

Salt River Project (SRP) Integrated System Plan Advisory Group Modeling Subgroup Meeting #2- Summary

Prepared by Kearns & West

Advisory Group – Modeling Subgroup Meeting #2 Overview

Meeting Objectives

- Review a selection of inputs and assumptions for scenarios and sensitivities
- Gather stakeholder feedback on potential alternative options for assumptions or data sources

Topic: Inputs for the Integrated System Plan Study Plan

Date: March 21, 2022

Time: 10:00 a.m.-12:30 p.m.

Location: Virtual

Please see the appendix for the Advisory Group member roster and attendance information. The [meeting agenda](#) and [presentation](#) are available at the [Integrated System Plan portal](#).

Welcome and Agenda Overview

Angie Bond-Simpson, Director of Integrated System Planning & Support at SRP, welcomed Advisory Group members and SRP Board and Council observers to the Modeling Subgroup meeting on inputs for the study plan. She then introduced Lakshmi Alagappan, consultant from E3, the Integrated System Plan’s technical consulting group, as meeting facilitator. The meeting objectives ([slide 6](#)) and [agenda](#) were then reviewed by Alagappan.

Recap of Scenarios and Sensitivities

Jed Cohen, Integrated System Planning Lead at SRP, provided a recap of the scenarios for the Integrated System Plan ([slide 9](#)), noting that narratives for each one would be presented at the April 15, 2022, Advisory Group meeting. He clarified that the Current Trends scenario represents a vision of the future in 2035 that is different from the world today and then reviewed the sensitivities ([slide 10](#)).

Load Forecasting Inputs and Assumptions

Harry Sauthoff, Manager of Load Forecasting at SRP, presented the economic growth inputs and data sources for each scenario ([slide 12](#)), noting that those forecasts have been reviewed and approved by SRP's Board. He also described the forecasting inputs for temperature rise ([slide 13](#)), electrification ([slide 14](#)) and distributed generation ([slide 15](#)).

Question: The Desert Contraction and the Desert Boom scenarios both use RCP 8.5 [Representative Concentration Pathway]. Can you clarify this for both scenarios?

Response: They do. For the Desert Boom scenario, population continues to increase as do temperatures. We are testing the boundaries of the load growth assumption. Under Desert Contraction not as many people move to Arizona.

Question [chat]: For the General Rule of Thumb section [[slide 13](#)], is the +/- degree Fahrenheit assumption in peak demand the same when converted to Celsius?

Response: Yes.

Question: To clarify, the thinking is that in 2035, out of 1.5 million vehicles, 975,000 will be electric vehicles?

Response: Yes, that is an estimate by that time for SRP's service area.

Customer Program Inputs and Assumptions

Nathan Morey, Manager of Product Development in Customer Programs at SRP, presented energy efficiency inputs ([slide 17](#)) and demand response programs ([slide 18](#)). He commented that SRP is already working from a high baseline of energy efficiency and customer programs, noting that technology and market advances will be needed to achieve targets cost effectively.

Question: It's important to push energy efficiency as much as possible. Has SRP looked at climate action plans from municipalities and integrated those commitments into the scenarios?

Response: Yes. SRP is working closely with municipalities to better understand how we can work together to meet their objectives, community objectives and our objectives. We will need a high level of coordination to reach the savings targets we are projecting.

Question: To the extent a municipality has building code standards or other polices, is that reflected in the scenarios?

Response: SRP has a robust building code initiative that has expanded into electric vehicles (EVs) and electrification. We coordinate with the Southwest Energy Efficiency Project (SWEET) and the International Code Council (ICC) on development and adoption of building codes and bring that into the modeling.

Question: Is SRP looking at the program or measure level? What types of energy efficiency measures take place with these different options?

Response: Over the past 5 years we have enhanced our focus on cooling measures. In the Current Trends, Desert Boom and Desert Contraction scenarios about 47% of those new savings will run through cooling load shapes. Another 26% is in lighting, which is mostly commercial, and the remainder (27%) is a mix.

Question: On carbon emissions, how do the energy efficiency numbers work into SRP's 2035 Sustainability Goals? Energy efficiency would help with a mass-based goal, but energy efficiency may not necessarily help with the intensity-based goal

Response: Energy efficiency does not relate directly to the emission intensity-based target. SRP uses the Climate Registry protocol so energy efficiency on the customer side does not count toward that target.

Question: Has SRP modeled changes to or removal of the standby rider?

Response: No, not within customer programs. We would have to do that with the pricing team.

Comment: On-site generation is another consideration.

Resource Planning Inputs and Assumptions

Michael Reynolds, Manager of Resource Analysis & Planning at SRP, described load management ([slide 21](#)) and carbon reduction targets ([slide 22](#)).

Question: Why not model the mass reduction target for all scenarios?

Response: We will have a separate process for exploring those targets.

Question: Why not use 80% by 2030? Where is the 2035 date coming from?

Response: We wanted to align with the study period for the Integrated System Plan. E3 did a literature review of studies about the path to net zero emissions by 2050. Those studies are in the range of an 80% reduction by 2035, which is why we chose that benchmark.

Question: Is this timeline to line up with SRP's 2035 Sustainability Goals? Breaking down the benchmarks further would be helpful.

Response: We are talking about reduction targets. Are you asking for more of a metric to get to this path?

Comment: Yes. It's helpful to see the correlation between the 2035 process and the Integrated System Plan. The line graphs are helpful, but it's good to see the percentages as well.

Response: SRP's 2035 Sustainability Goals are our board-approved target. We want to see the annual performance of each strategic approach to see the reductions over time. If people feel like milestones are needed before 2035 then we should discuss and add them to the study plan.

Comment: Yes, that would be helpful.

Response: The milestones may vary, but all strategic approaches in the Integrated System Plan have trajectories so we can follow up.

Question: For the other three scenarios vs. the Strong Climate Policy scenario, can you show the mass-based percentage for both?

Response: We have heard Advisory Group feedback on mass-based metrics and will capture those in a number of ways.

Question: Is it possible to model both intensity and mass-based targets?

Response: E3 can follow up and look at possible trajectories for the Integrated System Plan study.

Reynolds continued his presentation by describing natural gas price inputs based on publicly available data ([slide 23](#)) and the modeling of the sensitivity for gas price volatility ([slide 24](#)).

Question: How does SRP hedge gas?

Response: SRP uses a hedging strategy to procure most gas ahead of the year in which we use it. We are also active in daily markets to take advantage of any opportunities that arise.

Comment: In the Desert Boom scenario the issue is that the percentages get smaller.

Response: If the forecast is too low then SRP is exposed to more price fluctuations.

Question: How can SRP forecast gas prices 13 years from now? How does that modeling get done?

Response: Due to uncertainty it's important to look at a range and we want to use publicly available and justifiable information.

Question: Assuming gas price volatility continues, what are other options? I have concerns from a ratepayer perspective.

Response: We want to know if we have gotten these inputs right. The model starts from the middle price assumption and then moves to high and then the next year goes from middle to low, which should reflect exposure to natural gas price volatility.

Question: At what time of year does the model oscillate?

Response: At the change of the fiscal year in May.

Question: I'm interested in seeing the weighted average along the whole timeline. At what moment in time are those prices taken and how does that impact the model?

Response: SRP uses a weighted average across our different gas basin sources (Permian, San Juan). As gas usage changes over time we would need to change the assumptions.

Question: For the different reference cases, how will those impact current assumptions for the scenarios? In addition, what will be the balance between all these different inputs?

Response: The gas price sensitivity would be a line run off the Current Trends scenario. We are trying to answer whether using a smooth gas price forecast makes for bad conclusions.

Question: In other areas we were looking at the resource portfolio mix and here it is more about the prices. Is there a reason for that difference? Will this be the same in other areas?

Response: We know some inputs drive different results. If we assume gas prices stay at \$2 forever, then our modeling result would be inconsistent with this forecast.

Comment: Whether it's \$2 or \$4 it's still a fossil fuel with other costs. There's an impact to ratepayers so it's helpful to know the inputs.

Response: We are exploring policy choices. We want to understand the financial inputs so we can weigh the implications for costs and benefits.

Question: Will we receive the slide deck after the meeting?

Response: Yes.

Question: Does the yellow line on [slide 24](#) represent the only fluctuation SRP will look at? It's important to consider when it starts and the outputs it generates. It looks like the line only pertains to the high sensitivity/Strong Climate Policy scenario.

Response: We are trying to isolate just the gas price volatility and welcome feedback on this.

Question: With a deterministic model these are unknowns and that's the point of the sensitivity analysis. If the model is just given one line then it thinks it's the only possibility. How do the outputs change if that line changes?

Response: The model gets the Current Trends scenario central gas price estimate and then gas price volatility is introduced. Trying to enter different trajectories in the model might be helpful.

Comment: Yes, changing the fluctuations and timing might give better insight into the range of possible outcomes. It's a good first sensitivity, but there should be several.

Response: We are not changing resource selection. We can maybe do some splicing of models and follow up on that discussion.

Comment: The last 20 years have been abnormal with pricing and price stability. I'd like to see modeling similar to what happened in the 1980s with political issues, inflation and supply side shocks. The more frequent gas purchases smooth out volatility and the model captures that.

Response: Yes, bouncing between stable forecasts doesn't capture the potential range of the 1980s or even 2008.

Comment: Yes, perhaps widen that range a bit, depending on how often SRP makes purchases.

Response: We can talk to some of the active purchasers at SRP about this.

Question [chat]: How hard are these runs to do? Is there any reason not to use Monte Carlo techniques?

Response: We use Monte Carlo simulation for reliability modeling. The regional modeling needs to be updated as gas prices change, and that would have an impact. It's not difficult once we know where the inputs are.

Question: In these trends, has SRP shown the generation mix to get to the needed reliability?

Response: Generation mixes will come out of the modeling.

Comment [chat]: It's wise to stick with groups like EIA [Energy Information Administration]. They have a very good handle on industry dynamics. It's worth noting that there are plenty of gas resources in the world. Supply shortages don't need to be common in the future.

Response: Yes, the fundamentals remain the same.

Reynolds next presented the inputs for hydro availability ([slide 25](#)), market support ([slide 26](#)) and the technology cost of renewables ([slide 27](#)) and energy storage ([slide 28](#)).

Question: Is the reserve margin hour specific?

Response: The planning margin is calculated off of the annual peak hour.

Question: What is SRP's current reserve planning margin?

Response: We use 16% in our existing plans, as we do in the Current Trends scenario.

Question: Is the planning reserve margin just for planning purposes?

Response: Yes.

Question: Is the energy storage just batteries, or are there others like pumped hydro?

Response: I don't have a slide on pumped hydro storage, but it is considered.

Comment: For each of these graphs on technology cost of renewables [[slide 27](#)], why is the NREL conservative estimate not the highest?

Response: These numbers are from last summer and we have been warned that prices may be going up 45%. We wanted to model enough range on the upper end to capture supply chain issues and use the NREL conservative as a high case to reflect those risks.

Comment: It seems like SRP is saying that for wind and solar we are modeling those costs higher but with gas price sensitivities they will not exceed the highest range of \$7.

Response: We don't have any external data source for increasing the high case for gas. Gas is being traded at known prices for future years, but we can't lock in prices for future technologies.

Question: This approach is being taken despite the all-source request for proposals (RFP)?

Response: We can't comment on or use inputs from the RFP responses, but it's fair to say that those responses don't tell us that the high sensitivity price trajectories are unreasonable. For the Integrated System Plan we need to get bookends and extremes to draw conclusions on reliability, affordability and sustainability. The exercise is designed to get to those strategic approaches and make decisions. If there is a data source supporting higher gas prices, please share. We want to anchor to publicly available data sources. Some sources are not publicly available so we can't share those widely. We want a robust input range and are trying to capture the range of potential outcomes. There is a risk of having prices that exceed the model outputs.

Comment [chat]: Do the storage costs include the 30% ITC [Investment tax Credit] (available if storage is charged by a renewable source)?

Response: When we model a selection of resources, we will give the model the option to pair storage with solar and apply the ITC.

Reynolds continued by describing SRP's committed resource additions ([slide 29](#)), the technology available for selection in the Current Trends scenario ([slide 30](#)) and additional information about the "no new gas" strategic approach ([slide 31](#)).

Question: Is there a reason why more targeted demand-side management (DSM) or energy efficiency are not included in the available technology list ([slide 30](#))?

Response: We chose to address the potential for customer programs as a sensitivity. We discussed including energy efficiency in the capacity expansion model and reviewed the work done by Arizona Public Service (APS) and Tucson Electric Power (TEP). The model picks winners (i.e., the most cost-effective). This goes against SRP's core value of building a diverse portfolio to serve customer needs equitably and cost-effectively. Additionally, I believe pulling energy efficiency from the forecast and into the capacity expansion model will make the load forecast artificially higher, providing false inputs to the distribution and transmission planning efforts – effectively defeating the purpose of this integrated planning process.

Comment: I'm concerned about the inverse. If energy efficiency isn't included from the beginning then the load forecast may show as inflated at the start. I want to explore that within the Integrated System Plan.

Response: We are trying to get the most accurate forecast possible for this process. SRP's energy efficiency has been fully incorporated in the load forecast for years. We are trying to balance programs for all customers, maintain satisfaction and meet sustainability goals.

Comment: I'm concerned about when the study plan is released and energy efficiency does not show up as a resource in the final scenario. If the technology availability slide ([slide 30](#)) were the only information available about resources then energy efficiency would be excluded from the story.

Response: Yes, communicating this is key.

Question: I agree on energy efficiency as a first step resource. On the future technology categories, what work is SRP doing right now to make hydrogen and nuclear possible, if they are not available for a number of years? I have concerns on cost with fossil fuels and on safety with nuclear power. Solar, batteries and wind are better for both sustainability and affordability.

Response: We make modeling assumptions for both feasibility and cost. We are looking at those assumptions for resources our capacity expansion model could select from. Some technologies are more expensive and have higher risk but can be selected by the model as the most affordable way to meet our modeling constraints.

Comment: Some resource choices seem problematic. Nuclear has a high cost to ratepayers and has safety concerns. Even later in time, it doesn't seem like a smart direction.

Response: For the modeling we want to see if nuclear was not selected because it was not economic rather than excluding it from the outset. In many studies, deep decarbonization chooses some of these technologies. We are trying to determine the conditions for when and why a resource like nuclear is chosen. We are trying to learn from the results of the capacity expansion model to build a plan rather than determining a single resource plan first.

Comment: My concern is with ratepayer impacts and environmentally-friendly solutions not being chosen.

Question: For the “no new gas” strategic approach with CO₂ capture, has the internal discussion happened on assumptions? How is the social cost of carbon addressed?

Response: We address CO₂ capture with the no new gas strategic approach. We don’t include a social cost of carbon, but implicitly include carbon valuation through the carbon constraints being applied to the model.

Comment [chat]: Can you please list out all the specific constraints SRP is putting on the model, or forcing the modeling to either choose or not choose? To provide better feedback, we need to know SRP’s “hard-coded” inputs into the model for all four scenarios.

Response: We will look at that.

Next Steps

Alagappan provided a recap of the discussion topics and thanked Advisory Group members for their participation. Bond-Simpson noted that transmission and distribution inputs had not been addressed during the meeting due to time constraints and would be discussed at a future meeting of the Modeling Subgroup [April 4, 2022]. She reminded that SRP makes modifications to the Integrated System Plan during each iteration and that Advisory Group feedback is helpful in this process.

Question: The target for public release of the study plan is April 2023. What is SRP hoping to get back from us in the next 3-4 weeks? What’s the best format for providing feedback?

Response: Written emails work best so we can follow-up. We can also set up meetings.

Upcoming Meetings

- Advisory Group Meeting #6 on April 15, 2022, 12:00-4:00 p.m.
- Large Stakeholder Group Meeting #2 on April 29, 2022, 12:00-2:00 p.m.
- Large Stakeholder Group Technical Working Session #1 on April 29, 2022, 2:00-4:00 p.m.
- Advisory Group Meeting #7 on May 10, 2022, 9:00 a.m.-1:00 p.m.

Appendix

Meeting Attendance

Advisory Group Member Organizations (members in attendance on 3/21 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

CommonSpirit Health

CMC Steel Arizona

CyrusOne

Environmental Defense Fund (EDF)

Intel

Kroger

Local First

Mesa Public Schools

PAC Worldwide

Pinal County

SRP Customer Utility Panel (CUP)

Salt River Pima-Maricopa Indian Community (SRPMIC)

Southwest Energy Efficiency Project (SWEEP)

Western Resource Advocates (WRA)

Wildfire

Key SRP Staff

Angie Bond-Simpson, Director of Integrated System Planning & Support

Dan Dreiling, Director of Customer Programs

Harry Sauthoff, Manager of Load Forecasting

Jed Cohen, Integrated System Planning Lead

Justin Lee, Manager of Transmission Planning

Melissa Martinez, Manager of Distribution Planning

Michael Reynolds, Manager of Resource Analysis & Planning

Nathan Morey, Manager of Product Development in Customer Programs



Key Facilitation Team

Lakshmi Alagappan, E3

Joe Hooker, E3

Nick Schlag, E3

Eunice Lee, Kearns & West

Joan Isaacson, Kearns & West

Karen Lafferty, Kearns & West

Taylor York, Kearns & West

SRP Board and Council Observers

Anda McAfee, SRP Board Member

Larry Rovey, SRP Board Member

Victor Flores, SRP Board Member

Rocky Shelton, SRP Council Member

Suzanne Naylor, SRP Council Member