



Welcome to your CDP Climate Change Questionnaire 2020

C0. Introduction

C0.1

(C0.1) Give a general description and introduction to your organization.

Pinnacle West Capital Corporation, an energy holding Company based in Phoenix, has consolidated assets of about \$19 billion, about 6,300 megawatts of generating capacity and 6,200 employees in Arizona and New Mexico. Through its principal subsidiary, Arizona Public Service, the Company provides retail electricity service to nearly 1.3 million Arizona homes and businesses.

This report contains forward-looking statements based on current expectations, including statements regarding our earnings guidance and financial outlook and goals. These forward-looking statements are often identified by words such as “estimate,” “predict,” “may,” “believe,” “plan,” “expect,” “require,” “intend,” “assume,” “project,” “anticipate,” “goal,” “seek,” “strategy,” “likely,” “should,” “will,” “could,” 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 Pinnacle West or APS. These factors include, but are not limited to: the potential effects of the continued COVID-19 pandemic, including, but not limited to demand for energy, economic growth, our employees and contractors, supply chain, expenses, capital markets, capital projects, operations and maintenance activities, uncollectable accounts, liquidity, cash flows, or other unpredictable events; our ability to manage capital expenditures and operations and maintenance costs while maintaining high reliability and customer service levels; variations in demand for electricity, including those due to weather seasonality, the general economy or social conditions, customer and sales growth (or decline), the effects of energy conservation measures and distributed generation and technological advancements; power plant and transmission system performance and outages; competition in retail and wholesale power markets; regulatory and judicial decisions, developments and proceedings; new legislation, ballot initiatives and regulation, including those relating to environmental requirements, regulatory policy, nuclear plant operations and potential deregulation of retail electric markets; fuel and water supply availability; our ability to achieve timely and adequate rate recovery of our costs, including returns on and of debt and equity capital investments; our ability to meet renewable energy and energy efficiency mandates and recover related costs; risks inherent in the operation of nuclear facilities, including spent fuel disposal uncertainty; current and future economic conditions in Arizona, including in real estate markets; the direct or indirect effect on our facilities or business from cybersecurity



threats or intrusions, data security breaches, terrorist attack, physical attack, severe storms, droughts, or other catastrophic events, such as fires, explosions, pandemic health events, or similar occurrences; the development of new technologies which may affect electric sales or delivery; the cost of debt and equity capital and the ability to access capital markets when required; environmental, economic and other concerns surrounding coal-fired generation, including regulation of greenhouse gas emissions; volatile fuel and purchased power costs; the investment performance of the assets of our nuclear decommissioning trust, pension, and other post-retirement benefit plans and the resulting impact on future funding requirements; the liquidity of wholesale power markets and the use of derivative contracts in our business; potential shortfalls in insurance coverage; new accounting requirements or new interpretations of existing requirements; generation, transmission and distribution facility and system conditions and operating costs; the ability to meet the anticipated future need for additional generation and associated transmission facilities in our region; the willingness or ability of our counter parties, power plant participants and power plant land owners to meet contractual or other obligations or continue or discontinue power plant operations consistent with our corporate interests; and restrictions on dividends or other provisions in our credit agreements and ACC orders. These and other factors are discussed in Risk Factors described in Part I, Item 1A of the Pinnacle West/APS Annual Report on Form 10-K for the fiscal year ended December 31, 2019, in Part II, Item 1A in of the Pinnacle West/APS Quarterly Report on Form 10-Q for the quarter ended March 31, 2020, and in Part II, Item 1A in the Pinnacle West/APS Quarterly Report on Form 10-Q for the quarter ended June 30, 2020 which you should review carefully before placing any reliance on our financial statements, disclosures or earnings outlook. Neither Pinnacle West nor APS assumes any obligation to update these statements, even if our internal estimates change, except as required by law.

C0.2

(C0.2) State the start and end date of the year for which you are reporting data.

	Start date	End date	Indicate if you are providing emissions data for past reporting years
Reporting year	January 1, 2019	December 31, 2019	No

C0.3

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

United States of America



C0.4

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

USD

C0.5

(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your chosen approach for consolidating your GHG inventory.

Financial control

C-EU0.7

(C-EU0.7) Which part of the electric utilities value chain does your organization operate in? Select all that apply.

Row 1

Electric utilities value chain

Electricity generation

Transmission

Distribution

Other divisions

Smart grids / demand response

Battery storage

Micro grids



C1. Governance

C1.1

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

Yes

C1.1a

(C1.1a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for climate-related issues.

Position of individual(s)	Please explain
Chief Executive Officer (CEO)	<p>Chairman of the Board, President and Chief Executive Officer of Pinnacle West and Arizona Public Service Company, provides the vision and leadership to execute the Company's strategy and create shareholder value. Additionally, he has overarching responsibility for managing risk, including climate change and greenhouse gas risk that directly or indirectly affects our Company's mission and vision. The Board oversees the Company's risk management function. The Board focuses on fostering a culture of risk awareness and risk-adjusted decision-making. They discuss a listing of the Company's top risks and a suggested allocation of responsibilities for such risks among the Board and the Board committees. As an example, one of the physical risks in Arizona related to climate change that the Board reviewed in 2019 is wildfire risk. Catastrophic fire events were identified as an enterprise top risk in 2017-2019. Due to extended drought over the past decade, forests and vegetation have been stressed from the lack of regular and sufficient moisture, compounded by shorter, drier winters and longer, warmer summers. The CEO supported the Company's decision to use a proactive, multi-faceted approach to wildfire mitigation in our service territory, with a central focus on risk assessment, readiness and compliance. Main components of the mitigation strategy include: disabling of automatic reclosers on high risk feeders during fire season, wildland-urban/forestry fire risk assessments and prevention measures, wildland-urban interface/defensible space around poles program; vegetation management right-of-way program; and transmission line clearance program. Responsibility for oversight of wildfire risk was allocated to the Pinnacle West Board's Finance Committee.</p>



<p>Board Chair</p>	<p>Chairman of the Board, President and Chief Executive Officer of Pinnacle West and Arizona Public Service Company, provides the vision and leadership to execute the Company’s strategy and create shareholder value. Additionally, he has overarching responsibility for managing risk including climate change and greenhouse gas risk that directly or indirectly affects our Company’s mission and vision. The Board oversees the Company’s risk management function. The Board focuses on fostering a culture of risk awareness and risk-adjusted decision-making. They discuss a listing of the Company’s top risks and a suggested allocation of responsibilities for such risks among the Board and the Board Committees. One of the physical risks in Arizona related to climate change that the Board monitored in 2019 is wildfire risk. Catastrophic fire events were identified as an enterprise top risk in 2017-2019. Due to extended drought over the past decade, forests and vegetation have been stressed from the lack of regular and sufficient moisture, compounded by shorter, drier winters and longer, warmer summers. The CEO supported the Company’s decision to use a proactive, multi-faceted approach to wildfire mitigation in our service territory, with a central focus on risk assessment, readiness and compliance. Main components of the mitigation strategy include: disabling of automatic reclosers on high risk feeders during fire season, wildland-urban/forestry fire risk assessments and prevention measures, wildland-urban interface/defensible space around poles program; vegetation management right-of-way program; and transmission line clearance program. Responsibility for oversight of wildfire risk was allocated to the Pinnacle West Board’s Finance Committee.</p>
<p>Board-level committee</p>	<p>The Nuclear and Operating Committee has primary responsibility over environmental matters. The Committee reports regularly to the Board on the Committee’s activities. As an electric utility, environmental matters are at the forefront of our discussions on operations, strategy, and risk. The Nuclear Operating Committee has primary responsibility over environmental matters, though the Board also receives reports on matters of environmental importance, sustainability initiatives and strategy. The Committee periodically reviews, with management, principal risks related to the Company’s nuclear; fossil generation; transmission and distribution; environmental, health and safety (EH&S) operations; or other matters addressed by the Committee, including oversight of security policies, programs and controls for protection of cyber and physical assets. Our Board dedicates a great amount of time to environmental, social and governance matters at the Board and committee level. Another key focus of the Board is the adoption and maintenance of good governance practices, which is a primary responsibility of the Corporate Governance Committee. One of the physical risks in Arizona related to climate change that the Board reviewed in 2019 is wildfire risk. Catastrophic fire events were identified as an enterprise top risk in 2017-2019. Due to extended drought over the past decade, forests and vegetation have been stressed from the lack of regular and sufficient moisture, compounded by shorter, drier winters and longer, warmer summers. The Company uses a proactive, multi-faceted approach to wildfire mitigation in our service territory, with a central focus on risk assessment, readiness and compliance.</p>



C1.1b

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

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Please explain
Scheduled – some meetings	Reviewing and guiding risk management policies	The Nuclear and Operating Committee is responsible for the oversight of the Company’s sustainability initiatives and strategy and environmental, health and safety (EH&S) policies and practices. The Committee periodically reviews, with management, principal risks related to or arising out of the Company’s nuclear, fossil generation, transmission and distribution, EH&S operations or other matters addressed by the Committee. 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 and each Board Committee receives periodic presentations from management about its assigned risk areas and discusses their risk reviews with the Board at least annually.

C1.2

(C1.2) Provide the highest management-level position(s) or committee(s) with responsibility for climate-related issues.

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



Other, please specify Director of Corporate Environmental	Both assessing and managing climate-related risks and opportunities	More frequently than quarterly
President	Both assessing and managing climate-related risks and opportunities	More frequently than quarterly

C1.2a

(C1.2a) Describe where in the organizational structure this/these position(s) and/or committees lie, what their associated responsibilities are, and how climate-related issues are monitored (do not include the names of individuals).

President. The President's full title is President, Arizona Public Service Company (APS) and Executive Vice President, Public Policy, Pinnacle West Capital Corporation (PNW). The President is also the Chairman of the Board, President and Chief Executive Officer (CEO) of PNW and Chairman of the Board and CEO of APS. In addition, the President is the chairperson of the Energy Policy Committee (EPC), a group of senior executive members who review, debate and decide strategic points of view on energy-related issues, inclusive of climate-related issues, risks and opportunities, while establishing policies that support our long-term corporate strategy. The EPC governs and oversees corporate critical areas of focus and supports Tier 1 metrics, ensuring alignment with the Company's strategy. The EPC provides strategic direction to business planning and assists the Officers in aligning their plans with APS strategy. In addition, it guides development of the corporate strategic plan. Core strategies and initiatives in 2019 to address climate-related risks included a clean corporate initiative focusing on Palo Verde for the long term to reach our clean energy goals and prepare Palo Verde Generating Station for changing markets. The clean initiative also supports the research and development of Arizona electrification and promotes opportunities for electrification in Arizona.

Executive Vice President of Operations (EVP). This position reports directly to the President of APS. The EVP, as a member of the EPC and Executive Risk Committee (ERC), has the responsibility for both assessing and managing climate-related risks and opportunities as they are presented to the EPC and/or to the ERC. In addition, the EVP of Operations meets regularly with the Chief Sustainability Officer (CSO) to review climate-related issues that are being monitored by the Corporate Environmental business unit. The EVP of Operations is tasked with making sure the President is informed of material climate-related risks and that mitigation measures are in place for business continuity.

Chief Sustainability Officer (CSO). The CSO's full title is the Vice President of Environmental and CSO of APS. This position reports directly to the EVP of Operations. The CSO has responsibility e for both assessing and managing climate-related risks and opportunities. As a member of the EPC and ERC, the CSO ensures that climate-related risks and opportunities are considered during the business decision-making processes. The CSO also



meets monthly with the Director of Corporate Environmental to discuss and assess climate-related issues. The CSO is tasked with making sure the EVP of Operations is informed of material climate-related risks and that mitigation measures are in place for business continuity.

Director of Corporate Environmental (Director). This position is equivalent to a Business Unit Manager and reports directly to the CSO. The Director is responsible for both assessing and managing climate-related risks and opportunities. The Director has the responsibility of making sure the CSO is informed of material climate-related risks and that mitigation measures are set in place for business continuity. The Director has a team of employees that have the responsibility of monitoring any climate related issues, risk or opportunities and briefing the Director at least monthly or as issues and concerns arise. At least, twice a year the Director provides updates on any climate-related risks and opportunities to the EPC.

An example of this organizational structure being applied in 2019 to address a climate-related issue was the development of APS's clean energy commitment to deliver 100 percent clean, carbon-free electricity to our customers by 2050. The Director developed considerations and options for a clean energy commitment framework in conjunction with the CSO. Those options incorporated feedback from internal stakeholders who bring subject matter expertise and perspective in the decision-making process. The Director then presented the commitment to the EPC, which includes the CEO, EVP, and CSO, to get feedback, alignment, and support for the decision to make a clean energy commitment. In January 2020, the Company announced our commitment to deliver 100 percent clean, carbon-free and affordable electricity to our customers. This goal includes a nearer-term 2030 target of 65 percent clean energy, with 45 percent of our generation portfolio coming from renewable energy. We also will cease all coal-fired generation by 2031. We will make this transition in a responsible manner, working closely with the affected communities to minimize impacts and help identify new opportunities.

C1.3

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

	Provide incentives for the management of climate-related issues	Comment
Row 1	Yes	

C1.3a

(C1.3a) Provide further details on the incentives provided for the management of climate-related issues (do not include the names of individuals).



Entitled to incentive	Type of incentive	Activity incentivized	Comment
Corporate executive team	Monetary reward	Emissions reduction target	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. The Palo Verde Generation Station's capacity factor is an example. Palo Verde is the country's largest source of carbon-free energy. In 2019, Palo Verde's capacity factor target was set at 90.9 percent, and we exceeded this target with a capacity factor of 92.6 percent. As a result, Palo Verde generated 31.9 million megawatt-hours of carbon-free electricity in 2019. Palo Verde is the only generating facility in the United States to produce more than 30 million MWh in a year, a milestone the plant has achieved 11 consecutive years and a total of 15 times. APS operates the Palo Verde Generating Station and owns or leases 29.1 percent of the facility.
Business unit manager	Monetary reward	Emissions reduction target	Our Business Unit Managers' 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 performance. The Palo Verde Generation Station's capacity factor is an example. Palo Verde is the country's largest source of carbon-free energy. In 2019, Palo Verde's capacity factor target was set at 90.9 percent, and we exceeded this target with a capacity factor of 92.6 percent. As a result, Palo Verde generated 31.9 million megawatt-hours of carbon-free electricity in 2019. Palo Verde is the only generating facility in the United States to produce more than 30 million MWh in a year, a milestone the plant has achieved 11 consecutive years and a total of 15 times. APS operates the Palo Verde Generating Station and owns or leases 29.1 percent of the facility.
All employees	Monetary reward	Emissions reduction target	Eligible employees receive annual cash incentives based on the achievement of performance with a focus on transparency and with an emphasis on incentivizing performance. APS's compensation philosophy incorporates multiple business performance metrics, including nuclear capacity factor to assess performance.
Business unit manager	Non-monetary reward	Other (please specify)	As part of the formula to determine performance rating, Business Unit Managers receive ratings based on the achievement of performance of metrics. Some Business Unit Managers may have metrics that are related to climate change issues, for example: carbon avoidance goals, energy efficiency, and others. Each Business Unit has designated metrics in their annual Business Unit business plans, of which some



		All of the above, based on business unit.	may include climate related metrics. We believe the performance of each Business Unit is important to the success of the Company.
All employees	Non-monetary reward	Other (please specify) All of the above, based on business unit.	As part of the formula to determine performance rating, all eligible employees receive ratings based on the achievement of performance of metrics. Some employees may have metrics that are related to climate change issues, for example: carbon avoidance goals, paperless billing adoption, energy efficiency and others. Each Business Unit has designated metrics in their annual Business Unit business plans, of which some may include climate related metrics and are cascaded to the employees within the Business Unit. We believe the performance of each Business Unit is important to the success of the Company.

C2. Risks and opportunities

C2.1

(C2.1) Does your organization have a process for identifying, assessing, and responding to climate-related risks and opportunities?

Yes

C2.1a

(C2.1a) How does your organization define short-, medium- and long-term time horizons?

	From (years)	To (years)	Comment
Short-term	0	1	Short-term horizons are used to plan for the upcoming fiscal year to track to short-term goals from each business unit. Emergent risks are often identified in short-term time horizons with ultimate longer-term implications.
Medium-term	1	5	Medium-term horizons are typically used for the business planning process and by the Integrated Resource Planning team.



Long-term	5	30	Long-term horizons are used by the Integrated Resource Planning team, Enterprise Risk Management and Corporate Strategy to ensure the business is planning and assessing for future risks and opportunities and to support a sustainable future for Arizona.
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C2.1b

(C2.1b) How does your organization define substantive financial or strategic impact on your business?

APS defines substantive or strategic impact based on whether an observed effect is large enough to be meaningful within the context of financial, operational, reputational or safety assessments. To determine whether a risk will result in substantive or strategic impact, the Enterprise Risk Management (ERM) department has established a formal process by which business units identify and assess risks, including climate-related risks, consistent with our overall enterprise risk framework. The ERM framework is a depiction of the Company’s efforts to identify, assess, mitigate and control risks. Under the ERM framework, business units assign values to each risk for financial, operational, reputational and safety impacts utilizing a 0-4 threshold; levels 3-4 are considered substantive.

For financial impact, the thresholds are described as follows:

- (04) - Major means an impact of greater than \$25M;
- (03) - Significant means an impact between \$15M and \$25M;
- (02) - Moderate means an impact between \$5M and \$15M;
- (01) - Limited means an impact between \$2M and \$5M;
- (00) - Very limited means an impact between \$0 and \$2M.

For operational impact, the thresholds are described as follows:

- (04) - Major means potential for grid instability leading to large-scale blackouts due to generation or transmission related voltage and frequency instabilities;
- (03) - Significant means potential for rolling blackouts at times when the demand exceeds supply (large geographical area effects) or an event which has reasonable probability of significantly negatively impacting the Company’s operational objectives;
- (02) - Moderate means outages arising from a major line or circuit outage impacting greater than 50,000 customers or an event which has a reasonable probability of moderate negative impact to the Company’s operational objective;
- (01) - Limited means local outages caused by pole collapse, pole fires and transformer problems usually impacting a smaller geographical area or an event which has a reasonable probability of limited negative impact to the Company’s operational objective.



(00) - Very limited means no outages or local outages of a very small duration.

For reputational impact, the thresholds are described as follows:

(04) - Major means an event that generates local/national media coverage or causes a dramatic change in confidence with public, employees and/or stakeholders and/or results in negative action by regulators, with the impact lasting more than twelve months;

(03) - Significant means an event that generates local/national media coverage or causes a significant change in confidence with public, employees and/or stakeholders and/or attracts attention of regulators, with the impact lasting more than three months;

(02) - Moderate means an event that generates local/national media coverage or causes a moderate change in confidence with public, employees and/or stakeholders, with the impact lasting between one and three months;

(01) - Limited means a complaint or recognition at localized (contained) level with minimal change to stakeholder confidence, with impact lasting less than one month;

(00) - Very limited means little or no impact.

For safety impact, the thresholds are described as follows:

(04) - Major means life-impacting injuries and/or fatalities to employees may result, significant impact to public health may result or evacuation is necessary;

(03) - Significant means lost-time injuries to employees may result and/or moderate impact to public health may result;

(02) - Moderate means moderate injuries, including OSHA Recordables, with short-term impacts to employees or minor impact to public health may result;

(01) - Limited means minor injuries to employees may result or no impact to public health or impact to public is immediately correctable;

(00) - Very limited means no resulting injuries to employees or the public. This would include "close calls."

C2.2

(C2.2) Describe your process(es) for identifying, assessing and responding to climate-related risks and opportunities.

Value chain stage(s) covered



Direct operations
Upstream
Downstream

Risk management process

Integrated into multi-disciplinary company-wide risk management process

Frequency of assessment

More than once a year

Time horizon(s) covered

Short-term
Medium-term
Long-term

Description of process

The Enterprise Risk Management (ERM) department facilitates the establishment and implementation of committee(s) and process(es) for the identification, assessing and reporting of material risks inherent to the Company's business, inclusive of climate-related risks. Risks are identified, defined, assessed and prioritized based on the likelihood and impact of their occurrence. Due to the complexity of operational, financial and regulatory environments, APS has numerous risk objectives and obligations, which are addressed by policies, controls, processes and programs. Risks are identified, defined, assessed and mitigated at an asset level.

APS identifies and assesses climate-related risks in a manner consistent with our overall enterprise risk management framework. The ERM framework is a depiction of the Company's efforts to identify, assess, mitigate and control risks. The ERM process is one of the Company's efforts within this framework.

The ERM process at APS is a formal process by which business units and the ERM group support the Executive Risk Committee (ERC) as it carries out responsibilities set forth in the ERC charter. This includes the following, which can all be applied to climate-related risks:

No less than annually, the ERC in conjunction with the ERM group, develop an enterprise risk management profile of the organization based on risk identification and assessments from the organization's business units and ERM group. The chairperson of the ERC or his designee shall

present that profile to the Chairman of the Board & Chief Executive Officer (CEO).

No less than twice per year, the ERC presents and monitors highly critical risks, including climate risks, to its Board of Directors. No less than quarterly, or as often as the Chairperson determines to be necessary, the ERC reviews and monitors relevant material organizational risks, with members, participants and delegates of the ERC.

Business units maintain an inventory of their most significant risks and associated risk response plans. Annually, business units record this information in a prescribed format, for analysis, categorization and prioritization of risks to support development of an enterprise risk profile. ERM uses a planning committee to identify and evaluate opportunities, including opportunities associated with climate-related risks, at the Company and business unit level. The planning committee, using input from informed stakeholders and subject matter experts, provides strategic direction, business planning and management method recommendations consistent with the Company business direction from the CEO and Board of Directors.

Risk prioritization can include an assessment of likelihood, impact, risk direction, velocity, external evidence, feasibility and cost of mitigation. 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 identify factors affecting the budget and timing of projects, leading to more effective and efficient mitigation strategies. The planning committee reviews Company metrics, financial performance and business plans on a quarterly basis to ensure corporate targets are met. Opportunities are prioritized based on their ability to assist in meeting or exceeding targets.

While the ERM process receives input from and provides output to the execution and implementation of the Company's risk policies and controls, the business planning process and business units' specific risk management programs, the ERM process does not direct or control these policies, processes or programs, as they are exclusively within the control and purview of the responsible business units.

In 2019, the ERM identified and assessed the potential transitional risk of emerging carbon pricing regulations. This risk is considered in our ERM process based on assessments conducted by the business unit manager and the ERM group. There are numerous financial and operational risks inherent in managing mandatory compliance with the Company's vast and continually evolving regional and federal regulatory requirements. The risk is recorded and monitored to determine the magnitude of the risk and the associated mitigated measures. This risk is considered a (03) rating in terms of reputational significance, which means an event which generates local/national media coverage or causes a significant change in confidence with public, employees and/or stakeholders or attracts attention of regulators, with the impact lasting more than



three months. It was also considered a (01) rating in terms of financial significance, which means an impact between \$2M and \$5M.

In 2019, the ERM also identified heightened wildfire risk as a climate-related physical risk resulting from changes in precipitation patterns and extreme variability in weather patterns with a potential financial impact to operating costs. Wildfires have the potential to affect not only the communities that APS serves, but also APS’s vast network of electric lines and facilities. The Company uses a proactive, multi-faceted approach to wildfire mitigation, with a central focus on risk assessment, readiness and compliance. Main components of the mitigation strategy include: disabling of automatic reclosers on high risk feeders during fire season; wildland-urban/forestry fire risk assessments and prevention measures; wildland-urban interface/defensible space around poles program; vegetation management right-of-way program; and transmission line clearance program. Responsibility for oversight of wildfire risk is allocated to the Pinnacle West Board’s Finance Committee.

C2.2a

(C2.2a) Which risk types are considered in your organization's climate-related risk assessments?

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	<p>One example of a current regulation climate-related risk is compliance with regional and national regulation. This risk is considered in our ERM process based on assessments conducted by the business unit manager and the ERM group. There are numerous financial and operational risks inherent in managing mandatory compliance with the Company’s vast and continually evolving regional and federal regulatory requirements. The risk is recorded and monitored to determine the magnitude of the risk and the associated mitigated measures. This risk is considered a (03) rating in terms of reputational significance and a (01) rating in terms of financial significance.</p> <p>An example in 2019 of a current regulation of a climate-related risk are national and regional reporting requirements of greenhouse gas emissions, such as U.S. EPA Part 98 reporting. APS maintains an internal system that tracks reporting requirements and assigns tasks to individuals responsible for reporting to keep in compliance. In addition, the environmental policy expert monitors for changes in regulation so that we are in compliance and do not miss updates to potential rule changes. Potential financial impact for not remaining in compliance can be up to \$100k per day per violation.</p> <p>In 2019 EPA finalized the Affordable Clean Energy (ACE) Rule. The policy expert reviewed the proposed ACE Rule with the</p>



		<p>operations, engineering, environmental and legal teams to assess the risk of potential financial and operating impacts. The Company is taking all the necessary steps to comply with the requirements of the ACE Rule and any potential impacts at this stage appear to be minimal. This includes compliance with all reporting and monitoring at APS-owned and operated facilities.</p>
Emerging regulation	Relevant, always included	<p>One example of an emerging climate-related regulation risk is from climate change litigation and legislative and regulatory efforts to limit greenhouse gas emissions. This risk is considered in our ERM process based on assessments conducted by the business unit director and the ERM group. The risk is recorded and monitored to determine the magnitude of the risk and the associated mitigated measures. This risk is considered a (03) rating in terms of reputational significance and a (04) rating in terms of financial significance.</p> <p>Another example in 2019 of an emerging climate-related regulation risk is the potential of a carbon tax or cap and trade program. 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. It is difficult to forecast what final form that regulation may take; nonetheless, APS included in its analysis the potential for carbon pricing in its 2017 Integrated Resource Plan (IRP). The CO2 cost included in the IRP analysis was based on the California market cap and trade 2016 CO2 cost of \$12.80, escalated at 2.5 percent beginning in 2023. The potential cost is about \$1,195M million nominal (\$528M million net present value) making this a level (04) risk.</p> <p>APS maintains a specialized environmental policy expert who works with the various APS business units to ascertain, review and track local, state and federal environmental regulations that have the potential to impact APS's current and future operational goals. 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>
Technology	Relevant, always included	<p>The technology risk of the impact of disruptive technologies is considered in our ERM process based on assessments conducted by the business unit manager and the ERM group. The risk is recorded and monitored to determine the magnitude of the risk and the associated mitigated measures. This risk is considered a (04) rating in terms of financial significance, a (03) rating in terms of operational significance and a (04) rating in terms of reputational significance.</p> <p>Risk associated with new technologies remains a particularly acute concern for APS. As more emerging technologies, such as energy storage devices, become commercially viable, they will continue to change how our customers interact with us.</p>



		<p>By being proactive and working with our customers to identify and respond to their changing needs, we remain well positioned to deliver value. And by providing customers the opportunity to manage their own energy and peak demand, we can expand the use and understanding of load-management technologies, encourage customers to use energy during off-peak hours and better align with solar production and system peak conditions.</p> <p>These technology risks may cause potential resource substitutions and diversification that may impact our ability to operate in various conditions as demand for electricity shifts and diversifies. To address this shift to new technologies, APS is deploying a wide array of new distributed energy resource (DER) technologies to provide clean, reliable, affordable energy to its customers. These include battery storage, thermal storage, load management, electric vehicles and other beneficial electrification technologies that have the potential to increase the value of intermittent generation resources as well as increase grid reliability and stability.</p> <p>APS has a number of current and future planned initiatives that utilize DER technologies. Given the array of potential applications for energy storage, APS evaluates storage technologies on an ongoing basis. We currently plan to install at least 850 MW of energy storage by 2025, including 150 MW of energy storage projects under power purchase agreements. The additional 700 MW of APS-owned energy storage is expected to be made up of energy storage that will be added to our existing AZ Sun solar sites, along with current and future RFPs for energy storage and solar-plus-energy-storage projects.</p>
Legal	Relevant, always included	<p>The legal risk of increased litigation, including the cumulative effects of the legal/compliance requirements, is considered in our ERM process based on assessments conducted by the business unit manager and the ERM group. The risk is recorded and monitored to determine the magnitude of the risk and the associated mitigation measures. This risk is considered a (04) rating in terms of financial significance and a (03) rating in terms of reputational significance.</p> <p>There are several legislative and regulatory carbon-related actions that may impact future strategic resource decisions and are considered potential transitional risks that may impact operating costs. As an example, depending on the final outcome of a pending judicial review of the Affordable Clean Energy (ACE) Rule and repeal of the Clean Power Plan (CPP), along with related regulatory activity to implement the ACE regulations, the utility industry may face alternative efforts from private parties seeking to establish alternative greenhouse gas (GHG) emission limitations from power plants. EPA took action in October 2017 to repeal these regulations, and in July 2019, EPA published final regulations, the ACE Rule, to replace the</p>



		<p>Clean Power Plan (CPP) with a new set of regulations. EPA's action in 2019 to repeal the CPP and replace it with the ACE regulations is currently subject to pending judicial review in the U.S. Court of Appeals for the District of Columbia.</p> <p>During 2019, the Arizona Corporation Commission was actively engaged in revising their energy rules for Arizona, which would include updated goals for both clean and renewable energy for regulated utilities in the state. Accordingly, the future of GHG limitations is far from settled. However, for years APS has been transitioning its energy assets away from high carbon intensity assets (coal) to low or no carbon intensity assets (natural gas, renewables, storage). This is driven by many different factors, including the market forces of fuel and energy prices, and the cost of technology.</p>
Market	Relevant, always included	<p>The market risk of a potential water supply shortage and increased demand is considered in our ERM process based on assessments conducted by business areas manager and the ERM group. The risk is recorded and monitored to determine the magnitude of the risk and the associated mitigated measures. This risk is considered a (04) rating in terms of financial significance, a (03) rating in terms of operational significance, and a (04) rating in terms of reputational significance.</p> <p>One potential shift in the market in the desert Southwest is potential water supply shortage and increased demand. 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 generation.</p> <p>APS investment in water for the future includes purchase of effluent under contracts through 2050 for Palo Verde and Redhawk, to be extended if needed. It also includes purchase of long-term storage credits from the Gila River Indian Community to supply high priority water to the Sundance Power Plant. These long-duration contracts provide assured water at a known price and ensure reliable, continuous availability of water for power generation.</p> <p>Assured water supplies for a predictable price allows long-term budgeting with a high probability of confidence. The regional cost of water is currently increasing at twice the rate of inflation or more, therefore, from 2025 - 2050, it is likely that current contracts could save \$500,000/year, or more. This is based upon knowledge of the existing water market, supplemented by biennial audits of water sales in the area. Recent audits have revealed that the inflation rate has been less than 2%, however, local water costs are inflating at 4-8%. Having a contract with a maximum escalation rate of 3%/year between 2025 and 2050 in a water market that exceeds a 3%/year escalation rate will result in substantial savings. For example, if</p>



		<p>the cost of water in 2025 is \$20,000,000/year, escalating at a maximum of 3%/year, but the water market is escalating at 6%/year, the savings would be \$600,000/year.</p>
Reputation	Relevant, always included	<p>The reputation risk of wildfire safety is considered in our ERM process based on assessments conducted by the business unit manager and the ERM group. The risk is recorded and monitored to determine the magnitude of the risk and the associated mitigation measures. This risk is considered a (04) rating in terms of financial significance, a (04) rating in terms of reputational significance and a (04) rating in terms of safety significance.</p> <p>APS has taken great care to build our reputation over many years. Our commitment to our mission of creating a sustainable energy future for Arizona is a driving force in maintaining our reputational risk. For this reason, reputational risk is always considered when evaluating enterprise risks. We pride ourselves on delivering clean, reliable and affordable energy for our customers.</p> <p>One way that we can provide reliable power for our customers is to strengthen our system by staying focused on wildfires at all times, and planning year-round so that customers can feel confident in our ability to serve them. Fire risk is a climate-related physical risk due to precipitation patterns and extreme variability in weather patterns, with a potential financial impact to operating costs. In addition, a safety or environmental event could negatively impact the Company's reputation or standing in the community. Through proactive fire-mitigation measures, APS works to reduce the likelihood of fire in and around electrical equipment. Mitigation initiatives include the deployment of infrastructure systems technology as well as mobile technology to track and report fires. These technological innovations allow us to be more proactive and nimble in our efforts to provide for first responders and the safety of our customers.</p>
Acute physical	Relevant, always included	<p>The acute physical risk of wildfires due to changes in physical climate parameters are considered in our ERM process based on assessments conducted by the business unit manager and the ERM group. The risk is recorded and monitored to determine the magnitude of the risk and the associated mitigation measures. This risk is considered a (04) rating in terms of financial significance, a (04) rating in terms of reputational significance and a (04) rating in terms of safety significance.</p> <p>Catastrophic fire events were identified as an enterprise top risk in 2017-2019. Due to extended drought over the past decade, forests and vegetation have been stressed from the lack of regular and sufficient moisture, compounded by shorter, drier winters and longer, warmer summers. These changes in weather patterns pose a fire risk to the communities we serve. To effectively respond to this risk, we work to reduce wildland fire risk and create defensible space throughout</p>



		<p>Arizona. With over 39,000 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. Through proactive fire-mitigation measures, APS works to reduce the likelihood of fire in and around electrical equipment. Mitigation initiatives include the deployment of infrastructure systems technology as well as mobile technology to track and report fires.</p> <p>We also have proactively increased our system resiliency, implemented forest management programs to mitigate the risk of wildfires and developed rapid-response plans to promptly restore power after storms. We also work to mitigate the threat of fire to our transmission system. To reduce risk to our power lines and first responders working during wildfires, we make a priority of creating defensible space to address vegetation around equipment poles. Our goal is to remove combustible material within a minimum of 10-foot radius around equipment poles. Our right-of-way, which is cleared of vegetation, is used by firefighters to stop, anchor and suppress wildfires. Our Company also practices integrated vegetation management to promote the growth of lush, low-growing shrubs, grasses and forbs in communities such that vegetation does not interfere with overhead power lines, pose a fire hazard or impede access.</p>
Chronic physical	Relevant, always included	<p>The chronic physical risk of water supply is considered in our ERM process based on assessments conducted by the business unit manager and the ERM group. The risk is recorded and monitored to determine the magnitude of the risk and the associated mitigated measures. This risk is considered (02) rating in terms of financial impact, a (01) as operational impact and (01) as reputational impact.</p> <p>In the long term, water supply may be at risk due to climate change. Declining water reservoirs will require adaptation and new technological and policy solutions for water management. 2019 was an unusual year for water availability in the state due to significant amounts of rain and snow from January - March 2019 and above-average snowpack for the year.” This is likely an isolated occurrence, and we do not necessarily expect this to be a reduced risk in future years.</p> <p>APS Water Resource Management (WRM) is responsible for securing primary, secondary and contingent water supplies for nine power plants, through a combination of water rights (groundwater and surface water), water contracts and agreements. WRM also constructs and maintains reliable pumping, delivery and water storage infrastructure. The APS generation fleet consists of the Palo Verde Generating Station (nuclear), Cholla and Four Corners Power Plants (coal), and six natural gas-fired plants: Redhawk, West Phoenix, Ocotillo, Sundance, Yucca and Saguaro Power Plants. These plants use three</p>



		<p>sources of water primarily for cooling water, but also for drinking water and high-purity process water: treated effluent (71 percent), surface water (15 percent) and groundwater (14 percent). WRM manages water conservation programs and a strategy for all plants, designed to reduce water consumption and improve efficiency over time, and manages other programs such as the well and pumping equipment reliability program that ensures the water supplies can be reliably delivered to the plants, when needed.</p>
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C2.3

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

Yes

C2.3a

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

Identifier

Risk 1

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Emerging regulation

Carbon pricing mechanisms

Primary potential financial impact

Increased indirect (operating) costs

Company-specific description



A potential transition risk for APS in 2019 that may have financial impact on our operating costs are climate change litigation and legislative and regulatory efforts to limit greenhouse gas (GHG) emissions. Although there are no current or planned congressional attempts to pass cap and trade legislation to regulate GHG emissions, in the event cap and trade legislation ultimately passes, the actual economic and operational impact of such legislation on APS depends on a variety of factors, none of which can be fully known at this time. Factors include allowable GHG emissions; cost to reduce emissions; how any allowable emissions will be allocated to sources; the associated cost; and whether offsets and other measures to moderate the costs of compliance will be available. However, for numerous years the APS Integrated Resource Plan has included a “cost of carbon,” which is factored into resource allocation decisions to address this potential cost to operations. 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. 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 its 2017 Integrated Resource Plan (IRP). The CO2 cost included in the IRP analysis was based on the California market cap and trade 2016 CO2 cost of \$12.80, escalated at 2.5 percent beginning in 2023. Prior to 2023, APS’s analysis assumed the CO2 cost to be \$0. The resulting potential impact based on these assumptions and projected carbon emissions from 2019 thru 2032 is \$1,195M. These costs would result in higher revenue requirements recovered through a rate review or adjustor mechanisms. The carbon tax will continue to be integrated into future scenarios as we work with stakeholders on our new plan that is currently scheduled to be updated in 2020.

Time horizon

Medium-term

Likelihood

Likely

Magnitude of impact

Medium-high

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

1,195,000,000

Potential financial impact figure – minimum (currency)



Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

\$1,195M nominal (\$567M net present value). One of the most likely but unpredictable outcomes is a carbon tax. 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. 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 its 2017 Integrated Resource Plan (IRP). The CO2 cost included in the IRP analysis was based on the California market cap and trade 2016 CO2 cost of \$12.80, escalated at 2.5 percent beginning in 2023. Prior to 2023, APS's analysis assumed the CO2 cost to be \$0. The \$1,195M was calculated based on these assumptions and projected carbon emissions from generation between 2019 thru 2032. These costs would result in higher revenue requirements recovered through a rate review or adjustor mechanisms.

Cost of response to risk

500,000

Description of response and explanation of cost calculation

APS maintains a specialized environmental policy expert who works with the various APS business units to ascertain, review and track local, state and federal environmental regulations that have the potential to impact APS's current and future operational goals. 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. The policy expert meets monthly with the environmental support team and leadership to make sure that any regulations that have changed or are potentially being proposed are assessed for potential risks or opportunities. For example, in 2019 EPA finalized the Affordable Clean Energy Rule (ACE). The policy expert reviewed the proposed ACE Rule with the operations, engineering, environmental and legal teams to assess the risk of potential financial and operating impacts. The review process lead to the environmental and legal team working together to take all necessary steps to comply with the requirements of the EPA's ACE Rule which EPA enacted to provide existing coal-fired electric utility generating units (EGUs) with standards for reducing greenhouse gas (GHG) emissions. For example, starting in 2019 the Company began the required analysis of the Cholla Power Plant, and is required by Arizona Department of Environmental Quality (ADEQ) to submit its analysis for review by the December 1, 2020 deadline.

There is a yearly management cost of \$500,000 associated with monitoring the regulatory landscape, 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 help us understand potential impacts on the industry and, finally, employee time spent assessing and mapping the impacts of climate regulations. The \$500,000 is approximately 50 percent for personnel costs and 50 percent for various trade group memberships, tracking tools and services as needed to address the risk of emerging carbon-related regulation.

Comment

Identifier

Risk 2

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Chronic physical

Changes in precipitation patterns and extreme variability in weather patterns

Primary potential financial impact

Increased capital expenditures

Company-specific description

One of the largest physical risks driven by change in physical climate parameters is water supply, which may result in increasing capital expenditures to address this risk. Since water can be 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. 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 generation. APS has an entire business unit dedicated to assessing and addressing our current and future water needs.

In 2019, water risk is considered in our Enterprise Risk Management (ERM) process based on assessments conducted by the business unit manager and the ERM group. The risk is recorded and monitored to determine the magnitude of the risk and the associated mitigated measures. In 2019, this risk is considered (02) rating in terms of financial impact, which is a moderate potential impact of \$5M to \$25M. 2019



was an unusual year for water availability in the state due to significant amounts of rain and snow from January - March 2019 and above-average snowpack. The U.S. Drought Monitor also temporarily removed out of an official “drought period.” This is likely an isolated occurrence, and we do not necessarily expect this to be a reduced risk in future years.

Two potential drought-related projects could result in expenditures of \$4-6M in capital costs. If drought results in loss of surface water due to a shortage declaration on the Colorado River, agricultural users near the Sundance Power Plant could revert to pumping groundwater. This new groundwater pumping could lower the water table to levels that require drilling a new, deeper well at a cost of \$2-3M. A similar drought-related issue could occur at the Yucca Power Plant where a shortage declaration on the Colorado River could result in loss of all but one well supporting the plant; therefore, APS would likely be required to drill a well to avoid having a single point of failure, at a cost of \$2-3M.

Time horizon

Medium-term

Likelihood

Likely

Magnitude of impact

Medium-high

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

4,000,000

Potential financial impact figure – maximum (currency)

6,000,000

Explanation of financial impact figure



The financial implication related to drought is difficult to quantify in an exact financial figure. However, two potential drought-related projects could result in expenditures of \$4-6M in capital costs. If drought results in loss of surface water due to a shortage declaration on the Colorado River, agricultural users near the Sundance Power Plant could revert to pumping groundwater. This new groundwater pumping could lower the water table to levels that require drilling a new, deeper well at a cost of \$2-3M. A similar drought-related issue could occur at the Yucca Power Plant, where a shortage declaration on the Colorado River could result in loss of all but one well supporting the plant, requiring APS to drill a well to avoid having a single point of failure, at a cost of \$2-3M.

Cost of response to risk

1,400,000

Description of response and explanation of cost calculation

Because water supplies are so integral to the operations at APS, we have an entire Water Resource Management (WRM) department comprised of six employees, with an operations and maintenance budget of approximately \$1.4M a year. The budget is primarily personnel costs, about \$1M, and about \$400k for outside services contracts to support the business. 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 owns and operates 44 production wells that provide cooling water and supplemental water to support generation at eight of nine power plants. Unplanned well and pumping equipment failures can occur as a result of pumping equipment failure, electrical/mechanical issues, well casing problems, or human performance errors. These failures disrupt scheduled maintenance plans, result in unplanned/unbudgeted costs, and could result in loss of water necessary to support generation. The reliability rate in 2015 was 90%, equating to 5 unplanned failures. WRM established a goal to increase the reliability rate by 2%/year through 2019, resulting in a 98% reliability rate in 2019, equating to one unplanned failure.

Comment

Identifier

Risk 3

Where in the value chain does the risk driver occur?



Direct operations

Risk type & Primary climate-related risk driver

Chronic physical

Changes in precipitation patterns and extreme variability in weather patterns

Primary potential financial impact

Increased capital expenditures

Company-specific description

In 2019, a climate-related physical risk, due to changes in precipitation patterns and extreme variability in weather patterns with a potential financial impact to operating costs, is heightened wildfire risk due to drought. The risk was assessed through the ERM process and identified as a level (04) risk (meaning an impact of greater than \$25M) as it relates to financial impact. Catastrophic fire events were identified as an enterprise top risk in 2017-2019. In Arizona, about half of primary residential and commercial structures are located near the wildland-urban interface. Due to extended drought over the past decade, forests and vegetation have been stressed from the lack of regular and sufficient moisture, compounded by shorter, drier winters and longer, warmer summers. These changes in weather patterns pose a fire risk to the communities we serve. To effectively respond to this risk, we collaborate with key stakeholders to reduce wildland fire risk and create defensible space throughout Arizona. With over 39,000 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.

We use a three-pronged approach to mitigate fire risk. First, we assess site-specific fire risk and develop a model to prioritize resources. Second, we educate and inform the communities we serve about fire mitigation. Third, we implement a proactive program to create defensible space around poles (DSAP) to address vegetation at the base of utility poles. The goal of the DSAP program is to remove combustible material inside a minimum 10-foot radius around equipment poles on a three-year cycle. In 2019, we treated over 17,000 DSAP poles in the wildland-urban interface. Our rights-of-way, which are cleared of vegetation, are used by firefighters to suppress wildfires across Arizona. Since 2000, APS rights-of-way have been used to suppress 37 large fires of 100 acres or more.

Time horizon

Short-term



Likelihood

Likely

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

1,000,000

Potential financial impact figure – maximum (currency)

2,000,000

Explanation of financial impact figure

The financial implication related to catastrophic fire is difficult to equate to an exact financial figure. However, a potential capital project that could result in expenditures of \$1-2M is investment in new technology that would assist in earlier fire detection and prevention to address fire risk. Due to the growing risk and occurrence of fire, APS is assessing investment in new technologies that would assist in earlier fire detection and prevention. The cost is mostly associated with purchasing and implementing the new technology.

Cost of response to risk

17,000,000

Description of response and explanation of cost calculation

The cost of management is a yearly cost of approximately \$17M to support the forestry business unit, which is dedicated to management of rights-of-way and helping to harden assets against the threat of forest fires related to changes in physical climate parameters, including forest fires. The management costs are an approximate yearly cost to maintain the personnel in the department and all associated projects. Of the \$17M, approximately \$10.5M is for outside services and operations and management of the department. We use a three-pronged approach to



mitigate fire risk. First, we assess site-specific fire risk and develop a model to prioritize resources. Second, we educate and inform the communities we serve about fire mitigation. Third, we implement a proactive program to create defensible space around poles (DSAP) to address vegetation at the base of utility poles. The goal of the DSAP program is to remove combustible material inside a minimum 10-foot radius around equipment poles on a three-year cycle. In 2019, we treated over 17,000 DSAP poles in the wildland-urban interface. Our rights-of-way, which are cleared of vegetation, are used by firefighters to suppress wildfires across Arizona. Since 2000, APS rights-of-way have been used to suppress 37 large fires of 100 acres or more.

Comment

In Arizona, the 2019 wildfire season had notably fewer fires than 2018, but the state experienced significant destruction caused by the Woodbury Fire (burning over 112,000 acres), the Museum Fire (requiring mandatory evacuations in the Flagstaff area) and the Whiskey Fire. The Company has taken several steps to mitigate the risk of wildfires, including collaborations with state and local agencies and updating the Company's fire mitigation plan. To evaluate the effectiveness of the Company's fire mitigation plan and close any gaps, APS engaged an independent third-party quality assurance consultant to assess the plan. This ensures that the plan continues to evolve and continually improve safety of communities, infrastructure and ecosystems across the APS service territory.

C2.4

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

Yes

C2.4a

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

Identifier

Opp1



Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Energy source

Primary climate-related opportunity driver

Use of supportive policy incentives

Primary potential financial impact

Reduced indirect (operating) costs

Company-specific description

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 energy sales - measured in kWh - by the end of 2020. The savings from demand side management (DSM) potentially reduce our indirect (operating) costs by helping to reduce demand on our fleet. APS offers a comprehensive portfolio of DSM programs to achieve the required EES. These programs are designed to reach all segments of APS customers, including residential single-family homes, multifamily properties, new construction, limited-income households, existing commercial buildings, new commercial construction and schools. The APS DSM portfolio also includes a focus on demand response, load shifting, energy storage and load management programs designed to help flatten system load shapes and shift energy use into the middle of the day during peak solar production when APS's generation mix has the lowest carbon intensity. These programs are also designed to help APS provide beneficial use for solar over-generation in the region – allowing solar energy to be beneficially utilized to serve customer loads rather than being curtailed. Since 2005, the current portfolio of APS demand side management programs has provided over 5,700 GWh of reported energy savings, which has resulted in over 46 billion pounds of direct avoided carbon emissions and almost 17 billion gallons of water.

Time horizon

Short-term

Likelihood

Virtually certain



Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

1,100,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

From 2005-2019, APS has reported spending of over \$657M on demand side management (DSM) customer programs. Based on portfolio cost effectiveness results reported to the Arizona Corporation Commission, the APS DSM portfolio has produced more than \$1.1 billion in net benefits (total benefits minus costs) for APS customers from 2005-2019. Of the \$1.1 billion, \$466M is from implemented residential energy efficiency programs, \$746M is from implemented business energy efficiency programs, \$40M from implemented codes and standards and additional DSM initiatives (rewards program, measurement and evaluation, and performance incentives) deducted \$79.5M from overall benefits. Energy efficiency measures implemented, totalling 516,383 MWh annual savings, by our customers in 2019 contributed \$8,437.707 net benefits to the overall \$1.1 billion in net benefits from 2005-2019. The APS DSM portfolio is measured for cost effectiveness using the Societal Benefits Test. These net benefits are the result of avoided generation capacity, fuel savings and operations and maintenance savings due to APS DSM programs. These net benefits do not include any monetary value for the carbon emission savings resulting from programs – these savings are quantified but not monetized.

Cost to realize opportunity

657,317,843

Strategy to realize opportunity and explanation of cost calculation



During the time period from 2005 through 2019, APS has spent a total of over \$657M in customer-focused demand side management (DSM) programs. This investment has resulted in creating over \$1.1B of net economic benefits (present value of societal benefits created by avoiding energy generation less the present value of societal costs from installing energy efficient measures) for APS customers. Total expenses for the DSM program in 2019 were \$27,621,115. This included: \$11,620,294 for residential programs; \$5,688,017 for non-residential programs; \$6,313,219 for other DSM initiatives that included energy storage and load management rewards program, an energy and demand education pilot and the codes and standards program; and \$2,172,757 for measurement, evaluation and research. Energy efficiency measures implemented in 2019 totalled 516,383 MWh annual savings. Of the \$657M, \$287M was for the implementation of residential energy efficiency program, \$256M for the implementation of non-residential programs, \$553M for other initiatives including Energy Storage and Load Management programs, an energy and demand education pilot, and codes and standards, \$24M for measurement, evaluation, and research, \$55M for performance incentives.

Each year APS files an annual DSM implementation plan with the Arizona Corporation Commission (ACC) that includes detailed information about DSM program goals, estimated participation, energy savings, emissions reductions and proposed budgets. This annual plan is reviewed by ACC staff, commented on by stakeholders and intervenors and must receive a majority of Commissioner votes at an open meeting to proceed.

Comment

Identifier

Opp2

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Energy source

Primary climate-related opportunity driver



Use of lower-emission sources of energy

Primary potential financial impact

Reduced direct costs

Company-specific description

The financial impacts of increasing renewables as part of our resource mix reduce our exposure to future fossil fuel price increases as we do not need to purchase additional fossil fuels. 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. In 2019, the Company's total RES resources were 2,946,449 MWh, which is 10.6 percent of APS's total 2019 retail sales. The RES rules further mandate that 30 percent of an affected utility's total requirement be fulfilled with energy produced from distributed energy (DE) sources, one-half of which may come from residential applications and the remaining one-half from non-residential, non-utility applications. APS requested and received a waiver from the residential distributed generation (DG) requirement as APS did not meet the residential DE requirement. However, APS did meet the non-DE RES compliance requirement in 2019. Renewable energy resources installed in APS's service territory produced 4,092,508 MWh in 2019, which includes energy from rooftop solar installations for which an incentive was not provided. This is equivalent to nearly 14.7 percent of APS's 2019 retail sales. The renewable energy standard increases annually until reaching 15 percent in 2025. This regulatory driver is having a large impact on APS's generation mix.

Time horizon

Short-term

Likelihood

Virtually certain

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

4,447,000,000



Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

\$4,477M nominal (\$2,911M net present value). Potential financial impact reflects assumptions and models included in APS's 2017 Integrated Resource Plan for 2019-2032. The above financial impacts include the ongoing capital and operation and maintenance costs for owned renewables, purchased power agreement payments, integration costs and future liabilities on incentivized rooftop solar. The financial impacts of increasing renewables as part of our resource mix reduce our exposure to future fossil fuel price increases as we do not need to purchase additional fossil fuels.

Cost to realize opportunity

384,800,000

Strategy to realize opportunity and explanation of cost calculation

In July of 2020, APS submitted a renewable energy standard (RES) implementation plan to the Arizona Corporation Commission (ACC) requesting funding approval for existing program commitments and deployment of previously authorized programs. The requested budget for APS's 2021 plan consists of funding for previously authorized programs, including legacy production-based incentive (PBI) subsidy payments, purchased power agreement (PPA) and revenue requirement costs, educational outreach and administration of prior initiatives currently being implemented. The budget for APS's 2021 Plan consists of funding for previously authorized programs including PBI legacy payments, PPA and revenue requirement costs and prior initiatives currently being implemented. APS expects the total base budget for PBI, other distributed generation (DG) legacy programs and PPA projects in 2021 to be \$84.7 million, and the total request for the 2021-2025 plan years to be \$384.8 million, not including any funding offsets. This equates to a total RES budget of \$84.7M for 2021, \$85.2M for 2022, \$72.4 for 2023, \$71.1 for 2024 and \$71.3M for 2025.

One example within the RES implementation plan are renewable generation (RG) resources, which are larger-scale renewable energy resources that serve the energy demand of all APS customers. These resources are part of the Company's energy portfolio and are applied to APS's overall RES requirements. APS's targeted RG resources for 2021 are 2,579 GWh.



As of December 31, 2019, there were a total of 103,418 residential and non-residential solar grid-tied DG systems, with an associated capacity of 944 MW-AC. Of those systems, 22,220 were residential installations and 990 were non-residential installations that received incentives to interconnect solar grid-tied DG systems, with associated capacity of 130 MW-AC and 186 MW-AC, respectively. The DG projection does not include renewable energy credits (RECS) associated with non-incentivized installations. Through May 1, 2020, 84,358 residential solar grid-tied DG systems (604 MW-AC) and 682 non-residential solar grid-tied DG systems (64 MW-AC) have been installed across the APS service territory and interconnected to APS's grid without receiving incentives.

Comment

Identifier

Opp3

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Energy source

Primary climate-related opportunity driver

Use of lower-emission sources of energy

Primary potential financial impact

Reduced indirect (operating) costs

Company-specific description

APS is deploying a wide array of new distributed energy resource (DER) technologies to provide clean, reliable, affordable energy to its customers. These include battery storage, thermal storage, load management, electric vehicles and other beneficial electrification technologies that have the potential to increase the value of intermittent generation resources as well as increase grid reliability and stability while also reducing carbon emissions. Besides simply storing and dispatching power, they have the ability to provide other ancillary services such as



voltage regulation, frequency response, and support for intermittent renewable resources. DERs can also potentially help defer investments in more traditional transmission and distribution infrastructure, allowing system reliability to be maintained at lower overall cost. With respect to renewable resources, energy storage makes these intermittent resources more useful for the utility system by better aligning the availability of power with the system's peak energy demand.

In 2019, we expanded the Rewards distributed energy resource (DER) storage programs. Launched in 2018 and 2019, these industry-leading and award-winning programs incentivize customers to adopt advanced technologies in their homes to help consume electricity at midday when solar energy is plentiful and to conserve power in the late afternoon and early evening when it is in greatest demand and thus costs more. The APS Rewards initiative goes beyond using traditional batteries and helps to harness the use of thermal storage through smart water heaters and thermostats. Through our Cool Rewards program, focused on connected residential smart thermostats for demand response with pre-cooling, we had 18,000 smart thermostats enrolled in 2019 and a goal to install an additional 40,000 smart thermostats in 2020, providing about 50MW of demand response peak capacity. Through Storage Rewards, focused on residential and commercial battery systems installed on specific feeders, we selected 36 residential sites for batteries in 2019. Through the Reserve Rewards program, 226 grid-interactive water heaters were installed in homes on specific feeders in 2019.

Time horizon

Short-term

Likelihood

Very likely

Magnitude of impact

Medium-high

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

29,700



Potential financial impact figure – maximum (currency)

36,300

Explanation of financial impact figure

It is still too early to know the full financial impact these systems may provide to our operations, but we expect that they will be providing direct savings to our customers. Most of the proposed projects are research and development projects to determine their ability to provide voltage regulations, power factor improvements, load balancing and peak shaving. One of the objectives of the energy storage and load management program is to develop better information about the costs and benefits of these emerging distributed energy management technologies. Some of these technologies, such as residential battery storage, are not currently cost effective, but this project provides valuable learnings about how to connect to and manage distributed storage technologies while also offering participant benefits. Participants in the program receive a \$500/year incentive and ongoing savings of an average of range \$400-\$600 per year on energy costs on peak demand costs. There were a total of 33 participants in the residential storage battery storage program in 2019 for a total of approximately \$29,700 - \$36,300 potential savings for 2019.

Cost to realize opportunity

3,190,743

Strategy to realize opportunity and explanation of cost calculation

A total of \$3,190,743 was spent for the implementation of the Rewards program in 2019. This includes \$1,731,962 for rebates and incentives, \$36 for training and technical assistance, \$488 for consumer education, \$1,045,343 for program implementation, \$132,621 for program marketing and \$280,293 for planning and administration. The program includes emerging technologies for managing system load shapes and helping customers shift energy use to lower cost off-peak hours including battery storage, connected water heaters and demand response with smart thermostats. It is being marketed to APS customers as the Rewards program, which includes Storage Rewards (battery storage), Reserve Rewards (connected water heaters) and Cool Rewards (smart thermostats). 2019 was the first year for the programs, resulting in 120,029 annual gross MWh saving and 27.4 MW peak demand savings. For the Storage Rewards program, 33 residential scale batteries were installed and operating during this reporting period. In addition, three feeder-scale batteries were operating during 2019. The feeder-scale batteries are sized at 350 kW, 475 kW and 475 kW, providing a total energy storage capacity of 1.7 MW (including capacity reserve and line losses). For the Reserve Rewards program, a total of 226 connected water heaters were installed and operating during the reporting period.

Comment

The Customer to Grid Solutions team provides choice and value to APS customers, supports the Company's clean energy commitment and helps flatten summer load curves. To date, the Rewards program has won three prominent awards for these efforts. APS accepted the AESP



Energy Award for Outstanding Achievement in Emerging Tools and Technologies for the Rewards initiative. APS has met or exceeded the initial scope for distributed energy resource fleets that were built out as part of the Cool Rewards, Reserve Rewards and Storage Rewards programs. Customer to Grid Solutions was recognized for innovating typical utility smart thermostat demand response strategies by adding pre-cooling to weekday and weekend demand response events in the Cool Rewards program. This enhanced customer experience adds a buffer against extreme summer temperatures. APS is working with vendor EnergyHub and using a resource operating platform to carefully orchestrate distributed energy resource control strategies to benefit customer bills while serving grid needs. The Smart Electric Power Alliance (SEPA) announced the winners of the 2019 Power Players Awards, with APS and Energy Hub named Innovative Partner of the Year. In addition, the Peak Load Management Alliance recognized APS and Energy Hub as Program Pacesetters for distributed energy resource (DER) aggregations through the Solar Communities and APS Rewards programs. These awards highlight industry leaders who created, during calendar year 2019, innovative ideas, methods, programs and technologies that manage end use loads to meet peak load needs and support successful grid integration of distributed energy resources.

C3. Business Strategy

C3.1

(C3.1) Have climate-related risks and opportunities influenced your organization's strategy and/or financial planning?

Yes, and we have developed a low-carbon transition plan

C3.1a

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

No, but we anticipate using qualitative and/or quantitative analysis in the next two years

C3.1c

(C3.1c) Why does your organization not use climate-related scenario analysis to inform its strategy?

The Company has not completed a climate-related scenario analysis primarily because we were waiting for the 2020 Integrated Resource Plan (IRP) to be completed. We believe the scenario analysis should be aligned with the Company's most recent plan. In preparation, we are currently assessing



climate scenario analysis opportunities by consulting universities, consultants and peers about the process to help inform our decision. This is becoming an increasing request from stakeholders and investors that we have heard and we are making sure we choose a process that is technically grounded and appropriate for the complexity of the utility sector. In 2019, APS participates in the Electric Power Research Institute's (EPRI) Understanding Climate Scenarios and Goal Setting Activities project. This gives us the opportunity to develop a technical foundation to develop an informed dialogue and decisions as we move forward with determining a plan for developing climate-related scenarios. Additionally, in 2019, APS won an award from EPRI on integrating technical analyses of climate-related science into Company climate risk assessment, planning, greenhouse gas goal setting and outreach.

Our vision at APS is to create a sustainable energy future for Arizona. APS's executive team recognizes that we must strike a balance between delivering reliable, affordable energy and being responsible stewards of the environment. As a Company, we are working with our stakeholders to determine what our future resource mix; this is captured by our Integrated Resource Plan (IRP). Our stakeholders are providing us with the necessary inputs as we update our IRP in 2020; part of these considerations includes the potential use of a climate-related scenario analysis.

Although a formal climate-related scenario analysis has not been used to inform our business strategy in the past, we have successfully implemented strategies for reducing the carbon intensity of our electricity generation through our IRP. Advancing technologies, growing renewable energy resources and increasing customer sentiment for cleaner energy are accelerating change in the electric utility industry. The IRP details our blueprint to provide customers with clean, reliable and affordable energy, fulfil regulatory targets and manage environmental impacts. These trends are shaping the current planning objectives:

- Developing cleaner energy resources;
- Increasing investment in the energy grid;
- Participating in energy markets to lower customer bills; and
- Increasing system flexibility to maintain reliable service that our customers require.

In 2019, the Company began to discuss and plan for setting a longer-term target beyond our initial 2032 carbon intensity target from the 2017 IRP. The primary driver of the Company's commitment is to take steps to provide a clean energy future for our customers. The Company has been on a trajectory of increasingly clean energy through solar power innovation, major investments in energy storage technology, carbon-free nuclear operations and advances in energy efficiency solutions. Now, the Company's has set the boldest clean-energy goal of all Arizona electric companies, as well as one of the most ambitious in the country, to reach 100 percent clean, carbon-free electricity by 2050. This goal includes a nearer-term 2030 target of 65 percent clean energy, with 45 percent of our generation portfolio coming from renewable energy. We also will cease all coal-fired generation by 2031. The commitment is informed by consultations with Arizona universities and non-governmental organization experts. Their input is grounded in current,



globally recognized climate science and provides a greater understanding of the impacts of our changing climate across the state. Our 2050 target is consistent with the Intergovernmental Panel on Climate Change's recommended time frame for limiting global warming this century to 1.5°C above pre-industrial levels. We will continue to monitor climate science developments to stay aligned with new research and recommendations.

C3.1d

(C3.1d) Describe where and how climate-related risks and opportunities have influenced your strategy.

	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence
Products and services	Yes	<p>A climate related risk and opportunity the Company has addressed in 2019 is our strategic decisions related to the adoption of electric vehicles. According to the Electric Power Research Institute, automakers plan to begin selling more than 130 electric vehicle (EV) models to choose from by 2023, but barriers to adoption still exist. In the shorter term, we seek to make driving EVs convenient for participating customers by reducing range anxiety through access to more charging infrastructure. The transportation sector represents a significant emissions source, and the electrification of that economic sector can help achieve overall air quality goals and our goal of providing 100% clean, carbon free energy by 2050. In 2019, the Company developed and launched electric vehicle programs to educate customers and encourage the development of the electric vehicle industry. We also are collaborating with other Arizona electric utilities, regulatory agencies, policymakers, automakers, third-party charging service providers and other stakeholders in the development of a state-wide transportation electrification plan for Arizona. This strategic plan will provide a road map for electrifying transportation in Arizona, focused on realizing the associated benefits for all residents in the state. We will continue to encourage electric vehicle adoption in Arizona and provide incentives for customers to charge their vehicles at optimal times in order to maximize the use and viability of carbon-free renewables and benefit the grid. APS has proposed to launch a new EV Charging Demand Management Pilot Program to address the growing electric demand from EV charging. This proposed Pilot Program will work with vehicle fleets, charging station infrastructure, and individual EV owners to gather data on EV charging behaviour and to encourage off-peak charging to manage peak demand. APS anticipates spending</p>



		\$160,000 for the 2020 pilot. APS's EV strategies are long-term without an end date, but decisions about the strategy and overall spend will be revisited at least annually.
Supply chain and/or value chain	Yes	A climate related risk and opportunity the Company has addressed in our supply chain is the adoption of a Supplier Code of Conduct that includes climate related actions. In 2019, the Company made the strategic decision to update and expand its Supplier Code of Conduct. We provide our Supplier Code of Conduct to suppliers, vendors and others with whom we do business so that expectations for ethical business conduct and adherence to environmental standards are clear. Suppliers are expected to carry out operations in compliance with all applicable environmental laws and regulations as well as reduce or eliminate waste/pollution at source, and continually improve resource and materials use efficiency. Suppliers are expected to comply with APS/Pinnacle West's Low Carbon Economy Principles, Water Principles and EMS Environmental Policy and Scope. In addition, the Company expects suppliers to deploy mechanisms to ensure that products and services procured are from ethical sources and that suppliers comply with the principles ethical of conduct. The Supplier Code of Conduct is a long-term strategy adopted by Supply Chain, but decisions about the details of the Supplier Code of Conduct will be revisited at least annually.
Investment in R&D	Yes	Electric vehicle (EV) adoption represents a climate related opportunity and APS is making the strategic decision to invest in EV R&D. The transportation sector represents a significant emissions source, and the electrification of that economic sector can help achieve overall air quality goals and our goal of providing 100% clean, carbon free energy by 2050. In 2019, APS launched Take Charge AZ, an EV pilot program in which APS will install and own EV charging equipment located at various businesses, government agencies, non-profits and multifamily communities within the Company's service territory. Through the program, APS will gain valuable knowledge to better understand the needs of Arizona with regards to the electrification of the transportation sector. The program includes fleet, workplace and multifamily chargers and highway chargers to be included in the APS service territory. APS expects to install approximately 150 chargers in 2019 through the pilot programs and to install 300 chargers through 2021. The Take Charge AZ program also includes a research study that will look at EV growth and load impacts specific to Arizona. As of July 2019, APS has invested \$239,000 in the program. The Take Charge AZ Pilot is a long-term strategy, but decisions about the R&D Pilot will be revisited at least annually.



Operations	Yes	A climate related risk and opportunity for our Operations is to invest capital in clean generation A key driver of the Company's strategic plan is to take steps to reduce carbon with a long-term goal of reaching 100 percent clean, carbon free energy by 2050 through the Company's clean energy commitment. This goal includes a nearer-term 2030 target of 65 percent clean energy, with 45 percent of our generation portfolio coming from renewable energy. We also will cease all coal-fired generation by 2031. The commitment is informed by consultations with Arizona universities and non-governmental organization experts. This will impact the operations of the Company as it adopts resources and technologies to achieve this plan. The Company projects it will spend \$1.9 billion for the period 2019-2022 on clean generation and environmental capital expenditures.
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C3.1e

(C3.1e) Describe where and how climate-related risks and opportunities have influenced your financial planning.

	Financial planning elements that have been influenced	Description of influence
Row 1	Capital allocation	APS currently allocates its capital based on clean generation and other environmental expenditures. Capital expenditures are comprised of various additions and improvements to APS's clean generation resources, including nuclear plants, renewables and energy storage systems. Examples of the types of projects included in the forecast of generation capital expenditures are additions of renewables and energy storage and upgrades and capital replacements of our various nuclear and fossil power plant equipment, such as turbines, boilers and environmental equipment. We are monitoring the status of environmental matters, which, depending on their final outcome, could require modification to our planned environmental expenditures. As an example, in 2019 we allocated \$168M in capital investment in clean (nuclear and renewable) generation, \$27M in environmental upgrades and \$185M in traditional (oil, coal, gas) generation. APS currently reports forecasts for these capital allocations from 2020 - 2022 totalling \$2.2 billion.



C3.1f

(C3.1f) Provide any additional information on how climate-related risks and opportunities have influenced your strategy and financial planning (optional).

The key driver of the Company's strategic plan is to take steps to reduce the amount of carbon the Company produces. By 2050, the Company will deliver 100 percent clean, carbon-free and affordable electricity to our customers. This goal includes a nearer-term 2030 target of 65 percent clean energy, with 45 percent of our generation portfolio coming from renewable energy. We also will cease all coal-fired generation by 2031. We will make this transition in a responsible manner, working closely with the affected communities to minimize impacts and help identify new opportunities. The Company is including efforts to achieve this commitment within its financial planning process.

C4. Targets and performance

C4.1

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

Both absolute and intensity targets

C4.1a

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

Target reference number

Abs 1

Year target was set

2018

Target coverage



Company-wide

Scope(s) (or Scope 3 category)

Scope 1+2 (market-based)

Base year

2005

Covered emissions in base year (metric tons CO₂e)

16,557,441

Covered emissions in base year as % of total base year emissions in selected Scope(s) (or Scope 3 category)

99.5

Target year

2020

Targeted reduction from base year (%)

32

Covered emissions in target year (metric tons CO₂e) [auto-calculated]

11,259,059.88

Covered emissions in reporting year (metric tons CO₂e)

12,206,228.68

% of target achieved [auto-calculated]

82.1234301847

Target status in reporting year

Underway

Is this a science-based target?



No, and we do not anticipate setting one in the next 2 years

Please explain (including target coverage)

APS recognizes that electric utilities face a unique challenge when it comes to reducing their greenhouse gas emissions. Transitioning to a decarbonized generation resource mix is a long and expensive undertaking. In 2019, the Company began to discuss and plan for setting a longer-term target beyond our initial 2032 carbon intensity target from the 2017 IRP. The primary driver of the Company's commitment is to take steps to provide a clean energy future for our customers. The Company has been on a trajectory of increasingly clean energy through solar power innovation, major investments in energy storage technology, carbon-free nuclear operations and advances in energy efficiency solutions. Now, the Company has set the boldest clean-energy goal of all Arizona electric companies, as well as one of the most ambitious in the country, to reach 100 percent clean, carbon-free electricity by 2050. This goal includes a nearer-term 2030 target of 65 percent clean energy, with 45 percent of our generation portfolio coming from renewable energy. We also will cease all coal-fired generation by 2031. The commitment is informed by consultations with Arizona universities and non-governmental organization experts. Their input is grounded in current, globally recognized climate science and provides a greater understanding of the impacts of our changing climate across the state. Our 2050 target is consistent with the Intergovernmental Panel on Climate Change's recommended timeframe for limiting global warming this century to 1.5°C above pre-industrial levels. We will continue to monitor climate science developments to stay aligned with new research and recommendations.

C4.1b

(C4.1b) Provide details of your emissions intensity target(s) and progress made against those target(s).

Target reference number

Int 1

Year target was set

2005

Target coverage

Company-wide

Scope(s) (or Scope 3 category)



Scope 1

Intensity metric

Other, please specify
metric tons per MWh

Base year

2005

Intensity figure in base year (metric tons CO2e per unit of activity)

0.47

% of total base year emissions in selected Scope(s) (or Scope 3 category) covered by this intensity figure

99.5

Target year

2032

Targeted reduction from base year (%)

48

Intensity figure in target year (metric tons CO2e per unit of activity) [auto-calculated]

0.2444

% change anticipated in absolute Scope 1+2 emissions

19

% change anticipated in absolute Scope 3 emissions

0

Intensity figure in reporting year (metric tons CO2e per unit of activity)

0.32



% of target achieved [auto-calculated]

66.4893617021

Target status in reporting year

Underway

Is this a science-based target?

No, and we do not anticipate setting one in the next 2 years

Please explain (including target coverage)

APS recognizes that electric utilities face a unique challenge when it comes to reducing their greenhouse gas emissions. Transitioning to a decarbonized generation resource mix is a long and expensive undertaking. In 2019, the Company began to discuss and plan for setting a longer-term target beyond our initial 2032 carbon intensity target from the 2017 IRP. The primary driver of the Company's commitment is to take steps to provide a clean energy future for our customers. The Company has been on a trajectory of increasingly clean energy through solar power innovation, major investments in energy storage technology, carbon-free nuclear operations and advances in energy efficiency solutions. Now, the Company has set the boldest clean-energy goal of all Arizona electric companies, as well as one of the most ambitious in the country, to reach 100 percent clean, carbon-free electricity by 2050. This goal includes a nearer-term 2030 target of 65 percent clean energy, with 45 percent of our generation portfolio coming from renewable energy. We also will cease all coal-fired generation by 2031. The commitment is informed by consultations with Arizona universities and non-governmental organization experts. Their input is grounded in current, globally recognized climate science and provides a greater understanding of the impacts of our changing climate across the state. Our 2050 target is consistent with the Intergovernmental Panel on Climate Change's recommended time frame for limiting global warming this century to 1.5°C above pre-industrial levels. We will continue to monitor climate science developments to stay aligned with new research and recommendations.

C4.2

(C4.2) Did you have any other climate-related targets that were active in the reporting year?

Target(s) to increase low-carbon energy consumption or production

C4.2a

(C4.2a) Provide details of your target(s) to increase low-carbon energy consumption or production.



Target reference number

Low 1

Year target was set

2007

Target coverage

Company-wide

Target type: absolute or intensity

Absolute

Target type: energy carrier

Electricity

Target type: activity

Production

Target type: energy source

Renewable energy source(s) only

Metric (target numerator if reporting an intensity target)

Percentage

Target denominator (intensity targets only)

Base year

2007

Figure or percentage in base year



1.1

Target year

2025

Figure or percentage in target year

15

Figure or percentage in reporting year

10.6

% of target achieved [auto-calculated]

68.345323741

Target status in reporting year

Underway

Is this target part of an emissions target?

The Arizona Corporation Commission (Commission) requires through the Renewable Energy Standard and Tariff Rules (RES Rules) that 9.0 percent of the utility's 2019 retail kilowatt-hour (kWh) sales come from eligible renewable energy resources. In 2019, the Company's total RES resources were 2,946,449 MWh, which is 10.6 percent of APS's total 2019 retail sales. The RES Rules further mandate that 30 percent of an affected utility's total requirement be fulfilled with energy produced from Distributed Energy (DE) sources, one-half of which may come from residential applications and the remaining one-half from non-residential, non-utility applications. APS requested and received a waiver from the residential DG requirement as APS did not meet the residential DE requirement. However, APS did meet the non-DE RES compliance requirement in 2019.

Advancing technologies, growing renewable energy resources and increasing customer sentiment for cleaner energy are accelerating change in the energy industry. The APS Integrated Resource Plan (IRP) includes a 5-year action plan and a 15-year view of how we plan to provide customers with clean, reliable and affordable energy, fulfill regulatory targets and manage environmental impacts. These trends are shaping the current planning objectives:

- Developing cleaner energy resources
- Increasing investment in the energy grid



- Participating in energy markets to lower customer bills
- Increasing system flexibility to maintain reliable service that our customers require

We are engaging our stakeholders to review and discuss current and future resource plans and their input will be reflected in our upcoming 2020 IRP.

Is this target part of an overarching initiative?

Other, please specify

Arizona Corporate Commission (ACC) Renewable Energy Standard (RES)

Please explain (including target coverage)

The Arizona Corporation Commission requires through the Renewable Energy Standard and Tariff Rules (RES Rules) that 9.0 percent of the utility’s 2019 retail kilowatt-hour (kWh) sales come from eligible renewable energy resources. In 2019, the Company’s total RES resources were 2,946,449 MWh, which is 10.6 percent of APS’s total 2019 retail sales. The RES Rules further mandate that 30 percent of an affected utility’s total requirement be fulfilled with energy produced from distributed energy (DE) sources, one-half of which may come from residential applications and the remaining one-half from non-residential, non-utility applications. APS requested and received a waiver from the residential distributed generation requirement as APS did not meet the residential DE requirement. However, APS did meet the non-DE RES compliance requirement in 2019.

C4.3

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

Yes

C4.3a

(C4.3a) Identify the total number of initiatives at each stage of development, and for those in the implementation stages, the estimated CO2e savings.

Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
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Under investigation	9	0
To be implemented*	1	52,776
Implementation commenced*	0	0
Implemented*	1	735
Not to be implemented	0	0

C4.3b

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

Initiative category & Initiative type

- Low-carbon energy generation
- Other, please specify
 - Energy Storage and Load Management

Estimated annual CO2e savings (metric tonnes CO2e)

735

Scope(s)

Scope 1

Voluntary/Mandatory

Mandatory

Annual monetary savings (unit currency – as specified in C0.4)

42,714

Investment required (unit currency – as specified in C0.4)



890,000

Payback period

4-10 years

Estimated lifetime of the initiative

6-10 years

Comment

The Demand Response, Energy Storage and Load Management initiative was approved by the Commission on August 23, 2017, in Decision No. 76314. The initiative includes emerging technologies for managing system load shapes and helping customers shift energy use to lower cost off-peak hours, including battery storage, connected water heaters and demand response with smart thermostats. It is being marketed to APS customers as the Rewards program, which includes Storage Rewards (battery storage), Reserve Rewards (connected water heaters) and Cool Rewards (smart thermostats). In 2019, Reserve Rewards kicked off with 226 customers participating in the program.

C4.3c

(C4.3c) 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 our 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 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. The 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 standard increases annually until reaching 15 percent in 2025. This regulatory driver is having a large impact on APS's generation mix.



C4.5

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

Yes

C4.5a

(C4.5a) 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

Group of products

Description of product/Group of products

APS offers customers a comprehensive portfolio of energy efficiency options.

Are these low-carbon product(s) or do they enable avoided emissions?

Avoided emissions

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions

Other, please specify

Arizona Energy Efficiency Standard

% revenue from low carbon product(s) in the reporting year

0.8

Comment

In the 2019 DSM Plan, APS forecasted estimated savings of 411,000 MWh for the year, which would have been slightly below the compliance target of 427,511 MWh calculated by the 'smoothed compliance' approach approved in Decision No. 75679. In 2019, the Company actually



achieved 120.7 percent of the annual smoothed DSM savings goal. With the inclusion of its 2019 savings, APS has achieved cumulative MWh savings of 5,453,606, which is 19.9 percent of its 2018 adjusted retail sales putting APS slightly ahead of the cumulative EES goal of 5,342,474 or 19.5 percent by 2019. The programs helped to avoid 1,927 million pounds of CO2 in 2019 and a total of 46,676 million pounds of CO2 since January 2005.

Level of aggregation

Product

Description of product/Group of products

The APS Green Choice program allows customers to purchase up to 100 percent of their power from renewable energy from Arizona and New Mexico.

Are these low-carbon product(s) or do they enable avoided emissions?

Low-carbon product

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions

Other, please specify

Green e-Energy Certification

% revenue from low carbon product(s) in the reporting year

0

Comment

In 2019, 1,255 customers subscribed to these rates for 81,602 MWh of sales and gross revenue of \$832,338. In 2019, Green Choice block and percentage options were self-certified by APS. The renewable energy sources used in the APS Green Choice program were: biogas/landfill gas 2 percent, biomass 12 percent and wind 86 percent.

C-EU4.6

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



APS recognizes methane emissions are a significant greenhouse gas emission due both to its high global warming potential and the quantity of methane released. The methane emissions from APS's electricity generating activities are predominantly from natural gas releases, which are typically comprised of about 95 percent methane. APS does not own or operate any methane exploration, production or distribution facilities, so any methane releases associated with the supply of natural gas to APS is considered indirect emissions.

The natural gas consumed by the Company is used as a fuel for a fleet of 37 natural gas-fired combustion turbines. Each combustion turbine can combust upwards of 9 million cubic feet of natural gas per year. Due to the large amount of natural gas used by the facilities, APS has a great interest to properly manage and prevent inadvertent releases of methane to assure plant safety, environmental protection and fiscal responsibility. The natural gas supplied to the combustion turbines operates under high pressure, typically in the range of 350 to 650 pounds per square inch. Because of the elevated delivery pressure and highly flammable nature of natural gas, safety is of utmost importance. To assure continual safety of personnel and equipment, plant operators monitor and inspect daily the natural gas supply lines and gas conditioning equipment. Plant operators record any identified methane leaks and issue work orders for plant maintenance to repair leaks as quickly as possible.

To ensure there are not any methane leaks that may go undetected by plant personnel, APS uses a third-party methane detection Company to verify there are no leaks from any of the natural gas lines, valves and gas conditioning system. Our eight fossil plants all have their own frequency of third-party monitoring depending on various requirements: Four Corners Power Plant gets an annual inspection; Cholla Power Plant, Ocotillo Power Plant, Saguaro Power Plant, West Phoenix Power Plant and Yucca Power Plant get semi-annual inspections; Redhawk Power Plant and Sundance Power Plant get quarterly inspections.

The surveys are conducted by a third party and any leaks found are tagged and a report is generated. An engineer at the plant receives these reports and creates a service request in our internal reporting system. The plant personnel then have the responsibility to repair the leaks. The surveys start at the APS gas yards at each plant and cover the underground portion up to the unit (accessible above-ground piping). The contractor uses methane-specific intrinsically safe detection equipment. Starting this year, West Phoenix Power Plant is having a new consultant do their leak survey who is also qualified to do repairs on the system, making it a more streamlined approach to leaks and repairs. The daily monitoring by plant personnel and the third-party methane detection inspections provide a process for the Company to ensure any methane leaks are promptly identified and repaired.

Because methane leaks at the sites are rare, a specific methane reduction target has not been established. However, the methane identification and reduction actions taken by the plant ensures methane emissions are minimized to maintain the plant in a safe condition, protect the environment from greenhouse gas emissions and maintain fiscal responsibility by ensuring natural resources are not wasted. APS is currently becoming engaged with



various organizations to understand the larger issue of methane emissions associated with natural gas exploration, production, and distribution Emissions methodology.

C5. Emissions methodology

C5.1

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

Scope 1

Base year start

January 1, 2005

Base year end

December 31, 2005

Base year emissions (metric tons CO₂e)

16,661,531

Comment

2005 is used as the Scope 1 baseline year to align our carbon emission reductions with the targets set at COP 21.

Scope 2 (location-based)

Base year start

January 1, 2009

Base year end

December 31, 2009

Base year emissions (metric tons CO₂e)



17,209

Comment

2009 is used at the baseline year for Scope 2 carbon emissions because this is the first year we established emission reduction goals for Scope 2 emissions.

Scope 2 (market-based)

Base year start

January 1, 2009

Base year end

December 31, 2009

Base year emissions (metric tons CO₂e)

18,883

Comment

2009 is used at the baseline year for Scope 2 carbon emissions because this is the first year we established emission reduction goals for Scope 2 emissions.

C5.2

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

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

US EPA Mandatory Greenhouse Gas Reporting Rule



C6. Emissions data

C6.1

(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO₂e?

Reporting year

Gross global Scope 1 emissions (metric tons CO₂e)

12,298,802

Comment

In 2019, Scope 1 emissions increased by 2 percent since last year. The 2019 increase is attributable to about a 10 percent increase in utilization of gas-fired generation. The increased utilization of the gas-fired units was due primarily to two reasons. First, new Ocotillo Power Plant units came online in early 2019 to support the continued integration of renewable generation on the grid. The other contributing factor was a decrease in natural gas prices; the national average price of gas dropped by 23 percent from 2018 to 2019.

The overall Scope 1 emission for 2019 represents a decrease of 26 percent over total carbon dioxide emissions since 2005.

C6.2

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

Row 1

Scope 2, location-based

We are reporting a Scope 2, location-based figure

Scope 2, market-based

We are reporting a Scope 2, market-based figure



Comment

C6.3

(C6.3) What were your organization's gross global Scope 2 emissions in metric tons CO₂e?

Reporting year

Scope 2, location-based

13,880

Scope 2, market-based (if applicable)

13,694

Comment

Our commitment to reduce our environmental footprint through sustainable practices is evident throughout APS facilities. Our corporate headquarters in Phoenix has earned seven ENERGY STAR labels for energy efficiency from the EPA. Over the past 11 years, we have improved energy efficiency at this facility by approximately 25 percent. Overall, our facilities have received 12 ENERGY STAR labels. Sustainability strategies are embedded within our standard architectural and engineering specifications when managing changes to our buildings or constructing new space. We work to improve energy efficiency throughout our facilities by replacing obsolete building systems and equipment with more energy-efficient systems and equipment.

C6.4

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

No



C6.5

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

Purchased goods and services

Evaluation status

Relevant, calculated

Metric tonnes CO2e

339

Emissions calculation methodology

The CO2e emissions are calculated by APS using the Greenhouse Gas Protocol Scope 3 evaluator web-based tool. APS supply chain supplied the total amount spent on paper in the calendar year (\$576,521). The spend was inputted into the calculator, and the result was a total of 338,723 kg CO2ekg/year. Converted to mtons (1kg =0.001 metric tons) for a total of 339 metric tons CO2e in 2019.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Please explain

APS receives total dollars spent on paper purchased for printing from our Supply Chain department. The CO2e emissions are then calculated by APS Sustainability team using the Greenhouse Gas Protocol Scope 3 evaluator web-based tool.

Capital goods

Evaluation status

Not relevant, explanation provided

Please explain

We do not separate capital goods from overall purchased goods.



Fuel-and-energy-related activities (not included in Scope 1 or 2)

Evaluation status

Relevant, calculated

Metric tonnes CO₂e

2,069,826

Emissions calculation methodology

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 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 (0.46 metric tons/MWh). The total purchased power for 2019 was 6,579,584 MWh, of which 2,077,971 MWh were renewables. The emission factor was applied to the total purchased power minus the renewables, for a total of 4,501,613 MWh. $(6,579,584 \text{ MWh} - 2,077,971 \text{ MWh}) \times 0.46 \text{ metric tons CO}_2\text{e/MWh} = 2,069,826 \text{ metric tons CO}_2\text{e}$.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Please explain

CO₂e emissions are associated with purchase power agreements from conventional sources such as gas units, marketing and trading purchases (resales) and renewable purchased power. APS joined the Energy Imbalance Market (EIM) in October of 2016. 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

Evaluation status

Relevant, calculated

Metric tonnes CO₂e



7,544,210

Emissions calculation methodology

The CO₂e emissions are calculated by APS using the EPA Emission Factors for Greenhouse Inventories (March 2018) and the 5th Assessment of Global Warming Potentials. Specifically, the Product Transport Emission Factors for Medium and Heavy Duty Trucks. (CO₂ 0.207 ton/mile (GWP:1); CH₄ .0020 ton/mile (GWP:28); N₂O 0.0046 ton/mile (GWP:265)) In 2019, our logistics firm reported a total of 5,611,382 miles for their delivery trucks. The total miles were multiplied by the EPA Emission Factors for Greenhouse Inventories (March 2020) and the 5th Assessment of Global Warming Potentials. Specifically, the Product Transport Emission Factors for Medium and Heavy Duty Trucks. $[(5,611,382 \times .202) \times 1] + [(5,611,382 \times .0015) \times 265] + [(5,611,382 \times .002) \times 28] =$ tons of CO₂e. Converted to metric tons by multiplying by 0.90718474. $8,316,068 \times 0.90718474 = 7,544,210$ metric tons CO₂e.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Please explain

APS receives total miles from our logistics firm that handles the majority of our shipping needs. The CO₂e emissions are calculated by APS using the EPA Emission Factors for Greenhouse Inventories (March 2020) and the 5th Assessment of Global Warming Potentials. Specifically, the Product Transport Emission Factors for Medium and Heavy Duty Trucks.

Waste generated in operations

Evaluation status

Relevant, calculated

Metric tonnes CO₂e

431,052

Emissions calculation methodology

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. A total of 718,420 tons of fly ash was sold. $(718,420 \times 0.6 = 431,052$ metric tons CO₂e).



Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Please explain

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 energy consumption to produce cement. This estimated carbon reduction is 431,052 metric tons of carbon dioxide.

Business travel

Evaluation status

Relevant, calculated

Metric tonnes CO₂e

2,171

Emissions calculation methodology

i) Business travel encompasses greenhouse gas emissions from airline travel, rental cars and vehicle reimbursement for miles driven 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 are from internal accounting. iii) Travel emission calculations are based on the Greenhouse Gas Protocol for Business Travel Emission Factors and the 5th Assessment of Global Warming Potentials. (Passenger Cars; (CO₂ 0.335 kg/mile (GWP:1); CH₄ 0.009 g/mile (GWP:28); NO₂ 0.008g/mile (GWP:265)).

Percentage of emissions calculated using data obtained from suppliers or value chain partners

75

Please explain

This business travel data about APS employees is 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 level 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 travelled by employees.



Employee commuting

Evaluation status

Relevant, calculated

Metric tonnes CO2e

3,094

Emissions calculation methodology

This information was calculated based on APS employee responses to the 2019 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 trains and vans.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Please explain

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

Evaluation status

Not relevant, explanation provided

Please explain

APS does not have any upstream leased assets.

Downstream transportation and distribution

Evaluation status

Relevant, calculated



Metric tonnes CO2e

684,203

Emissions calculation methodology

i) Transmission losses are an estimate of CO2e emissions resulting from electrical 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 2017 Statistical Report and APS system CO2e emission. The estimated energy loss is multiplied by the APS System CO2e emission rate of 0.46 mtons CO2e/MWh.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

99

Please explain

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.

Processing of sold products

Evaluation status

Not relevant, explanation provided

Please explain

APS generates and distributes electricity. There is no processing of our products to calculate processing of sold products.

Use of sold products

Evaluation status

Not relevant, explanation provided

Please explain

APS generates and distributes electricity. Emissions are calculated in our Scope 1 response.

End of life treatment of sold products



Evaluation status

Not relevant, explanation provided

Please explain

APS does not have downstream leased assets.

Downstream leased assets

Evaluation status

Not relevant, explanation provided

Please explain

APS does not have downstream leased assets.

Franchises

Evaluation status

Not relevant, explanation provided

Please explain

APS does not have any franchises.

Investments

Evaluation status

Not relevant, explanation provided

Please explain

APS does not have a method presently of evaluating emissions by any of our investments.

Other (upstream)



Evaluation status

Not relevant, explanation provided

Please explain

APS does not have any additional upstream sources in 2019.

Other (downstream)

Evaluation status

Not relevant, explanation provided

Please explain

APS does not have any additional upstream sources in 2019.

C6.7

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

Yes

C6.7a

(C6.7a) Provide the emissions from biogenic carbon relevant to your organization in metric tons CO2.

	CO2 emissions from biogenic carbon (metric tons CO2)	Comment
Row 1	3,843	

C6.10

(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO2e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.



Intensity figure

0.368

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)

12,312,496

Metric denominator

megawatt hour generated (MWh)

Metric denominator: Unit total

33,402,000

Scope 2 figure used

Market-based

% change from previous year

0

Direction of change

No change

Reason for change

In 2019, gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO2e the total APS carbon dioxide emissions per total MWh generated remained flat as compared to 2018. In 2019, we had an increase in overall carbon emissions but we also increased the amount of megawatts delivered to our customers resulting in no change in intensity from 2018 to 2019. There was a total increase of 290,000 mtons CO2e and an increase of 756,000 MWh delivered, resulting in a 0% change from 2018 to 2019.

Intensity figure

0.00355134



Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO₂e)

12,312,496

Metric denominator

unit total revenue

Metric denominator: Unit total

3,467,000,000

Scope 2 figure used

Market-based

% change from previous year

9

Direction of change

Increased

Reason for change

In 2019, gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO₂e the total APS carbon dioxide emissions per dollar of revenue intensity increased by 9 percent since last year. The 2019 increase is attributable to about a 10 percent increase in utilization of gas-fired generation, especially the new Ocotillo Power Plant units. The increased utilization of the gas-fired units was due primarily to two reasons. First, in 2019 the new Ocotillo units came online in early 2019 to support the continued integration of renewable generation on the grid. The other contributing factor was a decrease in natural gas prices, the national average price of gas dropped by 23 percent from 2018 to 2019.

C7. Emissions breakdowns

C7.1

(C7.1) Does your organization break down its Scope 1 emissions by greenhouse gas type?

Yes



C7.1a

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

Greenhouse gas	Scope 1 emissions (metric tons of CO2e)	GWP Reference
CO2	12,222,251	IPCC Fifth Assessment Report (AR5 – 100 year)
SF6	9,522	IPCC Fifth Assessment Report (AR5 – 100 year)
CH4	37,563	IPCC Fifth Assessment Report (AR5 – 100 year)
N2O	29,465	IPCC Fifth Assessment Report (AR5 – 100 year)

C-EU7.1b

(C-EU7.1b) Break down your total gross global Scope 1 emissions from electric utilities value chain activities by greenhouse gas type.

	Gross Scope 1 CO2 emissions (metric tons CO2)	Gross Scope 1 methane emissions (metric tons CH4)	Gross Scope 1 SF6 emissions (metric tons SF6)	Total gross Scope 1 emissions (metric tons CO2e)	Comment
Fugitives	0	0	0.41	9,522	
Combustion (Electric utilities)	12,206,229	36,336	0	12,279,068	Emissions from our own generation.
Combustion (Gas utilities)	0	0	0	0	APS is not a gas utility.
Combustion (Other)	16,022	1,227	0	19,733	Diesel and gasoline from mobile fleet and generators.



Emissions not elsewhere classified	0	0	0	0	No additional emissions to report.
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C7.2

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

Country/Region	Scope 1 emissions (metric tons CO2e)
United States of America	12,298,802

C7.3

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

- By business division
- By facility
- By activity

C7.3a

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

Business division	Scope 1 emissions (metric ton CO2e)
Generation. All emissions based on owned energy production.	12,279,068
Transmission and Distribution. All emissions based on fleet and mobile generators.	19,733

C7.3b

(C7.3b) Break down your total gross global Scope 1 emissions by business facility.

Facility	Scope 1 emissions (metric tons CO2e)	Latitude	Longitude
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Four Corners Power Plant	5,489,554	40.929011	-121.544389
Navajo Generating Station	1,385,879	36.914722	-111.455833
Cholla Power Plant	1,531,749	34.94	-110.33
Ocotillo Power Plant	315,387	33.4225	-111.9122
West Phoenix Power Plant	1,401,241	33.773441	-84.394931
Redhawk Power Plant	1,795,527	33.335833	-112.840528
Yucca Power Plant	107,309	32.715235	-114.710441
Saguaro Power Plant	93,385	32.552181	-111.298135
Douglas Power Plant	212	31.363622	-109.552532
Sundance Power Plant	184,458	53.5075	-114.557222

C7.3c

(C7.3c) Break down your total gross global Scope 1 emissions by business activity.

Activity	Scope 1 emissions (metric tons CO2e)
Stationary Combustion	12,206,229
Mobile Combustion	19,733
Fugitive Combustion	9,522

C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4

(C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4) Break down your organization’s total gross global Scope 1 emissions by sector production activity in metric tons CO2e.



	Gross Scope 1 emissions, metric tons CO2e	Comment
Electric utility activities	12,298,802	

C7.9

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

Increased

C7.9a

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

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	71,268	Decreased	0.59	<p>APS consumes power from our own energy delivery grid, the mix of power delivered includes generated and purchased renewable energy (RE). In 2019 the total RE (purchased and generated) was 2,673 GWH of a total of 33,402 GWH of energy sources to meet our delivery needs. Whereas in 2018 the total RE (generated and purchased) was 2518 GWH of the total 32,646 GWH of energy sources to meet our delivery needs. This accounted for a 0.59% decrease in CO2e reductions as the increase in renewable generation of 155GWh is approximately 71,268 mtons CO2e.</p> <p>$[71,268 \text{ mtons CO2e (change in Scope 1+2 emissions attributed to renewable energy consumption)} / 12,022,368 \text{ mtons CO2e (2018 Scope 1\&2 emissions)}] \times 100 = .59\%$.</p>



Other emissions reduction activities	5,100,000	Decreased	42.42	<p>Due to other emission reduction activities implemented during the year, despite an increase in production, emissions have not grown as could be expected. 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. In 2019, we avoided 5.1 million metric tons of carbon, making it a total of 23.1 million metric tons of CO₂ since 2015. APS total carbon avoidance in 2019 was 5.1 million metric tons CO₂. This accounted for a 42.42 percent decrease in CO₂e reductions.</p> <p>$[5,100,000 \text{ mtons CO}_2 \text{ (change in Scope 1+2 emissions attributed to other emissions reduction activities)} / 12,022,368 \text{ mtons CO}_2\text{e (2018 Scope 1\&2 emissions)}] \times 100 = 42.42\%$.</p>
Divestment	0	No change	0	No divestment during 2019.
Acquisitions	0	No change	0	No acquisitions during 2019.
Mergers	0	No change	0	No mergers during 2019.
Change in output	290,773	Increased	2.4	<p>In 2019, total generation from coal, gas and oil was 18,956 GWh; this is 3,283 GWh more than in 2018 (15,673 GWh). This resulted in an increase of 290,773 mtons of CO₂e for our owned generation fleet (11,988,295 mtons CO₂e in 2018 and 12,279,068 mtons CO₂e in 2010). The 2019 increase is attributable to about a 10 percent increase in utilization of gas-fired generation, especially the new Ocotillo Power Plant units. The increased utilization of the gas-fired units was due primarily to two reasons. First, in 2019 the new Ocotillo units came online in early 2019 to support the continued integration of renewable generation on the grid. The other contributing factor was a decrease in natural gas prices, the national average price of gas dropped by 23 percent from 2018 to 2019. This accounted for a 2.4 percent increase in CO₂e emissions.</p>



				[290,773 mtons CO2e (change in Scope 1+2 emissions attributed to change in output)/ 12,022,368 mtons CO2e (2018 Scope 1&2 emissions)]x100 = 2.4%.
Change in methodology	0	No change	0	No changes in methodology during 2019.
Change in boundary	0	No change	0	No changes in boundaries during 2019.
Change in physical operating conditions	0	No change	0	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 year 2019 ended up being only the 28th warmest year recorded in the history of central Arizona (Phoenix) and the 46th warmest recorded for southwest Arizona (Yuma). Compared to recent years in Arizona, 2019 was somewhat cooler and ended up closer to normally expected temperatures.
Unidentified	0	No change	0	There are no unidentified emissions to report for 2019.
Other	0	No change	0	There are no other emissions to report for 2019.

C7.9b

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

Market-based



C8. Energy

C8.1

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

More than 70% but less than or equal to 75%

C8.2

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

	Indicate whether your organization undertook this energy-related activity in the reporting year
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	No
Consumption of purchased or acquired steam	No
Consumption of purchased or acquired cooling	No
Generation of electricity, heat, steam, or cooling	Yes

C8.2a

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

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total (renewable and non-renewable) MWh
Consumption of fuel (excluding feedstock)	HHV (higher heating value)	595,391	26,226,000	26,821,391



Consumption of purchased or acquired electricity		2,078,000	4,503,000	6,581,000
Consumption of self-generated non-fuel renewable energy		0		0
Total energy consumption		2,673,391	30,729,000	33,402,391

C8.2b

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

	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	Yes
Consumption of fuel for the generation of heat	No
Consumption of fuel for the generation of steam	No
Consumption of fuel for the generation of cooling	No
Consumption of fuel for co-generation or tri-generation	No

C8.2c

(C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.

Fuels (excluding feedstocks)

Bituminous Coal

Heating value

HHV (higher heating value)



Total fuel MWh consumed by the organization

8,120,000

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

Emission factor

205

Unit

lb CO2 per million Btu

Emissions factor source

APS Emissions Inventory Index

Comment

APS Emissions Inventory Index is a reporting tool we use to calculate emissions for our generation fleet that are reported to the Clean Air Markets Division (CAMD), EPA Part 98 reporting and other state emission inventory reporting.

Fuels (excluding feedstocks)

Natural Gas

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

8,817,000



MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

Emission factor

163

Unit

kg CO2 per million Btu

Emissions factor source

APS Emissions Inventory Index

Comment

APS Emissions Inventory Index is a reporting tool we use to calculate emissions for our generation fleet that are reported to the Clean Air Markets Division (CAMD), EPA Part 98 reporting and other state emission inventory reporting.

Fuels (excluding feedstocks)

Fuel Oil Number 2

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

1,756

MWh fuel consumed for self-generation of electricity

0



MWh fuel consumed for self-generation of heat

0

Emission factor

53.06

Unit

metric tons CO2e per million Btu

Emissions factor source

APS Emissions Inventory Index

Comment

APS Emissions Inventory Index is a reporting tool we use to calculate emissions for our generation fleet that are reported to the Clean Air Markets Division (CAMD), EPA Part 98 reporting and other state emission inventory reporting.

Fuels (excluding feedstocks)

Other, please specify
(Nuclear(Uranium))

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

9,289,000

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0



Emission factor

0

Unit

metric tons CO2e per MWh

Emissions factor source

APS Emissions Inventory Index

Comment

APS Emissions Inventory Index is a reporting tool we use to calculate emissions for our generation fleet that are reported to the Clean Air Markets Division (CAMD), EPA Part 98 reporting and other state emission inventory reporting.

Fuels (excluding feedstocks)

Other, please specify

Solar

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

8,120,000

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

Emission factor

0



Unit

metric tons CO2 per MWh

Emissions factor source

Not applicable

Comment

Not applicable

C-EU8.2d

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

Coal – hard

Nameplate capacity (MW)

1,357

Gross electricity generation (GWh)

8,735

Net electricity generation (GWh)

8,120

Absolute scope 1 emissions (metric tons CO2e)

8,407,183

Scope 1 emissions intensity (metric tons CO2e per GWh)

1,035

Comment



Lignite

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

APS does not currently use lignite.

Oil

Nameplate capacity (MW)

70

Gross electricity generation (GWh)

1.9

Net electricity generation (GWh)

1.8

Absolute scope 1 emissions (metric tons CO2e)

2,768



Scope 1 emissions intensity (metric tons CO2e per GWh)

1,576

Comment

Gas

Nameplate capacity (MW)

3,399

Gross electricity generation (GWh)

9,263

Net electricity generation (GWh)

8,812

Absolute scope 1 emissions (metric tons CO2e)

3,894,750

Scope 1 emissions intensity (metric tons CO2e per GWh)

442

Comment

Biomass

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0



Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

APS does not currently use biomass.

Waste (non-biomass)

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

APS does not currently operate a waste (non-biomass) facility.

Nuclear



Nameplate capacity (MW)

1,146

Gross electricity generation (GWh)

9,811

Net electricity generation (GWh)

9,289

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

Fossil-fuel plants fitted with CCS

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)



0

Comment

APS does not currently operate fossil-fuel plants fitted with CCS.

Geothermal

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

APS does not currently operate a geothermal facility.

Hydropower

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0



Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

APS does not currently operate a hydro power facility.

Wind

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

APS does not currently operate a wind facility.

Solar



Nameplate capacity (MW)

226

Gross electricity generation (GWh)

564

Net electricity generation (GWh)

595

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

Marine

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)



0

Comment

APS does not currently operate a marine facility.

Other renewable

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

APS does not currently operate other renewable facilities.

Other non-renewable

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0



Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

APS does not currently operate any other non-renewable facilities.

Total

Nameplate capacity (MW)

6,198

Gross electricity generation (GWh)

28,375

Net electricity generation (GWh)

26,818

Absolute scope 1 emissions (metric tons CO2e)

459

Scope 1 emissions intensity (metric tons CO2e per GWh)

459

Comment



C-EU8.4

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

Yes

C-EU8.4a

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

Country/Region

United States of America

Voltage level

Distribution (low voltage)

Annual load (GWh)

33,402

Annual energy losses (% of annual load)

5

Scope where emissions from energy losses are accounted for

Scope 2 (market-based)

Emissions from energy losses (metric tons CO₂e)

15,364,920

Length of network (km)

62,764



Number of connections

1,278,221

Area covered (km2)

89,733

Comment

APS owns transmission (above 69kV) and distribution lines; however, the majority of the lines are distribution (over 75 percent), so both types of lines are included in this response. The number of connections shown is the number of electric customers served in 2019.

C9. Additional metrics

C9.1

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

C-EU9.5a

(C-EU9.5a) Break down, by source, your total planned CAPEX in your current CAPEX plan for power generation.

Primary power generation source	CAPEX planned for power generation from this source	Percentage of total CAPEX planned for power generation	End year of CAPEX plan	Comment
Other, please specify Oil, Coal, and Gas	414,000,000	16	2022	Traditional generation oil, coal, and gas
Nuclear	377,000,000	14	2022	Nuclear
Solar	128,282,000,000	48	2022	Solar communities, energy storage, renewable and clean energy projects
Other, please specify	141,000,000	5	2022	Environmental projects



Environmental projects				
Other, please specify Systems and facilities upgrades	455,000,000	17	2022	Systems and facilities upgrades

C-EU9.5b

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

Products and services	Description of product/service	CAPEX planned for product/service	Percentage of total CAPEX planned products and services	End of year CAPEX plan
Other, please specify	May include energy storage, renewable projects, and other clean energy projects	1,282,000,000	48	2022

C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6

(C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6) Does your organization invest in research and development (R&D) of low-carbon products or services related to your sector activities?

	Investment in low-carbon R&D	Comment
Row 1	Yes	Take Charge AZ is an electric vehicle (EV) pilot program in which APS will install and own EV charging equipment located at various businesses, government agencies, non-profits and multifamily communities. Through the program, APS will gain valuable knowledge to better understand the needs of Arizona with regards to the electrification of the transportation sector. The program includes fleet, workplace and multifamily chargers and highway chargers to be included in the APS service territory. APS expects to install approximately 150 chargers in 2019 through the pilot programs. The Take Charge AZ program also includes a research study that will look at EV growth and load impacts specific to Arizona. Investment figure of \$239,000 is as of July 2019.



C-CO9.6a/C-EU9.6a/C-OG9.6a

(C-CO9.6a/C-EU9.6a/C-OG9.6a) Provide details of your organization's investments in low-carbon R&D for your sector activities over the last three years.

Technology area	Stage of development in the reporting year	Average % of total R&D investment over the last 3 years	R&D investment figure in the reporting year (optional)	Comment
Infrastructure	Pilot demonstration	0%	239,000	Take Charge AZ is an electric vehicle (EV) pilot program in which APS will install and own EV charging equipment located at various businesses, government agencies, non-profits and multifamily communities. Through the program, APS will gain valuable knowledge to better understand the needs of Arizona with regards to the electrification of the transportation sector. The program includes fleet, workplace and multifamily chargers and highway chargers to be included in the APS service territory. APS expects to install approximately 150 chargers in 2019 through the pilot programs. The Take Charge AZ program also includes a research study that will look at EV growth and load impacts specific to Arizona. As of July 2019, APS has invested \$239,000 in the program.

C10. Verification

C10.1

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

	Verification/assurance status
Scope 1	Third-party verification or assurance process in place



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

C10.1a

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

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Reasonable assurance

Attach the statement

 CDP Verification Statement APS CY2019 v1 TR.pdf

Page/ section reference

Page 2 - Verification Scope and Assertions

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

C10.1b

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

Scope 2 approach

Scope 2 location-based

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Reasonable assurance

Attach the statement

 CDP Verification Statement APS CY2019 v1 TR.pdf

Page/ section reference

Page 2 - Verification Scope and Assertions

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100



Scope 2 approach

Scope 2 market-based

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Reasonable assurance

Attach the statement

 CDP Verification Statement APS CY2019 v1 TR.pdf

Page/ section reference

Page 2 - Verification Scope and Assertions

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

C10.1c

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



Scope 3 category

Scope 3: Business travel

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Reasonable assurance

Attach the statement

 CDP Verification Statement APS CY2019 v1 TR.pdf

Page/section reference

Page 2 - Verification Scope and Assertions

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

C10.2

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

No, we do not verify any other climate-related information reported in our CDP disclosure



C11. Carbon pricing

C11.1

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

Yes

C11.1a

(C11.1a) Select the carbon pricing regulation(s) which impacts your operations.

California CaT - ETS

C11.1b

(C11.1b) Complete the following table for each of the emissions trading schemes you are regulated by.

California CaT

% of Scope 1 emissions covered by the ETS

2.3

% of Scope 2 emissions covered by the ETS

0

Period start date

January 1, 2019

Period end date

December 31, 2019

Allowances allocated



301,437

Allowances purchased

313,000

Verified Scope 1 emissions in metric tons CO2e

280,769

Verified Scope 2 emissions in metric tons CO2e

0

Details of ownership

Facilities we own and operate

Comment

C11.1d

(C11.1d) What is your strategy for complying with the systems you are regulated by or anticipate being regulated by?

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. Our strategy to ensure compliance is that our Risk Management group maintains an internal hedge policy comparing obligations and allowances. Our trading allowances purchased and allocated are monitored weekly and reported to all key internal parties. In addition, our Settlements department fulfils our obligation by transferring allowances through Compliance Instrument Tracking System Service (CITSS) as required by the California Air Quality Board. CITSS is a management and tracking system for accounts and compliance instruments issued through participating Western Climate Initiative cap-and-trade programs. CITSS is administered by the Western Climate Initiative, Inc. (WCI, Inc.). CITSS tracks compliance instruments (emissions allowances and offsets) from the point of issuance by jurisdictional governments, to ownership, transfer by regulated greenhouse gas emitters and other voluntary or general market participants, and to final compliance retirement. This strategy has kept us in compliance with our participation in the California cap and trade program. In 2019, we were allocated 301,437 allowance and purchased a total of 313,000 allowances, resulting in a total of 280,769 metric tons of verified CO2e.



C11.2

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

No

C11.3

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

Yes

C11.3a

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

Objective for implementing an internal carbon price

Navigate GHG regulations

Other, please specify

Integrated Resource Planning

GHG Scope

Scope 1

Application

APS has included in its analysis the potential for carbon pricing in the 2017 Integrated Resource Plan (IRP). The CO2 cost included in the IRP analysis was based on the California market cap and trade 2016 CO2 cost of \$12.80, escalated at 2.5 percent beginning in 2023. Prior to 2023, APS's analysis assumed the CO2 cost to be \$0.

Actual price(s) used (Currency /metric ton)

12.8



Variance of price(s) used

The CO2 cost included in the IRP analysis was based on the California market cap and trade 2016 CO2 cost of \$12.80, escalated at 2.5 percent beginning in 2023

Type of internal carbon price

Internal fee

Impact & implication

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 2017 Integrated Resource Plan (IRP) based on the actual trading price of CO2 allowances in the California market. In the IRP, annual revenue requirements steadily rise over the course of the planning period, regardless of the portfolio that was considered. Costs are driven by increasing fuel prices, inclusion of assumed carbon tax, increased operation and maintenance costs and increased capital investment to meet load growth. The Flexible Resource portfolio was chosen at the time as it has a number of positive elements. This portfolio set the framework to reach a goal of reducing our carbon-emission rate to less than 600 lb/MWh by 2032, which is a 48 percent reduction from our 2005 baseline year. The plan reduces carbon emissions through select coal reductions, continues to add more peak demand-reducing demand side management, has a prudent level of energy storage, continues to add renewables and maintains operation of the Palo Verde Generating Station – all leading to a cleaner energy generation portfolio for APS.

In 2019, we engaged our stakeholders to review and discuss current and future resource plans. Their input and potential impacts from carbon cap and trade programs will be reflected in our upcoming 2020 IRP, which will align to our commitment of 100 percent clean, carbon-free energy by 2050.

C12. Engagement

C12.1

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

Yes, our suppliers

Yes, our customers



C12.1a

(C12.1a) Provide details of your climate-related supplier engagement strategy.

Type of engagement

Information collection (understanding supplier behavior)

Details of engagement

Collect climate change and carbon information at least annually from suppliers

% of suppliers by number

1

% total procurement spend (direct and indirect)

29

% of supplier-related Scope 3 emissions as reported in C6.5

70

Rationale for the coverage of your engagement

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. In addition, proposal evaluations incorporate the importance of environmental stewardship and true supplier alignment to the APS core values, which includes environment. 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, operations and risk impact and supplier diversity. In 2019, we sent the surveys to 1 percent of our suppliers, representing 29 percent of our spend.

Impact of engagement, including measures of success

APS defines success in two ways: a year over year improvement in performance across the key performance indicators and increased engagement with suppliers. In 2018, we invited 90 suppliers to respond whereas in 2019, we decreased the number of suppliers to 31 so we



can focus on following up with our suppliers and increase engagement. Our response rate in 2018 was 17 percent vs 2019 which was 68 percent. In doing so, successful supplier discussions have led to a number of improvement opportunities incorporating sustainable best practices into some of our construction projects. Survey results revealed that almost 60 percent of our key suppliers have implemented controls, improvement plans and measurement processes to address key environmental priorities such as greenhouse gas emission reduction. In addition, nearly 70 percent of our key suppliers report on key issues and progress towards goals regarding environmental issues. While APS is a huge proponent of supplier recognition, due to COVID and its unprecedented impacts, APS chose to cancel the yearly supplier excellence awards in which environmental sustainability is a key criteria in the evaluation of an award as well as an award category in of itself.

Comment

C12.1b

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

Type of engagement

Education/information sharing

Details of engagement

Share information about your products and relevant certification schemes (i.e. Energy STAR)

% of customers by number

100

% of customer - related Scope 3 emissions as reported in C6.5

0

Please explain the rationale for selecting this group of customers and scope of engagement

APS engages with 100 percent of our customers through messaging on our website, monthly newsletters (printed and email), emails, social media, trade allies, sponsorships and advertising in order to give all our customers the opportunity to achieve energy savings and greenhouse



gas (GHG) emission reductions as all customers are eligible to participate in our programs. To help customers achieve energy savings and GHG reductions, we offer programs and financial incentives for energy efficiency, demand response, solar installation and more. Technologies such as rooftop solar, LED lighting and smart thermostats have given customers more power to control their energy usage, reduce GHG emissions and reduce their energy costs.

Impact of engagement, including measures of success

There are various ways to measure success of messaging, but the most successful measurement for knowing we have reached our customers is when they participate in our programs. This means they have not only become aware of the program, but they have taken action to potentially reduce their energy use and GHG emissions. With over a million customers in a very transitory service area, the measure of success is participation in one or more of our programs. For instance, in 2019 the energy efficiency program focused on educating customers on energy management best practices and helping them make informed buying decisions. This was done through traditional marketing channels and free, onsite energy assessments for customers interested in learning how their facility uses energy. Our marketing program resulted in our energy efficiency programs providing 515,961 MWh of energy savings for our customers in 2019.

Some specific actions included:

- personalized home energy reports delivered to over 250,000 residential customers 4 times per year with custom tips for saving energy, with additional access to monthly email reports and an online portal with more in-depth information on home energy use and opportunities to save
- over 40,000 customer visits to the online Home Energy Analyzer tool that provides a free personalized energy audit that shows where your home uses energy and the best opportunities and programs for saving energy
- rebates for 11,546 smart thermostat devices purchased by customers
- rebates for 3,147 AC unit installations in the existing homes program
- rebates for 7,660 ENERGY STAR® new homes in the residential new home construction program
- Incentives of \$2,282,522 for various energy efficiency activities for non-residential customers, including existing facilities, new construction, building operator training, energy information services and schools

Energy efficiency program effectiveness is measured through our Measurement Evaluation and Verification (MER) process conducted by a third party. MER refers to activities that will identify current baseline efficiency levels and the market potential of demand side management measures, perform process evaluations, verify that energy-efficient measures are installed, track savings and identify additional demand side management research.



C12.3

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

Trade associations

C12.3b

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

Yes

C12.3c

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

Trade association

WEST Associates

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

Recognizes the potential impact of climate change on electric utilities and works to integrate the unique western conditions into viable solutions.

How have you influenced, or are you attempting to influence their position?

An APS representative serves on the Board of West Associates. In addition, we provide technical support and funding to the organization.

Trade association



Edison Electric Institute (EEI)

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

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 greenhouse gas emissions. Policies to address climate change should seek to ensure energy reliability, minimize impacts on consumers and avoid harm to U.S. industry and the economy.

How have you influenced, or are you attempting to influence their position?

Our Chairman and CEO serves on the Board of the Edison Electric Institute.

Trade association

Nuclear Energy Institute

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

The Nuclear Energy Institute reports that we need deep decarbonization to hit our climate goals. Nuclear power can get us there. As our largest source of clean energy, nuclear power is critical to reduce carbon emissions. Wind, solar and geothermal are on the rise, but the smartest policies will ensure these technologies complement, not replace, nuclear's clean energy production. Protecting and growing our use of nuclear technologies are important ways to make a dent in greenhouse gases and help us make meaningful progress to address climate change. No other source, renewable or otherwise, contributes as much to meeting U.S. energy demand without emissions as nuclear. Every year, nuclear-generated electricity saves our atmosphere from more than 555 million metric tons of carbon dioxide emissions that would otherwise come from fossil fuels. That's the same as taking 117 million passenger vehicles off the road. Clean energy sources—nuclear, hydropower, geothermal,



wind and solar—work together to reduce greenhouse gases in our atmosphere. According to the Energy Information Administration, nuclear energy is the largest clean energy source in the United States, producing more carbon-free electricity than all other sources combined. 2017 figures show that nuclear energy generates more than 56 percent of America’s emission-free electricity. That is nearly three times the amount generated by hydropower, more than 3.5 times the amount generated by wind, and more than 18.5 times the amount generated by solar.

How have you influenced, or are you attempting to influence their position?

Our Chairman and CEO serves as the Chairman of the Nuclear Energy Institute.

Trade association

Nature Conservancy

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association’s position

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. In addition, the Nature Conservancy was a key partner to APS in the development of the Company’s clean energy commitment.

How have you influenced, or are you attempting to influence their position?

An APS Senior Vice President serves on the Board of the Nature Conservancy in Arizona.

Trade association

Center for Climate and Energy Solutions (C2ES)

Is your position on climate change consistent with theirs?

Consistent



Please explain the trade association’s position

The Center for Climate and Energy Solutions (C2ES) is the successor to the Pew Center on Global Climate Change, which was founded in 1998, and is widely recognized as an influential and pragmatic voice on climate issues. 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. C2ES is a:

- trusted source of timely, impartial information and analysis on our pressing climate and energy challenges
- bridge-builder, bringing city, state and national policymakers together with businesses and other stakeholders to achieve common understanding and consensus solutions
- policy innovator with a reputation for developing market-based solutions and other practical policy approaches that deliver real and lasting climate progress
- catalyst for business action that works with Fortune 500 companies to strengthen business action and business support for effective climate policy

C2ES’s work with the business community is facilitated through the Business Environmental Leadership Council (BELC), which was created with the belief that business engagement is critical for developing efficient, effective solutions to the climate problem. APS is a BELC member. BELC is currently comprised of 35 industry leading, mostly Fortune 500 companies across a range of sectors with combined revenues of nearly \$3 trillion and 3.7 million employees. Many different sectors are represented, from high technology to diversified manufacturing; from oil and gas to transportation; and from utilities to chemicals. C2ES and the BELC’s members believe that companies taking early action on climate strategies and policy will gain sustained competitive advantage over their peers.

APS provided critical input and feedback on C2ES’s recent publication titled Climate Innovation 2050. Climate Innovation 2050 examines potential pathways toward substantially decarbonizing the U.S. economy, is developing a range of scenarios for reducing U.S. emissions and will later produce decarbonization roadmaps to achieve that goal.

How have you influenced, or are you attempting to influence their position?

APS participates on C2ES’s BELC.

Trade association



Arizona Forward

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

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 state-wide editorial opinion pieces and/or stories about climate change to advocate for ways to mitigate the impacts.

How have you influenced, or are you attempting to influence their position?

An APS Senior Vice President serves on the Board of Arizona Forward.

C12.3f

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

In 2019, the Company continues to adopt strategies that align with its carbon-economy principles as part of our overall climate strategy. These principles in combination with our political participation policy work together to ensure that all of our direct and indirect activities are consistent with our overall climate change strategy. APS believes we have a responsibility to power a low-carbon economy with clean energy that can be used to support the transition of other sectors like transportation through increased electrification. A future powered by a low-carbon economy will achieve a healthier environment, greater social responsibility and allow APS and our customers to leverage future opportunities. To create a sustainable energy future for Arizona and a successful transition to a low-carbon economy, APS operates according to the following principles:

- Maintain appropriate governance to drive management practices and decisions to achieve cleaner air and a low-carbon economy.
- Continue to explore solutions to decarbonize our generation assets and provide the grid infrastructure that allows the adoption of low and zero carbon emission resources.
- Maintain a high level of transparency with respect to carbon metrics and emissions reporting.
- Participate in legislative and regulatory actions that address cleaner air and a low-carbon economy while ensuring reliable and affordable energy to our customers.



- Participate with non-governmental organizations, industry trade groups, think-tanks and other organizations to achieve attainable and meaningful carbon reductions and advancement of a low-carbon economy.
- Engage in and share research that may further reduce carbon emissions associated with supplying electrical energy.

APS has a political participation policy, which outlines our role in the political process as an advocate for a responsible and sustainable energy future for Arizona. The policy is posted on our website, www.pinnaclewest.com. The purpose of the policy is to promote compliance with all applicable federal, state and local laws, rules and regulations surrounding political contributions by APS in a manner consistent with our values. The policy also describes our decision-making and oversight processes for political spending and for reporting of political contributions, in which processes both management and our Board of directors play important roles. As one of the largest and longest-serving local businesses in Arizona, APS takes its commitment to corporate citizenship seriously. Being a good corporate citizen may include being informed about issues, encouraging our employees to volunteer and participate in their communities, speaking publicly about the issues of the day, sponsoring a political action committee and, where permitted by law, considering the contribution of corporate funds to political candidates, political parties, political action committees and organizations that engage in political activities. These activities may also include independent expenditures or the sponsoring of a political action committee that engages in independent expenditures, in relation to elections of candidates to office, get-out-the-vote efforts and ballot initiatives and referenda. In general, a political expenditure is independent when it is not made in cooperation, consultation or at the request or suggestion of a candidate, a candidate's agent or authorized political committee or a political party. Our low carbon-economy principles in combination with our political participation policy work together to ensure that all of our direct and indirect activities are consistent with our overall climate change strategy.

Strategically, the Company has been on a trajectory of increasingly clean energy through solar power innovation, major investments in energy storage technology, carbon-free nuclear operations and advances in energy efficiency solutions. Now, the Company has set the boldest clean-energy goal of all Arizona electric companies, as well as one of the most ambitious in the country, to reach 100 percent clean, carbon-free electricity by 2050. This goal includes a nearer-term 2030 target of 65 percent clean energy, with 45 percent of our generation portfolio coming from renewable energy. In addition, we also will cease all coal-fired generation by 2031.

C12.4

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



Publication

In mainstream reports

Status

Complete

Attach the document

 2019 PW Proxy Statement.pdf

Page/Section reference

- p. 3 - Strategic priorities
- p. 6 - Governance
- p. 12 - Governance
- p. 102 - Electric car charging station carbon emission savings

Content elements

- Governance
- Strategy
- Emissions figures

Comment

See 2019 Proxy Statement attached
Link: http://s22.q4cdn.com/464697698/files/doc_financials/annual/2019/2019-Proxy-Statement-Web-Ready.pdf

Publication

In mainstream reports

Status

Complete



Attach the document

 2019 PW Annual Report.pdf

Page/Section reference

- p. 7-9 - Clean energy commitment
- p. 5-6 attachment - Clean energy initiatives
- p. 11-12 attachment - Solar and storage
- p. 30 attachment - Financial risk related to climate change legislation

Content elements

- Strategy
- Risks & opportunities
- Other, please specify
 - Solar and storage solutions

Comment

See 2019 PNW Annual Report attached
Link: http://s22.q4cdn.com/464697698/files/doc_financials/2019/annual/2019-PNW-Annual-Report-Final.pdf

Publication

In mainstream reports

Status

Complete

Attach the document

 1912008_CRR_Highlights_Brochure_2019_FL_ONLINE_SEC.pdf



Page/Section reference

- p. 4 - Clean energy solutions
- p. 5 - Emission reduction 4C
- p. 6 - Smart thermostat solutions
- p.10 - What's next innovative solutions

Content elements

- Strategy
- Emissions figures
- Other, please specify
 - Smart thermostat solutions

Comment

See 1912008 CRR Highlights Brochure attached

Link: http://s22.q4cdn.com/464697698/files/doc_downloads/2020/04/1912008_CRR_Highlights_Brochure_2019_FL_ONLINE_SEC.pdf

See the section on Clean Energy: <http://www.pinnaclewest.com/corporate-responsibility/environment/clean-energy/default.aspx>

- Low Carbon Principles
- Coal Reduction
- Carbon and Air Emissions

C15. Signoff

C-FI

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



C15.1

(C15.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title		Corresponding job category
Row 1	Chairman of the Board, President and Chief Executive Officer, Pinnacle West Capital Corporation the Board and Chief Executive Officer, Arizona Public Service Company	Chairman of	Chief Executive Officer (CEO)

Submit your response

In which language are you submitting your response?

English

Please confirm how your response should be handled by CDP

	I am submitting to	Public or Non-Public Submission	Are you ready to submit the additional Supply Chain Questions?
I am submitting my response	Investors Customers	Public	No, Submit Supply Chain Questions Later

Please confirm below

I have read and accept the applicable Terms