SRP Integrated System Plan Advisory Group Meeting #12 ISP Analysis Key Findings & ISP Draft Strategies

May 19th, 2023

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Welcome

Bobby Olsen AGM & Chief Planning, Strategy & Sustainability Executive (SRP)

Welcome SRP Board and Council Observers



John Hoopes SRP Association Vice President



Chris Dobson SRP District Vice President



Anda McAfee SRP Board Member



Jack White SRP Board Member



Larry Rovey SRP Board Member



Krista O'Brien SRP Board Member



SRP Council Member



Rocky Shelton SRP Council Member

Safety & Sustainability Minute

Safety

May is Mental Health Awareness Month

Suicide and Crisis Lifeline – you can simply dial 988

Sustainability

Change your air filters regularly to help save on home energy



SRP Updates

Meeting Objectives:

Advisory Group Meeting #12: ISP Analysis Key Findings & ISP Draft Strategies

- Share and discuss key findings for affordability metrics from the ISP analysis
- Share and discuss draft system strategies

Advisory Modeling Subgroup Meeting: ISP Analysis Results Part 2- Technical Q&A Session

 Discuss Technical Q&A for the results from ISP analysis for resource planning, transmission planning, and affordability metrics

Agenda:

Advisory Group Meeting #12: ISP Analysis Key Findings & ISP Draft Strategies

Time		Topics	Presenter	
8:30-9:00	30 min	Breakfast & Networking		
9:00-9:20	20 min	Welcome, Opening Remarks and Meeting Orientation	Bobby Olsen (SRP) Joan Isaacson (K&W)	
9:20-9:30	10 min	Recap of April 21st ISP Advisory Group & May 12th Large Stakeholder Group Meetings	Maria Naff (SRP)	
9:30-9:40	10 min	Input Validation Update	Joe Hooker (E3)	
9:40-9:50	10 min	Transmission Planning & Production Cost Model Analysis Updates	Justin Lee (SRP) Michael Reynolds (SRP)	
9:50-10:35	45 min	Preliminary Affordability Metrics & Key Findings w/ Q&A and Roundtable Discussion	Angie Bond-Simpson (SRP) Adam Peterson (SRP)	
10:35-10:45	10 min	Coffee Break		
10:45-11:15	30 min	Review of Reliability and Sustainability Metrics	Kyle Heckel (SRP)	
11:15-12:00	45 min	Draft ISP System Strategies w/ Q&A and Small Group Discussion	Angie Bond-Simpson (SRP)	
12:00-12:25	25 min	Working Lunch: Ideas for Implementation	Facilitated by Joan Isaacson	
12:25-12:30	5 min	Next Steps, Wrap Up and Feedback on How to Receive Updates Over the Summer	Maria Naff (SRP)	

Agenda:

Advisory Modeling Subgroup Meeting: ISP Analysis Results Part 2 - Technical Q&A Opportunity

Time		Topics	Discussion Lead
12:30-12:45	15 min	Coffee Break	
12:45-2:30	105 min	Technical Q&A Opportunity	

Guides for Productive Meetings

- Actively participate
- Stand up name tent to indicate wanting to provide input, ask a question, etc.
- Encourage and seek multiple perspectives, including use of multiple engagement methods
- When introducing technical subjects, begin with straightforward definitions and avoid acronyms; create comfortable environment for questions and understanding
- Stay concise so that everyone has time to participate
- Maintain one representative per Advisory Group member organization in meeting discussions
- Enjoy the meeting!

Recap of April 21st ISP Advisory Group & May 12th Large Stakeholder Group Meetings

Maria Naff Manager, Integrated Planning (SRP)

April. 21st Discussion Themes

- Shared and discussed key findings from ISP analysis for Forecasting, Customer Programs, Distribution Planning, Transmission Planning, and ISP long-term capacity expansion
- Shared and discussed initial strategy themes



May 12th Discussion Themes

- Informed stakeholders on the process to interpret the results and ISP outputs
- Shared and discussed key findings from ISP analysis for Forecasting, Customer Programs, Distribution Planning, Transmission Planning, and ISP long-term capacity expansion
- Share initial strategy themes
- Hosted a poster session



Input Validation Update

Joe Hooker Director, Energy + Environmental Economics

Update to Long-Term Capacity Expansion Modeling

• The project team discovered that the cost of batteries was not flowing through correctly in the Long-Term Capacity Expansion model.

• This resulted in battery additions looking overly favorable to the model.

• After the team corrected this issue, the model built less battery storage and more of other resources.

Capacity Additions by 2035 (MW)

Old Results

New Results

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Next Steps

The project team is working to update affordability and sustainability metrics using the new long-term capacity expansion modeling results.

Transmission Planning & Production Cost Model: Analysis Updates

Justin Lee Manager, Transmission System Planning (SRP)

Michael Reynolds Manager, Resource Analysis and Planning (SRP)

Transmission Planning: Current Trends, Min. Coal Case

Justin Lee Manager, Transmission System Planning (SRP)

Cases Being Analyzed

Strategic Approaches

		Technology Neutral	No New Fossil	Min. Coal			
Cu	irrent Trends (aka FP23)						
	High, Low, & Volatile Gas Prices						
	High Deman <mark>d Response</mark>	•	•				
	High Energy Transmission is focused on 3 cases						
	High DG Ad otion	ling a wide ra	lige of results.				
	Increased Load Management						
De	esert Boom						
Strong Climate Policy							

Scenarios

Tech Neutral vs Minimum Coal Key Findings

- Location of generation matters
- Majority of the new 230 kV transmission projects needed across all cases are load growth driven

230 kV Transmission Line Upgrades and

Additions

Tech Neutral vs Minimum Coal Key Findings

• Several new transformers needed

New 500/230 kV Transformers

Tech Neutral vs Minimum Coal Key Findings

 Location of generation matters and plays a significant role in 500 kV transmission needs

New 500 kV line (miles)

Transmission Key Findings

- Location of generation matters and plays a significant role in 500 kV transmission needs
- Majority of the new 230 kV transmission projects needed across all cases are load growth driven
- Up to 380 miles of new or upgraded transmission lines and nearly double the number of 500/230 kV transformers could be needed

Production Cost Model: What is it and why is it important to the ISP analysis?

Michael Reynolds Manager, Resource Analysis and Planning (SRP)

Preliminary Affordability Metrics: Key Findings

Angie Bond-Simpson Director, Integrated System Planning & Support (SRP) Adam Peterson Director, Corporate Pricing (SRP)

Affordability Metrics

- Maintaining affordability for customers is a fundamental component of SRP's mission.
- Estimating affordability metrics for different system plans helps with assessing opportunities and risks across different cases analyzed.
- Affordability metrics include:
 - Total System Cost (\$ billion)
 - Average System Cost (\$/MWh)
 - Average Residential Bill Impact (\$/month)

Overview of Financial Modeling for the ISP

The ISP team performed simplified financial modeling to develop affordability metrics.

The simplified financial modeling does the following:

- Provides indicative affordability metrics to compare plans to one another
- Includes the costs of existing investments, new investments and operations
- Includes a rough estimate of system costs not modeled explicitly in the ISP

The simplified financial modeling does NOT do the following:

- Provide a forecast of future rates for SRP customers
- Reflect SRP's financial outlook through 2035

Costs Included in Total System Cost

Generation

- Fuel
- Market purchases and sales
- Power purchase agreements
- Existing and new investments
- Operations and maintenance
- Non-SRP transmission cost

Other

- General & administrative
- Customer systems (metering, billing, customer service, etc.)
 - Telecom
- Taxes

•

Assumed constant across all cases

Customers

Transmission & Distribution

- Existing and new investments
- Operations and maintenance

Customer Programs

• Program and market enablement costs

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Observations

- Generation costs are the primary driver of differences in cost between cases.
- Transmission costs follow similar trends as generation costs, as both are influenced by load growth and addition of new resources.
- Distribution costs vary across scenarios due to differences in load growth.
- Customer program costs grow through 2035 and continue to ease new infrastructure needs across all cases.

Total System Cost in 2035 (\$ billion) **Current Trends**

Generation Transmission Distribution Customer Programs Other

In Current Trends, Tech. Neutral is the lowest-cost strategic approach. Without a firm capacity option, other strategic approaches result in higher generation and transmission costs.

Note: Results differ by scenario due to a variety of external factors that are outside of SRP's control, including:

- Economic growth
- Temperature rise
- Federal government carbon reduction policy
- Technology costs
- Availability of emerging technologies
- Regional market conditions

Total System Cost in 2035 (\$ billion)

Generation Transmission Distribution Customer Programs Other

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Total System Cost in 2035 (\$ billion)

Generation Transmission Distribution Customer Programs Other

Total System Cost in 2035 (\$ billion)

Strong Climate Policy

Generation Transmission Distribution Customer Programs Other

In Strong Climate Policy, the three strategic approaches are similar in cost. The availability of a firm capacity resource (natural gas and/or hydrogen) in all three strategic approaches mitigates cost differences between them.

Note: Results differ by scenario due to a variety of external factors that are outside of SRP's control, including:

- Economic growth
- Temperature rise
- Federal government carbon reduction policy
- Technology costs
- Fuel prices
- Availability of emerging technologies
- Regional market conditions

Observations

- Generation costs are the primary driver of differences in cost between cases.
- Transmission costs follow similar trends as generation costs, as both are influenced by load growth and addition of new resources.
- Distribution costs vary across scenarios due to differences in load growth.
- Customer program costs grow through 2035 and continue to ease new infrastructure needs across all cases.
- The Technology Neutral strategic approach, which includes natural gas as a resource option, is lower cost than alternative strategic approaches that don't allow new firm capacity options.
- In the Strong Climate Policy scenario, the Minimum Coal strategic approach—which retires Springerville units early—results in similar costs as Technology Neutral.

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Average System Cost in 2035 (\$/MWh)

Desert Contraction

Current Trends

Strong Climate Policy

Desert Boom

For Desert Boom, the No New Fossil and Minimum Coal cases do not reach SRP's reliability targets and are not included.

The average system cost metric is not a customer rate metric and should not be interpreted as the rate that customers would pay under different cases.

Note: Results differ by scenario due to a variety of external factors that are outside of SRP's control.
Change in Average System Cost in 2035 (\$/MWh) Relative to Tech. Neutral



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Draft Subject to change

Plans & Resulting Costs Determine Future Price Levels



How Pricing Principles Impact Customer Prices

SRP Pricing Principles

- Gradualism
- Cost Relation
- Choice
- Equity



Change in Average System Cost in 2035 (\$/MWh) Relative to Tech. Neutral



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Questions

Affordability Roundtable Discussion:

What stands out to you in the affordability metrics?

Review of Sustainability and Reliability Metrics

Kyle Heckel Sr. Engineer, Integrated Planning (SRP)

Integrated System Plan Metrics



Affordability

Total Costs Average System Rate Impact

Average Residential Bill Impact (absolute and relative to inflation)



Sustainability

CO2 Reductions Over Time Water Use Carbon-Free Generation Capacity Factor for Gas Fleet Direct Air Emissions (NOx, SO2,

PM10, PM2.5, VOC)

Reliability

Resource Contribution to Reliability

Reliance on Emerging Technologies

Qualitative Risk Ratings (Development Risk and Operational Risk)

Planning Reserve Margin



Customer Preference Rating

CO2 Reductions from energy efficiency, demand response, distributed generation, and electrification

Bold items indicate metrics ready for review & discussion

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Sustainability



CO2 Reductions Water Use Carbon-Free Generation

Sustainability metrics help us understand different system plan's environmental impact and their effectiveness at helping SRP achieve or exceed our 2035 Sustainability Goals.

CO2 and Water Intensities by 2035



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Carbon-free Generation by 2035



Percent Carbon-free Generation

Desert Contraction Current Trends Strong Climate Policy Desert Boom

> For Desert Boom, the No New Fossil and Minimum Coal cases do not reach SRP's reliability targets and are not included.

Reliability



Reliance on Emerging TechnologiesPlanning Reserve Margin

Reliability metrics help SRP understand different system plan's ability to meet customer energy demand and the risk level associated with operating and developing each system plan.

Planning Reserve Margin in 2035

All cases achieve planning reserve margin (PRM) target, except cases that have high load growth but no firm capacity options by 2035.

	:			
Scenario	Technology Neutral	No New Fossil	Minimum Coal	
Current Trends	\checkmark	\checkmark	✓	Achieve PF
Desert Contraction	\checkmark	\checkmark	\checkmark	
Desert Boom	\checkmark	~ 500 MW Short	~ 930 MW Short	
Strong Climate Policy	\checkmark	 ✓ 	/ /	
reserved. SRP Integrated System Plan: Analysis Key Findir	nos & Draft Strategies	Fa	il to re PRM	

Reliance on Emerging Technologies

- Green hydrogen is only selected in the Strong Climate Policy scenario, where it is available in 2034.
- There are no nuclear small modular reactor (SMR) or carbon capture and storage (CCS) additions by 2035 in the cases studied.

	Strategic Approach					
Scenario	Technology Neutral	No New Fossil	Minimum Coal			
Current Trends	No Emerging Technology Additions Green hydrogen and nuclear SMR not available by 2035 CCS only available by 2035 in Technology Neutral					
Desert Contraction						
Desert Boom						
Strong Climate Policy	200 MW Green Hydrogen	200 MW Green Hydrogen	800 MW Green Hydrogen			

Questions

SRP's Draft ISP System Strategies With Synthesis of Stakeholder Input

Angie Bond-Simpson

Director, Integrated System Planning & Support (SRP)

Draft Products of the ISP



- Review metrics
- Discuss trends, tradeoffs & findings
- View outcomes through Guiding ISP Principles

2. Draft a Balanced System Plan

3. Identify ISP Actions

Draft System Strategy Themes

Grounded in ISP analysis results and Guiding ISP Principles

Themes:

- Evolve Customer Programs & Price Plans
- Develop and Preserve Optionality
- Build and Leverage Partnerships
- Proactive Siting for System Investments/Additional Infrastructure
- Prepare and Equip the Workforce

What We Heard from Advisory Group : System Strategy Brainstorming Idea Themes

Affordability

- Strategies around affordability appeared in multiple responses
- "Prioritize affordability," adjust time-of-use programs, and incentivize distributed resources in a more flexible business model
- Disproportionate impacts on low-income customers are a concern

Communication

- · Communication strategies are needed to educate customers about the ISP and inform them of coming changes
- Early communication for facilitating siting of transmission lines and recommended expansion of pilot programs

Partnerships

- · Leverage relationships with customers, state and local municipalities, and rural utility co-ops to educate them about the ISP
- Take advantage of federal funding and educate residential customers on how to take advantage of federal dollars
- Partnerships with small multicultural businesses and credit unions that could provide microloans for equipment upgrades
- · Strengthening partnerships with regulatory agencies

Taking the Lead

- Pursue emerging technologies, be proactive in land acquisition for solar and transmission projects, and explore regional markets
- "Trailblazer" mindset for SRP employees

What We Heard from Large Stakeholder Group: System Strategy Brainstorming Idea Themes

Customer Programs

- Expand customer programs for both residential and commercial/industrial customers
- · Support for behind the meter systems and ambitious programs to address peak load growth

Modeling and Analysis

• Requests for more information about the drivers in the ISP and the data used in the modeling

Policy & Stakeholder Engagement

- SRP should leverage its independent governance to optimize tools for growth and engage in more policy advocacy
- Increase opportunities for stakeholder feedback and information sharing to build partnerships

Transmission and Distribution

- Leverage current assets, such as retired coal transmission for renewable sources and non-wires alternatives for distribution
- Proactive siting and planning, especially for future transmission needs
- Aligning with siting, transmission priorities, constraints and providing adequate lead time for requests for proposal
- Rate affordability, elimination of carbon emissions and efforts to use solar power at the time of generation

Draft System Strategy



Draft subject to change

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System Strategy Development: Energy

Invest in renewable resources and storage to manage fuel consumption, drive carbon and water reductions.

- \checkmark When paired with firm capacity, solar and wind contribute to a least-cost portfolio.
- SRP is well positioned to surpass its 2035 Sustainability Goals for carbon emissions reductions and water usage reductions at power plants across all system plans.
- If the US government enacted a mandate for 85% CO2 reductions by 2035 (Strong Climate Policy Scenario), SRP would need to accelerate renewable & storage deployment significantly.

System Strategy Development: Capacity

Invest in firm generation, including natural gas, to support reliability and manage affordability, while also supporting advancement of emerging firm technologies.

- When allowed, the model selects natural gas which provides firm capacity, and when paired with solar and wind reliably drives lower carbon emissions.
- Portfolios without firm options are unable to satisfy reliability requirements in the high load growth scenario.
- The Technology Neutral strategic approach, which includes natural gas as a resource option, is lower cost than alternative strategic approaches that don't allow new firm capacity options.

System Strategy Development: Transmission

Proactively plan to expand transmission infrastructure to enable generator interconnections and load growth.

- Location of generation matters and plays a significant role in 500kV transmission needs.
- Significant investment over the next decade is needed to strategically build out new grid infrastructure to connect new resources and customers, while achieving reliability and sustainability goals.

System Strategy Development: Partnerships

Explore partnerships, supply chain and development solutions that provide certainty for cost and availability to meet the pace of transformation.

Developed related to key findings:

Significant investment over the next decade is needed to strategically build out new grid infrastructure to connect new resources and customers.

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.

System Strategy Development: Programs & Pricing Evolve pricing and customer programs to improve economy-wide carbon reductions and pace infrastructure development, while recognizing customers' diverse needs.

- Program and price plan design focus will shift to net load in most cases.
- Energy Efficiency & Demand Response will evolve to target later peak hours and overnight loads.
- Transportation and Beneficial Electrification programs can leverage mid-day hours to shift electric vehicle charging behaviors and to maximize carbon reduction impacts.

System Strategy Development: Distribution

Ensure distribution grid readiness to maintain reliability and enable customer innovations to drive carbon reductions.

Developed related to key findings:

- Distribution Planning, Customer Programs and Pricing partnership key to leverage distribution system to provide value
- Large timing dependency on technology maturement, market maturement, customer demand, and system health and reliability
- Anticipation of future regulatory impacts at the distribution level

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System Strategy Development: Existing Assets

Preserve and reinforce existing infrastructure to ensure future performance, grid security and resilience.

- SRP will need to build up to 7 times as many new resources in the next decade than in the last decade to serve customers while achieving reliability and sustainability goals.
- Significant investment over the next decade is needed to strategically build out new grid infrastructure to connect new resources and customers, while achieving reliability and sustainability goals.
- 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.

Draft System Strategy



Draft subject to change

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How to Balance **Considerations in the ISP: Draft Strategies Engagement Activity & Report Out**

Guiding Integrated System Plan (ISP) Principles

The purpose of the Guiding ISP Principles is to balance all important considerations in developing an Integrated System Plan. SRP strives to understand the inherent tradeoffs between reliability, affordability and sustainability for the principles and seeks to establish an Integrated System Plan in accordance with these Guiding ISP Principles.

Integrated Long-Term View

Develop a holistic view, including resources, transmission, distribution and customer program perspectives for meeting evolving customer needs and achieving our 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.

Small Group Discussion: Draft Strategies

Focus: Review metrics available to date and the draft ISP strategies

Discuss in Breakout Groups:

- What are the strengths of the draft strategies?
- Is there anything missing that would better balance all considerations in the Guiding ISP Principles?
- What questions do you still have about the draft strategies?

Small Group Discussion: Process

- 1. As you discuss strengths and any missing elements, consider how the themes relate to the Guiding ISP Principles.
- 2. With 2 minutes to go, each person indicates their top five most important ideas for the ISP using sticky dots.
- 3. Identify a volunteer to report on the five ideas with the most dots.

Small Group Discussion: Debrief

Focus: Review metrics available to date and the draft ISP strategies

Discuss in Breakout Groups:

- What are the strengths of the draft strategies?
- Is there anything missing that would better balance all considerations in the Guiding ISP Principles?
- What questions do you still have about the draft strategies?

Questions

Working Lunch
Working Lunch: Ideas for Implementation

Facilitated by Joan Isaacson Senior Facilitator, Kearns & West

Ideas for Implementation

Based on the draft ISP Strategies, what ideas do you have to share with SRP for implementation?

Use sticky notes to record your ideas and then place the sticky notes on the appropriate draft strategy flip chart.

Wrap Up and Next Steps

Maria Naff Manager, Integrated Planning (SRP)

Next Steps

- Wrap up the ISP analysis and calculate remaining ISP metrics over the summer
 - Average Residential Bill Impact
 - Phase 3 Customer Research Results Customer Preference Ratings
 - CO2 Reductions from Energy Efficiency, Demand Response, Distributed Generation and Electrification; Capacity Factor for Gas Fleet; and Direct Air Emissions
 - Qualitative Risk ratings: Development Risk & Operational Risk
- Fall Advisory Group Meetings (August & September)
 - August: Review Remaining Metrics, Review Phase 3 Customer Research, Review ISP Final Strategies
 & Share and Discuss ISP Draft Action Plans
 - Sept: Review Final ISP Action Plans, Review Balanced System Plan, and Collect Stakeholder Process Feedback

2023 Engagement Calendar





SRP Team

- Complete ISP Analysis
- Board approval of final system strategies
- Draft ISP action plans
- Draft balanced system plan

Stakeholder Communication Email: IntSysPlan@srpnet.com



Integrated System Plan: Informational Portal https://srpnet.com/about/integrated-system-plan.aspx

thank you!