KEARNS WEST

# Salt River Project (SRP)

# Integrated System Plan Advisory Group Meeting #12- Summary

*Prepared by Kearns & West*

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# Advisory Group – Meeting #12 Overview

## Meeting Objectives

- Share and discuss key findings for affordability metrics from the Integrated System Plan (ISP) analysis
- Share and discuss draft system strategies

**Topic**: ISP Analysis Key Findings & ISP Draft Strategies
**Date**: May 19, 2023
**Time**: 8:30 a.m. – 12:30 p.m.
**Location**: PERA – Whitetail E&W Conference Room

Please see Appendix A for the Advisory Group member roster and attendance information. The meeting agenda and presentation are available at the Integrated System Plan portal.

## Welcome, Opening Remarks and Meeting Orientation

Advisory Group members began convening in-person at 8:30 a.m. for breakfast and networking with the agenda content beginning at 9:00 a.m.

Bobby Olsen, Associate General Manager & Chief Strategy, Corporate Services & Sustainability Executive at SRP, welcomed Advisory Group members to the meeting and expressed appreciation for their attendance. He acknowledged the SRP Board and Council observers, thanking them for their engagement in the ISP. After sharing the safety and sustainability minute (slide 5), he provided updates, including the promotion of Rudy Navarro to Chief Customer Executive and the retirement of Kelly Barr. Angie Bond-Simpson, Director of Integrated System Planning and Support at SRP, announced that Olsen will succeed Barr as Associate General Manager.

Joan Isaacson, facilitator from Kearns & West, reviewed the meeting objectives and agenda for both the Advisory Group and Modeling Subgroup meetings (slides 7-9). She then reviewed the guides for productive meetings (slide 10).

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

Maria Naff, Manager of Integrated Planning at SRP, recapped the April 21st Advisory Group meeting, where the team shared key findings from the ISP analysis and introduced five draft system strategy themes grounded in the ISP results and Guiding ISP Principles (slide 12). Naff reported on key ideas from Advisory Group member feedback on the draft themes:

- **Affordability** – Multiple responses stated that strategies should focus on affordability.
- **Communication** – Customers need to be educated about the ISP process.
- **Partnerships** – SRP should leverage relationships with local municipalities in planning for challenges ahead.
- **Taking the Lead** – SRP needs to take the lead in exploring emerging technologies and regional markets, with encouragement to adopt a trailblazer mindset.

Naff also recapped the May 12, 2023, Large Stakeholder Group meeting. She shared key discussion themes and input on potential strategies for the ISP (slide 13) and then invited Advisory Group members who had attended to share their perspectives. Members said that the Q&A and polling conveyed openness and transparency and noted stakeholder comments on the role of customer programs in the ISP. One observation was that the presentations made clear that the constraints of the Desert Boom scenario are not only due to supply chain issues but also transmission capacity.

## Input Validation Update

Joe Hooker, Director at E3, reminded Advisory Group members of the project team's commitment to share any new developments. He then provided an update on a change to the long-term capacity expansion modeling regarding battery costs. Initially, too many batteries were selected by the model because costs were understated based on current cost information. After E3 adjusted battery prices and ran the analysis again, the model selected fewer batteries and, in some cases, less solar; however, the 2035 resource mixes remain largely the same (slide 15).

Hooker presented the previous and new results side-by-side and highlighted three key differences (slide 16). First, in the Desert Contraction, No New Fossil case, there is now less battery storage and more wind as well as a combination of biomass and geothermal to meet reliability needs. For the Desert Boom, Tech Neutral case, no battery storage is selected. The model adds a bit more natural gas capacity for reliability purposes. Finally, for all three cases in the Strong Climate Policy, there is less battery storage but additional pumped hydro storage

and slightly more wind. One difference is about 100 MW of natural gas capacity getting selected in the model in the Tech Neutral strategic approach.

On costs, E3 has done rough, "back of the envelope" estimates that indicate the differences are small and won't change the overall result. Hooker noted that the affordability and sustainability results shared at this meeting are based on the prior results. Next steps are for the team to work on rerunning production cost models with updated results being shared at the August meeting (slide 17).

## Q&A

**Question**: It feels like we might get both the Desert Boom and Strong Climate Policy scenarios. Does it look any different if we get a combination of both scenarios?
**Response**: We don't have that exact case, but we have results for both individually. If we had a federal climate policy like Strong Climate Policy – and we don't have that today – and the growth of Desert Boom, the resource additions would be much larger. One thing to highlight is that in the Desert Boom scenario, with the No New Fossil or Minimum Coal strategic approaches, there is no firm capacity. Having firm capacity like natural gas or hydrogen is crucial in a high growth world to mitigate the amount of capacity that needs to be added to the system.

**Question**: On battery feasibility, is the issue just cost or the technology, too? On wind, where is it located?
**Response:** On batteries, the only change is cost. Battery technology assumes four-hour lithium ion, the most prevalent type today. On wind, E3 and the SRP transmission team included current availability and future projects to integrate wind resources in the modeling. Some wind is in Arizona. Assuming the addition of new transmission lines, SRP could get some wind from out of state. Some materials on this modeling are available at the ISP portal.

**Question**: How much is "a little more gas"? On Strong Climate Policy, can you define what the "other renewables" (slide 16) are?
**Response**: In the Strong Climate Policy, Tech Neutral case, the gas is about 100 MW. Other renewables are geothermal and biomass. Natural gas is selected most in Tech Neutral cases across the different scenarios. It's not selected as much in Strong Climate Policy scenario so as to reach the climate target. We are not seeing more storage due to cost. Even though it's not shown, based on current resource plans SRP is already planning on adding 2000 MW of battery storage, and that is assumed in all cases.

**Question**: Will the results be provided in table format with numerical values?
**Response**: As we have additional metrics to share, we will develop a packet with that data in tabular form.

**Question**: Did SRP look at small modular reactors?
**Response**: Small modular reactors are only available in the Strong Climate Policy scenario by 2035, and the model does not select them by 2035.

**Question**: What is included in customer programs?
**Response**: Energy efficiency, demand response, and customer-sited solar and batteries.

## Transmission Planning: Current Trends, Minimum Coal Case

Justin Lee, Manager of Transmission System Planning at SRP, shared updated key findings for the Current Trends, Minimum Coal case. This scenario is compared against the Current Trends, Tech Neutral case, which was reported in the April Advisory Group meeting (slide 20). He stated that the team will not be generating metrics for the Desert Boom, Minimum Coal case because it failed to meet the planning reserve margin.

Lee recapped the pro rata versus hub approaches and reviewed the 230 kV transmission line upgrades and additions for both (slide 21). Across all cases the load level is the same. Lee noted that more transformers are needed for Minimum Coal as compared to Tech Neutral (slide 22). For 500 kV transmission, the biggest change with the Minimum Coal strategic approach is the significant increase in capacity in the pro rata approach with no change for the hub approach (slide 23). Updates confirm that the location of generation matters. In summarizing key findings, Lee emphasized that SRP may need to add up to 380 miles of transmission lines and nearly double the number of transformers on the system as exist today (slide 24).

### Q&A

**Question**: At our company we are seeing longer timelines for substations and transformers. How much does that timeline change for ordering one as compared to 12?
**Response**: Ordering 12 at once would have timeline impacts. We have to reserve production slots, so the sooner we can identify the need, the better off we are.

**Question**: Is 380 miles a lot to add for transmission lines?
**Response**: Today SRP solely owns approximately 490 miles of 230 kV and 360 miles of 500 kV. SRP jointly owns approximately 90 miles of 230kV and 1100 miles of 500kV. This case represents 25% growth of solely owned 230 kV and 500 kV. On the 230kV system, going from 490 miles of solely owned and adding another 200+ miles is significant.

**Question**: What about the high-voltage direct current (HVDC) transmission conversation?
**Response**: SRP has had some discussion on this topic, but only at the research level.

## Production Cost Model

Michael Reynolds, Manager of Resource Analysis and Planning at SRP, explained that his team informs what resources SRP builds, buys and retires (slide 25). He shared that SRP is in partnership with E3 to run the long-term capacity model and then add the production cost model. He described how the capacity expansion portfolio selection performed by E3 for this process reduces the year to representative periods, such as the peak day and other days of the year, and then the detailed production cost modeling uses E3's resource portfolio to run a decades-long, 8760 hourly analysis to look at affordability and sustainability metrics. The next step is verification that the simulation matches the long-term capacity expansion modeling. Reynolds commented that his team's work weaves through the results shared throughout the meeting.

### Q&A

**Question**: Can SRP provide more information on the representative years and months?
**Response**: We model every year and for three days each month, which is 36 days for each year. Generation benchmarking for this mix is conducted. We have seen good alignment on the annual generation mix and have confidence in that reduced chronology.
**Question**: What is the mix of days? Is it workdays, weekend days?
**Response**: It's a detailed algorithm that chooses the most representative days in a given month.
**Response**: We have to select days based on variations in wind and solar supply. Long-term capacity expansion doesn't handle dispatch and peaker plants as well in the modeling. That's where production cost modeling captures more.
**Comment**: It would be interesting to see how weather and air quality conditions are considered in the selection of days.

**Question**: Has SRP done any subhourly modeling for batteries and markets?
**Response**: At this point we are doing hourly modeling with Aurora.

**Comment**: I'm disappointed that the Desert Boom, Minimum Coal case is not considered because it would be interesting to see how much transmission is needed to help meet the planning reserve margin.
**Question from SRP**: From additional wind?
**Comment**: Yes. Some scenarios have more wind, so if SRP could add transmission, then the wind would be available.
**Response**: Desert Boom had the most transmission built.

## Preliminary Affordability Metrics: Key Findings

Bond-Simpson presented key findings for the preliminary affordability metrics for the ISP. She began by highlighting the importance of maintaining affordability given that an estimated 20% of SRP customers are eligible for income-based price plans and then described the affordability metrics (slide 27). She described the development of ISP-focused financial modeling to allow for comparison of plans and to provide a rough estimate of system costs; however, this will not provide a forecast of future rates for SRP customers or reflect the financial outlook of SRP through 2035 (slide 28). Bond-Simpson described the total system costs (slide 29) and highlighted that generation costs are the primary driver of differences (slide 30).

Bond-Simpson began by reviewing the total system cost for the Current Trends scenario (slide 31), noting that the $4.3B total cost in 2035 (in 2023 dollars) for the Tech Neutral strategic approach is the lowest cost strategic approach. This is because without a firm capacity option (i.e., a generating resource operated to maintain reliability for an extended duration) the other strategic approaches require more capacity additions to the system. She then reviewed metrics for Desert Contraction (slide 32), commenting that due to lower load growth the total system cost is less due to fewer needed investments, but the trend across strategic approaches remains the same.

Next, Bond-Simpson shared results for the Desert Boom and Strong Climate Policy scenarios (slides 33-34). She emphasized that Strong Climate Policy envisions a fundamentally different future for Phoenix with low technology costs, regional diversity, and the availability of inexpensive hydrogen.

She then outlined how the Tech Neutral strategic approach, which includes natural gas as a resource option, is lower cost than strategic approaches that don't allow new firm capacity options (slide 35).

Bond-Simpson next presented average system costs in 2035, expressed in dollar per MWh (slide 36). She explained the spread of the dots, representing the strategic approaches, as an

indication of risk and highlighted how in the Desert Contraction scenario the average system cost is higher since there are fewer customers. She added that once updated, additional sensitivities will show the range of risk across the scenarios and will be shared in a future presentation. She then presented the change in average system cost (slide 37), shown by percentage to indicate the magnitude of difference.

Adam Peterson, Director of Corporate Pricing at SRP, made qualitative observations about the total system costs and shared the pricing philosophy at SRP. He described how SRP determines future price levels and how pricing operates as a cost recovery model (slide 38). The pricing principles of gradualism, cost relation, choice, equity and sufficiency guide questions of how to allocate costs across customer categories (slide 39). He explained that the Tech Neutral strategic approach most closely aligns with what SRP does today, although this modeling is different from what they have done before.

## Q&A

**Comment**: It's important that the costs are not just the average but also the highs and lows and for both residential and commercial.
**Response**: The original metric we imagined was residential, but we will work to see what else we can provide.

**Question**: Information on capital costs out to 2050 and what that change might entail would be helpful. What kind of federal funding is factored into this? The cheap hydrogen assumption may not match reality right now. SRP is talking more and more about hydrogen, but it's not good for customers.
**Response**: The team is talking about costs past 2050, but we won't have total system costs due to transmission and distribution limitations.
**Response**: Costs for hydrogen in the model are capacity, not fuel cost. Hydrogen generation is for those few hours it's needed for reliability. It's expensive fuel.
**Comment**: There's a whole system cost that's not being considered.
**Response**: The [Strong Climate Policy] model assumes there is an active hydrogen economy.
**Comment**: On strong climate policies, there are indicators pointing in that direction, like the recent EPA rule on emissions from fossil plants. This suggests the federal administration intends to push on reducing fossil fuel emissions and there is a lot of money going into hydrogen.

**Question**: Is SRP including inflationary costs in the region for pricing models?
**Response**: SRP does have a forecast of future inflation baked in. These are all current-day dollars to remove the effect of inflation and make the results more recognizable.

**Response**: These initial results for average system cost (slide 36) show that Current Trends and Strong Climate Policy have similar load growth but impacts from the Strong Climate Policy drive the costs up. Desert Boom has higher growth, so the per unit basis is lower.
**Comment**: So, building capacity gets less expensive?
**Response**: Yes, the cost is spread over more customers.

**Question**: Has SRP looked at the social costs of carbon? Maybe through a sensitivity analysis?
**Response**: We will share results on carbon emissions later in this meeting. The costs presented are the system costs that customers would pay.
**Comment**: Those social costs still need to be paid.
**Response**: The Strong Climate Policy analysis shows the additional resource costs for the utility.
**Comment**: You're adding what makes sustainability expensive and not including things like health costs and water use.

**Question**: On total system cost, it could be beneficial to see a prior three-year cost average, such as a COVID year, a typical year, and high fuel cost year. On all of these, are you using fuel forward or today's costs?
**Response**: The input sources are futures prices for the near term and the Energy Information Administration Annual Energy Outlook for the long term.

**Question**: On pricing, system cost drives the total costs. What's the time horizon to pay those off?
**Response**: Some costs are incurred all at once and financed over time (interest plus depreciation). This determines how much cost shows up in a specific year.

**Comment**: System costs are higher without firm capacity since this reflects a model with artificial limits on energy efficiency. I'm concerned that we are hard-baking assumptions around affordability into system costs.
**Response**: We have heard this question on not unlocking the full potential of customer programs, and we're seeing strategies that can unlock additional value. This is the starting point for customer programs to pace infrastructure. We have sensitivities to rerun and update.
**Response**: Some customer programs are firm, such as building envelope (e.g., energy efficiency) upgrades. Demand response is more like battery storage since it has limitations.
**Comment**: If that's how building envelopes are considered, I'd like to explore that in the values. For investments SRP makes now and in the next round of requests for proposals, we want to make sure affordability options are included.
**Response**: We're not picking one of these scenarios. We consider all these factors.

**Question**: On total system cost (slide 31), we think of wind and solar as having a lower levelized cost of energy. Is this the case? Are batteries driving the difference? Why is the difference so big?
**Response**: The model is factoring in capacity for reliability, but lower energy costs is also a factor. That's why we see wind and solar being built.
**Response**: It comes down to levelized cost of energy as average cost across all hours of renewables. The question is whether those resources are producing for reliability during higher demand times. They are not as effective, so the cost looks higher.
**Question**: Is SRP doing that since solar is cheaper than batteries in those hours?
**Response**: It's complex.
**Response**: The model selects a whole portfolio. It considers lower cost energy resources when available and selects lower cost capacity resources for reliability.

## Affordability Roundtable Question and Responses

Isaacson invited Advisory Group members to respond to the following question on an index card, "What stands out to you in the affordability metrics?" A summary of responses is provided below with the transcribed responses found in Appendix B.

**Consistency across Scenarios** – A few Advisory Group members commented on the lack of variation in costs for the Strong Climate Policy across different strategic approaches, with two responses posing questions about the reasons for this consistency. One member noted the small degree of variation for the Tech Neutral approach across the four scenarios, whereas another noted that dispatchable generation provides the highest per MW dollar value.

**Affordability** – Another set of responses addressed residential customers and how the pricing structure impacts different customer categories, such as small businesses. Advisory Group members raised points about the effects of work-from-home, customer programs and equity of access, including access to both the technology to take advantage of SRP services (e.g., smart thermostats) and to tax benefits. A related set of responses posed questions about avoided cost comparisons across scenarios and which category of customers would bear the costs of investment.

**Total Decarbonization Costs –** A couple of responses referenced the social cost of carbon and suggested including total costs that would include benefits of decarbonization.

## Review of Sustainability and Reliability Metrics

Kyle Heckel, Senior Engineer for Integrated Planning at SRP, reviewed the ISP metrics (slide 44) and said he would be reporting on the sustainability and reliability metrics that are ready for review and discussion, noting these are the ones Advisory Group members had communicated the most interest in. The team continues work on additional metrics.

Heckel shared the sustainability metrics: CO2 reductions, water use and carbon-free generation (slide 45). In all four ISP scenarios, the goals for reduction in carbon and water intensity for 2035 are achieved, partly because SRP has already taken significant steps towards achieving these goals with announced coal retirements (slide 46). Although SRP does not have a 2035 goal for carbon-free generation, all scenarios show at least 50% carbon-free generation by 2035 (slide 47).

Next, Heckel reviewed two reliability metrics: the planning reserve margin and reliance on emerging technologies (slide 48). He reminded that in cases of high load growth and no firm capacity resources, SRP is unable to meet the planning reserve margin by a significant margin (slide 49). On emerging technologies, he noted green hydrogen as the only resource selected by 2035 in the model and characterized the magnitude on which SRP relies on hydrogen as a risk (slide 50). In the Tech Neutral strategic approach, the level of hydrogen reliance is low, comparable to a pilot project, whereas with Minimum Coal, the greater magnitude of use would require that the technology be more mature.

### Q&A

**Question**: In the 2035 Sustainability Goals, how much are customer-sited resources considered?
**Response**: These metrics are strictly for resources on the SRP system.

**Question**: As coal resources are retired, has SRP looked at how to use coal as a thermal battery?
**Response**: We have not studied that extensively.
**Response**: We are working with the Electric Power Research Institute (EPRI) to study this, but in this evaluation, coal is assumed not available. In the Minimum Coal strategic approach, we allow coal to operate seasonally and all cases allow coal to ramp down below full output when it makes economic sense.

**Question**: For the carbon intensity metric for Desert Boom, Tech Neutral, where is the dot (slide 46)?
**Response**: It is in the dot cluster between Current Trends and Desert Contraction.
**Comment**: There is room to be more aggressive.

**Question**: What is the price point for carbon capture and storage?
**Response**: I will follow up on this in the Modeling Subgroup meeting.

**Comment**: The Tech Neutral case with carbon intensity is why a mass-based goal is needed. The three dots on top of each other (slide 46) show different levels of emissions. The amount of carbon those three are emitting is wildly different, yet they appear to be all close together.
**Response**: Current Trends is about 10 million metric tons and Desert Boom is about 12 million.

## Draft ISP System Strategies with Synthesis of Stakeholder Feedback

In the next section, Bond-Simpson described how after conducting analysis, SRP is responsible for taking action. She reviewed the draft products of the ISP (slide 53) and then the draft system strategy themes presented at the prior Advisory Group meeting (slide 54). She shared feedback on the themes from both the Advisory Group and Large Stakeholder Group (slides 55-56), noting similarities between the two and commenting on the development of the draft system strategies for the ISP.

Bond-Simpson presented the seven draft system strategies as a set of interlocking pieces that need to work together to build the power system of the future (slide 57). For example, she cited the need for an advanced distribution grid to accommodate customer programs and customer-sited solar and batteries. Bond-Simpson then reviewed the draft system strategies, anchoring each one to key findings from the ISP analysis (slides 58-64):

- **Energy**: Invest in renewable resources and storage to manage fuel consumption, drive carbon and water reductions.
- **Capacity**: Invest in firm generation, including natural gas, to support reliability and manage affordability, while also supporting advancement of emerging firm technologies.
- **Transmission**: Proactively plan to expand transmission infrastructure to enable generator interconnections and load growth.
- **Partnerships**: Explore partnerships, supply chain and development solutions that provide certainty for cost and availability to meet the pace of transformation.
- **Programs & Pricing**: Evolve pricing and customer programs to improve economy-wide carbon reductions and pace infrastructure development, while recognizing customers' diverse needs.
- **Distribution**: Ensure distribution grid readiness to maintain reliability and enable customer innovations to drive carbon reductions.
- **Existing Assets**: Preserve and reinforce existing infrastructure to ensure future performance, grid security and resilience.

## How to Balance Considerations in the ISP: Draft Strategies Engagement Activity and Report Out

Isaacson provided context and instructions for small group discussions about the draft strategies (slides 67-69). She reminded Advisory Group members that they had heard other perspectives and shared their own and that their input had shaped the ISP study plan and would continue to do so. She encouraged members to think about different needs and multiple benefits in attempting to find common ground.

Advisory Group members met in three small groups to discuss the following questions:

- 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?

A project team member took flipchart notes (see Appendix C) for each group. At the close of discussion, Advisory Group members used sticky dots to indicate their top five most important ideas from the notes on the flipcharts. A volunteer from each small group reported on the top ideas from their discussion to the larger Advisory Group.

### Group 1

This group noted the interdependency of the draft strategies as a strength as well as the recognition of how the strategies will be deployed at a community level and for low-income households. They cited considerations at the federal level and a universal carbon aspiration as missing elements. Their questions included how peak load interacts with time-of-use rates, where transmission stops and distribution begins, and how firm capacity is defined.

### Group 2

The second group identified proactive planning for transmission as a strength. On missing elements in the draft strategies, they cited consideration of the timeline after 2035, any mention of legislative engagement and a sense of prioritization or tradeoffs. Questions from this group centered on how SRP can monetize the social cost of carbon to support cost findings.

### Group 3

This group cited inclusion of customers as a strength of the draft system strategies. They also noted that firm generation is part of the future and finding the best fit of resources is key. On artificial intelligence and customer programs, they expressed that they don't want SRP to get left out of this emerging area. Members of this group encouraged more affordability and

stated that on the social cost of carbon SRP should be a leader but recognized that SRP is not solely responsible.

## Working Lunch: Ideas for Implementation

After the reporting out, Isaacson asked Advisory Group members to consider how SRP might implement the draft strategies. She posed the question, "Based on the draft ISP Strategies, what ideas do you have to share with SRP for implementation?" and invited members to write ideas on sticky notes and place them on the relevant draft strategy posters as they transitioned to the working lunch (slide 74).

Advisory Group members provided the greatest number of ideas for the Programs and Pricing draft strategy (see Appendix D). Feedback topics across all draft system strategies included consideration for low-income and residential customers, exploration of emerging technology and innovative time-of-use plans – including to address affordability – and encouragement of advocacy and proactive actions.

## Wrap Up & Next Steps

Naff closed the meeting by sharing next steps for the ISP and the engagement calendar (slides 76-78). She reminded that the Technical Working Session on time-of-day programs would be rescheduled for when all panelists can attend. When asked if they would like to receive updates on the ISP during the summer, most Advisory Group members responded affirmatively. Naff thanked them for their time and engagement and invited those interested to remain for the Modeling Subgroup meeting to follow.

# Appendix A

## Meeting Attendance

### Advisory Group Member Organizations (members in attendance on 5/19 are indicated in **bold**)

**Arizona Hispanic Chamber of Commerce**
A New Leaf
**American Association of Retired Persons (AARP)**
**Arizona State University (ASU)**
**Arizona Public Interest Research Group (PIRG)**
Building Owners and Managers Association (BOMA)
Chicanos Por La Causa
**City of Phoenix**
**Common Spirit Health**
**CMC Steel Arizona**
CyrusOne
Environmental Defense Fund (EDF)
Intel
Kroger
Local First
Mesa Public Schools
Pinal County
**Profile Precision Extrusions**
**SRP Customer Utility Panel (CUP)**
**Salt River Pima-Maricopa Indian Community (SRPMIC)**
**Southwest Energy Efficiency Project (SWEEP)**
United Dairymen of Arizona
**Western Resource Advocates (WRA)**
**Wildfire**

## Key SRP Staff

Adam Peterson, Director of Corporate Pricing
Angie Bond-Simpson, Director of Integrated System Planning & Support
Bobby Olsen, Associate General Manager & Chief Planning, Strategy & Sustainability Executive at SRP
Domonique Cohen, Senior Strategic Planner for Integrated Planning
Duncan Kraft, Planning Analyst for Integrated Planning
Grant Smedley, Director of Resource Planning, Acquisition and Forecasting
Jed Cohen, Manager of Forecasting and Load Research
Justin Lee, Manager of Transmission Planning
Kyle Heckel, Senior Engineer for Integrated Planning
Maria Naff, Manager of Integrated Planning
Maxwell Burger, Senior Predictive Analytics Analyst for Integrated Planning
Michael Reynolds, Manager of Resource Analysis and Planning

## Key Facilitation Team

Arne Olson, E3
Joe Hooker, E3
Brisa Aviles, Kearns & West
Karen Lafferty, Kearns & West
Joan Isaacson, Kearns & West

## SRP Board and Council Observers

Anda McAfee, SRP Board Member
Larry Rovey, SRP Board Member
Rocky Shelton, SRP Council Member

# Appendix B
# Roundtable Responses

## What stands out to you in the affordability metrics?

- Both intrigued with, but quite curious, the real implications/reasons for the competitively similar costs across cases for Strong Climate [Policy]. Further, "billions" isn't a scary term for me, and I was surprised at the relatively consistent costs – perhaps I'm wired to think of model runs with much more divergent outcomes. I suspect the static/baseline assumptions moderate this [simulation].

- Isn't residential usage a larger percentage than before the pandemic? The fabled "return to the office" looks to have stalled. Many more work from home. Shouldn't residential usage gain a higher consistent value in determining which class pays how much?

- Not a question specifically, but as a low-income advocate at the table, this discussion left me with questions regarding impact to low-income customers:
    - Questions regarding the need to better understand the pricing principles and how this plays out in actuality.
    - Questions about additive costs to residents for components of these advancing technologies that they will need to utilize the services.
    - Questions about the equity burden between different rate classes (ex., Do commercial customers have more systemic/tax/etc. benefits to adoption than low-income residents? Is that a consideration in pricing principles?)

- Residential sector would pay for the majority of the investment. What mechanisms should be in place to support access to clean and affordable energy?

- Dispatchable generation
    - provides highest per MW dollar value.
    - provides firm capacity.
    - growth may not happen in SRP's future.

- Need more examination of customer programming, the evolution of programs, inputs, and value of contributions to the system (i.e., residential).

- They look fine. The social cost of carbon needs a narrative that address[es] the societal need as a societal problem.

- Metrics are a good start. I would like to see non-res[idential] bill impact for small business and comparing avoided costs from each approach.

- It was interesting to see how the Tech Neutral approach was the same regardless of which scenario it was applied to.

- Strong Climate Policy yield[s] the minimum change in average system cost.

- We don’t look at total costs that include the benefits of decarbonization.

- Similar costs in Strong Climate Policy

# Appendix C
# Flipchart Notes from Small Group Discussions

## Questions

- 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?

Advisory Group members used sticky dots (•) to indicate their top five most important ideas from the notes on the flipcharts.

## Group 1

**Strengths**

- Acknowledge connection of all strategies. (•)

**Missing**

- Recognition of how this is deployed in a community, especially low-income households (••••)
- A universal carbon aspiration/future perspective into all seven strategies (•••)
- Stakeholders' position in making recommendations, especially on policies (••)
- Stronger partnership in distribution and existing needs (•)

**Questions**

- Program & pricing – shifting to net load in most cases. What does that mean for customer pricing? (•••)
- Clarification of firm capacity and considerations of energy efficiency (•••)
- Where does transmission stop and when does distribution begin? (••)
- Distribution innovation – What are the customer intake costs for each of the innovations? Example: For solar, there are panels. Do customers have to buy in each strategy?

## Group 2

**Strengths**

- Proactive planning for transmission (•••)
- Surpass 2035 goals. (•)
- Talking about investment, thinking ahead
- No one solution

**Missing**

- Focus on 2035; doesn't recognize time after that. (••••)

- Empowering as a living document that needs to be constantly updated (••)
- Need for customer engagement (••)
- Not all strategies are equal; gap in prioritization and understanding tradeoffs. (••)
- Impact to communities in implementation (•)
- Role of regional markets (•)
- Want to keep fossil fuels beyond 2035 (with asset preservation).
- Impacts beyond 2035 to ratepayers
- What it means over time for 40-year asset timeline
- Legislative engagement
- What's happening with SRP's research and development (outside partnerships).

**Questions**

- On capacity, can SRP support the finding on the costs by monetizing the social cost of carbon? (••)
- How to shift from one technology to another while maintaining affordability (e.g., resource retirements)? (•)
- Where does distributed generation fit in, given high costs for customers?
- What are benefits/impacts in 2050?
- On workforce, what are the impacts?
- How does this fit with the 2035 goals and process?

## Group 3

**Strengths**

- Customer involvement (•••)
- Firm generation is a part of future. (••)
- Covers sustainability. (•)
- Robust and covers a big space
- Pragmatic, reliability
- Partnerships help equity.

**Better Balance**

- Artificial intelligence and customer programs (••••)
- More affordability (•••)
- Risk mitigation/volatility mitigation (•)
- Should pricing and customer programs be one? (•)
- Maybe remove natural gas specifically.
- Disintermediation
- Social cost of energy (carbon) – utility-leading but not solely responsible; part of partnership

**Questions**

- 100% renewable versus 24/7, which tool will we use? (•)

# Appendix D
# Ideas for Implementation

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

### Energy

- Much of the work of ISP seems to consider greater carbon-free generation. As such, SRP should take positions/advocate for policy appropriate for scenarios discussed (federal – i.e., oppose Inflation Reduction Act repeal – state, local level).
- Process improvement electrification
- Net load for customer helps onsite storage, solar, waste heat, interruptible programs.
- Continuing working towards day-ahead market implementation and longer-term regional transmission organization participation
- Use of community choice agreements
- Lobby federal government to ease permitting regulations on small nuclear reactors.
- Investing in combination of energy efficiency, renewables and storage to maximize capacity investments and system savings.
- Studying the potential of virtual power plants as a capacity addition

### Capacity

- Inflation Reduction Act and/or grants change SRP's interest in nuclear?
- Take advantage of Energy Imbalance Market, day-ahead markets and future regional transmission organization opportunities.
- Expand firm generation to include installed home performance measures with average life across ISP planning horizon.
- Use innovative time-of-use pricing as a resource for peak shaving and load shifting.
- Increase research into alternative firm capacity generation.
- Options other than new gas, new nuclear

### Transmission

- Co-optimize generation location and transmission needs. May need to do as an iterative process.
- Does the United States need a national high-voltage direct current network? SRP should have a position.
- Purchase substation property and go through siting process as early as possible. Mark them with signage in advance of development.
- Develop new tech with partners to ease supply problems for substations and other transmission parts.

- Conservation voltage reduction programs
- Any thoughts on deregulated transmission competition?

## Partnerships

- Partner with Arizona State University and industry for clean tech beyond wind and solar and better solar/storage.
- Focus on domestic partnerships?
- Include customers in these partnerships.
- Engage in places like Eloy that are trying to ban new renewables to ensure you're able to avoid future siting limitations.
- Encourage innovative requests for proposal from partners and suppliers.
- Develop a community theme for partnership. SRP will need to be proactive in evolving programs for heat, social cost of carbon, energy, poverty.
- List out partnerships/potential partnerships.
- Embrace proactive discussions and policy development at all levels of government (local, state, federal).
- Should not limit SRP's ability to implement local solar, local storage, microgrids.

## Programs and Pricing

- Run the model to show impacts of time-of-use rates on shifting and reducing peak power demands.
- Spell out customer programs and projections for each.
- More low-income customer focus on purchase/adoption of technologies as it relates to an advanced distribution grid. Ex: Can low-income people afford solar panels at the level needed to achieve plan goals?
- Focus on innovative time-of-use pricing as a resource to shift load.
- More attractive incentive programs
- Time-of-use should not overly penalize customer behavior they cannot change. People must shelter at home in extreme temperatures.
- Improve the conditions or rules for distributed solar.
- These programs – especially as they relate to low-income customers – need to be considered and built within a larger context of partnerships that consider the ability for this group to participate and afford a carbon-free future.
- Include different factors in determining rates. Pricing should evolve with the system and its structure.
- Considering energy efficiency and demand response from a low-income perspective, they are an increasing percentage of the population with a likely lower uptake of these programs. What are the reasons behind that? They can be solved for.
- Break down pricing per customer class and with high/low in addition to average.
- Increased incentives for customers to install solar and batteries

- System for real-time demand-based pricing
- Should pricing and customer programs be combined as customer offering (i.e., time-of-use and demand response)?
- As SRP considers residential solar in system planning it must also recognize “value” of customer and create/design appropriate pricing/programs.
- Focus on evolution of demand from new technologies and continue to focus on integrating into a comprehensive approach.
- Residential use should not pay one cent more than is fair and necessary.
- Be prepared for very rapid evolution of customer expectations from artificial intelligence-enabled system. Think parasitic load.

## Distribution

- Investigate latest technology for flexible, intelligent grid distribution.
- Deploy targeted demand side management measures for specific distribution feeders, the most congested at any given time.
- Expanding opportunities for third party aggregators and virtual power plants
- Explore the value of distributed generation and its ability to reduce investment requirements.

## Existing Assets

- Close coal.
- Balance environmental impact of 30-year-old coal plant vs. lithium-based storage asset.
- Maximize current system operations/efficiency.
- Provide closure dates for coal and push for them to be earlier rather than later.
- Projection for each asset