Salt River Project (SRP)

Integrated System Plan Advisory Group Modeling Subgroup Meeting #1- Summary

Prepared by Kearns & West

Advisory Group – Modeling Subgroup Meeting #1 Overview

Meeting Objectives

- Discuss the formation of a Modeling Subgroup for the Advisory Group
- Discuss the analytical methods and data sources for Forecasting, Distribution, Transmission, Resource Planning and Customer Programs
- Gather feedback on which inputs are of primary interest

Topic: Integrated System Plan Modeling Ecosystem
Date: February 11, 2022
Time: 9:00-11:30 a.m. MST
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, Agenda Overview and Subgroup Formation

Joan Isaacson, facilitator from Kearns & West, reviewed the meeting objectives (slide 5) and agenda. She also shared updates about the process for forming the Modeling Subgroup and how notes will be reported out to the full Advisory Group (slide 7).

Overview of Modeling Ecosystem and Study Plan

Lakshmi Alagappan, consultant from E3, the Integrated System Plan's technical consulting group, provided an overview of the modeling ecosystem (slides 9-12) and noted that this meeting would focus on sharing more technical details about integration across all planning functions and interdependencies of inputs and outputs.

Joe Hooker, consultant from E3, illustrated how modeling for the Integrated System Plan begins with the traditional resource areas (slide 13) and then layers in planning for distribution, transmission, and avoided costs and program design (slides 14- 17). He further explained that because no single SRP or third-party model can forecast for all areas and because the models were not designed to integrate with each other, modeling for this first Integrated System Plan will be a learning process. He also described the Western Interconnection, the Western Electricity Coordinating Council (WECC) and how SRP must plan for a regional system (slide 21).

Questions: Is the Integrated System Plan supposed to be an optimization process? The PSLF modeling software and others (e.g., Load SEER) do not have optimization. Where in the process is SRP doing optimization?

Response [Hooker]: Some tools don't do optimization but are needed in the overall process for analysis. Not every model performs optimization, but SRP's planning experts will identify low-cost solutions that meet the 2035 Sustainability Goals and maintain reliability.

Load Forecasting Analysis

Harry Sauthoff, Manager of Load Forecasting at SRP, provided an overview of the forecasting process, including inputs such as population forecasts, which are correlated to load growth and inputs related to customer programs ([slides 24-25](#)). He highlighted SRP's use of Itron for third-party verification.

Question: This is purely SRP's load forecast, not generation, right?
Response [Sauthoff]: Yes, this is purely SRP's forecasting on the demand side. We then pass our forecasts to other planning groups.

Question: Are there any regulatory or legislative forecasts, for example changes to gas pipelines or if nuclear were considered sustainable and not just carbon-free?
Response [Sauthoff]: Those forecasts are handled on the resource planning side. We just look at the demand side of electricity.

Question: It's encouraging that you're looking at IPCC (Intergovernmental Panel on Climate Change) data. How is SRP implementing that information?
Response [Sauthoff]: Our experts take global forecasts and then regionalize them. We use that information for our peak demand and energy sales forecasts. It's a trend forecast so when we look at energy sales in the summer, we would see a bump in load and capture those effects.

Question: It's helpful to see where the inputs are coming from. What exactly are the inputs? What is the update on SRP allowing people to see inputs?
Response [Vanessa Kisicki, Director of Distribution Strategy]: We hope this discussion lets us understand where the interest is so we can make the right information available. We want to look for opportunities for providing that data within the confines of our modeling.

Comment: Lay all the data on us, however it is being used. It's helpful for our organization to see data on electrification and electric vehicles (EVs). For others the important data may be in other areas. Transparency is important.
Response [Kisicki]: We are taking notes, especially for the larger Advisory Group.

Comment: Each stakeholder group has its own focus. It's less helpful to only provide the data that everyone is interested in, as it potentially eliminates the specialty of each individual stakeholder.

Comment: There is often interplay in the data, but some folks also like to dig into a particular area.

Nathan Morey, Manager of Product Development in Customer Programs at SRP, described the forecast inputs for customer program planning (slide 26) and how SRP's 2035 Sustainability Goals shape the portfolio. He then explained how those inputs are used in planning (slide 27) with a key measure being end-use load shapes.

Question: Does the customer programs forecasting use end-use load shapes at the measure level?
Response [Morey]: As an example, we enter the end-use load shape of an LED light bulb and the energy savings over a year of use in the evening hours with savings per year of 30 kilowatt hours. A 400-ton chiller may operate during peak hours in summer but less in the winter so the load shape will look different. We try to estimate when the energy will show up on our system. We have 20-25 categories for different load shapes (e.g., lighting, refrigeration, cooling, heating).

Question: In the modeling process, with 100,000 small businesses, where do they fit in? How will their planning or lack of engagement impact these models? When you get into lower-income levels, where concern is more with affordability than sustainability, where is the engagement with people?
Response [Sauthoff]: We look at residential customers by class and then break down by price plan. We do forecasts for limited-income customers.
Response [Morey]: We develop a diverse portfolio to meet the needs of different customer segments. We have less participation with limited-income and small business than from other segments. The impact on the modeling is that we are looking for a return on investment of under 2-3 years, mostly through lighting retrofits and rebates. We are just starting to look at thermostats. When we forecast participation in programs, we lean on trade allies.

Question: What about small manufacturing, for example with fewer than 25 employees? In between residential and large customers there is a wide range of users and knowledge about climate impacts. It's important to elevate that group since it's hardest to forecast.
Response [Sauthoff]: We place residential customers into classes and then break that down by price plan with some forecasts for limited-income customers.

3

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Question: When you model participation for load shape impacts, is SRP modeling changes to standby riders? Would this allow customers of all sizes to put more solar and the like on their sites?
Response [Morey]: We would have to talk to the pricing team at SRP.

Comment: It would allow small manufacturers to access the power purchase agreements that SRP offers its customers.

Sauthoff continued the presentation on load forecasting by describing the processes and modeling tools (slide 28) and how the forecast outputs include both base and range forecasts (slide 29). He highlighted uncertainty of battery storage and EV adoption with new forecasts.

Question: Which third party is SRP using for commercial load assumptions?
Response [Sauthoff]: With Itron we do commercial load assumptions on an aggregate basis and then use price plans. We use economic inputs such as employment and layer in energy efficiency.

Question: Is SRP using data from time-of-use (TOU) plans to update or send pricing signals to customers to try to change consumption patterns?
Response [Sauthoff]: We develop our forecasts to meet pricing plans. Our peak plans send these price signals effectively, especially in summer when we are seeing weekend peaks. We are looking at different pricing plans to meet the future load, which is transforming quickly.

Question: You said earlier to meet load growth, SRP would need about 5,000 MW? Is that SRP's internal assumption?
Response [Sauthoff]: That forecast would be for large customers, but many of these opportunities are not mature. It depends on whether they actually locate in our service area.
Comment: Consider comparing these new opportunities with the Integrated Resource Plan planning process. This is a significant addition to what SRP was originally planning and so look at how that can be enhanced in the Integrated System Plan.

Comment [chat]: It could be helpful for the Advisory Group members to provide a 1-, 3- and 5-year load forecast to help SRP's forecast. I am sure the third parties are good, but they may not know what the end customers know.

Comment [chat]: That is a good idea. For other Arizona utility resource plans, the Southwest Energy Efficiency Project (SWEEP) conducted independent modeling for capacity expansion with a focus on eliminating inefficiency in plant operations. These concepts would be helpful to this process. Here is an example of this modeling work for APS's service territory:
https://docket.images.azcc.gov/E000013367.pdf?i=1620854217837

Comment [chat]: The SWEEP modeling work has been extremely valuable.

4

Resource Planning Models

Michael Reynolds, Manager of Resource Analysis & Planning at SRP, described the challenges in balancing reliability, affordability and sustainability and the inputs used in the resource planning process (slides 31-33). He explained the process for modeling using Aurora and how WECC data is used for the electric price forecast, emphasizing how the models account for interconnectedness and availability of market energy (slides 34-35). He also described the resource analysis outputs and how those serve as inputs for other steps in the process (slide 36).

Question: Does the modeling assume no congestion and that SRP can dispatch power in the system?
Response [Reynolds]: Yes, the modeling assumes no congestion in the zone.

Question: The Arizona Corporation Commission has said that future Integrated Resource Plans will have to use sub-hourly forecasting, especially for batteries because hourly modeling can't capture the full value. Does SRP plan to move to sub-hourly forecasting?
Response [Reynolds]: We have experimented with sub-hourly modeling. We did a modeling effort with energy imbalance market (EIM) engagement and have a pretty good understanding, but we don't expect to include it this year.

Question: How is SRP planning for retirements, especially retiring coal as quickly as possible?
Response [Reynolds]: We can use the model to choose when to exit resources but are concerned that it's not catching all the transmission impacts. We hope in the Integrated System Plan to explore that in the deterministic steps. For example, we might retire a plant at different times in the future and compare those runs to evaluate impacts of those decisions across input groups to compare costs and sustainability impacts.

Comment [chat]: It's hard to keep reliability while increasing sustainability while eliminating dispatchable generation.

Distribution Planning Methods

Melissa Martinez, Manager of Distribution Planning at SRP, first provided a system overview and then described the distribution planning process, inputs and how loads are allocated using local area forecasts (slides 38-42). She then explained the process for load flow analysis and the outputs (slides 43-44).

Question: Is SRP's distribution system able to measure real time injection of energy from distributed energy resources (DER) and especially rooftop solar? A number of states are reconsidering net energy metering (NEM) for distributed solar and moving to pricing that is more connected to the utilities' COG [cost of oil and gas].
Response [Martinez]: We are putting systems in place and have a path to be able to measure and model that for the future.

Question: What does SRP anticipate is the most likely scenario for how people will charge their EVs? At home at night, during the day at work or out for other activities?
Response [Martinez]: We anticipate at home. We talk about when people get home or on Sunday and are charging for the week. We are also asking what the use of DC fast chargers in the middle of the day looks like in the system.

Question: The advanced metering infrastructure (AMI) data is at 15 minutes (slide 40). Does SRP have data at a lower level of granularity?
Response [Martinez]: We have almost instantaneous data and then aggregate to 15 minutes.

Question: On assumptions related to residential and commercial battery storage, how does that impact forecasting? How is SRP estimating the value of DER in the aggregate? It could be interesting to compare with Arizona Public Service's aggregation tariff.
Response [Martinez]: We are looking internally at these questions and where we might have looked at a traditional resource, we are looking at new options and evaluating reliability. We are still evaluating new technology to see where we get the biggest benefit.

Question: When the timing is right, we would want to talk more about utility-scale and residential storage. What do the assumptions look like at the distribution level for demand-side resources? It's so new, it would be helpful to know how it's being considered for this Integrated System Plan so Advisory Group members can provide feedback.
Response [Martinez]: We are looking at this but have not yet documented all the assumptions. We are looking for additional input and feedback on that part of the process.

Transmission Planning Methods

Justin Lee, Manager of Transmission Planning at SRP, described planning with regard to the Western Interconnection, emphasizing the reliance on accurate data and models from WECC and correct grid topology from neighboring utilities (slides 46-49). He also illustrated the transmission investment process (slides 51-58), how SRP performs analysis of steady state flow (slides 59-64) and described the analysis outputs (slide 65).

Question: Annually, is SRP a net importer or exporter of energy to WECC?
Response [Lee]: Generally, we are a net exporter, but it depends on the time of year. Across the summer peak, we rely on the market. We would have to look at times of year due to change and complexity in the system.

Modeling Ecosystem Recap

Alagappan provided a recap of the modeling system discussion. She thanked Advisory Group members for their feedback on what's important in developing this Integrated System Plan and the roadmap for future iterations.

Upcoming Meetings

- Advisory Group Meeting #4 on February 15, 2022, 9:00 a.m.-1:00 p.m. MST
- Advisory Group Meeting #5 on March 14, 2022, 9:00 a.m.-1:00 p.m. MST
- Advisory Group Optional Modeling Subgroup Meeting #2 on March 21, 2022, 10:00 a.m.-12:00 p.m. MST

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Appendix
Meeting Attendance

Advisory Group Member Organizations (members in attendance on 2/11 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
Harry Sauthoff, Manager of Load Forecasting
Jed Cohen, Integrated System Plan Project Co-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
Vanessa Kisicki, Director of Distribution Strategy

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 & Council Observers
Larry Rovey, SRP Board Member
Randy Miller, SRP Board Member
Rocky Shelton, SRP Council Member
Suzanne Naylor, SRP Council Member