SRP's Integrated System Plan Pre-Read

August 2023 Board & Council Study Session

The purpose of this document is to provide Board & Council members context and background about SRP's first Integrated System Planning (ISP) process in preparation for the two half-day Board & Council ISP Work Study Sessions on August 29th and August 30th, 2023, where the SRP project team will:

- *Share the motivation behind SRP's transition to Integrated System Planning*
- *Demonstrate the extensive and collaborative nature of the ISP process*
- *Present ISP findings and proposals for SRP's planning through 2035*

SRP
Delivering water and power®

ALIGN: BUILDING A SHARED VISION TOGETHER

The electric power industry is undergoing a rapid transformation, presenting Salt River Project (SRP) with unprecedented opportunities and future uncertainties. SRP strives to provide high quality electricity services to its customers and work closely with them to respond to their needs, advance their priorities and goals, and collaboratively adapt to changes.

An Integrated System Plan (ISP) is a data-driven, collaboratively developed plan for generation, transmission, distribution and customer programs to meet SRP's 2035 Corporate Goals at a high customer value while preparing for rapidly evolving system needs.

The analytical objectives of the ISP are to identify:

- Viable pathways for achieving SRP's 2035 Corporate Goals
- Costs, risks and tradeoffs of these different pathways
- System strategies that are valuable across different pathways
- New capabilities or tools required to effectively plan and operate as the system evolves
- Activities SRP should undertake in the next 6 years to plan for these system strategies

SRP considers customers and community stakeholders to be important partners in building a sustainable, reliable, and affordable future power system. During the ISP process, SRP built a study plan that considered customers' needs and interests and allowed SRP to explore a shared vision for the future of the power system.

Guiding ISP Principles

In developing the ISP, SRP followed certain Guiding ISP Principles, which were defined through a collaborative and transparent process involving the ISP Advisory Group, which represents a diverse set of stakeholder perspectives. These principles were intended to balance reliability, affordability, sustainability, and other important considerations.

Integrated Long-Term View: Develop a holistic view, including resources, transmission, distribution and customer program perspectives for meeting evolving customer needs and achieving SRP's Corporate Goals for 2035 and beyond. The long-term view ensures that SRP is making the right decisions today to support its customers and stakeholders in the future.

Transparency: Engage customers and other stakeholders in a system planning process that is responsive to questions and input.

Measure Success Through the Eyes of Our Customers: Maintain industry-leading customer satisfaction by responding to evolving customer needs by providing sustainable, safe, reliable, and affordable power while equitably recognizing the different needs, challenges, and perspectives of our customers.

Manage Costs: Deliver exceptional system and energy value by minimizing impacts from additional grid needs and future uncertainties to average retail prices, while maximizing customer value through diligent, long-term oriented cost management.

Build an Adequate and Reliable Power System: Meet, and in some cases, exceed industry standards to provide a dependable supply of electricity to all SRP customers. Provide a reliable grid that is able to prepare for and recover from both anticipated and unanticipated disruptions to ensure energy availability.

Adapt Toward a More Sustainable Future: Meaningfully reduce carbon emissions and generation water usage to achieve SRP's 2035 Sustainability Goals to help address climate change and create less waste.

PREPARE: PLANNING AMIDST CHANGE

The ISP used scenario planning methods to help SRP better understand future uncertainties and take advantage of opportunities. Using scenario planning allows SRP to develop the future power system in a way that can flexibly adapt to the changing industry and maintain affordable, reliable and sustainable power delivery.

The scenario planning framework for the ISP included three distinct elements: scenarios, strategic approaches and metrics.

Scenario defines a plausible future state of the world around us, reflecting societal, technological, economic, environmental, and political trends and conditions. These factors are outside of SRP's control and reflect the unpredictable nature of the future that needs to be accounted for in SRP's planning activities.

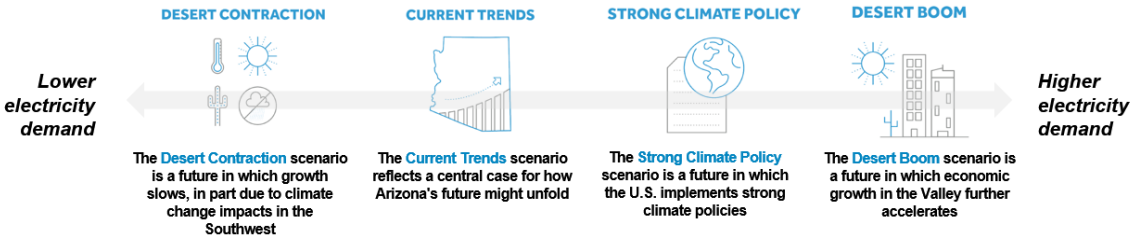
Strategic approach represents a possible decision, or set of decisions, that SRP could make in planning the future power system. These decisions are fully within SRP's direct control.

Metrics are outputs from the ISP modeling ecosystem that allow SRP, customers and other stakeholders to measure the performance of different system plans across a range of future scenarios and sensitivities.

These elements of the ISP made up the holistic study plan that was developed with input from SRP subject matter experts and customer and stakeholder feedback. The SRP project team, consisting of representatives from Forecasting, Resource Planning, Transmission Planning, Distribution Planning and Customer Programs, performed a first of its kind system-wide scenario analysis that allowed SRP to test strategies for building the future power system across a wide range of possible futures. Based on learnings from that analysis, the project team developed, and shared with stakeholders, the ISP key findings that identified costs, risks and tradeoffs to consider when planning the future power system.

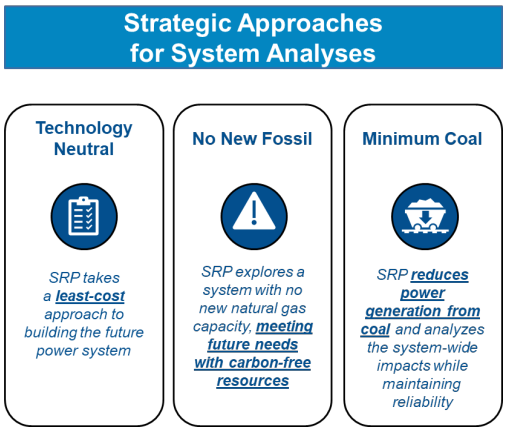
Scenarios

SRP, with Advisory Group input, developed four scenarios to analyze in the ISP. The four scenarios reflect a diverse set of possible futures and consider uncertainties across a broad set of parameters. The figure below shows the four scenarios with a short narrative that describes each scenario.



Strategic Approaches

SRP developed three strategic approaches to analyze in the ISP. These strategic approaches were intended to explore clearly delineated key decisions that may impact the future power system and to understand how these strategies perform across the scenarios described above. SRP strategy decisions resulting from the ISP are not restricted to only those analyzed in the strategic approaches and will include paths that combine the strategies described below.



- The *Technology Neutral* strategic approach aimed to develop future system plans on a technology-neutral and least-cost basis.
- In the *No New Fossil* strategic approach, SRP explored a system with no new natural gas capacity, meeting future needs with carbon-free resources. Existing and in-development natural gas units were still able to be used to meet customer needs under this strategic approach.
- The *Minimum Coal* strategic approach utilized a no new fossil approach to new capacity and also aimed to reduce power generation from coal in SRP's system by testing operational changes to SRP's coal resources, including seasonal operations and SRP coal exit by the end of the study period in 2035.

Metrics

Metrics were used to provide information to internal and external stakeholders, evaluate the performance of each strategic approach across scenarios, and design customer preference research. SRP, drawing on Advisory Group input, developed metrics for affordability, sustainability, reliability, and customer focus, as shown in the figure below.

Affordability
Total System Costs
Average System Costs
Average Residential Price Impact

Sustainability
CO2 Reductions
Water Use
Carbon-Free Generation
Capacity Factor for Gas Fleet
Direct Air Emissions (NOx, SO2, PM, VOC)

Reliability
Resource Contribution to Reliability
Reliance on Emerging Technologies
Qualitative Risk Ratings (Development Risk and Operational Risk)
Planning Reserve Margin

Customer Focus
Customer Preference Rating
CO2 Reductions from energy efficiency, demand response, distributed generation, and electrification

ANALYZE: PERFORMING ANALYSIS & VALIDATING RESULTS

SRP's planning groups evaluated the strategic approaches across scenarios using a rigorous analytical process. For each combination of a strategic approach and scenario, SRP developed a system plan for 2025-2035 that sought an affordable way to meet customer needs while ensuring reliability and meeting or outperforming SRP's sustainability goals related to generation carbon emissions and water usage. Each modeled system plan includes a plan for customer programs, distribution investments, transmission investments and generation resource additions.

External Validation: SRP leveraged external technical expertise, from Energy and Environmental Economics (E3), to benchmark analytical methods used in the ISP. E3 has worked collaboratively with the SRP Project team in developing an industry-leading ISP by providing validation services on generation capacity modeling.

Transparency: A key aspect of the ISP was the development and implementation of a robust plan to actively engage customers and community stakeholders. Inclusive, transparent and proactive dialogue with SRP stakeholders aimed to build support for the ISP process. The ISP team has hosted more than 20 forums for engagement, including ISP Advisory Group meetings, Large Stakeholder Group meetings, Technical Working Sessions, Modeling Subgroups and one-on-one discussions with interested stakeholders. The ISP team posts meeting agendas, slides and summaries on the ISP web portal.

Voice of the Customer: To bring the voice of SRP's residential customers into the planning of the future energy system, SRP conducted residential customer research in partnership with Bellomy. During three phases of research, information on preferences pertaining to reliability, affordability and sustainability was collected through customer focus groups and surveys.

Metric Takeaways: The Need for Balance

The section below provides a brief description on how the ISP strategic approaches performed across scenarios under the four metric categories described above: affordability, sustainability, reliability, and customer focus.

Affordability: On affordability, a Tech Neutral strategic approach results in lowest system cost, driven largely by differences in generation costs across cases. All strategic approaches have similar costs under a scenario where the U.S. government provides federal incentives for clean energy technologies (Strong Climate Policy).

Sustainability: With respect to sustainability, a Minimum Coal strategic approach results in greater emissions reductions and lower water use, followed by No New Fossil. Decreased dependence on fossil fuel technology for energy (e.g., coal retirements and projected declined utilization of natural gas), paired with renewable and storage additions drive significant carbon reductions. These efforts enable SRP to achieve the 2035 Sustainability Goals related to generation carbon emissions and water reduction in all cases.

Reliability: In terms of reliability, a Tech Neutral strategic approach results in paced infrastructure development and is the only approach able to meet reliability under high customer demand conditions. Existing resources play a key role in ensuring reliability across all cases. When allowed, firm capacity resources are selected to help meet reliability needs at the least cost. All cases have development and operational risks given the amount of infrastructure necessary to enable the future system, which also poses new operational challenges and proactive measures to mitigate.

Customer Focus: Residential customers are sensitive to bill impacts and have preferences for managing costs while maintaining reliability and transitioning to a more sustainable energy system. Customer Preference Ratings reflected that Tech Neutral is most favorable in futures with higher load growth driven by lower generation costs, while Minimum Coal and No New Fossil were preferred when there is low load growth and federal incentives are driving down the cost of technology. Customer programs also have the potential to unlock greater economy-wide carbon reductions.

Summary of ISP Key Findings

SRP shared these key findings from the ISP analysis with stakeholders in the spring of 2023.

Resources & Infrastructure

- ✓ Significant investment over the next decade is needed to strategically locate and build out new grid infrastructure to connect new resources and customers, while achieving reliability and sustainability goals.
- ✓ SRP will likely need to double or triple resource capacity in the next decade to serve customers while achieving reliability and sustainability goals. This will be at an unprecedented pace.
- ✓ New renewables and firm capacity are part of a least-cost portfolio, even under a wide range of gas price and technology cost sensitivities.
- ✓ When paired with firm capacity, solar and wind contribute to a least-cost portfolio while being able to help reduce carbon emission.
- ✓ Without new firm generation capacity, the system cannot satisfy reliability requirements under a high load growth scenario. Higher levels of renewables and storage, including pumped storage, are required in lower load growth scenarios.
- ✓ Hundreds of miles of new or upgraded transmission lines and nearly double the number of 500/230 kV transformers could be needed relative to today.
- ✓ Location of generation matters and plays a significant role in the buildout of the 500 kV transmission system.

Customer Programs

- ✓ Electrification of end uses, including transportation and heating demand, creates new opportunities to shift energy usage to mid-day hours to help integrate more renewable energy and maximize carbon reduction impacts.
- ✓ SRP will need to evolve programs and price plans to shift consumer behavior, and further educate customers on when to consume and when to conserve energy.

Future Considerations

- ✓ If the U.S. government enacted a mandate for 85% CO2 reductions by 2035 (Strong Climate Policy), SRP would need to significantly accelerate renewable & storage deployment.
- ✓ Future uncertainties around development, planning and permitting processes could impact SRP's ability to grow at the pace needed to meet increasing future load growth.
- ✓ With the amount of future infrastructure and resources needed, internal and external partnerships are going to be essential to build the future system and maintain high customer value.