



Salt River Project (SRP) Integrated System Plan Technical Working Session 1: Study Plan Details Summary

Prepared by Kearns & West

Technical Working Session – Meeting Overview

Meeting Objectives

- Provide an overview of the Integrated System Plan’s modeling ecosystem
- Discuss the analytical methods and data sources for forecasting, distribution, transmission, resource planning and customer programs

Topic: Study Plan Details

Date: April 29, 2022

Time: 10:15 a.m.-12:00 p.m. PDT

Location: Virtual

Of the more than 120 organizations invited from the Large Stakeholder Group members, 41 stakeholders from 31 organizations attended the Technical Working Session. Please see the appendix for attendance information. The [meeting agenda](#) and [presentation](#) are available at the [Integrated System Plan portal](#).

Welcome and Agenda Overview

Lakshmi Alagappan, consultant from E3, the Integrated System Plan’s technical consulting group, welcomed participants to the first Technical Working Session. She reviewed the meeting objectives ([slide 2](#)) and [agenda](#).

Overview of the Modeling Ecosystem

Alagappan first described the Integrated System Plan process and its system-wide approach ([slides 5-7](#)). She then presented an Integrated Resource Plan ([slide 8](#)) for comparison and described the foundational elements of the more holistic Integrated System Plan ([slide 9](#)).

Joe Hooker, consultant from E3, provided an overview of the modeling ecosystem components for the Integrated System Plan, including distribution planning, transmission planning and costs, avoided costs and customer programs ([slides 10-15](#)). He noted the role of regional planning and the Western Interconnection in ensuring energy reliability and security in the West ([slides 16-17](#)). He explained that the information in the modeling ecosystem allows SRP to design its power system and navigate uncertainties.

Q&A and Discussion

Question: Can you provide clarity on customer programs? I have concerns about the level of customer programs assumed in the Integrated System Plan if some elements are determined after the fact.

Response: Customer programs are a key input. The modeling captures energy efficiency and demand response with a planning process that feeds into the Integrated System Plan. SRP has aggressive plans as part of the 2035 Sustainability Goals and we have accelerated beyond those goals. The current design of the Integrated System Plan delivers avoided costs at the end of the process. The intent is to better understand those avoided costs to help shape the customer program portfolio and design future programs.

Comment: Customer program implementation is unclear since the Integrated System Plan will show the level of ambition for customer programs in the future.

Response: With this pilot Integrated System Plan we are still trying to refine the processes and conduct analysis of all 42 cases. Customer programs serve as an input to those analyses, so we won't have an opportunity to revisit or refine the program metrics until the end – in preparation for the next Integrated System Plan. It's an iterative process.

Load Forecasting Analysis, Including Customer Programs

Harry Sauthoff, Manager of Load Forecasting at SRP, provided an overview of load forecasting inputs, modeling tools and outputs and then a detailed description of modeling inputs ([slides 19-20](#)). He also described the processes and tools for forecasting and outputs, noting the modeling work conducted with Itron ([slides 23-24](#)).

Q&A and Discussion

Question: Has SRP modeled what would happen if the Valley hit 124 degrees for 5 days?

Response: No, not in load forecasting.

Question: For SRP's goal of 500,000 electric vehicles by 2035, what would be the added load as a percent of the total?

Response: We have 100-125 MW in our forecast today, which assumes the status quo for customers on our current price plans. We are looking at ways to reduce that demand through load management projects.

Morey then described customer program inputs for forecasting, including energy efficiency and others ([slide 21](#)) and then how customer program inputs factor into the integrated modeling ecosystem, including short and long-term considerations ([slide 22](#)).

Q&A and Discussion

Question: Are programs limited to rebates? Rebates will never reach some of the worst performing equipment on your system because people can't afford the capital costs of upgrades or have no incentive to upgrade.

Response: SRP has one of the largest behavioral energy efficiency programs in the country. These programs have no cost for participation and provide an opportunity to help customers understand their energy consumption.

Comment: Behavioral programs are great for encouraging efficiency in non-critical loads, but they don't help for critical loads such as air conditioning during peak summer temperatures. They can even hurt if they encourage people to live in unsafe indoor heat. If they can't afford to upgrade to efficient air conditioning units, or don't control ownership of those units, then they're stuck.

Response: It is certainly tempting to focus on air conditioning alone, but we want to have programs that serve all customers. Air conditioning investments are expensive. Behavioral programs are available to everyone. We try to drive as much peak load reduction as possible through our other programs.

Question: Is SRP considering the added value of customer programs for distribution and transmission deferral (non-wires solution) to improve the business case for some of these programs?

Response: Yes, but right now with demand response everything is about addressing the system needs. We have a diverse portfolio that can adapt to local needs, and we intend to grow capacity and develop the operational characteristics to address localized needs.

Question: How is SRP considering demand side management distribution planning that includes aggregating localized traditional energy efficiency?

Response: We have everyone mapped geographically for demand response. Currently we are operating for system level needs and are preparing for geographic operations in the future. This is an example of why SRP is moving to system planning so we can add granularity. Localized operations might not be in the first Integrated System Plan, but we want to be prepared to do that planning.

Comment: Having the ability to finance equipment replacement and then adding the carrying charge as a "facility charge" embedded within the bill may be one way of offsetting the high capital charges associated with equipment replacement.

Response: This is currently not in SRP's charter, but we continue to explore.

Resource Planning Methods

Michael Reynolds, Manager of Resource Analysis & Planning at SRP, presented resource planning methods, describing power generation and challenges in planning for reliability, affordability and sustainability ([slides 26-27](#)). He shared the resource analysis inputs, process and methodology using the Aurora optimization model and explained zonal configuration modeling ([slides 28-31](#)). He also described the resource analysis outputs ([slide 32](#)).

Q&A and Discussion

Question: Where does SRP’s study of a “virtual battery” fit into the resource planning exercise?

Response: We add a virtual battery to our resource portfolio and identify constraints for charging and discharging. We see how it improves the ability to build our systems and the costs. It’s an opportunity to explore economics and shift load.

Question: The California Independent System Operator (CAISO) is predicting increased daytime solar coming from California through 2030 and low or negative pricing. Is SRP’s modeling identifying sinks for this energy as a source of low-cost and often renewable energy?

Response: When we simulate the region, we include California utilities and loads plus their expected build. We could take advantage of lower midday energy prices if we have a need for energy midday. We don’t know for certain what we would use since SRP could also have extra energy, but part of the Integrated System Plan process is figuring out what our portfolio should be. We can import from our neighbors when it makes sense.

Comment: SRP could use surplus energy to produce hydrogen for a fuel cell that runs at peak.

Response: That’s a great idea. As we move forward, we expect some interesting conclusions regarding energy storage. Hydrogen is an example of potential energy storage.

Question: Areas for possible SRP study include additional outputs and modeling (e.g., production cost vs. capacity expansion). Is it possible to consider changes to the Integrated System Plan timeline to include additional areas of study that are considered critical?

Response: We have modified the timeline for the Integrated System Plan by extending it from December 2022 to April 2023. We need to balance getting the first plan in place and opportunities for additional analyses in the next one. We need some certainty within the year, but that doesn’t mean we can’t immediately build from that. We have worked with our Advisory Group on additional ideas we will be pursuing. One exploratory study is for increased regional connections. Based on feedback about coal, we will also do an exploratory study to simulate allowing coal generation to turn off when it’s not economically justified.

Question: Does CAISO share information with SRP, such as other types of Integrated System Plans?

Response: We read the Integrated Resource Plans from the California entities and E3 has been involved with those studies and studies with government-based organizations. We share information for future resources and work with the Western Electricity Coordinating Council to coordinate and share plans about forecasts and resources to right-size what we're doing.

Distribution Planning Methods

Melissa Martinez, Manager of Distribution Planning at SRP, provided an overview of distribution system planning, including an overview of the process, inputs, the LoadSEER forecasting tool and outputs ([slides 34-36](#)). She then described the process, methodology and outputs in greater depth ([slides 37-40](#)).

Q&A and Discussion

Question: What does the load forecast for distribution look like? Is it a single set of daily/seasonal load or a set of simulations under different scenarios? How much sensitivity analysis is done around different load sizes and shapes?

Response: For the distribution forecast, all planning teams have access to the 8760 data and the hourly outlook. In annual planning we also do range forecasts, which include optimistic and pessimistic outlooks that are incorporated into the scenarios and sensitivities for the Integrated System Plan. For distribution planning we begin with a bottom-up approach. We take in all the daily and seasonal information, add customer load and projections and then mirror that with the corporate forecast so we have both a top-down and bottom-up approach.

Question: Can SRP put generation at substations less than 100 MW?

Response: It depends, many forces are at play in siting. When a plant of any size is built it needs access to the transmission network.

Question: How is distribution planning considering equity, especially for neighborhoods that might not be adopting distributed energy resources and electric vehicles as fast? Is that factored in?

Response: For this first Integrated System Plan we are looking at understanding the impacts. We will be looking at that issue in the future.

Question: Where does or where will two-way power flow occur?

Response: We are analyzing the system to see what that will look like. We are looking at penetration of distributed energy resources to explore those solutions.

Transmission Planning Methods

Justin Lee, Manager of Transmission Planning at SRP, gave an overview of transmission planning and the Western Interconnection, noting regional interactions ([slides 42-43](#)). He described the planning process inputs, analysis and outputs ([slide 44](#)) and then the resulting inputs for transmission investments ([slide 45](#)). He illustrated the investment process and gave an example analysis, including outputs used to create cost estimates ([slides 46-53](#)).

Q&A and Discussion

Question: Will growth in rooftop solar impact transmission adversely?

Response: There will be an impact but positive or negative is yet to be determined. We don't have control over rooftop solar generation but it will influence how power flows across the transmission system, especially if we have areas that grow in distributed energy resources and others that do not. Some models show that when enough solar develops in a concentrated area that power will flow back to the transmission network during the day and then reverse at night. Impacts such as this will change how we do our analysis.

Question: Is the voltage at a station or a substation?

Response: A station is where we have lines connected together, usually of the same voltage. A substation is made up of two or more stations that are connected via transformers. In a substation you could have transmission lines at two different voltage levels that are connected via the substation.

Question: What happened with California's proclamation last year, where if there is a potential for power outages on the California grid, they can take any energy that is flowing through California on contract to Arizona?

Response: California's proposed changes to implement this rule were upheld by the Federal Energy Regulatory Commission, but CAISO was required to submit a proposal for an alternate approach. CAISO had committed to an equitable path forward by the end of May this year, but then they filed for an extension of the proposed rule to remain in place for an additional two years. We do not see a path forward right now where California shares more equitably in transmission as they have historically been required to do (similar to other transmission providers). When we look at markets and regional coordination in constrained energy or constrained capacity scenarios, the reality is that entities across the entire West have a "my customer first" perspective and it makes it harder to coordinate or realize benefits that we can reliably count upon for meeting our customer needs.

Question: Could Arizona receive lost energy from California at Palo Verde?

Response: There were requests by regulators and politicians about Arizona utilities not sending energy to California during such events, however SRP is not interested in pursuing that at this time. In general, we believe the system operates best when we are following the Golden Rule of treating others as we would want to be treated, and we aren't prepared to alter our practices or endorse California's approach at this time. They do have contractual rights and ownership in Palo Verde, so it is not really within our rights to prevent that energy flowing.

Question: On distributed generation, is SRP saying more rooftop solar might negatively impact your transmission planning? Isn't the inverse much more likely?

Response: There will be an impact; negative or positive is yet to be determined. Considering batteries could change that answer. From an operations perspective, we must look at challenges with monsoons, variability and other considerations in addition to rooftop solar.

Recap and Next Steps

Alagappan thanked participants for their participation and presented the timeline for future meetings ([slide 55](#)) with the next Large Stakeholder Group meeting scheduled for Fall/Winter 2022. Olsen concluded the session by thanking stakeholders for their engagement.

Appendix

Meeting Attendance

Large Stakeholder Group Organizations (groups represented on 4/29/22 are shown in **bold**)

AARP
Advanced Energy Economy
AEP
AES Clean Energy
Air Products
American Lung Association
AMPUA
AMWUA
Apache County
Apache County Economic Development
Apex Clean Energy
Apple Inc.
AriSEIA
Arizona Cattle Growers Association
Arizona Center for Law in the Public Interest
Arizona Chamber of Commerce
Arizona Commerce Authority
Arizona Competitive Power Alliance
Arizona Cotton Growers Association
Arizona Energy Policy Group
Arizona Farm Bureau
Arizona Hispanic Chamber of Commerce
Arizona Lodging and Tourism Association
Arizona Power Authority
Arizona Public Service
Arizona Residential Utility Customer Office
Arizona Solar Deployment Alliance
Arizona Solar Energy Industries Association/Veregy
Arizona State Land Department
Arizona State University
Avangrid Renewables
Atlas Renewable Power
AzCPA
AZ Thrives
AZ PIRG
AZ Strategies
AZ Sustainability Alliance
Balanced Rock Power
Basha's
Beatitudes Campus
Boeing
Building Owners and Managers Association (BOMA)
Bureau of Land Management
Calpine
Candela Renewables
Casa Grande
Chicanos Por La Causa
Christian Care Inc., Mesa District
City of Apache Junction
City of Chandler
City of Mesa
City of Phoenix
City of Tempe
CMC Steel, AZ
CommonSpirit Health
ConnectGen, LLC
Coolidge
Copper State Consulting Group
Cushman & Wakefield
Cyrus One
Digital Realty
DMB
East Valley Chamber of Commerce
East Valley Partnership
Enel Green Power North America, Inc.
Energy Exemplar, LLC
Environmental Defense Fund
EPRI
Facebook
Forest Service U.S. Department of Agriculture
Fort McDowell Yavapai Nation
Freeport-McMoRan Copper and Gold

Gamage & Burnham Attorneys at Law
General Electric
Gila Bend
Gilbert
Glendale
Google
Greater Phoenix Economic Council
Greater Phoenix Leadership
Greenlots
Home Builders Association of Central
Arizona
Hospice of the Valley
Intel
Interwest Energy Alliance
Invenergy
JKL Consulting Services, LLC
Kroger Co. (Ralphs and Food4Less)
Kyl Center for Water Policy
Local First Arizona
Mercy Gilbert Medical Center/Dignity
Health
Mesa Community Action Network
Mesa Gateway Airport
Mesa Public Schools
Microchip Technology
Mitsubishi Hitachi Power Systems Americas,
Inc.
Nature Conservancy/ Arizona Thrives
Navajo County
New Leaf/Mesa-CAN
New Life Christian Center, Coolidge
NextEra Energy Resources
Northern Arizona University
NREL
Onward Energy
Origis Energy
Orsted Onshore North America

PAC Worldwide
Page
Pattern
Phoenix Chamber of Commerce
Pinal County
Queen Creek Chamber of Commerce
Queen Creek Unified School District
Roosevelt Water Conservation District
Salt River Pima-Maricopa Indian
Community
SRP Customer Utility Panel
Scottsdale
Seguro Energy
Sierra Club
Southwest Energy Efficiency Project
Southwestern Power Group
St. Johns
St. Paul Church, Randolph
Starwood Energy Group Global, Inc.
Sustainable Energy Power Alliance
Tierra Strategy
Tormoen Hickey, LLC
Town of Florence
Town of Springerville
Tucson Electric Power
United Dairymen of Arizona
University of Arizona
Valle Del Sol Strategic Initiatives: The Real
Arizona Coalition
Valley Partnership
Vote Solar
Walmart
West Marc
Western Grid Group
Western Resource Advocates
Wildfire

Key SRP Staff

Angie Bond-Simpson, Director of Integrated System Planning & Support
Bobby Olsen, Senior Director of Corporate Planning, Environmental Services and Innovation
Domonique Cohen, Integrated System Plan Communications Lead
Harry Sauthoff, Manager of Load Forecasting
Jed Cohen, Integrated System Planning Lead
Justin Lee, Manager of Transmission Planning
Kyle Heckel, Integrated System Plan Project Manager
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

Joe Hooker, E3
Lakshmi Alagappan, E3
Nick Schlag, E3
Eunice Lee, Kearns & West
Joan Isaacson, Kearns & West
Karen Lafferty, Kearns & West
Taylor York, Kearns & West

Board & Council Observers

John Hoopes, SRP Board Vice President
Jack White, SRP Board Member
Larry Rovey, SRP Board Member
Rocky Shelton, SRP Council Member
Suzanne Naylor, SRP Council Member