Metric tonnes CO2e per megawatt hour (MWh)*	2012	0.529	2032	No, but we anticipate setting one in the next 2 years	In line with projected population growth in Arizona, APS anticipate customer growth of approximately 45 percent by 2032, representing up to an additional 549,000 customers. APS expects renewable energy and energy efficiency to meet more than 50 percent of that growth. This will help them achieve their long-term goal to reduce their carbon-emission rate to less than 600 pounds per megawatt-hour (lb/MWh) by 2032.

CC3.1c

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

ID	Direction of change anticipated in absolute Scope 1+2 emissions at target completion?	% change anticipated in absolute Scope 1+2 emissions	Direction of change anticipated in absolute Scope 3 emissions at target completion?	% change anticipated in absolute Scope 3 emissions	Comment
Int1	Increase	1			Although the emission rate will be less CO2e, overall Scope 1 + 2 emissions is likely not going to decrease as the amount of MWh needed by customers will increase. However, had the carbon emissions rate not decreased, overall emissions would have increased by 39%. APS anticipates customer growth of approximately 45 percent by 2032, representing up to an additional 549,000 customers and an increase of MWh delivered by 50%. APS expects renewable energy and energy efficiency to meet more than 50 percent of that growth. APS will reduce the carbon-emission rate to less than

ID	Direction of change anticipated in absolute Scope 1+2 emissions at target completion?	% change anticipated in absolute Scope 1+2 emissions	Direction of change anticipated in absolute Scope 3 emissions at target completion?	% change anticipated in absolute Scope 3 emissions	Comment
					600 pounds per megawatt-hour (lb/MWh) by 2032 through CO2e reduction activities, the current rate is about 720 lbs/MWh. From 2012 - 2016, APS has reduced its CO2 emissions by 30%. In 2012, APS's scope 1 emissions were 14,614,070 metric tons. In 2016, APS's scope 1 emissions were reduced to 10,062,603 metric tons.

CC3.1d

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

ID	Energy types covered by target	Base year	Base year energy for energy type covered (MWh)	% renewable energy in base year	Target year	% renewable energy in target year	Comment
RE1	Electricity production	2007	324094	1.1%	2025	15%	In 2016, APS purchased or generated 324,094 MWh of renewable energy, or approximately 1.1 percent of total retail sales. This total includes renewable generation APS has under contract, APS -owned solar generation, as well as energy generated by Solar Partners Incentive Program ("SPIP") participants. By 2025, APS is targeting to have at least 15% of it's energy from renewable generation. 2007 is used as the baseline year because this was the first year APS implemented actions for the Arizona Renewable Energy Standard.

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
Int1	25%	52%	In 2016, overall carbon emissions from APS's fossil-generation fleet totaled 10 million metric tons. This is 3.5 million metric tons fewer than 2015. The carbon intensity of their fossil generation fleet was reduced to 1,476 lb/MWh in 2016, representing a 25 percent decrease from the 2015 fossil carbon intensity. This decrease is due to a larger percentage of energy being generated from gas-fired units and less coal units.
RE1	47%	66%	In 2016, APS demonstrated their commitment and leadership to renewable energy and reached a milestone of 1-gigawatt of solar on our system. In 2016, APS has 3,351,983 MWh of renewable energy resources on its system, including energy from rooftop solar installations for which an incentive was not provided. This is equivalent to nearly 12.0 percent of APS's 2016 retail sales. APS's renewable energy portfolio is in compliance with the Renewable Energy Standard (RES).
Abs1	100%	100%	APS's 2016 carbon-avoidance goal was 3.5 million metric tons. APS ended the year with a carbon avoidance of 4.9 million metric tons. The primary reason for far surpassing their carbon avoidance goal was due to more renewable energy generation than originally projected. To measure overall carbon reduction—not just decreasing emissions from generation but also in their own operations—they use a carbon avoidance metric. This reflects actions taken throughout the company, including retiring coal units, installing renewable generation, energy efficiency incentives for customers, increasing building and operating efficiencies, and pursuing fleet electrification.

CC3.1f

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

CC3.2

Do you classify any of your existing goods and/or services as low carbon products or do they enable a third party to avoid GHG emissions?

Yes

CC3.2a

Please provide details of your products and/or services that you classify as low carbon products or that enable a third party to avoid GHG emissions

Level of aggregation	Description of product/Group of products	Are you reporting low carbon product/s or avoided emissions?	Taxonomy, project or methodology used to classify product/s as low carbon or to calculate avoided emissions	% revenue from low carbon product/s in the reporting year	% R&D in low carbon product/s in the reporting year	Comment
Group of products	APS offers residential and business customers a comprehensive portfolio of energy efficiency options, ranging in dollar amounts to meet the needs of all customers.	Avoided emissions	Other: Arizona Energy Efficiency Standard	0.09%	Less than or equal to 10%	APS achieved over 573 gigawatt-hours of savings in 2016, avoiding about 2.5 million tons for carbon emissions from energy efficient actions taken in 2016 alone.
Group of products	APS offers customers a comprehensive portfolio of demand response options to reduce electricity use at periods of high demand.	Avoided emissions	Other: Arizona Energy Efficiency Standard	0%	Less than or equal to 10%	In 2016, APS saved a total of 912,544 MWh from Demand Response and Load Reductions projects. 56,213 MWh counted toward the Energy Efficiency Standard per ACC Decision No. 71436, the credit for demand response and load management peak reductions shall not exceed 10% of the EE standard.
Product	APS Green Choice program allows customers to purchase up to 100% of their	Low carbon product	Other: Green-e Energy Certification	0%	Less than or equal to 10%	In 2016, 1,930 customers subscribed to these rates for 29,074 MWh of sales and a total of \$296,565 in gross revenue.

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
	power from renewable energy from Arizona and New Mexico.					

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	1	4602
To be implemented*	6	20964
Implementation commenced*	4	4039825
Implemented*	2	101225
Not to be implemented	1	4632

CC3.3b

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

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/ Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
Energy efficiency: Processes	In 2016, 66 K-12 schools participated in the Schools Pilot program receiving \$3.0 million in fully funded energy efficiency audits and upgrades. Of the \$3.0 million, \$2.0 million were from the Schools Pilot Program and \$1.0 million was funded through the APS Solutions for Business Schools program. Collectively, these schools are projected to save more than 8.73GWh and \$570,000 in annual energy costs. This Schools Pilot program launched and was completed in 2016.	72982	Scope 1	Mandatory	0	3000000	<1 year	6-10 years	Decision No. 75323 from the Arizona Corporation Commission ordered APS to implement a pilot program for schools. The Schools Pilot Program helped schools that were unable to participate in our energy efficiency programs due to lack of available funding. The Schools Pilot Program rebates, in addition to the APS Schools rebates, paid 100% of the school's cost for energy efficiency projects.
Fugitive emissions	APS has reduced Scope 1 SF6 emissions by	28243	Scope 1	Voluntary	0	0	<1 year	Ongoing	By implementing process, procedure and tracking

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
reductions	implementing process, procedure and tracking improvements. This includes an active breaker replacement program. APS continues to implement tighter controls and tracking measures to enhance their management of SF6 emissions.								improvements at APS, they had a 52% reduction in SF6 emissions, from 54,690 metric tons of CO2e in 2015 to 26,455 metric tons of CO2e in 2016.

CC3.3c

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

Method	Comment
Compliance with regulatory requirements/standards	APS uses an integrated planning process to link business strategy with resource planning. Benchmarking and continuous improvement are valued by the executive team and employees ensuring that the process keep APS focused on key objectives and will ultimately help them deliver reliable and affordable power to Arizona. The Arizona Corporation Commission (ACC) also has an electric Energy Efficiency Standards (EES). Under the EES, Arizona's public utilities under the ACC's jurisdiction are required to achieve cumulative annual energy savings of at least 22 percent of retail sales in 2019 - measured in kWh - by 2020. The Arizona Corporate Commission (ACC) has adopted a Renewable Energy Standard (RES), in which electric utilities under its jurisdiction must supply an increasing percentage of their retail electric energy sales from eligible renewable resources, including solar, wind, biomass, biogas and geothermal technologies. The renewable energy

Method	Comment
	standard increases annually until reaching 15 percent in 2025. This regulatory driver is having a large impact on APS' generation mix.
Dedicated budget for other emissions reduction activities	APS is a key committee member in the development of the Edison Electric Institute (EEI) Electrification Initiative, with the goal of accelerating the adoption of plug-in hybrid electric vehicles (PHEVs) throughout the electric utility industry. Involvement in this program allows APS to exchange valuable ideas, understand emerging technologies and identify potential opportunities within our fleet. APS's total 2016 fleet carbon emissions were 15,699 metric tons, which is essentially flat compared to total 2015 fleet carbon emissions. However, 2016 followed two years where APS averaged greater than a 12 percent reduction each year in total fleet carbon emissions. In addition, APS is closely monitoring the market as manufacturers develop PHEV pickups and commercial trucks. In 2016, APS spent \$3,221,000 for Electric Power Take Offs (ePTO's) for the fleet. Instead of using the transmission to drive the hydraulic pump to power the aerial unit, an ePTO uses an electric motor to drive the hydraulic pump. This reduces engine idle time which also saves fuel, reducing GHG.
Internal price on carbon	APS maintains a projection on carbon pricing. The internal cost and projection is used to evaluate business decisions.
Partnering with governments on technology development	APS has taken an industry lead to find innovative ways to increase customer and system reliability and meet future resource needs by partnering on microgrid projects with customers like the Marine Corps Air Station Yuma. The signing of this deal marks the start of a new collaboration between the Department of the Navy and APS, and will exemplify energy security and resiliency.
Dedicated budget for energy efficiency	The APS budget for implementation of DSM programs in 2016 was \$70.9M. APS exceeded the kWh energy savings required by the ACC EES by about 2%, while spending about \$300,000 or 0.4% less than the approved budget amount. The breakdown of DSM expenses was: \$1.9M for Demand Response, \$30.6M for residential programs, \$32.0M for non-residential programs, and \$6.1M for measurement evaluation research and performance incentive. These components of the DSM Program Portfolio sum to a total spend in 2016 of \$70.6M.
Dedicated budget for low carbon product R&D	APS participates in R & D programs through the Electric Power Research Institute (EPRI) dedicated to sustainability, electric transportation, energy storage and distributed generation research. In 2016, APS budgeted a total of close to \$5 Million and almost a \$1million of self-directed funds towards EPRI membership and research activities.

CC3.3d

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

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 mainstream reports (including an integrated report) but have not used the CDSB Framework	Complete	42, 44-45, 55	https://www.cdp.net/sites/2017/83/14783/Climate Change 2017/Shared Documents/Attachments/CC4.1/PNW_2016_Annual_Report.pdf	
In mainstream reports (including an integrated report) but have not used the CDSB Framework	Complete	17	https://www.cdp.net/sites/2017/83/14783/Climate Change 2017/Shared Documents/Attachments/CC4.1/PNW_2017_Proxy_Statement.pdf	
In other regulatory filings	Complete	13, 14-16, 24-25, 54, 93, 97, 118, 122, 125-126, 130-140, 182, 201-202, 208, 211-212, 214, 328-329, 340, 342, 350-354	https://www.cdp.net/sites/2017/83/14783/Climate Change 2017/Shared Documents/Attachments/CC4.1/2017IntegratedResourcePlan.pdf	
In voluntary communications	Complete	4, 8, 10-12, 13, 16, 18-21, 46, 50	https://www.cdp.net/sites/2017/83/14783/Climate Change 2017/Shared Documents/Attachments/CC4.1/2016_CRR_Web.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	A change in regulation that is driving an inherent risk for the utility sector, and APS in particular, is the Clean Power Plan (CPP). Although the current administration is seeking to rescind the CPP, the future of carbon regulation is far from settled. Accordingly, APS continues to monitor the CPP review and rescission process to determine if it will have any noticeable effect on its operations or obligations. Before	Increased operational cost	1 to 3 years	Direct	Likely	High	Under the CPP approximately 53% of APS generation assets are at risk of compliance obligations. The CPP will not require significant financial investment by APS. However, because of uncertainty related to legal challenges against the CPP, it creates financial uncertainty. For	APS maintains a specialized Environmental Policy expert who works with the various operational teams to ascertain, review and track local, state and federal environmental regulations that have the potential to impact our current and future operational goals. APS also participates in CPP review and	There is a cost associated with monitoring the regulatory landscape as it relates to the CPP, including the cost of a full time Environmental Policy expert, subscriptions to the various tracking tools, memberships in various industry trade groups that help alert APS to proposed regulations and also help us understand any

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>the stay was issued, APS and the Arizona Utilities Group (which is a working group comprised of all the major electric utilities in Arizona) had reviewed the obligations imposed by the CPP. The conclusion APS reached after exhaustive study was that the conversion from coal to natural gas and renewables required to meet the CPP (along with energy efficiency), were the very things that APS was already doing based on market forces and strategic long range planning. For years APS has been migrating its power generation assets away from coal and into natural gas and renewables. This is the result of many different factors including, market forces which have pushed the price of</p>						<p>example, APS and its partners have allocated over \$600 million dollars to add significant emission control equipment to the 4 Corners Power plant. Significant changes in the final CPP could have direct financial implications for this and other APS facilities. A substantial change in the CPP could require a change in APS's generation portfolio which in turn could require additional capital investments and increased operating costs, and thus have a significant financial impact on the Company.</p>	<p>assessment on a national level through its membership with numerous trade and industry groups. APS engages with the regulatory community in order to understand and become aware of environmental regulations that may impact our current and future operational goals.</p>	<p>impacts on the industry as a whole and, finally significant employee time spent assessing and mapping the impacts of CPP on APS. Additionally, APS is planning to spend upwards of \$500 million to build new gas-fired generating units that will help offset load demand as coal units are shut down.</p>

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>natural gas to a level where it competes directly with coal, further diminishing the value of coal as the low cost energy option. Moreover, the way energy is used and the available energy generation mix has changed in recent years creating less need for large base-load plants and a greater focus on smaller, quick-ramping generation such as natural gas peaking and load shaping generating assets. Finally, the growth of the renewables market has directly impacted generation by providing significant renewable energy generation assets that further reduce the need for large base-load units while at the same time putting greater stress on the system as the larger number of</p>						<p>However, because APS, for years, has been proactively moving its generation towards a more balanced generation mix, APS remains well positioned.</p>		

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>small sources cause peaks and valleys spread over a larger operating timeframe. Accordingly, even though the CPP is subject to a stay as well as a rescission effort by the executive branch, because of the scope and breadth of the CPP and its potential impacts to the electric utility sector, the CPP poses a significant, inherent risk driven by change in regulation.</p>								
Cap and trade schemes	<p>Although there are no current or planned congressional attempts to pass cap and trade legislation that would regulate greenhouse gas (“GHG”) emissions, it is possible that the next election cycle will create fertile ground for such legislation. In the event cap and trade legislation ultimately passes, the actual</p>	Increased operational cost	Up to 1 year	Direct	Very unlikely	High	<p>With over 50% of APS generation coming from fossil fuel sources, any cap and trade scheme will have a direct financial impact on our operations. For example, the California legislature enacted AB 32</p>	<p>APS directly manages potential impacts from Carbon Cap and Trade programs. For example, under the California Cap and Trade program, entities selling electricity into California, including APS, must hold carbon allowances to cover GHG</p>	<p>There is a cost associated with the management of this risk driver. Primarily, the costs will consist of various internal full time and external legislative liaisons, networks of governmental relations experts and subscriptions to</p>

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>economic and operational impact of such legislation on APS depends on a variety of factors, none of which can be fully known until a law is enacted. These factors include the terms of the legislation with regard to allowed GHG emissions; the cost to reduce emissions; whether any permitted emissions allowances will be allocated to source operators free of cost or auctioned (and, if so, the cost of those allowances in the marketplace) and whether offsets and other measures to moderate the costs of compliance will be available. California passed cap-and-trade legislation that, as of 2013, requires APS, as a seller of electricity into California, to hold carbon allowances for all associated</p>						<p>and SB 1368 in 2006 to address GHG emissions. In October 2011, the California Air Resources Board approved final regulations that established a state-wide cap on GHG emissions beginning on January 1, 2013 and established a GHG allowance trading program under that cap. The first phase of the program, which applies to, among other entities, importers of electricity, commenced on January 1, 2013. Under the program, entities selling electricity into California, including APS, must hold carbon allowances to</p>	<p>emissions associated with electricity sales from outside the state. This creates direct financial implications to APS that must be managed. APS is currently authorized to recover the cost of these carbon allowances through the PSA. Additionally, APS uses the following management strategy: obtain information from federal and state agencies and third-party organizations; utilize the APS Regulatory Peer Review committee to ensure that all aspects of the company understand the new proposed or</p>	<p>the various tracking tools, and memberships in various industry trade groups that help alert us to proposed legislation and also help us understand any impacts on the industry as a whole. Additionally, in order to comply with the California cap-and-trade legislation APS manages all power sales to California to ensure APS holds the proper GHG allowances.</p>

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	electricity sales.						cover GHG emissions associated with electricity sales into California from outside the state. This creates direct financial implications to APS. If other states pass similar legislative initiatives aimed at CO2, APS may be required to purchase allowances for power sold to those jurisdictions.	final rule; update costs of technology needed for compliance as better information becomes available; monitor legislative activities related to CO2 and develop cost sensitivities to evaluate the potential impact; develop additional options, including scenarios containing minimum and maximum technology requirements to evaluate the range of possible outcomes; and incorporate a hypothetical carbon cost into resource planning analytics. APS also provides	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								comments, both through industry groups and independently, on local, state and federal proposed legislation and regulations in order to help influence the final requirements in a way that furthers our corporate vision of creating a sustainable energy future for Arizona.	
Carbon taxes	Although there are no current or planned state or federal efforts to pass a carbon tax that would regulate greenhouse gas (“GHG”) emissions, it is possible that the next election cycle will create fertile ground for such legislation at the state and federal levels. In the event carbon tax legislation ultimately passes, the	Increased operational cost	Up to 1 year	Direct	Very unlikely	High	Carbon tax costs are challenging to forecast because, despite numerous efforts, the federal government has not reached policy consensus on the magnitude, timing, or need for a carbon tax.	APS directly manages potential impacts from Carbon Cap and Trade programs. For example, APS has included in its analysis the potential for carbon pricing in the most recent IRP. APS then incorporates assumed carbon costs based on	There is a cost associated with the management of this risk driver. Primarily, various internal full time employees including the Environmental Policy expert and external legislative liaisons, networks of governmental

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>actual economic and operational impact of such legislation on APS depends on a variety of factors, none of which can be fully known until a law is enacted and the specifics of the resulting program are established. These factors include the terms of the legislation with regard to carbon taxes; and the amount of the tax per pound of carbon dioxide ("CO2") equivalent emitted. Additionally, since the future of the Clean Power Plan (CPP) is not certain, there is a potential risk that in place of the CPP, Congress may look to a GHG tax.</p>						<p>It is difficult to forecast what final form that regulation may take; nonetheless, APS has included in its analysis the potential for carbon pricing in the most recent Integrated Resource Plan (IRP). APS is incorporating assumed carbon costs based on the actual trading price of CO2 allowances in the California market as of September 24, 2013. For this analysis, it is assumed that federal legislation is passed requiring utilities to acquire carbon allowances beginning in 2021. Carbon prices are then</p>	<p>the actual trading price of CO2 allowances in the California market as of September 24, 2013. Additionally, APS uses the following management strategy: obtain information from federal and state agencies and third-party organizations; utilize the APS Regulatory Peer Review committee to ensure that all aspects of the company understand the new proposed or final rule; update costs of technology needed for compliance as better information becomes available; monitor legislative</p>	<p>relations experts and subscriptions to the various tracking tools, and memberships in various industry trade groups that help alert us to proposed legislation and also help us understand any potential adoption of carbon taxes.</p>

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
							<p>escalated at the rate of inflation. Carbon prices range from a low of zero, representing scenarios in which carbon legislation is not enacted, to a high of \$15/ton starting in 2019 and escalating at 7.5% per year.</p>	<p>activities related to CO2 and develop cost sensitivities to evaluate the potential impact; develop additional options, including scenarios containing minimum and maximum technology requirements to evaluate the range of possible outcomes; and incorporate a hypothetical carbon cost into resource planning analytics. APS also provides comments, both through industry groups and independently, on local, state and federal proposed legislation and regulations in order to help influence the</p>	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								final requirements in a way that furthers our corporate vision of creating a sustainable energy future for Arizona.	
Other regulatory drivers	Residential rooftop solar is a growth business in the southwest. Rooftop solar provides a number of benefits for the homeowner, but one of the most important from a regulatory perspective is net metering. Under a regulatory structure that mandates net metering, rooftop solar customers receive the benefit of a flat rate for the solar energy produced by their panels. Net metering is a great benefit to the homeowner since it enables the homeowner to easily and accurately quantify the relative	Wider social disadvantages	Up to 1 year	Direct	Very likely	High	The financial implications of rooftop solar are significant for APS. If the Arizona Corporation Commission (ACC), the Arizona public utility commission, does not grant the APS rate relief related to net metering, it will have even greater financial implications on APS going forward. If APS is required to buy power from rooftop solar at rates higher than market rates, then APS	To manage the risks and uncertainties with rooftop solar and net metering regulations, APS uses the following strategy: Obtain information from sources, including federal and state agencies, industry publications, market research, and third-party consulting organizations, to maintain awareness of proposed changes to rooftop solar net metering regulations;	There is a cost including various legislative liaisons, networks of governmental relations experts and subscriptions to the various tracking tools, memberships in various industry trade groups that help alert us to proposed regulatory action and also help us understand any impacts on the industry as a whole, including those associated with the regulatory landscape as it relates rooftop

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>cost of buying and paying off the rooftop solar system. Although a great tool to help close the sale on rooftop solar systems by showing a repayment method for the large up-front cost, net metering is quickly becoming a burden for the utilities. Utilities under a net metering agreement are required to buy the excess power generated by the homeowner's panels at a time when energy prices are generally low – midday. The result is a benefit for the homeowner, and an unnecessary added cost for the utility. Additionally, rooftop solar customers benefit from a reliable grid that is there whenever they need it – even when their solar panels are not producing any electricity such as at</p>						<p>is rewarding homeowners with rooftop solar at the expense of the rest of the customers. APS has proposed that future rooftop solar customers pay a fair price for their use of the grid, based on how much power they use. Alternatively, APS has proposed to give customers a credit based on the amount of electricity they generate, at a price set by the ACC and based on the rates that APS pays other generators for power. APS's proposal would allow existing customers to be exempt from the rate increase for 20 years.</p>	<p>Keep engagement in and understanding of legislative activities and ballot initiatives related to rooftop solar and net metering and develop cost sensitivities to evaluate the potential impact; Develop additional options, including scenarios containing minimum and maximum technology requirements to evaluate the range of possible outcomes.</p>	<p>solar and net metering,</p>

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	night, in the rain or when it is so hot they need more power to run their air conditioners. As more people install solar on their homes, it becomes more important that everyone who uses the grid helps cover the cost of keeping it reliable. Under current rules, rooftop solar customers benefit from a reliable grid, but pay little to nothing for their use of it.								

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 precipitation	One of the largest inherent	Increased operational	3 to 6 years	Direct	Likely	Medium-high	The financial implication	Because water supplies are so	The cost of managing for this

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
extremes and droughts	risks driven by change in physical climate parameters is water supply. APS owns and/or operates eight power generation plants in Arizona and one on the Navajo Reservation in New Mexico. Each requires water, primarily as cooling water to support generation. As a result, assured supplies of water are important for APS's generating plants. Water in the Southwest is a very limited resource. However, since its inception over a century ago, APS has been diligent and forward-looking in its efforts to find and secure sufficient water for current and future power	cost					related to drought is significant. Drought, due to climatic change, can limit availability of groundwater and surface water. This can have a direct impact on generation assets that rely upon surface water, but it can also have an impact on generation assets that rely upon groundwater since drought conditions could cause the surface water users to rely more heavily on groundwater. Some direct financial implications for APS could be: the inability to run units at design value, reducing available	integral to the operations at APS, APS has an entire Water Resource Management unit comprised of six full-time employees. This management team assesses and manages current as well as future risk associated with drought and extreme weather. APS has identified both primary water supplies and contingencies for each power plant in order to ensure reliable long-term operation, even in times of possible shortage, such as extended drought. APS works with various research entities such as Sandia National Laboratories, Electric Power Research Institute (EPRI), U.S. Department of Energy (DOE) and Idaho National Laboratory (INL) to	risk is substantial, but also something that APS has been doing since it was first conceived over a century ago. Water is such an important aspect to the current and future operations of APS that APS has an entire unit within its corporate structure dedicated to water management. This unit which is comprised of six full-time employees is responsible for tracking the current water usage at each well head or withdrawal point for each facility within the APS generation portfolio. APS actively engages in evaluating the possibility of future water stress. The company

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>generation. Since water is a scarce resource in the Southwest, any change in precipitation or extended droughts driven by climate change bring with it inherent risks for APS and could materially impact on our business and operations. Fortunately, APS has an entire unit dedicated to assessing and addressing our current and future water needs. At the opposite end of the spectrum from droughts are higher than normal precipitation events. Climate change forecasts do not anticipate a wetter Southwest, but should that change occur, there is no</p>						<p>generation and financial benefits for APS and its ratepayers; needing to transfer load to other more costly, polluting, or water intensive units that have access to assured water; having to purchase generation from other more costly, polluting, or water intensive units; requiring APS to drill additional or deeper wells to access available groundwater; finally, it could cause APS to have to pay senior water right holders to acquire additional water rights to meet demand.</p>	<p>evaluate new technologies, determine the cost of practical implementation, and to reduce water intensity at power generating facilities. Finally, at APS 2016 water consumption was Tier 1 metric tied to financial incentive. Additionally, there is an internal metric to reduce water intensity by 20% by 2025. Finally, we support and are involved with the Kyle Center for Water Policy to promote sound water policy and stewardship in Arizona. APS has committed support to the Kyl Center and executive APS Leadership serves on the Center's Board of Advisors. Through participation in the Kyl Center, we are actively engaging in discussion of the</p>	<p>participates in operations meetings and groups for surface water supplies, which often include detailed risk-based modeling of near-term operations. APS also has developed custom tools to support the modeling of power plant production in conjunction with groundwater modeling to perform scenario analysis supporting planning objectives around groundwater supplies.</p>

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	indication that it would adversely impact APS operations.							water economy, water-energy nexus, water rights, drought, water costs, and policy solutions that are important to our customers, our company and our state.	
Change in temperature extremes	For APS, there are significant inherit risks driven by changes in physical climate parameters, especially as related to forest fires. Risks associated with forest fires may not be new, but scientists have indicated that as global temperatures increase, there is a greater risk of drought and a correlated increase in risk and intensity of forest fires. Forest fires threaten not only	Increased operational cost	3 to 6 years	Direct	Likely	High	Preparing for temperature extremes and managing forest fire related risks throughout our 35,000 miles of transmission and distribution wires is a very costly venture. However, failing to manage this risk has even greater financial implications. As the sole source of power for most customers, if we are unable to deliver power, our customers suffer. Additionally, if we are unable to deliver power,	APS is prepared to meet the challenge of managing the risks from wildfires by training employees to work in close coordination with fire-fighting organizations as well as to make certain that our transmission rights-of-way are as free of vegetation as possible. With regards to the coordination with fire-fighting organizations, the company is often asked to de-energize power lines so fire personnel can work safely within APS	APS has a significant financial commitment in servicing over 35,000 miles of transmission and distribution wires across the state, through open deserts, forests, grasslands, mountains and large metropolitan areas. Additionally, APS has an entire forestry business unit dedicated to management of rights-of-way and helping to harden assets against the threat of forest fires related to changes in

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>the communities that APS serves, but also our vast network of electric transmission lines and facilities. With over 35,000 miles of transmission and distribution wires throughout the state, the potential threat to our system from wildfires is very real. APS is focused on wildfires at all times, planning year-round and continually strengthening the system so that customers can feel confident in our ability to serve them power.</p>						<p>we are unable to make money. Forest fires can cause temporary loss of service to areas due to de-energizing of lines to allow fire crews to work safely, and it can also cause long term loss of service due to downed transmission or distribution lines. Because of these financial implications, APS has a very robust management plan in place for addressing forest fires. Climate change risks will not change the base-level financial implications, but it will result in the potential for greater frequency and intensity of fires and increased costs associated</p>	<p>rights-of-way. For example, APS crews worked closely with fire personnel during the fire season to assess and mitigate risk. APS was embedded in the fire incident command to ensure the safety of crews fighting the fire, while monitoring the system to ensure safe and efficient repairs so that when customers were able to return to their homes, their power was back on and waiting for them. In addition, APS Forestry Unit assists Incident Command (IC) teams to: identify potential power line conflicts and restoration efforts; monitor progress of fire and predict impacts to power lines and facilities; act as a conduit of information between IC and</p>	<p>physical climate parameters including forest fires.</p>

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
							with the fires.	APS management communicating projected impacts to lines; coordinate scheduling of outages on fire line for firefighter safety; Participate in restoration efforts by clearing dead and down trees; prepare maps of fire footprint.	
Other physical climate drivers	An additional significant risk associated with changes in physical climate parameters is the potential for extreme heat and extreme weather. Summers in the Southwest are known for punishing heat and APS has built its generation and distribution systems with the functionality to meet this need. However, extreme heat can dramatically	Increased operational cost	3 to 6 years	Direct	Likely	Medium-high	There are two key areas of financial implication. First is the cost to harden the system to make it more efficient and to withstand the added heat load and extreme weather. Extreme heat and monsoon events can take a physical toll on equipment leading to premature failure. Moreover, monsoon events can disrupt the	Because summers in the Southwest are known for extreme heat, APS has been managing for this climate parameter since APS began over a century ago. However, the risks driven by changes in physical climate parameters have required APS to sharpen its focus. For example, APS prepares high temperature load forecasts that capture the possibility of experiencing more extreme	APS's core business is to power the state's bright future with safe, reliable and affordable electricity. APS will do this through: continuing investments in the neighborhood-level power grid to ensure reliability in communities across Arizona; targeting investments in smart-grid technologies that enhance customer satisfaction, improve power

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>impact generation and distribution efficiencies. Additionally, extreme heat can also take a toll on the generation and distribution system by increasing prolonged demand for electricity. In addition to extreme heat, Arizona traditionally experiences monsoonal storm events which include high winds, blowing dust and heavy rainfall, all of which can wreak havoc on electrical transmission systems. As weather patterns change, APS expects to see more frequent and powerful monsoons.</p> <p>Weather</p>						<p>distribution system knocking down power lines and damaging equipment. The second financial implication is the cost to meet the excess demand from extreme heat. As temperatures rise, the peak load on the system grows. Peak load is generally met by purchasing excess power from other generators. Anytime a utility relies upon the market to meet peak load demand, there is an inherent financial risk: the more days of extreme heat, the higher the demand and the greater the potential for higher costs. Extreme weather can result in</p>	<p>temperatures than our "normal" peak day conditions. These high temperature load forecasts are then provided to our distribution system planners for use in their planning so that they know what their capacity requirements could be under such conditions. Additionally, APS made the switch to its new Advanced Distribution Management System (ADMS). ADMS is the digital platform APS uses to operate its distribution system. While still in the early stages of implementation, the system (used by both field crews and operators) has proven beneficial to improving outage response by introducing advanced mapping systems and</p>	<p>quality and enable the continued growth of distributed generation and other technical advances; and, investing \$3.5 billion in Arizona's electricity infrastructure through 2017.</p>

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>extremes such as drought, high temperature variations and monsoon storms are common occurrences in the Southwest's desert area, and these are risks that APS considers in the normal course of business in the engineering and construction of its electric system. Large increases in ambient temperatures or prolonged exposure to extreme heat could require evaluation of certain materials used within the system and represent a greater challenge.</p>						<p>more and larger power outages from storms.</p>	<p>technology that allow all parties to work seamlessly from the same screen to pinpoint the cause of an outage more quickly and precisely. Advanced technologies such as high-efficiency microgrids and utility scale energy storage, brought into service in 2016, help benefit customers and the grid during peak times by increasing reliability and preventing disruptions and outages.</p>	

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
Other drivers	A significant driver of climate related developments in Arizona is the growth of Rooftop Solar. One of the primary drivers for rooftop solar is the desire by homeowners to help fight climate related developments by reducing their carbon footprint. Residential rooftop solar is a growth business in the southwest. Rooftop solar provides a number of benefits for the homeowner, but one of the most important from a regulatory perspective is net metering. Under a regulatory structure that mandates net metering, rooftop solar customers receive the benefit of a flat rate for the solar energy produced by their	Increased operational cost	Up to 1 year	Indirect (Client)	Very likely	High	The financial implications of rooftop solar are significant for APS. If the Arizona Corporation Commission (ACC) does not grant APS rate relief related to net metering, it will continue to have a greater and greater financial impact on the company. If APS is required to buy power from rooftop solar at rates higher than market rates, then APS is rewarding homeowners with rooftop solar at the expense of the rest of the customers. APS has proposed that future rooftop solar customers pay a fair price for their use of the grid, based on how much power they use. Alternatively, APS has proposed to give customers	To manage the risks and uncertainties with rooftop solar and net metering regulations, APS uses the following strategy: • Obtain information from sources, including federal and state agencies, industry publications, market research, and third-party consulting organizations, to maintain awareness of proposed changes to rooftop solar net metering regulations; • Monitor legislative activities and ballot initiatives related to rooftop solar and net metering and develop cost sensitivities to evaluate the potential impact; and, • Develop additional options, including scenarios containing minimum and maximum	There is a cost associated as it relates rooftop solar and net metering, including various legislative liaisons, networks of governmental relations experts and subscriptions to the various tracking tools, memberships in various industry trade groups that help alert us to proposed regulatory action and also help us understand any impacts on the industry as a whole. Specifically, we are currently working with the Arizona Deployment Alliance on a pilot program to analyze how rooftop solar can evolve in combination with storage and demand management programs on behalf of customers.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>panels. Net metering is a great benefit to the homeowner since it enables the homeowner to easily and accurately quantify the relative cost of buying and paying off the rooftop solar system. Although a great tool to help close the sale on rooftop solar systems by showing a repayment method for the large up-front cost, net metering is quickly becoming a burden for utilities. Utilities under a net metering agreement are required to buy the excess power generated by the homeowner's panels at a time when energy prices are generally low – midday. The result is a benefit for the homeowner, and an unnecessary added cost for the utility. Additionally, rooftop</p>						<p>a credit based on the amount of electricity they generate, at a price set by the ACC and based on the rates that APS pays other generators for power. APS's proposal would allow existing customers to be exempt from the rate increase for 20 years. Finally, APS's proposal supports an increase in the up-front solar cash incentive for customers who want the choice of rooftop solar.</p>	<p>technology requirements to evaluate the range of possible outcomes.</p>	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	solar customers benefit from a reliable grid that is there whenever they need it – even when their solar panels are not producing any electricity such as at night and the rain. As more people install solar on their homes, it becomes more important that everyone who uses the grid helps cover the cost of keeping it reliable. Under current rules, rooftop solar customers benefit from a reliable grid, but pay little for their use of it.								

CC5.1d

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

CC5.1e

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

CC5.1f

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

Further Information

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
Other regulatory drivers	The Arizona Corporation Commission (ACC) has an electric Energy Efficiency Standard (EES). Under the EES, Arizona's public utilities under the ACC's jurisdiction are required to achieve cumulative annual energy savings of at least 22 percent of retail sales in 2019 - measured in kWh - by 2020. APS has developed a number of Demand-Side Management (DSM) programs to achieve the required EES. These programs consist of the residential, non-residential, and demand	Investment opportunities	1 to 3 years	Direct	Virtually certain	High	The APS budget for implementation of DSM programs in 2016 was \$70.9M, including the Schools Pilot Program. APS exceeded the kWh energy savings required by the ACC EES by about 2%, while spending about \$300,000 or 0.4% less than the approved budget amount. The breakdown of DSM expenses was: \$1.9M for Demand Response, \$30.6M for residential programs, \$32.0M for non-residential programs, and \$6.1M for measurement evaluation	APS documents the management of its DSM programs in an annual Demand Side Management Progress Report submitted to the ACC each spring. This report is publicly available from the ACC website. The annual report outlines the progress in each DSM program in terms of energy savings, which is independently validated by a third party, and the associated costs. In 2016, APS focused on introducing smart thermostats as	During the time period from 2005 through 2016 APS has spent a total of about \$531M in DSM programs. The breakdown is about \$18M for Demand Response, \$233M for residential programs, \$210M for non-residential programs, and \$70M for measurement evaluation research and performance incentive. This investment has resulted in creation of over \$975M of net economic benefits (present value of societal benefits created by avoiding

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>response programs listed below.</p> <ul style="list-style-type: none"> Residential Energy Efficiency Programs • Consumer Products Program • Residential New Home Construction Program • Residential Existing Homes Heating, Ventilation, and Air Conditioning Program • Home Performance with ENERGY STAR® Program • Residential Conservation Behavior Program • Multifamily Energy-Efficiency Program • Energy Wise Limited Income Weatherization Program; Non - 						<p>research and performance incentive. These components of the DSM Program Portfolio sum to a total spend in 2016 of \$70.6M.</p>	<p>an energy efficiency measure to residential customers, expanding the discounted sales of LED lighting, and introducing a behavior demand response program component for residential customers. APS achieved over 573 gigawatt-hours of savings in 2016, resulting in 11.82 percent cumulative savings as a percent of retail sales since the EES began. The breakdown of this energy saving is about 230 gigawatt-hours from residential programs, 240gigawatt-</p>	<p>energy generation less the present value of societal costs from installing energy efficient measures) for APS customers.</p>

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	Residential Programs • Large Existing Facilities Program • New Construction and Major Renovation Program • Small Business Program • Schools Program • Energy Information Services ("EIS") Program; Demand Response Programs • Time of Use ("TOU") Rates Including Super Peak Pricing ("SPP") • APS Peak Solutions® Program • Critical Peak Pricing - General Service and Residential							hours from non-residential programs. The remainder of the 2016 reported energy savings was from initiatives such as system savings, codes and standards, and demand response programs. Based on the achievement of this energy saving, APS avoided about 2.5 million tons for carbon emissions from energy efficient actions taken in 2016 alone.	
Other regulatory drivers	The Arizona Corporate Commission (ACC) has adopted a	Investment opportunities	1 to 3 years	Direct	Virtually certain	High	Maintaining a diverse generation portfolio is a key component of	APS has a firm management plan in place to address the incorporation of	In 2016, APS budgeted \$140M for renewable energy

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>Renewable Energy Standard (RES), in which electric utilities under its jurisdiction must supply an increasing percentage of their retail electric energy sales from eligible renewable resources, including solar, wind, biomass, biogas and geothermal technologies. For calendar year 2016, the ACC mandated through its RES rule that 6.0 percent of APS' 2016 retail kilowatt-hour (kWh) sales must come from renewable resources, with 30 percent of the total requirement to be fulfilled with energy</p>						<p>assuring APS is able to meet the load demand of its customers as well as the financial benefit of electrical sales. APS invested about \$675M in the AZ Sun Program, in which APS built 170 MW of utility scale solar renewable facilities. APS will also continue to expand renewables and has already received approval for a requested budget for the years 2016-2020 of almost \$531M in funding for further development of APS's renewable energy portfolio during this four year period.</p>	<p>renewable energy. APS documents the management of its renewable energy program in an annual Renewable Energy Standard Compliance Report to the Arizona Corporation Commission (ACC) each spring. This report is publically available on the ACC website. At the end of 2016, APS had a gross total of 803 MW of utility scale renewables (solar, wind, biomass, geothermal, and landfill gas), 356 MW of residential solar renewable, and</p>	<p>projects. Total 2016 expenses for renewable projects were about \$129M, which after a correction of an RES offset cost, there remains about \$20M for reallocation. In addition to the project costs, in 2016 APS incurred about \$42M in above market utility scale costs and about \$37M in production based incentives.</p>

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>produced from Distributed Energy (DE) sources. The renewable energy standard increases annually until reaching 15 percent in 2025. This regulatory driver is having a large impact on APS' generation mix. In 2016, the total renewable energy on the APS system increased to more than 1,400 MW. APS expects the percent of generation from renewable energy to increase from the current level of 12 percent of APS' total generation to about 18 percent by 2031.</p>							<p>241 MW of non-residential solar renewable. All of these sources total 1,400 MW of renewable energy generation on the APS system. In 2016, 3,351,983 MWh of renewable energy was generated on the APS system, including energy from rooftop solar installations. APS's total eligible RES resources were 2,871,942 MWh, which is 10.3 percent of APS's total 2016 retail sales. Total distributed energy production for the year</p>	

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								<p>reached 795,804 MWh. Total residential performance was 118 percent of the requirement for 2016 and non-residential performance was 198 percent of the requirement. In 2016, APS further demonstrated their commitment and leadership to renewable energy and reached a milestone of 1-gigawatt of solar on our system. APS developed it's largest grid-scale solar plant with the completion of the Red Rock Solar Plant outside of Casa Grande, AZ.</p>	

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 temperature extremes	Changes in the global climate may result in regional changes that might impact the physical or operational environment of an electric utility such as APS. Other projections for the southwest United States from climate change models include an increase in the number of extreme hot days in the summer, less precipitation in the form of snow and the earlier runoff of snowmelt, increased wildfire potential, and the potential for	Increased demand for existing products/services	3 to 6 years	Direct	Likely	Medium-high	Summer electric sales tend to be a large source of revenue for APS. Because the APS service territory is located in the desert southwest, the load demand for APS virtually doubles in the summer months compared to the winters. As climate change effects may increase the duration and intensity of summer heat, there could be an opportunity for increased electrical sales for the company. Due to many market and environmental factors throughout the	Weather extremes such as drought and high temperature variations are common occurrences in the Southwest's desert area, and these are risk factors that we consider in the normal course of business in the engineering and construction of our electric system. APS prepares high temperature load forecasts that capture the possibility of experiencing more extreme temperatures than our "normal" peak day conditions. These high temperature	To assure APS can meet future load demands APS plans to invest \$3.5 billion for improvements in its transmission and distribution network through 2017, and will be investing over \$500M in new generation resources by 2020. These costs will help ensure APS can take advantage of increased electrical sales due to higher temperatures should these conditions occur.

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>increased water shortages. The annual 2016 temperature in Phoenix was the third higher ever.</p>						<p>southwest, APS may also see an increase in off-system electric sales as a result of the physical effects of climate change. The total financial impact is unknown at this time as there remains some uncertainty on the factors that will influence the financial implications.</p>	<p>load forecasts are then provided to our distribution system planners for use in their planning so that they know what their capacity requirements could be under such conditions. Forecasting load is the foundation of resource planning, fundamental to analyzing not only how many resources the Company needs and when, but to an increasing degree, the type of resources needed. In addition, weather, population growth, economic trends and energy consumption patterns all play a role in developing a forecast.</p>	

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
Changing consumer behavior	Customers are changing how they use energy and they want more interaction and control over their choices. Advanced electric grids are making it possible for customers to generate electricity not only for their own use but also for sale back to the grid. Distributed generation, as well as energy efficiency, is transforming customer relationships into that of energy partners. Demand response is also enabling customers more	New products/business services	1 to 3 years	Direct	Very likely	Medium-high	The financial impact of all the programs APS is implementing that deals with changes in our customers behaviors and expectations are enormous. For example, advance metering is estimated to have a cost saving of over \$20M, however, it is still too early to know the total financial impact from some of the new programs, such as Project Cinergy.	APS customers want more control and options in how they use and receive electricity, and APS is listening. To meet customers' expectations, APS is implementing numerous new programs, with each program having a unique method of management. The Customer Technology group was created in 2016 to identify and implement new opportunities that leverage behind-the-meter (BTM) solutions. The	The large financial results of innovative programs to address the changes in customer behavior and expectations require large investments. APS plans to spend over \$3.5 billion in infrastructure investments over the next three years. In addition to the billions in infrastructure improvements, APS will be spending millions of dollars on programmatic changes, such as the new customer care

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>control over when their energy is delivered and at what price points. In virtually every phase of the energy process, APS' interaction with customers has deepened and that trend is projected to continue. APS is transforming its energy generation and delivery to meet changing customer expectations. Our energy innovation and business development programs include automated metering, improved grid control, participation in the energy imbalance market, new rate plans, and Project Cinergy.</p>							<p>team will work together with groups within the company with technical and operational expertise to provide mutual customer and utility value.</p>	<p>and billing program (Project Cinergy).</p>

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	Project Cinergy is a new customer information system that will transform the way APS conducts business and interacts with customers.								
Changing consumer behavior	Solar Innovation Study - 75 is a 75-home field research project that represents a step toward a future that includes modernized rate structures and realistic pricing signals that drive market innovation and technological development at the grid edge. The initiative will examine the integration of distributed energy resources (DER), such as rooftop solar,	Investment opportunities	1 to 3 years	Direct	Very likely	Medium-high	In 2016 and 2107, APS will invest about \$2.25M in the Solar Innovation Study. However, because this is an R&D program, the financial impacts of this study are still unknown. The Solar Innovation Study is a step forward in our move toward a future that includes modernized rate structures and realistic	APS will manage the study using an application programming interface ecosystem that will serve as the nerve center of what will amount to a “virtual” rate laboratory. The study will demonstrate which price signals best encourage customers to shift their energy use to better align with APS system requirements. Participants will be able to	APS has invested \$1.5M for this study in 2016. In 2017, we plan to invest \$750,000 in this study for continued research and technology.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>battery storage, home energy management systems, smart thermostats and multi-stage, variable speed HVAC systems, with demand-based rates. The study will test ways customers can employ DER technologies to manage their energy use while using price signals that encourage customers to shift their energy use to align with system requirements. Data from the study will be used to expand industry-wide knowledge and enable the efficient use of DERs that are either available or are emerging in today's advanced energy market.</p>						<p>pricing signals that drive market innovation and technological development. This initiative will give our customers more control over their energy use, while allowing us more flexibility to integrate new energy solutions into the grid.</p>	<p>control their home energy use from personal smart devices like a smart phone or tablet, giving them a true "customer experience."</p>	

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Other drivers	In 2015, APS launched the Solar Partner Program, the nation's first utility-owned rooftop solar research and development program, in which we have direct control of advanced inverters through a central control system. The program allows APS to partner with customers and local solar installers to bring more solar energy to communities across the state, all while contributing to the local economy by keeping jobs and money in Arizona. Up to 10 MW of power will be generated through the APS-owned and maintained	Investment opportunities	1 to 3 years	Direct	Very likely	Medium-high	To date, APS has invested about \$36M in the Solar Partners Program. However, because this is an R&D program, it is still too early to know the exact financial impact. The greatest financial impact will arise from the ability of the advanced inverters to stabilize local grid fluctuations, which could produce a huge financial saving to the company	APS has a well-structured identification and assessment program to determine the most appropriate customers for implementation of the SPP. APS installed almost 1,600 systems on eligible customers' homes. The systems installed as part of this program allow APS to conduct ground-breaking research on how to use advanced inverters to integrate solar and other technologies onto its existing grid. APS is working in conjunction with EPRI and will share the information gained from the study across the	APS has incurred almost \$36M in initial capital cost for this program. Additionally, there will be on-going operational costs of over \$500,000 per year. Participants of the program will receive an annual \$360 savings on their electric bills through the life of the 20-year program .

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>rooftop solar systems, which are currently installed on almost 1,600 eligible customer's rooftops. A unique aspect of the program is that it makes rooftop solar available to customers who may not otherwise be able to obtain it. Working with nonprofit partners and community action organizers, APS offered the installation of systems at the homes of limited-income customers whenever possible.</p>							industry, as well as with academia and consumer advocacy groups.	
Other drivers	Battery storage is a growing technology that has the potential to increase the	Investment opportunities	1 to 3 years	Direct	Very likely	Medium-high	The proposed energy storage projects are research and development	APS is constructing two battery systems, at 2 MW each, in order to	APS spent about \$4.5M in 2016, we will spend about another \$12.5M

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>value of intermittent generation resources as well as increase grid reliability and stability. Besides simply storing and dispatching power, batteries have the ability to provide other ancillary services such as voltage regulation. Energy storage makes renewable resources more useful for APS by better aligning the availability of power with APS's peak energy demand. APS is invested in developing a long-term energy storage strategy that includes the following: Evaluating emerging technologies and applications to determine the</p>						<p>projects for determining their ability to provide voltage regulations, power factor improvements, and peak shaving. Because the degree to which these systems will be able to provide these services, as well as the scalability of energy storage, it is still too early to know the full financial impact these systems my provide. However, APS committed about \$4.5M to study and assess the financial impact of energy storage.</p>	<p>advance its knowledge of energy storage In addition, the Solar Innovation Study is investigating residential-scale batteries. APS is conducting an all-source request for proposal meaning storage providers can bid energy storage solutions in the form of purchase power agreements to meet APS's resource needs in the future. Lastly, APS's Technology Innovation and Integration, Distribution Planning and Engineering, and Resource Management departments continue to look for opportunities</p>	<p>between 2017 and 2018. This cost is only expected to grow as energy storage moves more towards the implementation phase, and could substantially grow if the benefits of energy storage are scalable on the APS network.</p>

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>potential cost-benefit of using these technologies at various locations on the APS grid; Evaluating system impacts from customer adoption of stand-alone batteries and combinations of batteries with other technologies as part of the Solar Innovation Study; Developing funding approaches and proposing regulatory structures that allow the development of energy storage projects within the regulated utility model; •Developing processes and procedures for incorporating energy storage into APS's day-</p>							to use storage on the grid.	

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	to-day operations and maintenance; and •Procurement, construction and maintenance of a new storage portfolio.								
Changing consumer behavior	APS provides the Green Choice Rate program which enables customers to determine how much more of their electricity (above the regulated amount) will come from renewable energy sources. Green Choice is Green-e Energy certified, and meets the environmental and consumer-protection standards set forth by the nonprofit Center for Resource Solutions. The	New products/business services	Up to 1 year	Indirect (Client)	Very likely	Medium-high	In 2016, APS continued its three existing Green Choice rate offerings which were approved by the Commission in Decision No. 71276 in September 2009. Participating customers pay a premium on their bills based on actual energy produced at Renewable Generation facilities that are part of the APS Green Choice portfolio. In	Each year, APS develops a total renewable energy program budget based on estimated expenses for renewable generation and distributed energy programs and projects. Revenues to offset these expenses are collected through both the RES Adjustor and base rates.	The revenue associated with the Green Choice rates ultimately supports the development of additional renewable resources. Green Choice sales are subtracted from total Renewable Generation, and do not count toward compliance with RES targets. All Green Choice renewable energy sold under APS's GPS-1, GPS-2, and GPS-3 rate plans are certified through

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>Green Choice program, for an additional one cent per kilowatt-hour (kWh), allows customers to elect to purchase renewable energy in specific amounts or as a percentage of their monthly usage. APS will use these funds to pay for energy generated from utility-size renewable projects. This program consist of the following three options: - Green choice 1 is a fixed level of "green" power that a customer can subscribe to each month - Green choice 2 varies month to month and is based on a percentage of a customer's monthly use -</p>						<p>2016, 1,930 customers subscribed to these rates for 29,074 MWh of sales and a total of \$296,565 in gross revenue.</p>		<p>Green-e, a national certification and verification program for renewable energy. In 2016, 1,930 customers subscribed to these rates for 29,074 MWh of sales and a total of \$296,565 in gross revenue.</p>

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	Green choice 3 is a single block of "green" power for use at special event. Our Green Choice plans make it easy and affordable to use energy generated from a variety of renewable resources, reduce pollution and improve Arizona's quality of life.								
Other drivers	In October 2016 APS joined the California Independent System Operator (CAISO) Energy Imbalance Market (EIM), the only five minute energy market in the western United States. Partnering with other utilities across the West to share generation	Reduced operational costs	1 to 3 years	Direct	Very likely	Medium-high	The on-going costs associated with the EIM are \$4 million a year. However, on-going benefits are \$11 million a year which translates to a net benefit of \$7 million a year. Additional benefits include fuel cost savings and lower flexibility reserve costs.	The ISO Board of Governors has delegated authority over the EIM rules to the western Energy Imbalance Market (EIM) Governing Body, as proposed by the EIM Transitional Committee. The five members of this body are financially independent	One-time costs (estimated) associated with the implementation of the EIM are \$13.5 million. These costs consist of new computer systems and meters, personnel, and an EIM fee.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>resources provides us with greater operational efficiency and flexibility. The EIM relies on resource and geographic diversity to more economically balance supply and demand for electricity in five minute increments. The diversity of the participants enables better integration of variable renewable resources and more economic energy generation for our customers. The EIM is already delivering benefits—CAISO reported that APS customers saved \$5.98 million in the first three months of our participation.</p>							<p>from market participants and are selected by representatives of all EIM stakeholders. The Committee's Board-approved governance structure also established an advisory body comprised of regulators in states that participate in the real-time market and created a periodic stakeholder forum to discuss regional issues. The Energy Imbalance Market (EIM) Transitional Committee is an advisory committee to the ISO Board of Governors comprised of industry experts from a range of sectors and geographic</p>	

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>We had estimated it would save customers between \$7 to \$18 million per year. The EIM is a sub-hourly real-time energy market that will expand the company's ability to efficiently dispatch its generating resources, and will provide additional tools to manage the impact of rooftop solar intermittency on the APS system. APS expects participation in the Energy Imbalance Market will create at least three benefits: - Produce economic savings to APS customers through lower production costs; - Improve</p>							<p>regions around the west. The committee will develop a proposal for a long-term EIM governance structure and will advise the Board on matters related to the final testing and early operational phase of the EIM. APS is a part of Transitional Committee.</p>	

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	visibility and situational awareness for system operations in the Western Interconnection; and - Improve integration of renewable resources								
Other drivers	Microgrids are small-scale, distributed power generation facilities installed at customer locations that can provide backup power to the customer in the event of a grid outage and also deliver peaking and other services to APS. APS and the Microgrid host customer share in the costs of developing and construction of the microgrid, which results in cost effective	New products/business services	1 to 3 years	Indirect (Client)	Virtually certain	Medium-high	APS is currently pursuing adding certain Distributed Energy Resource activities, such as microgrid investments intended for meeting specific customer needs while also benefiting the grid and other rate payers. To date, APS has not received regulatory assurance of cost recovery for such investments. As APS engages	At MCASY, the lease agreement gives APS access for the development, operation and maintenance of the microgrid power generation facility, located adjacent to the existing APS substation and the base's existing substation. During normal grid operating conditions, the microgrid will provide peak power to APS customers in the	Between 2015-2016, APS will have invested approximately \$25 million in microgrids (not including the cost sharing provided by the host customers)

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>economic deployment of new grid resources. The ability of the Microgrid fast acting generators also enhance grid resilience and flexibility by providing important peak resources and ancillary services such as frequency response, which can lessen the frequency event effect and impact of power outages. Through an innovative relationship with the U.S. Department of the Navy, APS deployed a low emission, 25-MW microgrid at the Marine Corps Air Station Yuma (MCASY). The system, which came online in</p>						<p>in these activities, we will have to demonstrate to regulators that these investments are both prudent and useful in providing electric service to customers.</p>	<p>Yuma area if and when they need it most. In the event of a grid outage, this facility will provide power to MCAS Yuma through a direct connection to the base's infrastructure, creating a backup generation facility. The 25-megawatt capacity is projected to meet all future energy requirements at the base. For Aligned, APS entered into a Microgrid Services Agreement which provides a lease of the areas occupied by the microgrid systems, including roof mounted generators. The microgrid is tied</p>	

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>December 2016, will provide 100 percent of the base's backup power needed in the event of a grid disruption, enhancing the base's reliability and security. The Microgrid has additional capacity as the base load grows over time and is ready for adding PV and Energy Storage if needed in the future. APS has also deployed another microgrid at the Aligned Data Center-Phoenix campus, which will be built out in phases to match their planned growth. The first phase, 11 MW, was deployed in 2016. At full build-out, the project will comprise 63 MW of back up power</p>							<p>into a newly built substation located adjacent to Aligned's facility. During normal grid operating conditions, the microgrid will provide peak power and frequency response capability to APS customers in the north Phoenix area if and when they need it most. In the event of a grid outage, this facility will provide power to Aligned through a direct connection to the data center power distribution infrastructure, creating a backup generation facility. APS will add additional capacity as the data center load</p>	

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	for Aligned and peaking generation with frequency response capability for APS and its customers within the heart of the Phoenix metro area.							grows.	

CC6.1d

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

CC6.1e

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

CC6.1f

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

Further Information

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

Page: CC7. Emissions Methodology

CC7.1

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

Scope	Base year	Base year emissions (metric tonnes CO2e)
Scope 1	Sun 01 Jan 2012 - Mon 31 Dec 2012	14614070
Scope 2 (location-based)	Sun 01 Jan 2012 - Mon 31 Dec 2012	10081
Scope 2 (market-based)	Sun 01 Jan 2012 - Mon 31 Dec 2012	10081

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
The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)
Other

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

California Air Resources Control Board Assembly Bill 32 Transactional Protocol

CC7.3

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

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

CC7.4

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

Fuel/Material/Energy	Emission Factor	Unit	Reference
Distillate fuel oil No 2	161	lb CO2 per million BTU	US EPA Mandatory Greenhouse Gas Reporting Rule
Natural gas	117	lb CO2 per million BTU	US EPA Mandatory Greenhouse Gas Reporting Rule
Diesel/Gas oil	22.38	lb CO2 per gallon	The Greenhouse Gas Protocol
Biodiesels	17.9	lb CO2 per gallon	The Greenhouse Gas Protocol
Motor gasoline	19.42	lb CO2e per gallon	The Greenhouse Gas Protocol

Further Information

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

Financial control

CC8.2

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

10112329

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	APS calculates Scope 2 emissions as the portion of electricity use attributed to purchased electricity for APS buildings. For the market based emission factor, APS uses an emission rate based on their fleet generation of 0.405962164 metric tons CO ₂ e/MWh.

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
14302	11047	APS calculates Scope 2 emissions as the portion of electricity use attributed to purchased electricity for APS buildings. For the market based emission factor, APS uses an emission rate based on their fleet generation of 0.405962164 metric tons CO ₂ e/MWh. For location-based, APS uses the AZNM (WECC Southwest) emission factors from EPA eGrid2012.

CC8.4

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

No

CC8.4a

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

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

CC8.5

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

Scope	Uncertainty range	Main sources of uncertainty	Please expand on the uncertainty in your data
Scope 1	Less than or equal to 2%	Metering/ Measurement Constraints	The quality assurance programs at APS insures that equipment is maintained at less than 2% error margin. APS employees adhere to approved Enterprise Wide Policies, Procedures & Processes for all business activities to ensure accuracy and compliance.
Scope 2 (location-based)	Less than or equal to 2%	Metering/ Measurement Constraints	The primary source of data for Scope 2 emissions is APS's measurement of company usage. APS uses power that is generated or purchased by the company for supplemental power and at company service and office locations. Additionally, a small percentage of power is consumed on the T&D system through efficiency losses. All meters follow performance standards set by the American National Standards Institute.
Scope 2 (market-based)	Less than or equal to 2%	Metering/ Measurement	The primary source of data for Scope 2 emissions is APS's measurement of company usage. APS uses power that is generated or purchased by the company for supplemental power and at company service

Scope	Uncertainty range	Main sources of uncertainty	Please expand on the uncertainty in your data
based)		Constraints	and office locations. Additionally, a small percentage of power is consumed on the T&D system through efficiency losses. All meters follow performance standards set by the American National Standards Institute.

CC8.6

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

Third party verification or assurance process in place

CC8.6a

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

Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/section reference	Relevant standard	Proportion of reported Scope 1 emissions verified (%)
Annual process	Complete	Reasonable assurance	https://www.cdp.net/sites/2017/83/14783/Climate Change 2017/Shared Documents/Attachments/CC8.6a/CDP Verification Statement APS CY2016 vTR.pdf	p.1 - 3	ISO14064-3	100

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
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CC8.7

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

Third party verification or assurance process in place

CC8.7a

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

Location-based or market-based figure?	Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/Section reference	Relevant standard	Proportion of reported Scope 2 emissions verified (%)
Location-based	Annual process	Complete	Reasonable assurance	https://www.cdp.net/sites/2017/83/14783/Climate Change 2017/Shared Documents/Attachments/CC8.7a/CDP Verification Statement APS CY2016 vTR.pdf	p. 1 - 3	ISO14064-3	100

CC8.8

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

Additional data points verified	Comment
Emissions reduction activities	Navigant Consulting provides Measurement, Evaluation and Research (MER) Services for APS's DSM programs. These Measurement and Evaluation activities include, but are not limited to: • Performing process evaluation research to indicate how well programs are working to achieve their objectives; • Performing impact evaluation research to verify that energy-efficient measures are installed as expected; measuring savings on installed projects to monitor the actual program savings that are achieved; and conducting research activities to refine savings and cost benefit models and identify additional opportunities for EE; • Performing and tracking savings measurements to monitor the actual program savings that are achieved; and • Conducting updates and maintenance of Measure Analysis Spreadsheets and Analytic Databases for all APS programs and measures. Updates include calculation of electric energy and demand impacts, hourly end-use load-shapes, natural gas impacts, water impacts, incremental equipment costs, and operation & maintenance (O&M) cost impacts. • Providing support for program design options to be included in the annual DSM Program Portfolio including program design, technology research, energy efficiency measure analysis, and cost-effectiveness analysis. • Assessing new and emerging technologies to support current and future program offerings.

CC8.9

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

No

CC8.9a

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

Further Information

CC9.1

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

No

CC9.1a

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

Country/Region	Scope 1 metric tonnes CO2e

CC9.2

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

- By business division
 - By facility
 - By GHG type
 - By activity
-

CC9.2a

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

Business division	Scope 1 emissions (metric tonnes CO2e)
Generation	10112329

CC9.2b

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

Facility	Scope 1 emissions (metric tonnes CO2e)	Latitude	Longitude
Four Corners Power Plant	4214670	40.929011	-121.544389
Navajo Generating Station	1345663	36.914722	-111.455833
Cholla Power Plant	867464	34.940	-110.300
Ocotillo Power Plant	95209	33.4225	-111.9122
West Phoenix Power Plant	1200586	33.773441	-84.394931
Redhawk Power Plant	2070161	33.335833	-112.840528
Yucca Power Plant	107775	32.715235	-114.710441
Saguaro Power Plant	14454	32.552181	-111.298135
Douglas Power Plant	727	31.363622	-109.552532
Sundance Power Plant	148455	53.5075	-114.557222

CC9.2c

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

GHG type	Scope 1 emissions (metric tonnes CO2e)
CO2	10028008
SF6	26455
CH4	21164
N2O	36701

CC9.2d

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

Activity	Scope 1 emissions (metric tonnes CO2e)
Stationary Combustion	10065272
Mobile Combustion	20602
Fugitive Combustion	26455

Further Information

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

CC10.1a

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

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

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

By facility

CC10.2a

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

Business division	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)
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CC10.2b

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

Facility	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)
502 Office	87	67
505 Office	59	45
Buckeye Customer Service Office	82	64
Casa Grande Customer Service Office	35	27
Casa Grande Service Center	245	189
Corporate Headquarters	2977	2302
Cottonwood Customer Service Office	37	28
Cottonwood Service Center	95	73
Deer Valley Complex	45	35
Deer Valley (DVA)	1588	1228
Deer Valley (DVE)	15	12
Deer Valley (DVF)	784	606
Deer Valley (DVK1)	86	67
Deer Valley (DVL)	85	65
Deer Valley (DVM)	37	29
Deer Valley (DVN1)	3105	2400
Deer Valley (DVN2)	1851	1431
Douglas Customer Service Office	35	27
Douglas Service Center	18	14
Flagstaff Administrative Customer Service Office	132	102
Flagstaff Service Center	185	143
Glendale Customer Service Office	30	24
Globe Service Center	250	193
Goodyear Service Center	139	107
Holbrook Customer Service Office	16	12
Ocotillo Service Center	159	123

Facility	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)
Paradise Valley Service Center	363	280
Parker Customer Service Office	30	23
Payson Customer Service Office	133	103
Prescott Customer Service Office	83	64
Prescott Service Center	350	271
Prescott Service Center 2	58	45
Snowflake Customer Service Office	195	151
Surprise Service Center	286	221
Wickenburg Service Center	63	49
Williams Customer Service Office	25	19
Williams Service Center	42	32
Winslow Customer Service Office	18	14
Winslow Service Center	42	32
Yuma Customer Service Office	20	15
Yuma Service Center	323	249
T&D Training Center	62	49
Ocotillo Star Center	36	28

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)

Further Information

CC11.1

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

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

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

24793358

CC11.3a

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

Fuels	MWh
Bituminous coal	6681349
Natural gas	8269723
Distillate fuel oil No 2	338

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
No purchases or generation of low carbon electricity, heat, steam or cooling accounted with a low carbon emissions factor	0	0	

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
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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
1406230	0	24848696	508305	0	

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	30	Decrease	APS uses a carbon avoidance metric to measure overall carbon reduction—not just decreasing emissions from generation but also in our own operations. This reflects actions taken throughout the company, including retiring coal units, installing renewable generation and energy efficiency, increasing our building and operating efficiencies and pursuing fleet electrification. Our 2016 carbon-avoidance goal was 3.5 million metric tons. We ended the year with a carbon avoidance of 4.9 million metric tons. APS total carbon avoidance in 2015 was 3,809,059 metric tons CO2 and 4944703 metric tons CO2 in 2016. The percent difference [(3,809,059-

Reason	Emissions value (percentage)	Direction of change	Please explain and include calculation
Divestment			4944703 /3,809,059]*100 = 29.81%.
Acquisitions			
Mergers			
Change in output	26	Decrease	Reductions in natural gas prices allowed us to shift a large portion of our energy generation from coal to gas. Carbon emissions from our gas, coal, and oil fleet had an overall 26% reduction in CO2 emissions. APS total carbon emissions from coal, gas, and oil in 2015 was 14,970,101 lbs CO2 and 11,035,460 lbs CO2 in 2016. The percent difference [(14,970,101 -11,035,460)/14,970,101]*100 = 26.28%.
Change in methodology	52	Decrease	Emissions reduction activities included improved efforts in SF6 emissions by implementing process, procedure and tracking improvements to reduce emissions by 52%. APS total SF6 emissions in 2015 were 54,698 metric tons CO2e and 26,454 metric tons CO2e in 2016. The percent difference [(54,698-26,454)/54,698]*100 = 51.64%
Change in boundary			
Change in physical operating conditions	0	No change	Projections for the southwest United States from climate change models include an increase in the number of extreme hot days in the summer, less precipitation in the form of snow and the earlier runoff of snowmelt, increased wildfire potential, and the potential for increased water shortages. The annual 2016 temperature in Phoenix was the third higher ever. National Weather Service in Phoenix's annual shows the four of the five warmest years on record have occurred since 2012. The year 2014 was warmest at 77.1 degrees, followed by 1989 (76.9), 2016, 2015 and 2012 (76.7).
Unidentified			
Other			

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?

Market-based

CC12.2

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

Intensity figure =	Metric numerator (Gross global combined Scope 1 and 2 emissions)	Metric denominator: Unit total revenue	Scope 2 figure used	% change from previous year	Direction of change from previous year	Reason for change
0.0029	metric tonnes CO2e	3489754000	Market-based	26	Decrease	Overall Scope 1 and Scope 2 emissions decreased 26% from 2015 to 2016, due to our efforts that include closing coal units, modernizing natural gas plants, deploying renewable energy and improving energy efficiency.

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
0.3185	metric tonnes CO2e	megawatt hour (MWh)	31788576	Market-based	20	Decrease	Overall Scope 1 and Scope 2 emissions decreased 26% from 2015 to 2016, in addition APS sold approximately 7% less MWh of electricity in 2016 (31,788,576MWh) as compared to 2015 (34,290,622).

Further Information**Page: CC13. Emissions Trading**

CC13.1

Do you participate in any emissions trading schemes?

Yes

CC13.1a

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

Scheme name	Period for which data is supplied	Allowances allocated	Allowances purchased	Verified emissions in metric tonnes CO₂e	Details of ownership
California's Greenhouse Gas Cap and Trade Program	Fri 01 Jan 2016 - Wed 30 Nov 2016	668448	670000	250675	Facilities we own and operate

CC13.1b

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

Beginning in 2012, APS began purchasing carbon allowances in the secondary market to cover any compliance obligations related to net imports into the state of California. Details of those strategies are proprietary and may result in a competitive advantage.

CC13.2

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

No

CC13.2a

Please provide details on the project-based carbon credits originated or purchased by your organization in the reporting period

Credit origination or credit purchase	Project type	Project identification	Verified to which standard	Number of credits (metric tonnes CO2e)	Number of credits (metric tonnes CO2e): Risk adjusted volume	Credits canceled	Purpose, e.g. compliance
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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
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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	165558986	In the Survey, suppliers report on what methodology they use to calculate their emissions. This could be Carbon Disclosure Project, Carbon Trust Standard, California Climate Action Registry, The Climate Registry, ISO Certification (e.g. ISO14064-1), and others depending on the supplier's choice.	100.00%	Data was gathered from the suppliers that completed the Electric Utility Sustainable Supply Chain Alliance Annual Sustainability Survey. The results were calculated based on the responses of the 65 suppliers. Suppliers are asked to report their most recent GHG emissions reported, the years range from 2013 to 2016.
Capital goods	Not relevant, explanation provided				In 2008, APS joined the Electric Utility Industry Sustainable Supply Chain Alliance (EUISSCA), a group of North American electric utility companies formed to improve the environmental performance in electric utility industry supply chains. The alliance seeks to do this by developing voluntary consensus standards for creation of a supply chain that is environmentally responsible, efficient, cost effective and positively impacts communities. In addition, the Alliance provides an opportunity for utilities to share best practices and learn from each other. APS has not yet calculated GHG emissions specifically related to products that we purchase, but we do query our suppliers on their GHG emissions. In addition, we do not separate capital goods from overall purchased goods.
Fuel-and-energy-related activities (not included in Scope 1 or 2)	Relevant, calculated	2647368	Purchased Power is electrical energy purchased by APS from merchant power plants or from transmission systems as source of energy for APS's electric utility	100.00%	CO2e emissions are associated with purchase power agreements from conventional sources such as gas units. Purchased power from Renewable sources are not included in this

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
			customers. (ii) Data is provided by Fuel Analysis and Forecasting team. (iii) APS calculated this emission category based on CO2e emissions factor from our own fleet (0.405 metric tons/MWh).		calculation. APS joined the Energy Imbalance Market (EIM) in October of 2106. The EIM enables utilities across the western region to buy and sell energy more efficiently. The difference between participating in the EIM over traditional energy markets is that the EIM automatically finds the most efficient energy resources available if APS decides to buy or sell power in five minute increments. EIM's real-time market capabilities help APS respond quickly to variable renewable energy production (like solar) and better incorporate renewable resources by automatically adjusting to intermittency.
Upstream transportation and distribution	Relevant, calculated	2468839	The CO2e emissions are calculated by APS using the EPA Emission Factors for Greenhouse Inventories (Nov 2015). Specifically, the Product Transport Emission Factors for Medium and Heavy Duty trucks. (CO2 0.146 ton/mile (GWP:1); CH4 0.00015 ton/mile (GWP:25); N2O 0.0014 ton/mile (GWP:298))	100.00%	APS receives total miles from ours logistics firm that handles the majority of our shipping needs.
Waste generated in operations	Relevant, calculated	322441	The EPA identifies a range of carbon reduction emission factors for the reuse of fly ash. The values range from 0.71 to 0.8 tons of carbon reduction per ton of fly ash reuse. APS currently uses a more conservative factor of 0.6 tons of carbon reduction per ton of fly ash, which is a factor developed internally based on engineering evaluation.	100.00%	APS is reusing fly ash to help reduce its environmental footprint while adding to its bottom line. APS sells much of its fly ash for use in concrete production. This allows concrete manufacturers to reuse the coal ash as a base product in cement production, eliminating the need to produce this material themselves and significantly reducing their

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
					energy consumption to produce cement. This estimated carbon reduction is 322,441 metric tons of carbon dioxide.
Business travel	Relevant, calculated	4153	i) Business travel encompasses GHG emissions from airline travel, rental cars, and vehicle reimbursement for miles drives for business by APS employees. ii) The source of the airline data is from BCD Travel's Decision Source Database, the rental car data is from our rental car agencies, and the reimbursement miles from internal accounting. iii) Travel emission calculations are based on the Greenhouse Gas Protocol for Business Travel Emission Factors. (Passenger Cars; (CO2 0.355 kg/mile (GWP:1);CH4 0.021 g/mile (GWP:25); NO2 0.015g/mile (GWP:298))	100.00%	This business travel data about APS employees as recorded by our business travel agency, rental miles are provided by the approved rental car agencies for employee travel, and reimbursement miles are provided by our internal accounting based on a type of cost code. All APS travel must be approved at the Vice President's for conference travel and at the leader level for local travel. Employees are asked to use teleconferencing as much as possible to reduce overall miles traveled by employees.
Employee commuting	Relevant, calculated	3586	This information was calculated based on the APS's employee responses to the 2016 Maricopa County Regional Travel Reduction Program survey. Emission calculations are based on the Greenhouse Gas Protocol using the distance based method and Business Travel Emission Factors for passenger cars, buses, commuter train, and vans.	100.00%	We encourage employees to take part in the Trip Reduction Program. This program focuses on reducing the number of single-occupancy vehicles commuting to our work sites. Maricopa County is a customer of APS, but the survey is not performed as part of our value chain.
Upstream leased assets	Not relevant, explanation provided				APS does not have upstream leased assets.
Downstream transportation	Relevant, calculated	559829	i) Transmission losses are an estimate of CO2e emissions resulting from electrical	0.00%	APS delivers electrical energy from the power plant to customer's location though a

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
and distribution			energy consumed in delivering energy between power plant and a substation. ii) Source of the data is from the losses and company use in the Pinnacle West 2015 Statistical Report and APS system CO2e emission. The estimated energy loss is multiplied by the APS System CO2e emission rate of 0.405 mtons CO2e/MWh.		transmission and distribution system. There is an inherent loss in MWh during transmission.
Processing of sold products	Not relevant, explanation provided				APS generates and distributes electricity. There is no processing of our products to calculate processing of sold products.
Use of sold products	Not relevant, explanation provided				APS generates and distributes electricity. Emissions are calculated in our Scope 1 response.
End of life treatment of sold products	Not relevant, explanation provided				APS generates and distributes electricity. All generation is used when generated, so there is no end of life treatment of our product.
Downstream leased assets	Not relevant, explanation provided				APS does not have downstream leased assets.
Franchises	Not relevant, explanation provided				APS does not have any franchises.
Investments	Not relevant, explanation provided				APS does not have a method presently of evaluating emissions by any of our investments.
Other (upstream)	Not relevant, explanation provided				APS does not have any additional upstream sources in 2016.

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
Other (downstream)	Not relevant, explanation provided				APS does not have any additional downstream sources in 2016.

CC14.2

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

Third party verification or assurance process in place

CC14.2a

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

Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/Section reference	Relevant standard	Proportion of reported Scope 3 emissions verified (%)
Annual	Complete	Reasonable	https://www.cdp.net/sites/2017/83/14783/Climate Change	p. 1 - 3	ISO14064-	25

Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/Section reference	Relevant standard	Proportion of reported Scope 3 emissions verified (%)
process		assurance	2017/Shared Documents/Attachments/CC14.2a/CDP Verification Statement APS CY2016 vTR.pdf		3	

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	Change in boundary	293	Increase	In 2016 APS had 97% more suppliers respond to the survey than in 2015. In 2015 there were only 33 suppliers that responded, while 65 suppliers responded in 2016.
Fuel- and energy-related activities (not included in Scopes 1 or 2)	Change in output	8	Increase	APS purchased more power in 2016 due to participation in the EIM, purchased power accounted for an increase of 3.5% of APS fuel mix in 2016. In addition, APS had 1.4% more customers and increased of 71 GWh in electricity sold.
Waste generated in	Change in	32	Decrease	This decrease is due to a larger percentage of energy being generated from our gas-

Sources of Scope 3 emissions	Reason for change	Emissions value (percentage)	Direction of change	Comment
operations	output			fired units. APS permanently retired four coal-fired units since 2013—one unit at our Cholla Power Plant in Arizona in 2015 and three units at our Four Corners Power Plant on the Navajo Nation in 2013.
Business travel	Change in boundary	123	Increase	The increase in emissions is due to including mileage from rental cars and vehicle reimbursement in 2016. Airline travel CO2e did decrease by 11% in 2016 (1862 in 2015 to 1654 in 2017).
Employee commuting	Change in output	26	Decrease	Employees are to take part in the Trip Reduction Program. This program focuses on reducing the number of single-occupancy vehicles commuting to our work sites.
Downstream transportation and distribution	Change in output	43	Increase	APS had 1.4% more customers and increased of 71 GWh in electricity sold. APS delivers electrical energy from the power plant to customer's location through a transmission and distribution system. There is an inherent loss in MWh during transmission.

CC14.4

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

Yes, our suppliers
Yes, our customers

CC14.4a

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

1) Methods of engagement

a. Suppliers: Annually, APS engages our top tier suppliers in a sustainability survey, with questions on how they are managing environmental impacts in their operations, including greenhouse gas emissions, energy and water usage, waste, and materials management.

b. Customers: As an integral part of our business, we work with customers to help them achieve energy savings and greenhouse gas emission reductions through

programs and incentives for energy efficiency, demand response, and solar installation.

2) Strategy for prioritizing engagements

a. Suppliers: Within APS's supply chain, we prioritize our top tier suppliers, our most critical and strategic suppliers and those with whom we spend significant dollars. APS evaluates these suppliers using key performance indicators such as safety, quality and operations, and supplier diversity.

b. Customers: By taking advantage of new technologies to help customers understand, actively manage, and reduce their energy use, we are enabling them to make more informed decisions and improving the level of service we provide helping them reduce their energy use and greenhouse gas reductions.. APS also helps small and medium business customers find opportunities to save energy which in turn helps to lower operating costs. In addition, APS assists local governments and key accounts develop strategies and implementation plans to reduce emissions, including partnerships in utility scale solar and microgrids. APS offers online energy audits tools for residential and commercial customers. Recognizing that customers want more choices and control over their energy use, APS in 2016 launched a number of customer service enhancements including an upgraded mobile friendly outage map and a new mobile app that allows customers to use their smartphones to view usage and pay bills. In the first quarter of 2017, APS launched one of the largest information technology projects in company history—a new \$106 million customer information system that will provide a stronger, more nimble platform to support continued innovations in the way APS serves their customers.

3) Measures of success

a. Suppliers: APS defines success in two ways: a year over year increase in supplier response rate to the survey, and a year over year improvement in performance across the key performance indicators.

b. Customers: We measure a composite score of customer satisfaction, which serves as one of the metrics we use for determining performance related compensation. Compared to 2015 full year JD Power (residential) results, APS's 2016 full year Overall Satisfaction score decreased one point from 692 to 691 (out of 1,000). Although the 2015 full year score of 692 is nearly equal to that of 2016, due to ties and leapfrogging, APS rank shifted to 14th among the 53 large investor-owned utilities, dropping them to second quartile. Out of the 13 large utilities classified as “West” region brands, APS ranked 5th, maintaining the same rank as 2015 Full Year results. APS will be conducting benchmarking analysis to glean insights into the best practices that are driving the results of top-performing utilities.

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: Electric Utility Sustainable Supply Chain Alliance Annual Sustainability Survey	65	42%	In 2016, APS engaged with 3,540 suppliers through Supply Chain Management, of these supplier 65 of them participated in the EUISSCA survey. Those participating in the survey, account for 42% of total spend with APS Supply Chain Management, this is a 10% increase

Type of engagement	Number of suppliers	% of total spend (direct and indirect)	Impact of engagement
			from 2015.

CC14.4c

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

Further Information

Module: Sign Off

Page: CC15. Sign Off

CC15.1

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

Name	Job title	Corresponding job category
Mark Schiavoni	Executive Vice President and Chief Operating Officer	Chief Operating Officer (COO)

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

Further Information

Page: EU1. Global Totals by Year

EU1.1

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

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emission intensity (metric tonnes CO2e/MWh)
2015	8730	25191	13580663	0.53
2016	8730	24793	10065272	0.405

Further Information**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
Oil & gas (excluding CCGT)
Nuclear
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)
2015	1794	10913	10725279	0.98
2016	1794	6681	6427797	0.96

EU2.1b**Lignite**

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

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

Oil & gas (excluding CCGT)

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

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
2015	1898	259	161133	0.62
2016	1898	545	366621	0.67

EU2.1d

CCGT

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

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

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

Year ending	Nameplate capacity (MW)	Production (GWh)
2015	4235	9462
2016	4235	9382

EU2.1f**Waste**

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

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

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

Year ending	Nameplate capacity (MW)	Production (GWh)

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)
2015	803	2232
2016	803	2261

EU2.1i

Other

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

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

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 CO ₂ e)	Emissions intensity (metric tonnes CO ₂ e/MWh)
2015	0	0	0	0
2016	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 CO ₂ e)	Emissions intensity (metric tonnes CO ₂ e/MWh)
2015	0	0	0	0
2016	0	0	0	0

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)
2015	8730	25191	13580663	0.53
2016	8730	24793	10065272	0.405

Further Information

An efficient, diverse portfolio is vital to delivering sustainable power for Arizona, even more so in the face of federal environmental regulations and changing economic conditions. As a result, APS is making the next generation of power cleaner and more efficient through a balanced energy mix, investments in renewable energy and upgrades to power plants. APS's diversified mix of energy sources, including coal, natural gas and nuclear energy, as well as an increasing portfolio of renewable energy sources effectively manages overall price volatility for our customers, and insulates against risks in commodity supply chains such as price spikes or infrastructure issues. Palo Verde Nuclear Generating Station continues to break records, and Unit 2 produced the highest electricity output of any nuclear unit in the country in 2016—all of it clean, carbon-free energy. When complete in 2019, APS's \$500 million Ocotillo Modernization Project's cleaner, quick-starting natural gas power plants will provide reliable and flexible generation to serve Arizona, supporting the continued growth of renewable energy while making more efficient use of fuel and water. At Four Corners Power Plant, APS's investment of \$400 million in Selective Catalytic Reduction environmental technology is expected to be complete in 2018. The new environmental controls are designed to reduce emissions of nitrogen oxide by more than 90 percent. APS reached a major milestone in May 2016 when they surpassed one gigawatt of solar in the energy mix they provide to customers. Prior to last year, no other electricity company outside of California had achieved that distinction.

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 – Arizona	6%	15%	2025	In 2006, the Arizona Corporation Commission (ACC) adopted the Renewable Energy Standard (RES). Under the RES, electric utilities are regulated by the ACC must supply an increasing percentage of their retail electric energy sales from eligible renewable resources, including solar, wind, biomass, biogas, and geothermal technologies. The renewable energy requirement is 65 percent of retail electric sales in 2016 and increases annually until it reaches 15 percent in 2025. In APS's 2009 retail rate case settlement agreement (the "2009 Settlement Agreement"), APS committed to have 1,700 GWh of new renewable resources in service by year-end 2015 in addition to its 2008 renewable resource commitments. In 2016, APS has 3,351,983 MWh of renewable energy resources on its system, including energy from rooftop solar installations for which an incentive was not provided. This is equivalent to nearly 12.0 percent of APS's 2016 retail sales. The Arizona Corporation Commission (Commission) requires through the Renewable Energy Standard and Tariff (RES Rules) that 6.0 percent of the utility's 2016 retail kilowatt-hour (kWh) sales come from eligible renewable energy resources. Compliance for total RES for 2016 was 6% of retail sales or 1,678,030 MWh, APS accomplished 10.30% and an equivalent of 2,871,942 MWh.

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
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Please give:	Monetary figure	%	Comment
Renewable electricity's contribution to EBITDA		5%	This percentage is based on 2016 budget. In May 2016, APS surpassed 1 gigawatt (GW) of overall solar energy capacity. APS solar leadership continued in December with the startup of their innovative Red Rock Solar Plant. The plant demonstrates how electricity companies can help commercial customers realize their clean-energy goals. APS developed and owns the 40-megawatt plant, and entered into an agreement with two customers—Arizona State University and PayPal—that have committed to purchase renewable energy from APS over the next 20 years equivalent to the amount APS estimates Red Rock will generate. Nine solar power plants in APS's AZ Sun Program collectively produce 170 MW of clean power using more than 1 million photovoltaic panels in the Arizona desert. Since the first of APS-owned AZ Sun solar plants came on line in 2011, APS's grid-scale plants have produced more than 1 billion kilowatt-hours (kWh) of clean energy for their customers.

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		5%	2017	This percentage is based on 2017 budget. In May 2016, APS surpassed 1 gigawatt (GW) of overall solar energy capacity. APS solar leadership continued in December with the startup of their innovative Red Rock Solar Plant. The plant demonstrates how electricity companies can help commercial customers realize their clean-energy goals. APS developed and owns the 40-megawatt plant, and entered into an agreement with two customers—Arizona State University and PayPal—that have committed to purchase renewable energy from APS over the next 20 years equivalent to the amount APS estimates Red Rock will generate. Nine solar power plants in APS's AZ Sun Program collectively produce 170 MW of clean power using more than 1 million photovoltaic panels in the Arizona desert. Since the first of APS-owned AZ Sun solar plants came on line in 2011, APS's grid-scale plants have produced more than 1 billion kilowatt-hours (kWh) of clean energy for their customers.

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	4000000	0.6%	2017	Based on 2017 capex (as disclosed in 1Q2017 Form 10-Q). In 2015-16, APS designed and implemented the 10 MW APS Solar Partner Program, in part to better understand the ability of advanced inverters to help mitigate the power-quality issues that can arise with high photovoltaic penetration. In addition to the 10 MW of new photovoltaic capacity under the program, APS has deployed two battery storage systems, each rated at 2 MW/2 MWh for use in peak-shaving (flattening the net feeder demand) and distribution-system voltage management on two of the primary SPP research feeders. APS has proposed an AZ Sun II program, the purpose of the program, which has been proposed in APS's general rate case settlement, is to expand access to rooftop solar for low and moderate income Arizonans throughout APS's service territory, including in rural Arizona. For this program, distributed generation would be defined as photovoltaic solar generation connected to the distribution system, and may include any multi-family housing (such as apartment buildings), Title I Schools, and rural government customers. APS will own all the generation, renewable energy credits and other attributes from this program to benefit all customers. APS will propose a program of not less than \$10 million per year, and not more than \$15 million per year, in direct capital costs for the program. All reasonable and prudent costs incurred by APS pursuant to this program will be recoverable through the Renewable Energy Adjustment Clause until the next rate case. This program is contingent upon Commission approval.

Further Information

CDP 2017 Climate Change 2017 Information Request