Call to Order
Roll Call

1. **CONSENT AGENDA**: The following agenda item(s) will be considered as a group by the Committee and will be enacted with one motion. There will be no separate discussion of these item(s) unless a Committee Member requests, in which event the agenda item(s) will be removed from the Consent Agenda and considered as a separate item ................................................................. CHAIRMAN PAUL ROVEY

   - Request for approval of the minutes for the meeting of June 24, 2021

2. **Integrated System Planning Summer Stakeholder Series Debrief** ................................................................. ANGIE BOND-SIMPSON

   Informational presentation regarding stakeholder feedback from the Integrated System Planning (ISP) Summer stakeholder series and an update on the next steps for the ISP, including future Power Committee engagement.

3. **Coolidge Expansion Project** ................................................................. GRANT SMEDLEY, SPENCE WILHELM, and BILL McCLELLAN

   Request for approval of the Coolidge Expansion Project (CEP), which will add 16 new generating units at the Coolidge Generating Station.

4. **Amended and Restated Arizona Nuclear Power Project Valley Transmission System Participation Agreement** ............................................. BRYCE NIELSEN

   Request for approval for the District to enter into the Amended and Restated Arizona Nuclear Power Project (ANPP) Valley Transmission System Participation Agreement.

5. **Major Generation Projects Update** ................................................................. KEVIN NIELSEN

   Informational presentation regarding the status of the Navajo Generating Station (NGS) decommissioning and Near-Term Capacity Projects.
6. Report on Current Events by the General Manager and Chief Executive Officer or Designees ................................................................. MIKE HUMMEL

7. Future Agenda Topics ........................................................................ CHAIRMAN PAUL ROVEY

The Committee may vote during the meeting to go into Executive Session, pursuant to A.R.S. §38-431.03 (A)(3), for the purpose of discussion or consultation for legal advice with legal counsel to the Committee on any of the matters listed on the agenda.

The Committee may go into Closed Session, pursuant to A.R.S. §30-808, for records and proceedings relating to competitive activity, including trade secrets or privileged or confidential commercial or financial information.

THE NEXT POWER COMMITTEE MEETING IS SCHEDULED FOR THURSDAY, SEPTEMBER 23, 2021

08/17/2021
A meeting of the Power Committee of the Salt River Project Agricultural Improvement and Power District (the District) and the Salt River Valley Water Users' Association (the Association), collectively SRP, convened at 9:30 a.m. on Thursday, June 24, 2021, via teleconference from the Board Conference Room at the SRP Administration Building, 1500 North Mill Avenue, Tempe, Arizona. This meeting was conducted via teleconference in compliance with open meeting law guidelines.

Committee Members present at roll call via teleconference were P.E. Rovey, Chairman; and D.S. Hendrickson, A.G. McAfee, J.M. White Jr., and L.C. Williams.

Committee Members absent at roll call were R.J. Miller, Vice Chairman; and M.V. Pace.


In compliance with A.R.S. §38-431.02, Merari Eastman of the Corporate Secretary’s Office had posted a notice and agenda of the Power Committee meeting at the SRP Administration Building, 1500 North Mill Avenue, Tempe, Arizona, at 9:00 a.m. on Tuesday, June 22, 2021.

Chairman P.E. Rovey called the meeting to order.

Consent Agenda

Chairman P.E. Rovey requested a motion for Committee approval of the Consent Agenda, in its entirety.

On a motion duly made by Board Member D.S. Hendrickson and seconded by Board Member A.G. McAfee, the Committee unanimously approved and adopted the following item on the Consent Agenda:

- Minutes of the Power Committee meeting on May 20, 2021, as presented

Corporate Secretary J.M. Felty polled the Committee Members via teleconference on Board Member D.S. Hendrickson’s motion to approve the Consent Agenda, in its entirety. The vote was recorded as follows:
Exception to the Municipal Aesthetics Program

Using a PowerPoint presentation, Chris R. Janick, SRP Senior Director of Power Delivery, stated that the purpose of the presentation was to request approval of an exception to the Municipal Aesthetics Program Guidelines to allow the City of Chandler to use up to $19.5 million in current and future Aesthetics Fund allocations, along with other consideration, to pay the incremental cost of undergrounding a portion of the 230 kilovolt (kV) transmission lines proposed to be installed as part of the High-Tech Interconnection Project.

Mr. C.R. Janick said that exception includes granting a six-year advanced funding term which is greater than the three years allowed by the policies and utilizing up to $7 million of the City of Chandler’s $19.5 million Aesthetics Funds to reimburse the City of Chandler as partial compensation for city-owned utility relocation costs which are not provided for in the policies.

Mr. C.R. Janick concluded with a request for approval of an exception to the Municipal Aesthetics Program Policies to allow the City of Chandler to use up to $19.5 million in current and future Aesthetics Fund allocations to underground a portion of the proposed Schrader-RS28 230 kV transmission line.

Mr. C.R. Janick responded to questions from the Committee.

On a motion duly made by Board Member D.S. Hendrickson, seconded by Board Member A.G. McAfee and carried, the Committee agreed to recommend Board approval, as presented.

Corporate Secretary J.M. Felty polled the Committee Members via teleconference on Board Member D.S. Hendrickson’s motion to recommend Board approval. The vote was recorded as follows:

YES: Board Members P.E. Rovey, Chairman; and D.S. Hendrickson, A.G. McAfee, M.V. Pace, J.M. White Jr., and L.C. Williams (6)
NO: None (0)
ABSTAINED: None (0)
ABSENT: Board Member R.J. Miller, Vice Chairman (1)

Copies of the PowerPoint slides used in this presentation are on file in the Corporate Secretary’s Office and, by reference, made a part of these minutes.

Executive Session: Four Corners Project Agreements

Chairman P.E. Rovey requested a motion to enter into executive session, pursuant to A.R.S. §38-431.03(A)(3) and (A)(4), to discuss or consult with attorneys for legal advice and to consider the Committee’s position and instruct its attorneys regarding the implementation of seasonal operations at the Four Corners Generating Station and other related changes to the four Corners project agreements that govern the ownership, operation and supply of coal to the plant.

Mr. C.R. Janick left the meeting.

On a motion duly made by Board Member L.C. Williams, seconded by Board Member D.S. Hendrickson and carried, the Committee convened into executive session at 9:56 a.m.

Corporate Secretary J.M. Felty polled the Committee Members via teleconference on Board Member L.C. Williams' motion to enter into executive session. The vote was recorded as follows:

YES: Board Members P.E. Rovey, Chairman; and D.S. Hendrickson, A.G. McAfee, M.V. Pace, J.M. White Jr., and L.C. Williams (6)

NO: None (0)

ABSTAINED: None (0)

ABSENT: Board Member R.J. Miller, Vice Chairman (1)

Implementation of Seasonal Operations at the Four Corners Generating Station

Using a PowerPoint presentation, Craig R. Larson, SRP Director of Coronado Generating Station, stated that the purpose of the presentation was to request approval to authorize the implementation of seasonal operations at the Four Corners Generating Station and other related changes to the Four Corners project agreements that govern the ownership, operation and supply of coal to the plant.

Mr. C.R. Larson provided background on the Four Corners Generating Station’s units, ownership, and coal supplier; Public Service of New Mexico (PNM) merger with AVANGRID; and the legal disputes regarding operations. He provided an overview of the overarching objectives and amendments sought to the project agreements relating to seasonal operations. Mr. C.R. Larson summarized the benefits of seasonal operations and resolving ownership associated with PNM’s sale of its interest in Four Corners Generating Station.

Mr. C.R. Larson concluded by requesting approval to authorize the General Manager and Chief Executive Officer, or the Associate General Manager and Chief Power System Executive, to approve the terms of the negotiated resolution and execute (i) the amendments to the Project Agreements and any ancillary agreements necessary to implement seasonal operations at Four Corners, allow Navajo Transitional Energy Company (NTEC) to self-mine, and provide NTEC’s acquisition of PNM’s share of the plant, and (ii) any subsequent amendments to such agreements provided that such amendments do not materially modify the terms of such agreements.

Mr. C.R. Larson responded to questions from the Committee.

On a motion duly made by Board Member M.V. Pace, seconded by Board Member L.C. Williams and carried, the Committee agreed to recommend Board approval, as presented.

Corporate Secretary J.M. Felty polled the Committee Members via teleconference on Board Member M.V. Pace’s motion to recommend Board approval. The vote was recorded as follows:

YES: Board Members P.E. Rovey, Chairman; and D.S. Hendrickson, A.G. McAfee, M.V. Pace, J.M. White Jr., and L.C. Williams (6)
NO: None (0)
ABSTAINED: None (0)
ABSENT: Board Member R.J. Miller, Vice Chairman (1)

Copies of the PowerPoint slides used in this presentation are on file in the Corporate Secretary’s Office and, by reference, made a part of these minutes.

Board Member S.H. Williams left the meeting during the presentation.
Transition to SRP’s Integrated System Plan – Part 2

Using a PowerPoint presentation, Angie N. Bond-Simpson, SRP Manager of Integrated System Planning and Support, stated that the purpose of the presentation is to discuss near-term planning considerations prior to the development of SRP’s Integrated System Plan (ISP), and a summary of key outcomes from the first ISP Summer Stakeholder Series meeting on June 16, 2021.

Ms. A.N. Bond-Simpson provided an overview of the summer stakeholder series. She reviewed a list of stakeholders who attended the June 16, 2021 stakeholder meeting and feedback from SRP’s overall progress. Ms. A.N. Bond-Simpson introduced Harry D. Sauthoff, SRP Manager of Forecasting, with a preliminary load forecast.

Mr. H.D. Sauthoff stated there is a strong economic growth that lies ahead and took into account that Maricopa County is the number one fastest growing county in the United States; Phoenix is one of only four major cities to have recovered at least 74% of jobs lost during the pandemic; the Southwest is becoming America’s advanced manufacturing hub; and that housing permits are at the highest since the mid-2000’s, over 100 permits every day. He said that the Greater Phoenix Economic Council (GPEC) is considering 237 active prospects and anticipates 40,000+ jobs; 31% of the active prospects are California-based companies and would require less than 4,000 Megawatts (MW) of potential new load on SRP’s system.

Mr. H.D. Sauthoff compared residential, small commercial and other customers to large commercial and industrial customers with respect to MW from 2000 through projected 2030, along with a graph of MW from Fiscal Year 2022 (FY22) through projected FY30. He concluded with key takeaways.

Continuing, Ms. A.N. Bond-Simpson reviewed the preliminary near-term source needed from projected calendary year 2022 (CY22) to CY26, and stated that load growth, reserves, and coal retirements are increasing the need for near-term resources. She discussed the era of “And” where customers manage their programs of power and include solar energy, battery storage technology, and/or flexible gas, along with managing the sequencing. Ms. A.N. Bond-Simpson reviewed the firm and intermittent resources available to customers. She discussed the resource adequacy fundamentals, and maintaining reliability with a cleaner grid. Ms. A.N. Bond-Simpson concluded with key takeaways for near term planning.

Ms. A.N. Bond-Simpson and Mr. H.D. Sauthoff responded to questions from the Committee.

Copies of the PowerPoint slides used in this presentation are on file in the Corporate Secretary’s Office and, by reference, made a part of these minutes.
Messrs. Z.J. Heim, C.R. Larson, K.R. Nielsen, and J.C. Robertson left the meeting during the presentation. Council Members C.J. Dobson, M.A. Freeman, A.M. Herrera, and T.S. Naylor; Ms. A.M. Feeney; Messrs. M. Feder and B.J. Koch; and Mitch Basefsky of Central Arizona Project (CAP) entered the meeting during the presentation.

Executive Session: National Renewable Energy Laboratory

Chairman P.E. Rovey requested a motion to enter into executive session, pursuant to A.R.S. §38-431.03(A)(2), to discuss confidential information regarding National Renewable Energy Laboratory (NREL) Battery Storage Research – Year Two Findings.

Mitch Basefsky of CAP left the meeting.

On a motion duly made by Board Member D.S. Hendrickson, seconded by Board Member L.C. Williams and carried, the Committee convened into executive session at 11:13 a.m.

Corporate Secretary J.M. Felty polled the Committee Members via teleconference on Board Member D.S. Hendrickson’s motion to enter into executive session. The vote was recorded as follows:

- **YES:** Board Members P.E. Rovey, Chairman; and D.S. Hendrickson, A.G. McAfee, M.V. Pace, J.M. White Jr., and L.C. Williams (6)
- **NO:** None (0)
- **ABSTAINED:** None (0)
- **ABSENT:** Board Member R.J. Miller, Vice Chairman (1)


Mitch Basefsky of CAP entered the meeting.
Report on Current Events by the General Manager and Chief Executive Officer or Designees

Mike Hummel, SRP General Manager and Chief Executive Officer, reported on a variety of federal, state, and local topics of interest to the Committee. He updated the Committee on the transmission systems, fires, and state legislature.

Future Agenda Topics

Chairman P.E. Rovey asked the Committee if there were any future agenda topics. None were requested.

There being no further business to come before the Power Committee, the meeting adjourned at 11:47 a.m.

John M. Felty
Corporate Secretary
Integrated System Planning Summer Stakeholder Series Debrief

Power Committee

Angie Bond-Simpson | August 24, 2021
Agenda

• ISP Summer Stakeholder Series
• IRP to ISP Transition Topics
  • ISP Vision
  • Solar Hosting
  • Battery Roadmap
  • Reliability Analysis
• ISP Next Steps
Near Term Planning

Educate on forces of change affecting the industry and near-term planning.

Collect perspectives from stakeholders.

Where We Want to Go

“Long-Term”

Engage stakeholders in early development of the ISP.

*Additional Meeting “Near-Term Planning: Part 2” to discuss next resource decision in SRP’s near-term plan

Date: August 23rd, 2021
Time: 10:00AM – 11:30AM (PST)
SRP Board and Council Observers

John Hoopes  
SRP Vice President

Randy Miller  
SRP Board Member

Anda McAfee  
SRP Board Member

Jack White  
SRP Board Member

Larry Rovey  
SRP Board Member

Suzanne Naylor  
SRP Council Member

Rocky Shelton  
SRP Council Member
ISP Summer Series Stakeholders

1. AARP
2. AEPCO
3. AES
4. Air Products
5. Amazon
6. AMPUA
7. AMWUA
8. Apache County
9. Apache Junction
10. Apex Clean Energy
11. Apple Inc
12. APS
13. Arizona Cattle Growers Association
14. Arizona Center for Law in the Public Interest
15. Arizona Chamber of Commerce
16. Arizona Commerce Authority
17. Arizona Competitive Power Alliance
18. Arizona Cotton Growers Association
19. Arizona Energy Policy Group
20. Arizona Farm Bureau
21. Arizona Hispanic Chamber of Commerce
22. Arizona Lodging and Tourism Association
23. Arizona Power Authority
25. Arizona Solar Deployment Alliance
27. Arizona State Land Department
28. Arizona State University
29. Avangrid Renewables (Iberdrola)
30. AZ Thrives
31. AZ PIRG
32. AZ Strategies
33. AZ Sustainability Alliance
34. Basha’s
35. Beatitudes Campus
36. Boeing
37. Bureau of Land Management
38. Casa Grande
39. Candela Renewables
40. Chandler
41. Chicanos Por La Causa
42. City of Mesa
43. City of Phoenix
44. City of Tempe
45. CMC Steel
46. Coolidge
47. Copper State Consulting Group
48. Cushman & Wakefield
49. Cyrus One
50. Digital Realty
51. DMB
52. East Valley Chamber of Commerce
53. East Valley Partnership
54. Environment America
55. Environmental Defense Fund
56. EPRJ
57. First Solar
58. Florence
59. Forest Service U.S. Department of Agriculture
60. Fort McDowell Yavapai Nation
61. Freeport McMoRan Copper and Gold
62. Gamage & Burnham Attorneys at Law
63. General Electric
64. Gila Bend
65. Gilbert
66. Glendale
67. Google
68. Greater Phoenix Economic Council
69. Greater Phoenix Leadership
70. Greenlots
71. Home Builders Association of Central Arizona
72. Intel
73. Interwest Energy Alliance
74. Leeward Energy
75. Local First Arizona
76. Kyl Center for Water Policy
77. Mercy Gilbert Medical Center/Dignity Health
78. Mitsubishi Hitachi Power Systems Americas, Inc.
79. Northern Arizona University
80. Navajo County
81. New Leaf/ Mesa-CAN
82. NextEra Energy Resources
83. NREL
84. Page
85. Phoenix Chamber of Commerce
86. Pinal County
87. Queen Creek
88. Roosevelt Water Conservation District
89. Salt River Pima-Maricopa Indian Community
90. Scottsdale
91. Scottsdale School District
92. Seguro Energy
93. Sierra Club
94. Southwest Energy Efficiency Project
95. Springerville
96. SRP Customer Utility Panel (CUP)
97. St. Johns
98. Strata Solar
99. Sustainable Energy Power Alliance
100. TEP
101. The Nature Conservancy
102. University of Arizona
103. United Dairymen of Arizona
104. Valle Del Sol Strategic Initiatives; The Real Arizona Coalition
105. Valley Partnership
106. Walmart
107. West Marc
108. Western Grid Group
109. Western Resource Advocates
110. WildFire

08/24/2021 Power Committee, A. Bond-Simpson
ISP Summer Stakeholder Series

What We Heard After Meeting #3:

Overall Meeting Experience?
- The time spent, logistics, overall understanding and pre-read material was all beneficial with insignificant disagreement.

What is most important for SRP to consider in the ISP horizon (2025-2035)?
- A deeper push to decarbonization: past 65% reductions
- Reliability, reliability, reliability
- The energy-water nexus, water conservation

What do stakeholders want to learn more about?
- Deeper technical details: balancing reliability and sustainability
- The roles of customers & citizens in achieving our goals
- Emerging technologies
- The challenges in achieving a net-zero system
ISP Vision

SRP collaboratively plans a future system (2025-2035), achieving or exceeding our 2035 goals, at the best customer value.

Renewables Support
What fills in the renewable gaps?

Storage Potential
How can we unlock the potential of energy storage?

Customer Greenhouse Gas Reduction
How can we empower customers to contribute to greater greenhouse gas reductions?

Grid Location
Where should resources be located to enhance the grid?

Two-Way Powerflow Enablement
How can we re-imagine a reliable and equitable grid infrastructure to enable two-way power flow for customers with evolving energy needs?

New Technology Timing
When is new technology ready to scale safely and reliably?
What is Solar Hosting?

The amount of solar generation that can be reliably placed on SRP’s system

- What does it cost to add more?
- Where should it be located to maximize value for the grid?
Meeting Customer Load

Customer Demand (MW)

- Midnight
- 7AM
- Noon
- 7PM

- Lowest Demand Point
- Wake Up & Coffee
- Peak Demand
Integrating Substantial Solar

Solar displaces conventional resources during daytime hours

Demand served by conventional resources

Demand served by solar resources

Customer Demand (MW)

Midnight  7AM  Noon  7PM
Integrating Substantial Solar – Sunrise & Morning Hours

- Solar output increases
- Conventional resources reduce output to lowest limits
- “Morning Ramp”
Integrating Substantial Solar – Cloud Cover

- Solar output fluctuates
- Flexible resources need to respond quickly
Integrating Substantial Solar – Sunset and Peak

- Solar resources reduce output
- Other resources need to come online quickly and sustain output
  - “Evening Ramp”
Solar Hosting Considerations

1. Times of potential excess generation “Overgeneration”

2. Cloud cover “Intermittency”

3. Sunrise and sunset “Ramping”

4. Peak demand

5. Stability (not shown)

6. What ifs (not shown)
Unlocking Battery Potential
Near-Term Roadmap to 2025

Duration, Size, Chemistry, Charge/Discharge Strategy, Performance, Safety, Controls, Communication, Siting, What’s Next?

Research Projects
- 9 EPRI
- 8 University
- 1 SRP

Pilots & Studies
- 20 MW
- Innovation Lab
- Transmission Demonstrations
- Distribution Pilots
- Customer Programs Pilots

Deployment & Engagement
- 372 MW
- Interconnection Standards
- Resource Adequacy

Performance & Analytics
- Effective Load Carrying Capability (ELCC)

Partners:
Reliability Analyses & Planning
What ifs

**NERC Warns Energy Shortfalls Almost Inevitable This Summer**

**Western officials reckon with reliability challenges as heat and 'wildcard' wildfire threaten grid**

Salt Fire near Roosevelt Lake knocks out SRP power line

Sources: Power, Utility Dive, AZ Family

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Reliability Simulation
Summer 2024

- **Available Capacity**
- **Unmet Need**
- **4 HR, 800 MW Storage**

System Requirements

08/24/2021   Power Committee, A. Bond-Simpson
ISP Next Steps

• Stakeholder listening and feedback conversations (Aug – Sept)
• Internal ISP Readiness (Aug – Sept)
• Prepare overarching stakeholder timeline (Sept – Oct)
  • ISP Scenario and Metric Workshops
  • Customer Focus Groups
  • Technical Working Teams
  • Regular Power Committee Updates
SRP ISP SUMMER SERIES MEETING 1:
“Since We Last Met”

The following materials will provide background information for topics that will be covered in the ISP Summer Stakeholder Series Meeting 1, “Since We Last Met.” This first meeting will update stakeholders on actions taken in accordance with the Strategic Resource Directions from the 2017-2018 Integrated Resource Plan.

To make the most of this session, it is important that you have a basic understanding of how the power grid works and the planning required to deliver energy to our customers. This session will also provide a base knowledge of the System Planning Foundation as well as cover Distribution and Transmission Planning. This will best prepare you to collaborate in our upcoming Integrated System Plan (ISP) efforts where we will develop plans to holistically address the modern needs of the grid across all SRP planning areas.

SRP Background

The Salt River Project (SRP) is a community-based not-for-profit water and energy company that provides reliable, affordable water and power to more than 2 million people living in central Arizona. SRP has provided these essential resources for more than a century to meet the growing needs of customers through innovation, planning and a focus on doing what’s right for the region. SRP is a vertically integrated utility company which owns and plans for all levels of the electric energy supply chain, including generation, transmission and distribution.
2017-2018 INTEGRATED RESOURCE PLAN

2017-2018 Integrated Resource Plan Analytic Overview

Previously, SRP used an Integrated Resource Plan (IRP) to analyze possible critical uncertainties and the resources available to navigate them. Using this IRP process, SRP could clearly understand how different resource choices and energy portfolios performed in a variety of scenarios and future business environments.

<table>
<thead>
<tr>
<th>Drivers</th>
<th>• Identify the key drivers of change</th>
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</thead>
<tbody>
<tr>
<td>Scenarios</td>
<td>• Construct plausible futures in terms of key drivers</td>
</tr>
<tr>
<td>Portfolios</td>
<td>• Design alternative resource strategies (portfolios)</td>
</tr>
<tr>
<td>Results</td>
<td>• Model the resource portfolios under each scenario</td>
</tr>
<tr>
<td>Direction</td>
<td>• Identify guiding resource principles</td>
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Stakeholder Engagement Process Overview

Recognizing that resource choices have meaningful long-term impacts on customers and many stakeholders, SRP’s IRP process relied on key analytics as well as extensive collaboration with stakeholders and SRP’s elected officials. SRP held more than 20 discussions with SRP’s elected officials, as well as five in-depth stakeholder meetings and 26 stakeholder interviews. This process was informed by and responsive to customer, stakeholder and elected official perspectives.
2017-2018 INTEGRATED RESOURCE PLAN (continued)

**Strategic Directions**

**Fundamental Objective**

The objective of SRP’s resource portfolio has always been to deliver reliable, affordable and sustainable power to our customers. The construction of the path follows a disciplined analytical process that incorporates:

1. SRP Board policy
2. 2035 and 2050 sustainability goals (in particular, our CO₂ commitment)
3. Customer needs and preferences
4. Regulations
5. Technological advancement
6. Customer costs
7. Customer satisfaction
8. Cost stability
9. Key financial indicators

The overall objective of the IRP process was to incorporate a flexible resource plan that can embrace the challenges, uncertainties and growing energy requirements of tomorrow’s world.

The following are the concluding strategic directions from the 2017-2018 IRP process:

- **Coal Generation**: Reduce the amount of energy in SRP’s portfolio produced by coal generation.
- **Natural Gas Generation**: Develop flexible natural gas generation options to meet peak demand and integrate renewables.
- **Renewable Energy**: Grow SRP’s renewables portfolio to reduce CO₂ 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**: Continue the promotion of energy efficiency programs and technologies that help customers save energy and money.
- **Market Resource**: Implement Energy Imbalance Market participation as planned and seek opportunities to expand participation in other 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.
Transmission System Overview

Transmission and distribution refer to the various stages of delivering electricity from generating resources to a “load” such as a home or a business. The primary distinction between transmission and distribution is the voltage level at which electricity moves. At SRP, transmission refers to facilities that are energized at 69 kV (69,000 volts) or higher.

The transmission system is the “interstate” of electricity delivery. It consists of three primary components: 1) substations, 2) switchyards and 3) transmission lines. Both substations and switchyards are connection points where two or more transmission lines connect to form an “intersection.”

The transmission lines are responsible for getting large quantities of electricity from the generation resources over long distances to the distribution system to deliver to customers. In a few instances, larger energy customers connect directly to the transmission system.

SRP’s grid is also part of a larger transmission network, called the Western Interconnection, which ties SRP to other regional utilities and allows SRP to participate in wholesale power markets. The SRP transmission system is just a small portion of this much larger system. Being part of the Western Interconnection provides significant reliability benefits; each entity within the interconnection can rely on others in times of emergency.
Transmission Planning for the Future

As the demand for electricity in the Phoenix metro area continues to grow, the need for new and upgraded transmission infrastructure also increases. Transmission infrastructure is planned well in advance to construct facilities and place them in service before they are needed. One of the significant challenges with planning the transmission system is the uncertainty around the location of both the new electric demand and future generation resources. SRP proactively identifies and develops effective transmission solutions to serve current and future electric customers.

SRP is integrating low-carbon resources, such as solar, to meet the growing electricity demand from our customers and to replace retiring generation assets. This shift in our resource mix also impacts the transmission system. Some of the transmission-related challenges facing utilities are system voltage control, greater fluctuations in frequency, and increased risk of interruption due to forest fires. To best prepare for these transmission-related issues, SRP is shifting from the IRP process for long-term strategic planning to an Integrated System Planning (ISP) process. These new efforts will aid in the development of plans to holistically address grid needs across all SRP planning areas. This move also bolsters our efforts to achieve our 2035 Corporate Goals.
Distribution Planning Overview

Distribution Overview

The Distribution Electrical System includes the distribution substations and the infrastructure required to bring the power safely and reliably to the customer. There are currently 189 substations located throughout the SRP distribution territory, each built to serve an approximate area of 4 square miles. A substation can accommodate between one and four transformers with each transformer serving 2,800–3,200 customers.

Distribution Planning is responsible for ensuring that SRP has the capacity to serve the electrical needs of both current and future customers safely and reliably. This is accomplished through the development of annual growth plans and designing a looped system. The development of the annual load growth plan uses criteria to provide capacity margins and to accommodate for unexpected load (e.g., planned and unplanned outages, hotter-than-normal summers and large load new customers). The looped system provides SRP with the ability to serve a customer by more than one path. If service from one path gets interrupted, SRP can still serve the customer from a secondary path. This configuration also allows SRP to reconfigure the system for optimal use of existing capacity.

This commitment to provide reliable power is why SRP has ranked highest in customer satisfaction in the western United States among Large electric utilities 21 times in the past 22 years that J.D. Power has been surveying residential electric customers.

Distribution Planning for the Future

The SRP system is very robust, has large hosting capacity and suffers few significant voltage issues. As more distributed energy resources (DER), including solar generation and battery storage, are added to the distribution system, the possibility of voltage issues increases. The system is also experiencing an increase in electrification (electric vehicle adoption, smart appliances, etc.) that draws more of the load.

When we take these factors into account, it becomes clear that we need to enhance our projection models of the distribution system as well as increase our ability to collect and analyze data. These efforts to plan for the changing grid system will better enable distribution planning to work collaboratively with other planning areas at SRP through the Integrated System Planning (ISP).
In recent years, the electric power industry has undergone a dramatic transformation which is expected to accelerate.

This transformation is driven by a variety of factors, including:

- Rapid deployment of large-scale variable energy resources (VER)
- The growth of distributed energy resources (DER)
- Dramatic advances in digital energy and communications technologies
- Persistent low natural gas prices
- Increased reliance on just-in-time delivery of natural gas to support gas-fired generation
- Growing awareness of the electric sector’s potential role in achieving environmental goals

Where these changes are occurring, traditional planning methods are increasingly insufficient to optimally develop a safe, reliable, affordable and environmentally responsible power system.
SRP has begun transitioning from a traditional Integrated Resource Plan (IRP) to a more holistic and comprehensive Integrated System Plan (ISP). This new ISP, formally kicking off in early 2022, is a data-driven process that collaboratively integrates all internal planning functions for generation, transmission, distribution, and customer-sided resources to adapt to evolving industry demands and enhance long-term resource value for our customers and communities, through the lenses of sustainability, reliability and affordability.

The SRP Summer Stakeholder Series is an opportunity to update, educate and engage with community partners like yourself regarding this upcoming transition. Working with community stakeholders is valuable and essential as SRP charts the course to achieving its aggressive 2035 corporate and sustainability goals.

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<tr>
<th>ISP SUMMER SERIES MEETING 1</th>
<th>ISP SUMMER SERIES MEETING 2</th>
<th>ISP SUMMER SERIES MEETING 3</th>
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</thead>
<tbody>
<tr>
<td><strong>“Since We Last Met”</strong></td>
<td><strong>“Near-Term Planning”</strong></td>
<td><strong>“Where We Want To Go”</strong></td>
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<tr>
<td>June 16</td>
<td>July 22</td>
<td>August 16</td>
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<td>9:30AM – 11:30AM (PST)</td>
<td>10:00AM – NOON (PST)</td>
<td>8:30 - 10:30AM (PST)</td>
</tr>
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</table>

**OBJECTIVE:**
- **Update** on actions taken in accordance with Strategic Resource Directions from the 2017-2018 Integrated Resource Plan

**OVERVIEW OF TOPICS:**
- 2017-2018 Integrated Resource Plan Strategic Direction Progress
- System Planning Foundations (Distribution, Transmission & Load Growth)

**OBJECTIVE:**
- **Educate** on forces of change affecting the industry and SRP’s near-term planning focus

**OVERVIEW OF TOPICS:**
- Integrated Resource Plan to Integrated System Plan Transition
- Current Planning Environment
- Near-Term Reliability Challenges & Solutions

**OBJECTIVE:**
- **Engage** stakeholders in early development of the ISP

**OVERVIEW OF TOPICS:**
- Integrated System Plan Objectives
- Stakeholder Involvement Opportunities
- Preliminary Integrated System Plan Metric Considerations


**Glossary**

**Distributed Energy Resource (DER):** Any resource on a distribution system that produces electricity and/or can be controlled (e.g., demand response).

**Distribution System (distribution lines):** The last phase of power delivery. This is where high-voltage electricity is distributed from generation assets to substations where the voltage is lowered to a level that can be delivered directly to residential homes and businesses.

**Energy:** The amount of electricity customers use or that a generating resource produces over a specific period.

**Integrated Resource Planning (IRP):** A process in which SRP plans with community stakeholders to identify and prepare electricity generating resources and customer programs to serve customer needs.

**Integrated System Plan (ISP):** A data driven, collaboratively developed plan for generation, transmission, distribution and customer resources to meet SRP’s 2035 Corporate Goals and prepare for SRP’s growing power system needs and aggressive 2050 ambitions.

**Load/Demand:** The amount of electricity being used at any given moment by a single customer or by a group of customers. The total demand on a given system is the sum of all individual demands on that system occurring at the same moment. The peak demand is the highest demand occurring within a given span of time, usually a season or a year. The peak demand that a transmission or distribution system must carry sets the minimum requirement for its capacity (see also the definition for energy).

**Substations:** Secure areas where the high-voltage transmission system connects to the lower-voltage distribution system for purposes of switching, metering or adjusting voltage.

**Transmission and Distribution:** Transmission and distribution refers to the different stages of carrying electricity over poles and wires from generators to a home or a business. The primary distinction between the two is the voltage level at which electricity moves in each stage, with transmission carrying a higher voltage than distribution.

**Transmission System (transmission lines):** Facilities that are energized at 69 kV (69,000 volts) or higher. Transmission is the “interstate highway” of electricity delivery. It refers to the part of electricity delivery that moves bulk electricity from the generation sites over long distances to substations closer to where the electricity is needed.

**Variable Energy Resource (VER):** Any generation resource whose output is not perfectly controllable by a transmission system operator and whose output is dependent on a fuel resource whose availability is difficult to predict. Residential solar is a good example of a VER.

**Western Electricity Coordinating Council (WECC):** WECC is an independent organization that works with entities across the West to further grid reliability. Through its various reliability-related activities, WECC provides critical support to the Reliability Coordinator and the resource owners/operators throughout the Western Interconnection.

**Resources:** Power generation assets that produce electricity for SRP customers or customer programs to reduce customer energy use.
SRP’s Mission Background

SRP has been committed to providing sustainable, reliable and affordable power to Central Arizona for more than a century. By providing this essential resource, SRP has helped the Phoenix metropolitan area develop and thrive. SRP acts in the best interest of the people it serves and strives to help build a better future for Arizona. For over a century, SRP has focused on building strategic partnerships and innovative solutions to meet the Valley’s ever-changing needs. In the years ahead, SRP will continue to lead the way by applying a forward-thinking approach and new technology to address energy supply challenges.

SRP focuses on these key elements when planning energy resources for the future: obligation to serve customers’ growing energy demand, maintaining reliability through resource adequacy and appropriately balancing reliability with sustainability and affordability.
Serving Growing Customer Energy Needs

Customer Usage and Changing Needs

As discussed in Meeting 1 of the Summer Stakeholder Series, forecasting SRP customers’ future energy demand (load) is one of the most important inputs for any long-term plan development. It is vitally important to know how many residential, industrial and commercial customers are expected to reside in SRP’s load serving territory so that SRP can plan and maintain the reliability of its transmission and distribution systems and also have enough generating resources online to meet that load. Additionally, customers’ energy usage and needs continue to evolve and change as the digital economy drives an evolution in how and when customers use power. SRP continues to adapt customer programs to meet changing patterns in electricity use and needs. The smart thermostat program and electric vehicle price plan are just two examples of how SRP is adapting to customer usage and needs.

The metro Phoenix area continues to rank high in population growth nationally. For SRP, this growth means more customers, higher energy demand and increases in peak demand. In addition to the growth in residential customers, the SRP service area is experiencing unprecedented economic development growth from tech firms and advanced manufacturing. This demand is coming rapidly, putting the pressure on SRP to develop solutions ahead of the development of the Integrated System Plan (ISP). Demand has increased 1.7% per year during the last decade and SRP expects these trends to continue. Given the significant range in possible outcomes regarding impact to energy demand (load) growth, this requires a full portfolio of resource options to manage uncertainty.

Every year, the SRP forecasting team conducts a thorough process to develop the load forecast. This process gathers many different economic outlook perspectives from experts in both academia and industry on projected growth in economic development in SRP territory based on the latest information. Energy efficiency, electric vehicles, customer time-of-use plans and other demand response programs are all major considerations included for the development of the load forecast. It is also important to note that climate change has impacts on forecasting energy demand. In recent years, extreme heat waves have swept across the western United States and set all-time records. SRP meteorologists utilize the Intergovernmental Panel on Climate Change scenarios to employ climate change weather assumptions to inform the load forecast. The forecasting team then compiles all key assumptions and inputs into the model that projects SRP’s expected customer energy demand in the coming years. This forecast helps inform many of SRP’s key financial, resource, distribution and transmission plans and decisions.
Keeping the Lights On

Energy versus Capacity

Keeping the lights on means that SRP must plan to provide reliable electric service in all hours of the year. This type of planning requires an evaluation of both energy and capacity needs, which are two important pieces of planning for reliable electric service.

Capacity is the maximum output a generating resource can physically produce or export at a single point in time, measured in megawatts (MW). This output helps serve peak demand hours and other times when the system has critical needs. Not all resources have the same capability to produce power at full capacity for all hours of the day and year. Customer programs, such as Demand Response, are measured by their capacity to reduce demand, also in MW.

Energy is the amount of electricity a generator produces over a specific period of time. Many generators do not operate at their full capacity all the time. A generator’s output may vary according to conditions at the power plant, the availability and cost of fuel, variability of wind and sun, market prices or dispatch instructions from the utility.

We can think of capacity like the lanes on a freeway and the number of vehicles it can allow at any given point. Commuters need enough lanes to accommodate the number of vehicles during rush hour traffic. This means several of the lanes may be empty during other times of the day, but the additional lanes are necessary for vehicles during a peak traffic time.

We can think of energy as the flow and number of vehicles traveling on the freeway over a given period of time.

Analogy:
Capacity: Maximum number of cars on Interstate 10 during rush hour.
Energy: Cars per year traveling on Interstate 10.
What Is Resource Adequacy and Reliability?

Resource adequacy refers to having enough resources — generation, efficiency measures, and demand-side resources — to serve electricity demand across a wide range of conditions with a sufficient degree of reliability. **Resource adequacy is the ability to meet customers’ energy demand at all times of the day and across a variety of system conditions.** It is like making sure there is enough money in a bank account to cover known expenses and unforeseen emergencies. The North America Electric Reliability Corporation (NERC) defines resource adequacy as “the ability of the electric system to supply the aggregate electric power and energy requirements of the electricity consumers at all times, taking into account scheduled and reasonably expected unscheduled outages of system components.” Resource adequacy is primarily a function of energy demand (load), generation and transmission.

Electric power systems must continuously balance instantaneous supply and demand. However, neither supply nor demand is perfectly predictable. For example, generating resources are sometimes unavailable due to either planned or unplanned outages. The outputs of some renewables are subject to significant variability due to clouds and wind fluctuations, and customer loads vary for reasons ranging from weather to behavioral factors. To ensure that supply is available to meet demand, electric system operators and planners rely on reserves, or additional resource capacity as insurance.

Power system reliability refers to the ability to supply adequate electric service to end use customers on a nearly continuous basis, with few interruptions over an extended time period. In simple terms, reliability means that electricity is always there when the customer needs it. **Resource adequacy, as described above, is one key element of reliability. A second key element is power system stability.**

Under normal operating conditions, the power system is in a state of “equilibrium”; the electric demand and supply of energy are perfectly balanced, and all power system elements are operating within their respective ratings and limits. However, disturbances on the power system will frequently occur that will disrupt the state of equilibrium; the power system will either recover to a new state of equilibrium or will completely fail resulting in a widespread blackout. **Power system stability is the ability of the power system to transition from one state of equilibrium to another in response to a system disturbance.**

Traditional generating resources have inherent characteristics that strengthen power system stability. The ability to maintain power system stability will be challenged as traditional generation resources are retired and renewable generation technologies are introduced to the power system. The current ability of most renewable resources to support power system stability is not comparable to those inherent in traditional generating resources. **Ensuring a strong system stability moving forward will require a more integrated approach to plan, design and operate the power system.**

What Happens Without Resource Adequacy?

**Without sufficient generation resources and power system stability, the region may experience power shortages. Sometimes, a power shortage can mean the lights stay on, but electricity becomes more expensive to supply.** Other times, a power shortage means the electrical grid fails and there is a complete loss of power. This type of power shortage is called a blackout. Traditionally, an area of great concern is meeting the most intense hours of demand where risk is the highest for power shortages. A widespread blackout during an intense heatwave may be detrimental to the health and safety of customers, which is why SRP needs to maintain resource adequacy to serve its customers during the hottest days of the year when the peak demand is highest.

Resource adequacy is becoming more complex as the utility industry is transitioning away from conventional generating technology and towards renewables and storage. Resource adequacy considers conditions across all hours of the year, not just during peak demand periods. With more renewables and storage on the system, resource adequacy must consider more types of conditions that could result in loss of load, such as periods of cloud cover. Reliable electricity supply is also becoming increasingly important to society as recent extreme weather events triggered regional outages that impacted customers and communities across the electric system. Since SRP is connected to a larger grid system that connects with neighboring utilities, when one area is not resource adequate, it puts the risk on the regional grid.
Extreme temperatures also put pressure on utilities in terms of maintaining reliability. Extreme temperatures not only drive up the demand for more energy by customers, but they also fuel natural disasters such as wildfires that can damage the transmission system and limit utilities’ ability to bring power into their service territories to serve customers. These issues are expected to continue given the climate change impacts experienced over the last few years. Recent issues in the West have led officials to urge customers to use less electricity to prevent further power outages. For more information about resource adequacy issues in the western United States, please reference the appendix of the pre-read, Near-Term Challenges in the West.
Types of Resources and How They Contribute to Resource Adequacy

**Firm Resources:** These are sources of electricity (generation resources) that the utility can dispatch to meet system needs. Characteristics of a firm resource include reliable capacity in all seasons and over long durations. Some firm resources also provide flexibility to balance ramps caused by intermittent resources and fast response during emergency events. Of the commercially available technologies today, firm resources include natural gas combustion turbine/peakers (including hydrogen ready), natural gas combined cycle, nuclear, coal, geothermal and biomass.

![Diagram of firm resources](image)

**Intermittent Resources:** These energy sources are not fully dispatchable due to their variable output, which is determined by weather conditions. Intermittent resources include wind and solar.

![Diagram of intermittent resources](image)

**Limited Duration Resources:** These resources can be dispatchable but can only provide energy for a set number of hours before needing to be recharged or affecting customer behavior. Examples include battery storage, pumped hydro, customer demand response and energy efficiency programs.

![Diagram of limited duration resources](image)

Harnessing intermittent generation resources like solar and wind is a key part of lowering SRP’s carbon emissions, but these resources alone cannot supply the flexible and sustained capacity needed to maintain reliability and resource adequacy. To maintain reliability and resource adequacy, SRP needs enough firm dispatchable resources to meet capacity needs when the sun is not shining and the wind is not blowing. As SRP transitions its resource portfolio and plans for growing customer energy demand, there is a near-term planning need to integrate all resource types: firm, intermittent and limited duration. An all-the-above approach will provide value to customers in terms of reliability, affordability and sustainability.
Balancing Sustainability, Reliability and Affordability

As SRP plans its resource decisions to address growing customer energy demand, it is working towards a sustainable future to benefit customers and the communities served. To do this, SRP makes decisions through future generations’ eyes while still providing reliable and affordable power for customers today.

Resource Focused Sustainability Corporate Goals

SRP’s 2035 Corporate Goals set specific sustainability targets that impact SRP’s future resource planning. SRP integrates these commitments into resource planning objectives to advance these corporate goals.

- Reduce the amount of CO2 emitted by generation by 65% (per MWh) from 2005.
- Reduce carbon intensity by 90% from 2005 levels by 2050.
- Achieve a 20% reduction in generation-related water use intensity across all water types.
- Eliminate or offset power generation groundwater use in Active Management Areas (AMAs).

As explained in Meeting 1, SRP is positioning its resource portfolio for a lower-carbon future by retiring coal plants, adding new renewable resources, adopting customer programs that reduce demand, integrating storage, adding flexible natural gas and acquiring existing zero-carbon nuclear resources. SRP will soon launch preparation of the Integrated System Plan for continued progress on achieving a lower-carbon future.

Importance of Affordability

For many decades, the power industry counted on traditional generation resources such as coal as the least-cost resource that could operate day and night to serve retail load reliably. These resources were an essential part of a utility’s generation mix to help keep operating costs low. Given the retirement of traditional resources paired with customers’ growing energy needs, SRP faces significant near-term resource decisions from 2021-2024 to address near-term energy needs. These investment decisions for additional resources must consider costs for customers. Affordability is a pillar in SRP’s mission to serve customers. Increases in energy costs impact all SRP customers but often have a higher burden on low-income households that struggle to keep up with rising costs.
Other Ways SRP Supports Saving Customers Money on Their Energy Bills

- Providing customers an understanding of their energy usage and offering energy saving solutions and ways to save.
- Offering price plans and billing options that fit customers’ energy usage and lifestyle.
- Providing rebates and incentives for customer technologies from smart thermostats to electric vehicle chargers.

SRP Ranks Highest in West Large Region for 21st Year

SRP takes great pride in serving its community. With careful planning, SRP strives to strike the right balance of reliability, affordability and sustainability for its customers. J.D. Power recently ranked SRP highest in customer satisfaction in the western United States among large electric utilities for the 21st time in the 22 years that J.D. Power has been surveying residential electric customers — and the 19th year in a row.

Among the large electric utilities (500,000+ households), customers ranked SRP as the top-performing utility nationwide in three of the six factors that make up the customer satisfaction score: Power Quality and Reliability, Corporate Citizenship and Customer Care. On the other three factors — Price, Billing and Payment and Communications — SRP ranked a close second.
Key Takeaways

• When planning energy resources for the future, SRP focuses on the obligation to serve customers’ growing energy demand, maintaining reliability through resource adequacy and appropriately balancing reliability with sustainability and affordability.

• The SRP service area is experiencing unprecedented economic development growth from a wide variety of new and expanding customers, including tech firms and advanced manufacturing. This demand is coming rapidly, putting the pressure on SRP to develop solutions ahead of the development of the ISP.

• To address some immediate resource needs, SRP has already more than doubled its commitment to solar to 2,025 MW by 2025, is adding 114 MW of carbon-free nuclear generation by 2023, 150 MW of demand response by Summer 2022 and with the additions of 372 MW of battery storage by 2023 SRP will have some of the largest solar plus battery installations in the country.

• Given the significant range in possible outcomes regarding impact to energy demand (load) growth, this requires a full portfolio of resource options to manage uncertainty.

• SRP must maintain resource adequacy, or the ability to meet customers’ energy demand, at all times of the day and across a variety of system conditions. The second key element of reliability is power system stability, or the ability of the power system (transmission and distribution) to transition from one state of equilibrium to another in response to a system disturbance. To ensure strong system stability moving forward will require a more integrated approach to plan, design and operate the power system.

• Without sufficient generation resources and power system stability, the region may experience power shortages. Sometimes, a power shortage can mean the lights stay on, but electricity becomes more expensive to supply. Other times, a power shortage means the electrical grid fails, and there is a complete loss of power.

• As SRP transitions its resource portfolio and plans for growing customer energy demand, there is a near-term planning need to integrate all resource types: firm, intermittent and limited duration. An all-the-above approach will provide value to customers in terms of reliability, affordability and sustainability.

• Given the retirement of traditional resources paired with customers’ growing energy needs, SRP faces significant near-term resource decisions from 2021-2024 to address near-term energy needs. These investment decisions for additional resources must consider sustainability, costs and reliability.

• For the long term, SRP is positioning its resource portfolio for a lower-carbon future by retiring coal plants, adding new renewable resources, adopting customer programs that reduce demand, integrating storage and adding zero-carbon nuclear resources. SRP will soon launch preparation of the ISP for continued progress on achieving a lower-carbon future.

• Customers ranked SRP as the top-performing utility nationwide in Power Quality and Reliability, Corporate Citizenship and Customer Care. In Price, Billing and Payment and Communications, SRP ranked a close second.
Appendix: Near-Term Challenges in the West

Planning for resource adequacy with rising load growth is essential because of the expected retirements of baseload generation, the expanding penetration of intermittent renewable resources and long-term carbon goals. For more information about resource adequacy issues in the western United States check out these articles:


SRP ISP ROADMAP
Stakeholder Engagement and Public Outreach

01 Align
ISP Summer Series Meeting 1 “Since We Last Met”:
Review 2017-18 IRP process and the actions taken since.

ISP Summer Series Meeting 2 “Near-Term Planning”:
Discuss IRP to ISP transition and current planning environment.

ISP Summer Series Meeting 3 “Near-Term Planning Part 2 / Where We Want to Go”:
Address Stakeholder feedback to date and inform of upcoming resource decisions. Engage in early development of the ISP.

02 Prepare
ISP Goals
Discuss objectives for the ISP.

Periodic ISP Elected Officials and Leadership Updates:
Share updates on progress to date.

ISP Metrics & Scenario Workshops:
Determine measures of success and what to test.

03 Analyze
Periodic ISP Elected Officials and Leadership Updates:
Share updates on progress to date.

ISP Analytical Framework Overview:
Review approach to the ISP analysis and share inputs and assumptions.

ISP Analysis Update(s):
Share updates on progress to date.

04 Synthesize
ISP Draft Results:
Preview the ISP before it’s finalized.

Periodic ISP Elected Officials and Leadership Updates:
Share updates on progress to date and align on final ISP.

ISP Final Results & Recommendations:
Share finalized ISP and next steps.
Request for a Recommendation to Approve the Coolidge Expansion Project

Power Committee

Kelly Barr, Grant Smedley, Bill McClellan, Spence Wilhelm | August 24, 2021
Addressing Near-Term Needs – “AND” Strategy

2021-2024
New Solar Announcements

2024-2025
Energy Efficiency & Demand Response

2024-2025
Coolidge Expansion Project

2024-2025
All-Source RFP* & Additional Announcements

2025-2035
Integrated System Plan

* RFP = Request for Proposals
Significant Near-Term Growth

Base: 8,514 MW by summer 2024

Base: 8,826 MW by summer 2025

High: 11,046 MW

Low: 8,966 MW

FP22: 8,977 MW

Key Takeaway: ~900 MW of new load expected by 2024, ~1,200 MW 2025
Near-Term Resource Additions and Needs

- 2024: 700+ MW
- 2025: 1000+ MW

Capacity Additions:
- Natural Gas
- NG Upgrades
- Demand Resp.
- Add. Palo Verde
- New Solar
- Add. Needs

Load Growth and Add. Reserve Margin

08/24/2021 Power Committee, K. Barr, G. Smedley, B. McClellan, and S. Wilhelm
Considerations for Near-Term Capacity Additions

- **Reliability**
  - Available when needed
  - Timely development
  - Technology maturity

- **Sustainability Commitments**
  - Carbon
  - Water

- **Affordability**
  - Lowest quartile prices regionally
Recommendation – Coolidge Expansion

16 Units (820MW) Serves Near-Term Growth

“AND” Strategy—Low-Use Flexible Natural Gas, Wind, Solar, Storage

Enable Integration of Renewables

Existing Infrastructure Utilization

Hydrogen Capable

Contributes to SRP’s Reliability Backbone
SRP Carbon Commitment
Intensity Based

SRP can meet its carbon reduction commitment through multiple resource pathways.

Additions of renewables, storage, and emerging technologies are necessary for deep decarbonization.

08/24/2021 Power Committee, K. Barr, G. Smedley, B. McClellan, and S. Wilhelm
Why not add more Battery Storage instead?

- Adding ~400 MW by 2023
- Lack of operational experience
- No long-term performance data
- Limited discharge duration
- Supply chain risks (2024 need)
Economic Comparison

- Coolidge portfolio is the least cost option under all scenarios
- Coolidge expansion breaks even in the 2030s in all scenarios
- All scenarios meet SRP carbon commitments
- 3-4 times the carbon free capacity needed to provide similar reliability

### Table: Coolidge vs. Zero-Carbon Portfolio

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Net Present Value</th>
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<tr>
<td>Low Gas Prices</td>
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<tr>
<td>Base Gas Prices</td>
<td>+ $637 million</td>
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<tr>
<td>High Gas Prices</td>
<td>+ $407 million</td>
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<tr>
<td>Low Battery Costs</td>
<td>+ $342 million</td>
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</table>
Existing Coolidge Facility

Natural Gas Fired – Simple Cycle

- 12 aeroderivative gas turbines (GE LM6000)
- 615 MW nameplate capacity
- Built in 2008 by TransCanada
- Purchased by SRP in 2019
- Best available emission controls
Coolidge Expansion

Expansion Scope

• 16 additional aero. gas turbines
• 8 in 2024, 8 in 2025
• 820 MW nameplate capacity
• Best available emission controls
• 500 kV switchyard

Leverage Existing Infrastructure

• Two natural gas pipelines
• Sufficient water supply
• 500 kV and 230 kV transmission
## Siting and Permitting Schedule

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<thead>
<tr>
<th>Year</th>
<th>Event Description</th>
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<td>Power Com/Public Launch</td>
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<td>SRP Board Review</td>
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<td>90-day Pre-Filing</td>
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<td>CEC Application</td>
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<td>ACC Approval</td>
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<td>Submit Application</td>
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<td></td>
<td>Public Comment Begins</td>
<td>01/10/22</td>
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<td></td>
<td>Issue Final Permit</td>
<td>03/31/22</td>
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08/24/2021 Power Committee, K. Barr, G. Smedley, B. McClellan, and S. Wilhelm
Opportunities for Public Involvement

- Hotline/Website: Aug. ‘21
- Virtual Open House: Sept. ‘21
- Open House: Oct./Nov. ‘21
- Siting Hearing: Jan./Feb. ‘22
- ACC Open Meeting: Mar. ‘22
Proposed Construction Schedule (Accelerated)

SRP Board Meeting
9/13/21
ACC & Air Permit Approval
3/31/22

Turbine Procurement
- Turbine pre-payment
  10/1/21
- Manufacturing start
  10/1/21
- First 8 delivery
  12/26/23
- Second 8 delivery
  9/16/24

Transformer orders
10/1/21

Transmission
- 500kV Switchyard complete
  1/2/24

First 8 Online
5/13/24
Second 8 Online
3/29/25
## Planned Expenditures

### Capital Expenditures (in millions)

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<th>FY24</th>
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<tr>
<td>Capital</td>
<td>$37</td>
<td>$261</td>
<td>$464</td>
<td>$68</td>
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08/24/2021  Power Committee, K. Barr, G. Smedley, B. McClellan, and S. Wilhelm
Coolidge Advancement vs. FP22

- Capital spending for Coolidge reflects most recent estimate; cash outflows advanced to earlier years
- Existing liquidity sufficient to cover budget year expenses
- Management will share broader financing plan at October Board/Council Work Study Session
  - Plan includes:
    - Commercial Paper
    - Revenue Bonds
Request for Approval

Management requests that the Power Committee recommend that the Board authorize the Associate General Manager and Chief Power System Executive, President, Vice-President, or General Manager and Chief Executive Officer to:

(i) execute agreements for the purchase of 16 GE LM6000 gas turbines and associated equipment and for the installation thereof including any necessary balance of plant modifications and transmission system upgrades for a total cost not to exceed $953 million;
(ii) obtain any necessary permits or modifications to existing permits for the installation and use of such equipment; and
(iii) execute any subsequent amendments to such agreements that do not materially modify the terms of the agreements.
Questions
Amended and Restated ANPP VTS Participation Agreement

Bryce Nielsen | August 24, 2021
Background

In July 1981, the Participants of the Arizona Nuclear Power Project (ANPP), entered into an ANPP Valley Transmission System (VTS) Participation Agreement associated with:

- Palo Verde - Westwing 500kV Line
- Westwing 500kV Switchyard Expansion
- Palo Verde - Kyrene 500kV Line
- Kyrene 230kV Switchyard Expansion
- New Kyrene 500/230kV Substation
Background, Cont.

• Amendment 1 was executed in August 1982:
  • Palo Verde – Westwing 500kV Line #2
  • Joint development of the Rudd 500kV Switchyard

• Amendment 2 was executed in May 1987:
  • Revised the liability provisions

• Amendment 3 was executed in December 2001:
  • Added the Jojoba 500kV Switchyard to the Transmission System
  • Looping the Palo Verde-Kyrene 500kV line in and out of the Jojoba 500kV Switchyard
Proposed Administrative Changes to the Agreement

• Incorporate revisions made by Amendments 1 through 3

• Updates to VTS Components
  • Kyrene Interconnection Agreement
  • New facilities constructed
  • Document ownership allocation of all components

• Incorporates updates to conform with current FERC, NERC and WECC practices

• Clarifies Common Facilities charges
  • Eliminates the Equalization charge at Kyrene to match APS eliminating a similar charge at Westwing
Proposed Administrative Changes to the Agreement, Cont.

• Authorizes the E&O Committee to approve future revisions to Appendices

• Clarifies the term of the VTS Agreement
  • Tied to ANPP HVS Agreement

• Adds a Right of First Refusal (ROFR) provision

• Future amendments will reflect the District’s purchase of a portion of PNM interest
  • ROFR exemption executed previously
Request

• In accordance with the terms discussed herein, request that the Committee recommend that the Board authorize the Associate General Manager and Chief Power System Executive, President, Vice-President, or General Manager and Chief Executive Officer, to execute:
  • The Amended and Restated ANPP VTS Participation Agreement;
  • Future amendments to reflect the changes in ownership related to the sale from PNM to SRP; and
  • Any subsequent amendments to such agreement that do not materially modify the terms of the agreement.
thank you!
Agenda

• Major Generation Projects Update
  • NGS Decommissioning
  • Near Term Capacity Project (LM6000’s at Desert Basin and Agua Fria)
**Project: NGS Decommissioning Project**

<table>
<thead>
<tr>
<th>Cost</th>
<th>Budget</th>
<th>Forecast</th>
<th>Comments</th>
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<tr>
<td></td>
<td>$171.8M</td>
<td>$169m</td>
<td>High scrap value has offset overruns due to asbestos landfill and PCB cleanup</td>
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<th>Schedule</th>
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<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dec 2024</td>
<td>Feb 2023</td>
<td>Only ongoing monitoring and water purging will remain</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Risks/Issues</th>
<th>Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procurement costs, ex. Landfill liner</td>
<td>Fixed price in contract, monitor contractor performance to avoid “make up” charges.</td>
</tr>
<tr>
<td>Availability of native seed mix</td>
<td>Identify alternative mix options</td>
</tr>
</tbody>
</table>
## Project: NGS Decommissioning Project

<table>
<thead>
<tr>
<th>Accomplishments</th>
<th>Upcoming Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong safety record</td>
<td>Ash landfill and pond civil work continues</td>
</tr>
<tr>
<td>High scrap recovery credits, + $15m</td>
<td>Circ water pipe removal and remediation</td>
</tr>
<tr>
<td>Turbine pedestal demolition</td>
<td></td>
</tr>
<tr>
<td>Contractor Job Fair, 100 applicants</td>
<td></td>
</tr>
</tbody>
</table>
## Project: Near Term Capacity (NTC) Project

### Cost

<table>
<thead>
<tr>
<th>Cost</th>
<th>Budget</th>
<th>Forecast</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not to Exceed $254m</td>
<td>$222M</td>
<td>High contingency in early cost estimates, EPC formal bid costs included</td>
</tr>
</tbody>
</table>

### Schedule

<table>
<thead>
<tr>
<th>Schedule</th>
<th>Planned</th>
<th>Forecast</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>June 1, 2022</td>
<td>June 1, 2022</td>
<td>Long lead items have been identified. A detailed schedule is being finalized.</td>
</tr>
</tbody>
</table>

### Risks/Issues

<table>
<thead>
<tr>
<th>Risks/Issues</th>
<th>Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPC (Engineering, Procurement, Construction) contract</td>
<td>Resolved: Primoris Services Corporation selected, ARB Industrial business unit completing work.</td>
</tr>
<tr>
<td>Permit process</td>
<td>Permits are moving thru the process</td>
</tr>
<tr>
<td>Procurement challenges</td>
<td>Expedite RFP and PO processes, negotiate vendor performance.</td>
</tr>
</tbody>
</table>
# Project: Near Term Capacity (NTC) Project

## Accomplishments
- PO’s issued for long lead time items
- EPC selected

## Upcoming Activities
- Transmission interconnection design work
- 10/31: Draft permit for Agua Fria, begin construction
- 12/31: Draft permit for Desert Basin, begin construction
Questions?