



Appendix C: February 2021 Update



Current Business Environment

Changing customer preferences, technology advancements in natural gas extraction, and supply chain efficiencies for renewable and battery storage projects are upending long-term trends in utilities' resource portfolios nationwide. As a result, coal-fired generation continues to be displaced by natural gas, wind and solar resources, and the amount of energy storage on the grid is increasing. Moreover, scores of utilities, corporations and state governments have recently announced net-zero carbon and carbon-free generation goals. These trends are driven by a combination of economics, technological advancements, and societal momentum for carbon reduction.

As these external forces evolve, it is important for SRP to assess and test them against the 2017-2018 Integrated Resource Plan (IRP) key driver assumptions. Doing so ensures that SRP's strategic directions remain sufficiently comprehensive and appropriate in today's business environment.

SRP regularly reviews and updates its resource plan to identify how best to secure the power necessary to meet the growing electricity needs of its customers reliably, sustainably and affordably. This review process examines market conditions and other external factors, including projected customer demand for electricity and forecasted fuel supply and technology costs, which affect SRP's business environment and influence SRP's resource decisions. During SRP's most recent annual resource planning process, conducted in 2020-2021, SRP produced new forecasts for retail peak demand and natural gas and technology costs. These forecasts are consistent with the scenario ranges used during the 2017-2018 IRP process.

In addition to external matters, SRP considers current and future corporate objectives, such as carbon reduction targets, that the resource plan must achieve. Through the 2035 Sustainability Goals Stakeholder Process, SRP committed to steadily and meaningfully reducing the carbon emissions intensity of its generation resources, targeting a 65% reduction from 2005 levels by 2035 and a 90% reduction from 2005 levels by 2050. These targets will drive a material change in SRP's future resource portfolio.

Demand growth in SRP's service territory is anticipated to continue at three times the national average through the end of the decade and beyond. Because of this growth, SRP will require more resources, particularly clean energy resources, to meet the needs of its customers. The future development and acquisition of these resources will continue to be consistent with the 2017-2018 IRP strategic directions, taking into account demand-side resource management, alternatives to fossil fuel-based generation, and, where necessary, flexible natural gas generation to meet peaking needs and balance renewable generation intermittency.

The COVID-19 pandemic, and the associated restrictions and mitigation efforts, derailed a growing economy and affected the current business environment in profound ways. Certain sectors, such as the leisure and hospitality industry, suffered, while others, such as retail sales at grocery stores, thrived. Economic activity quickly rebounded as restrictions were eased, but cases and hospitalizations have experienced a resurgence during the winter months. Looking ahead, the policy response from the federal government will likely have a large impact on the path of the recovery. While the long-term impacts of the pandemic remain highly uncertain, the post-pandemic "new normal" may include more remote work, different urbanization patterns and ongoing restrictions on certain activities.

Within SRP’s electric service territory, commercial and industrial (C&I) customers, particularly in the leisure, hospitality and medical industries, experienced acute drops in electricity demand due to COVID-19 impacts and restrictions. Meanwhile, stay-at-home orders, combined with the shift to remote work, powered residential electricity demand higher. The shift from C&I demand to residential demand moderated as the state lifted restrictions. It is unclear how these trends will alter the long-term forecast for load growth, but thus far, the scenario ranges used during the 2017-2018 IRP process remain valid.


SRP has evaluated the external key drivers impacting its resource strategy, from changing economic trends and established carbon reduction goals to sizeable growth in forecasted load. In light of these evaluations, SRP believes the 2017-2018 IRP strategic directions are still sufficiently comprehensive and appropriate. As such, SRP continues to implement an IRP action plan based on these strategic directions. The following pages share more details on this action plan.

Implementation of 2017-2018 IRP Conclusions

Stakeholders provided input and guidance during the 2017-2018 IRP process on the elements of SRP’s strategic directions for resource decisions. These strategic directions, summarized below, have guided SRP’s resource decisions since completion of the 2017-2018 IRP process.

Element	Strategic Resource Directions
Coal Generation	Further reduction in coal generation; address implications for employees and communities.
Natural Gas Generation	Develop flexible natural gas generation options to meet peak demand and integrate renewables.
Renewable Energy ¹	Grow renewables portfolio to reduce CO ₂ intensity and manage costs; expand opportunities for customer-dedicated projects.
Energy Storage	Add cost-effective energy storage to support additional renewable energy integration.
Nuclear Generation	Preserve option for new nuclear generation in the mid-to-late 2030s with a focus on small modular technology.
Customer Programs	Develop and promote energy efficiency programs and new customer-side demand management programs and technologies.
Market Resources	Expand participation in regional markets.
New Technologies	Pursue pilot projects and research and development efforts for innovative applications of new power generation, load management, energy storage and electrification.

¹ For current and future IRP-related discussions, Renewable Energy and Energy Storage have been separated into two strategic directions.



The following sections describe major resource initiatives completed or underway as part of SRP's IRP action plan, which is based on the strategic resource directions described above.

Coal Generation

SRP recently completed a comprehensive assessment of its remaining coal units, which included an analysis of risks associated with joint ownership, fuel supply, regulatory and legislative action, environmental policies and transmission systems, and impacts to the communities in which these plants operate. The results from this assessment have helped inform strategic action plans for future coal retirements on SRP's system. Initial findings and proposed action plans resulting from the assessment were shared with stakeholders during the 2019 IRP Biennial Workshop.


Since the 2019 Workshop, SRP has made some decisions regarding the retirement of certain coal units. First, in January 2020, SRP announced plans to retire all 773 megawatts (MW) of units 1 and 2 of Coronado Generating Station (two of the three remaining coal units wholly owned by SRP) no later than 2032. This decision balanced customer affordability, adequate transition timing for employees and the surrounding communities, carbon reduction goals, forecasted peak load growth, anticipated developments in load-serving technology, and regulatory and technical hurdles. In addition, SRP and the other joint owners of Craig Generating Station Unit 2 announced in July 2020 that the unit will be retired by September 2028 (following the previously announced retirement of Craig Unit 1 by December 2025). Finally, in January 2021, SRP and the other joint owners of Hayden Generating Station Unit 2 announced that the unit will be retired by the end of 2027.

SRP continues to evaluate the 415 MW of SRP-owned capacity at Springerville Generating Station, and a retirement plan for this resource has yet to be determined. Furthermore, the exact timeline of SRP's exit from Four Corners Power Plant units 4 and 5 is yet to be determined and requires agreement by all participating owners but will occur no later than the end of 2031.

Natural Gas Generation

In March 2019, SRP completed the purchase of Coolidge Generating Station. Prior to the purchase, the full output from this resource was being delivered to SRP through a power purchase agreement. Acquiring the asset gives SRP access to its full capacity for the entire useful life of the facility, rather than through the expiration of the power purchase agreement. While the acquisition did not add additional capacity to the peak-serving resource portfolio, it did allow SRP to preserve financial flexibility by taking advantage of low borrowing costs and gain operational experience to apply to similar assets. The 12 combustion turbines at Coolidge are designed for quick and flexible dispatch, which helps facilitate further integration of renewables and performs a valuable role in SRP's mission to provide sustainable, reliable and affordable power.

SRP continues to seek ways to increase the cost-effectiveness of its existing gas generation resources. Using established relationships with research partners and vendors, SRP has identified low-cost modifications to those resources that will increase the capacity, flexibility and efficiency of these plants. These modifications to existing units will enable the integration of greater amounts of renewables and reduce the need for new resources, ultimately saving money for SRP's customers. These upgrades, which



began in the fall of 2019, will continue over the next five to six years across the natural gas combined-cycle units.

Renewable Energy

Since announcing in November 2018 its commitment to add 1,000 MW of new solar by 2025 (the "2025 Commitment"), SRP has executed contracts for 648 MW of solar, consisting of three 100 MW solar projects and two solar-plus storage projects totaling 348 MW of solar paired with three-hour and four-hour storage.

The first 200 MW of solar successfully reached commercial operation in December 2020 and is dedicated to 12 of SRP's commercial and industrial customers through SRP's Sustainable Energy Offering (SEO), which was developed as part of SRP's ongoing commitment to support customers in achieving their sustainability goals. Due to the success of the initial SEO, SRP dedicated an additional 100 MW of solar, expected to reach commercial operation by the end of 2021, to another 21 large customers.


Details about the two solar-plus storage projects are provided in the following section, titled "Energy Storage."

SRP intends to procure the remaining balance of the 2025 Commitment through proposals submitted in response to a request for proposals (RFP) issued in January 2020. Under this RFP, SRP indicated its preference for 200 MW of solar to be developed on the Navajo Nation to support the energy transition proclamation made in April 2019 known as the "Navajo Háyoołkáát (Sunrise) Proclamation." This proclamation emphasizes the Nation's pursuit and prioritization of renewable energy development to diversify its economy and energy portfolio. Projects selected from this RFP are intended to come online prior to the end of 2023.

Separate from the 2025 Commitment, SRP issued a Request for Information (RFI) in June 2020 seeking information on wind energy projects up to 500 MW in size that can deliver to SRP's transmission system. Responses to the Wind RFI will be used to inform future renewable energy procurement options, such that SRP's 2035 Sustainable Goal for carbon reduction can be achieved while managing long-term procurement costs. Additionally, as customer requests for 24/7 carbon-free energy increase, SRP will use the responses to the RFI to determine what role wind energy may play in meeting these requests.

Energy Storage

In alignment with SRP's strategic direction to integrate energy storage, SRP has contracted several utility-scale battery storage projects. Most recently, as part of the 2025 Commitment, SRP entered into power purchase agreements for two solar-plus battery storage projects totaling 348 MW. These projects were procured to support SRP's future peak capacity needs that would have otherwise been met through natural gas generation. The first project is Sonoran Energy Center, located in Little Rainbow Valley, south of Buckeye, Arizona. It will consist of 260 MW of solar with 260 MW of four-hour duration lithium-ion batteries intended to shift abundant, carbon-free daytime solar energy to serve the early evening peak load. The second project is Storey Energy Center, to be constructed south of Coolidge, Arizona. Storey will pair 88 MW of solar with 88 MW of three-hour lithium-ion batteries. Both plants are intended to be online by June 2023.



In addition to the projects above, SRP is installing the Bolster energy storage system, a 25 MW four-hour grid-charged battery, adjacent to SRP's Agua Fria Generating Plant. This energy storage system is expected to begin commercial operation by the end of 2021 and will be owned and operated by SRP.

In preparation for the large-scale adoption of energy storage systems, SRP deployed a "battery learning plan" to monitor industry and technology developments and gain the necessary operation, procurement and design knowledge to integrate additional batteries in the future. In furtherance of that plan, SRP utilizes and purchases power from both Pinal Central Solar Energy Center (20 MW of solar paired with 10 MW four-hour battery) and Dorman Energy Center (10 MW four-hour stand-alone battery), which came online in 2018 and 2019, respectively.

Nuclear Generation

SRP has taken measured steps to develop and preserve the option for new nuclear generation in the mid-to-late 2030s, including the initial pursuit of an Early Site Permit (ESP). Due to developments in the industry, SRP has decided not to submit an ESP application at this time but is tracking regulatory developments and is engaged in several nuclear industry boards and working groups, including the NuScale Advisory Board, Nuclear Energy Institute and SMR Start, Nuclear Nonoperating Owners' Group, and the Electric Power Research Institute (EPRI).

With respect to existing nuclear generation, in December 2020, SRP's Board of Directors approved the purchase of an additional ownership share in zero-carbon-emitting baseload energy from Palo Verde Generating Station. This purchase will allow SRP to economically add 114 MW of safe and reliable capacity and reduce SRP's overall carbon intensity. The purchase of the first 104 MW is expected to be completed in January 2023 and the remaining 10 MW in 2024. When completed, this purchase will increase SRP's ownership share of Palo Verde from 17.5% to 20% of the total plant capacity.


Customer Programs

Last year, SRP delivered 24.3% of its annual energy through sustainable resources, exceeding its 20% by 2020 Sustainable Portfolio Principles objective. Energy efficiency (EE) was the primary contributor to meeting the objective, as EE provided over 11% to the total. Audited year-end results confirmed that in FY20, SRP's portfolio of EE programs exceeded its 2.00% annual incremental savings target and delivered savings equal to 2.09% of SRP's retail requirements representing more than 641,000 MWh of incremental savings.

SRP's 2035 Sustainability Goal for its EE programs is to deliver more than 3 million MWh of annual aggregate energy savings. In FY21, SRP's target is to deliver annual incremental EE savings totaling 510,000 MWh. At mid-year, SRP is positioned to again meet its annual goal, as year-to-date savings equal 338,572 MWh. SRP remains committed to further developing and promoting a diverse portfolio of EE programs to help its customers manage their energy usage while focusing on reducing system peak demand.

Over the past year, SRP continued to expand programs in the areas of demand response, electric transportation and technology, and distributed resources to aid in delivering greater customer and resource value.

First, SRP has accelerated the growth of its demand response (DR) portfolio. SRP's DR programs are designed to reward participating residential and commercial customers for reducing their electricity use



during periods of high demand, while maintaining the reliability of the grid. Through mid-year, SRP grew its residential Bring Your Own Thermostat (BYOT) program (under which participants agree to brief, limited conservation events that adjust their thermostats during peak electric demand periods from May 1 through Oct. 31) to nearly 40,000 smart thermostats, representing 45 MW of load reduction, up from 34 MW at the end of FY20. In January 2020, SRP launched its Business Demand Response program, to which over 200 customer sites quickly subscribed, allowing the program to secure the planned 25 MW of capacity. During the extreme heat of summer, each program was dispatched eight times and performed well, as both contributed to managing SRP's summer peak. Through these two programs, SRP's portfolio of DR resources has delivered 70 MW of capacity at mid-year and has surpassed its annual goal to secure 67 MW of DR capacity. SRP's 2035 Sustainability Goal for DR is to deliver at least 300 MW of dispatchable DR and load management programs.

The 2017-2018 IRP concluded that other cost-effective options, such as transportation electrification and other electric technologies, would be considered and implemented as a means of meeting SRP's strategic objectives and reducing carbon emissions. To foster electric vehicle (EV) adoption, SRP committed, under its 2035 Sustainability Goals, to support the enablement of 500,000 EVs in SRP's service territory and manage 90% of EV charging through price plans, dispatchable load management, original equipment manufacturer integration, connected smart homes, and other behavioral and emerging programs.

In furtherance of those goals, over the past year, SRP grew the number of EV rebate programs offered to its customers. First, SRP expanded its Business EV Charging Program to include business, multifamily and fleet customers and increased the rebate from \$500 to \$1,500 per charging port for the installation of a new smart charger. Additionally, SRP leveraged its ENERGY STAR® Homes program and offered a \$200 rebate per home for homebuilders to pre-wire newly constructed homes to accommodate EV chargers. Finally, SRP launched its residential Smart Charger program, under which SRP will provide a \$250 rebate toward the purchase of a smart EV charger on SRP's Marketplace. Additionally, SRP is continuing to expand its plug-in EV fleet with a goal of 100% of SRP sedans being electric by 2021. SRP also offers an EV price plan, similar to the Time-of-Use Price Plan, which provides customers with price savings when they charge their vehicles during lower-priced off-peak hours.

Within the electrification space, a 2035 Sustainability Goal is to expand SRP's portfolio of electric technology programs (non-EVs) to deliver 300,000 MWh of annual aggregate energy impact. The E-Tech Program offers rebates for electric forklifts, forklift chargers, and infrastructure for truck refrigeration units, and provides a pathway to submit custom electrification projects. The program continues to experience strong customer participation, and at mid-fiscal year was at 66% of its 8,400 MWh. Over time, SRP's E-Tech Program will continue to expand to include additional cost-effective electrification measures and offerings.

As part of the development and promotion of new customer-side demand technologies, SRP initiated a residential Battery Storage Incentive Program that supports the study of how residential customers use battery systems, and how the battery systems perform in Arizona's desert environment and affect the operation of the grid. The program provides an incentive of up to \$3,600 toward a customer's purchase and installation of a qualifying home energy storage system. The incentive is available to up to 4,500 SRP residential electric customers on a first-come, first-served basis during a 36-month period, which began May 1, 2018. Through mid-fiscal year, SRP has paid customer incentives for 826 commissioned battery systems.



New Technologies

SRP continues to maintain a broad and robust research and development (R&D) program. Following the implementation of a new Innovation Pipeline process approximately two years ago, R&D and other SRP staff have been reviewing and evaluating the successes and weaknesses of that process and will introduce changes to improve its effectiveness. While the COVID-19 pandemic impacted the ability to have in-person meetings in 2020, SRP still completed a number of significant efforts in a safe, remote manner.

In 2018, eight Innovation and Technology Priorities were developed as a framework for selecting and developing the research to be performed. Since then, SRP established a “2035 Planning Future” that provided the foundation for development of the 2035 Corporate Goals. New research proposals are now evaluated against their alignment with those goals, and efforts are underway to review and evaluate how recently initiated and ongoing research are aligned with the 2035 goals. This alignment to our goals will help ensure that we proceed with R&D projects that provide the most value to SRP and its customers while meeting our 2035 Corporate Goals.

In addition to goal- and technology-specific research projects, SRP is engaging in broader utility industry and stakeholder initiatives. In 2020, SRP joined a large national study with EPRI called the Low-Carbon Resources Initiative. The goal is to identify and plan demonstrations of technologies where the electric sector can enable emission reductions in other sectors, such as transportation and buildings, through production of low-carbon fuels and other advanced technologies. Additionally, SRP launched a new strategic partnership in 2020 with Arizona State University to address issues related to sustainability, technology innovation, education and workforce training.

SRP continues to support joint research programs with Arizona State University, the University of Arizona and Northern Arizona University. For the 2020-2021 academic year, SRP is supporting a combined 28 research projects across the three universities on a wide variety of energy, power delivery, water resource, sustainability and forest health topics.


Market Resources

On April 1, 2020, SRP began participating in the Western Energy Imbalance Market (EIM) operated by the California Independent System Operator (CAISO). EIM is a real-time five-minute energy market available to non-CAISO members. The EIM leverages advanced market systems to enable participating utilities to optimize resources and costs across the EIM footprint. During the last 10 months, SRP has benefited from the EIM through additional sales and purchase opportunities to optimize SRP’s resources for our customers.

Transition to an Integrated System Plan

As mentioned in earlier sections, there are numerous factors that are driving a transformation of the electric power industry, which is resulting in a more decentralized, bi-directional power system. As these changes are occurring, traditional planning methods are becoming increasingly insufficient to efficiently develop a safe, reliable, affordable and environmentally responsible power system.

SRP is preparing to navigate this industry change by developing new analytical processes and integrating the planning functions provided by forecasting, transmission, distribution, generation and customer programs. In doing so, SRP will be able to better develop cross-functional solutions that result in the best



value for its customers. SRP began this transition with the formation of the Planning Coordination Council (PCC), which serves as a cross-functional leadership body to support integration of the planning functions. In FY20, the PCC provided oversight for a focused effort guided by industry best practices to develop a new Integrated Planning Process (IPP) which helps enable key planning areas at SRP to collaborate to develop strategy-led systemwide solutions. In FY21, the IPP is being utilized to conduct multiple cross-functional planning special studies and to develop an Integrated Annual Plan.

Aligned with this transition, SRP will be sunsetting the 2017-2018 IRP and shifting focus to a new public-facing Integrated System Plan (ISP) process. SRP plans to begin the public stakeholder engagement process in 2021, with a goal of completing its first ISP in early 2023. With this transition and anticipated stakeholder engagement occurring for the ISP throughout 2021 and 2022, SRP will not be providing additional stakeholder updates on the 2017-2018 IRP following the February 2021 Appendix publication.