



**SRP Integrated System Plan
Advisory Group Meeting #6
Integrated System Plan Study Launch**

April 15, 2022

Welcome

Kelly Barr

Associate General Manager Chief Strategy and Corporate Services & Sustainability Executive, SRP

Welcome SRP Board and Council Observers



John Hoopes
SRP Vice President



Victor Flores
SRP Board Member



Anda McAfee
SRP Board Member



Jack White
SRP Board Member



Larry Rovey
SRP Board Member



Suzanne Naylor
SRP Council Member



Rocky Shelton
SRP Council Member

Updates

Safety & Sustainability Minute

Meeting Objectives:

- Review the Study Plan for the Integrated System Plan and Scenario narratives
- Gather feedback on the draft Metrics proposal
- Get to know each other and celebrate the completion of the first-ever Integrated System Plan Study Plan

Agenda

Time		Topics	Presenter
9:00 - 9:30	30 mins	Breakfast and Conversation	
9:30 – 10:00	30 mins	Welcome, Opening Remarks, and Advisory Group Roundtable	Kelly Barr (SRP) Joan Isaacson (K&W)
10:00- 10:30	30 mins	Review of the Integrated System Plan Study Plan – Open Discussion	Angie Bond-Simpson (SRP)
10:30 – 10:40	10 mins	*Scenario Narratives Review/Coffee Break	Jed Cohen (SRP)
10:40- 11:10	30 mins	*Scenario Narratives Breakout Session	Joan Isaacson (K&W)
11:10 – 12:00	50 mins	Metrics Draft Proposal and Advisory Group Feedback	Jed Cohen (SRP) Kyle Heckel (SRP) Joan Isaacson (K&W)
12:00 - 12:10	10 mins	Coffee Break	
12:10 - 12:25	15 mins	What we Heard on Metrics	Nick Schlag (E3)
12:25 – 12:30	5 mins	Wrap Up and Next Steps	Joan Isaacson (K&W)
12:30 – 1:30	60 mins	Lunch and Conversation	

*Scenario narratives agenda items not covered due to time constraints

Guides for Productive Meetings

- Actively participate
- Be respectful of other perspectives
- Listen for understanding
- Stay concise to allow time for everyone to participate
- One representative for each organization in meeting discussions
- Enjoy the meeting!

How to Participate Virtual Attendees

- Turn on camera for a more engaging experience
- Join the conversations
 - Use the Raise Hand feature in Zoom
 - Enter questions and input in Chat
- Enjoy the breakout rooms that will run parallel to in-person discussion groups



SRP ISP ROADMAP

Stakeholder Engagement
and Public Outreach

Collaboratively
develop Study Plan:
Scenarios & Sensitivities
Strategic Approaches
Metrics

Gather input data

Perform system
analysis

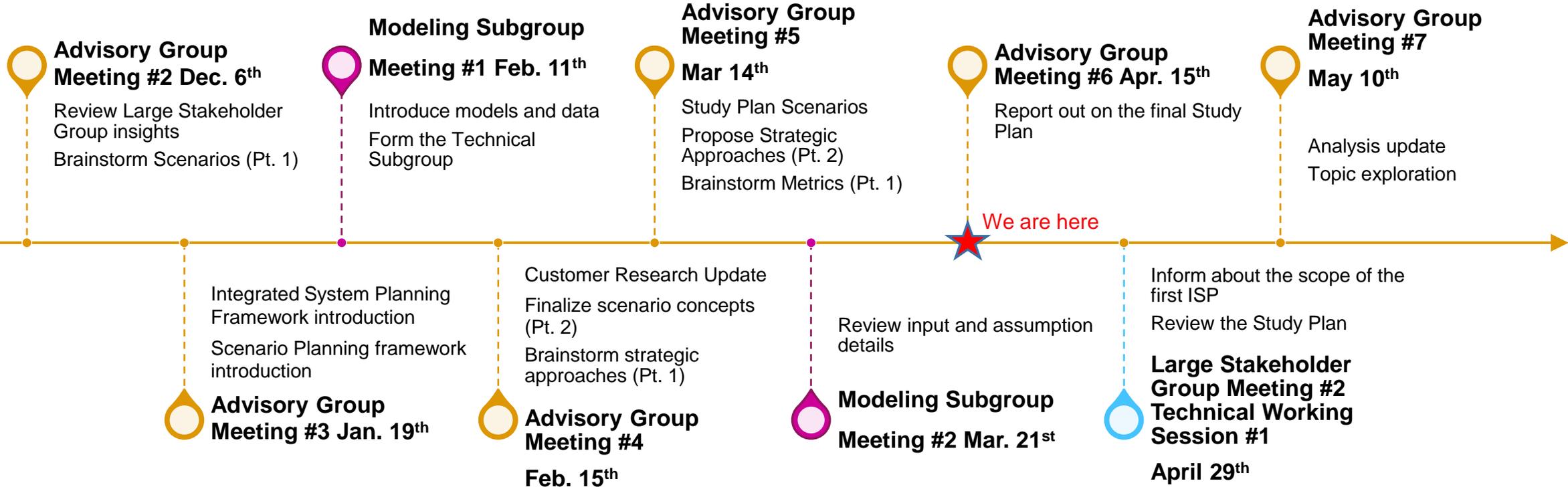
Validate and share
results

Recommend new
SRP strategic
directions

Recommend near
term actions

Developing the Study Plan

Prepare Phase



-  Large Stakeholder Group Meetings
-  Advisory Group Meetings
-  Modeling Subgroup Meetings

Analysis Phase

Advisory Group Roundtable & Re-Introductions

Advisory Group Re-Introductions

Step 1: Interview in Pairs

Step 2: Introduce Partner to Group

1. What's your name and who do you represent on the Advisory Group?

2. How long have you lived in the Phoenix area and where did you live before?

3. What is a fun fact about your pets, kids, or plants?

4. What is your organization's number one discussion topic around energy?

Integrated System Plan Study Plan

Angie Bond-Simpson

Director, Integrated System Planning & Support, SRP

Integrated System Plan Study Plan: Process Overview

Study Plan Components	Stage of Completion	Advisory Group Brainstorm	Draft Proposal	Advisory Group Review & Feedback	Final Proposal	Share Final Proposal with Stakeholders
Scenarios & Sensitivities	Finalized	✓	✓	✓	✓	✓
Strategic Approaches	Final Proposal	✓	✓	✓	✓	April 15th
Metrics	Draft Proposal	✓	✓	April 15th	Pending Review	May 10th

Reviewed the modeling ecosystem and specific assumptions with the Advisory Group: Modeling Subgroup

Recap of Modeling Subgroup Meetings

Meeting 1 (February 11th)

- Discussed the modeling ecosystem and planning processes for each of the SRP planning groups

Meeting 2 (March 21st)

- Discussed the detailed inputs for scenarios and strategic approaches

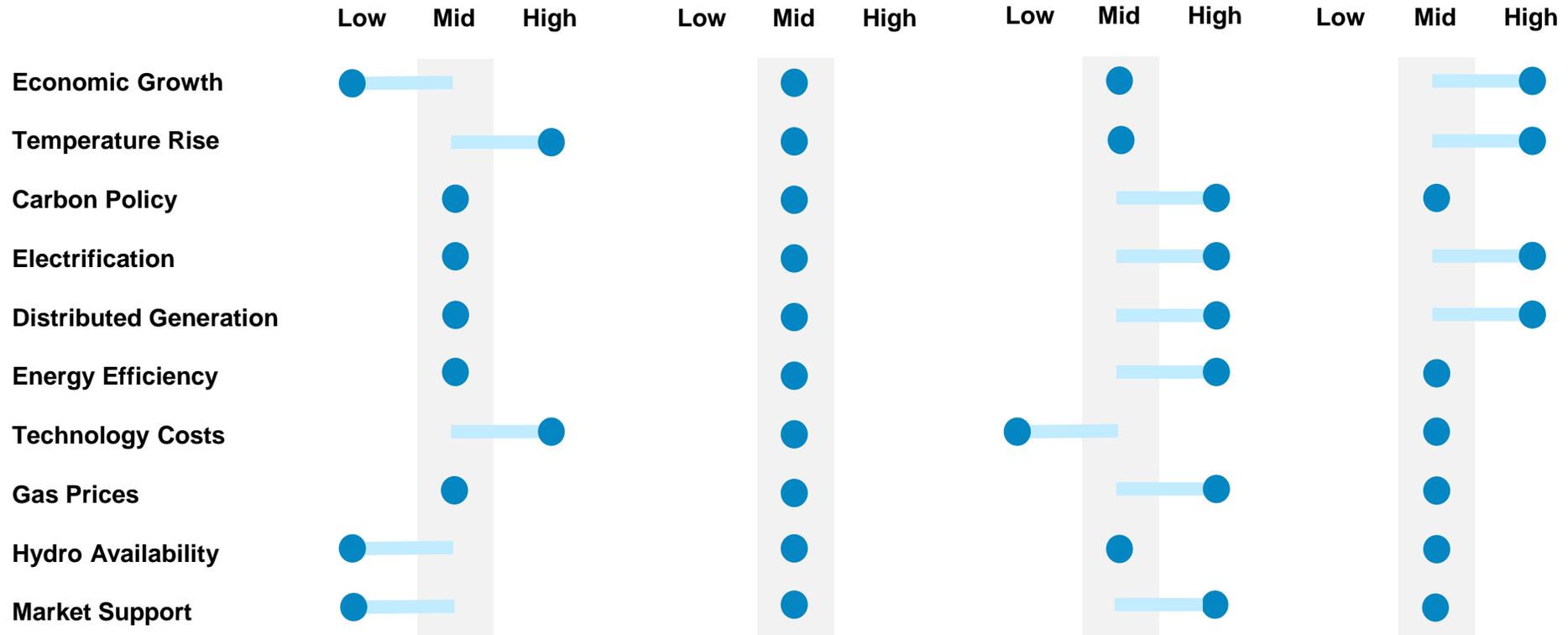
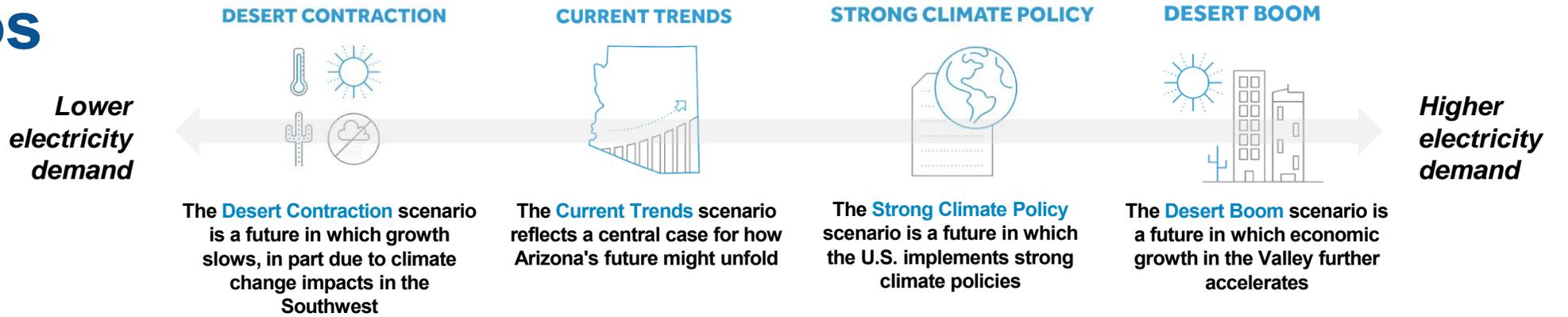
Meeting 3 (April 4th)

- Followed up on select topics from the March 21st meeting

Feedback Incorporated

- Updated carbon reduction target in Strong Climate Policy scenario
- Updated gas price forecast to incorporate recent events
- Updated gas price volatility to reflect historic volatility
- Will communicate energy efficiency as a resource option

Scenarios



Sensitivities

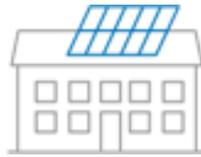
Sensitivities

High Demand Response

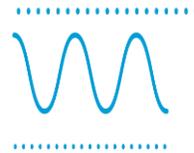


High Energy Efficiency

High Distributed Generation Adoption



Increased Load Management



High, Low & Volatile Gas Prices



High & Low Technology Costs



Regional Transmission Organization Assessment



Strategic Approaches & Exploratory Studies

Strategic Approaches for System Analyses

Technology Neutral



SRP takes a **least-cost** approach to building the future power system

No New Fossil



SRP avoids investment in new natural gas capacity, **meeting future needs with carbon-free resources**

Minimum Coal



SRP **reduces power generation from coal** and analyzes the system-wide impacts while maintaining reliability

Exploratory Studies

Next Generation Time of Use



SRP explores the next generation of residential TOU plans

High Regional Interaction



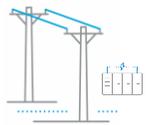
SRP explores integration with regional electricity markets

Flexible Coal Operations



SRP explores the system impacts and value of flexible operation of the coal generation fleet

SRP Storage on Distribution System

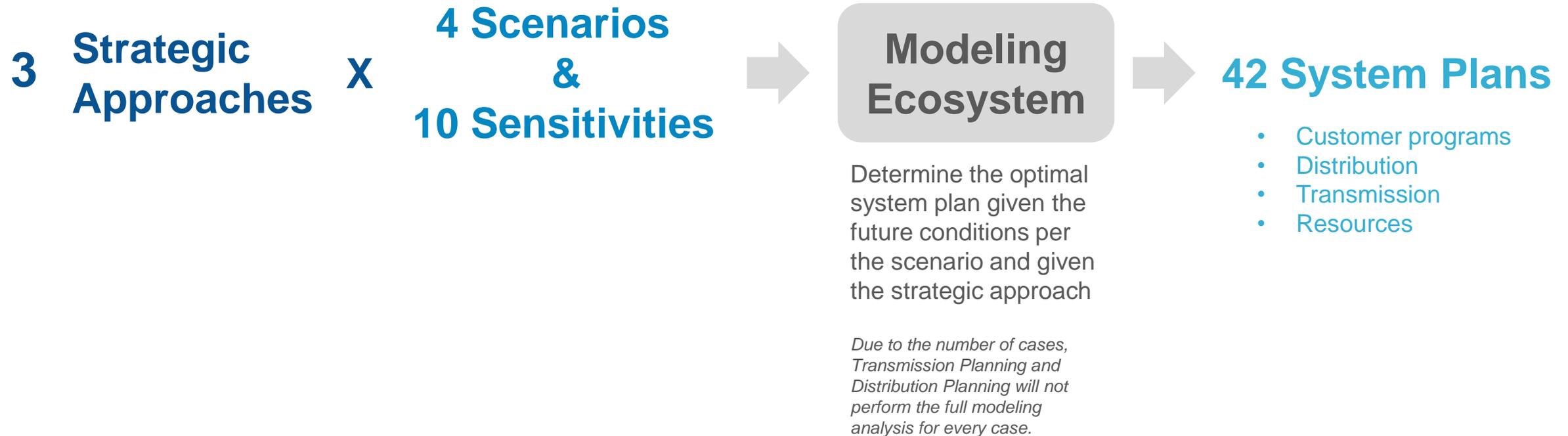


SRP explores storage sited on the distribution versus transmission systems

Recap of Strategic Approaches Feedback Incorporated

- Excluded natural gas carbon capture and sequestration (CCS) as a resource option in the No New Fossil strategic approach.
- Added an exploratory study to model flexible operations of the coal fleet.

Developing a System Plan



Study Plan Matrix

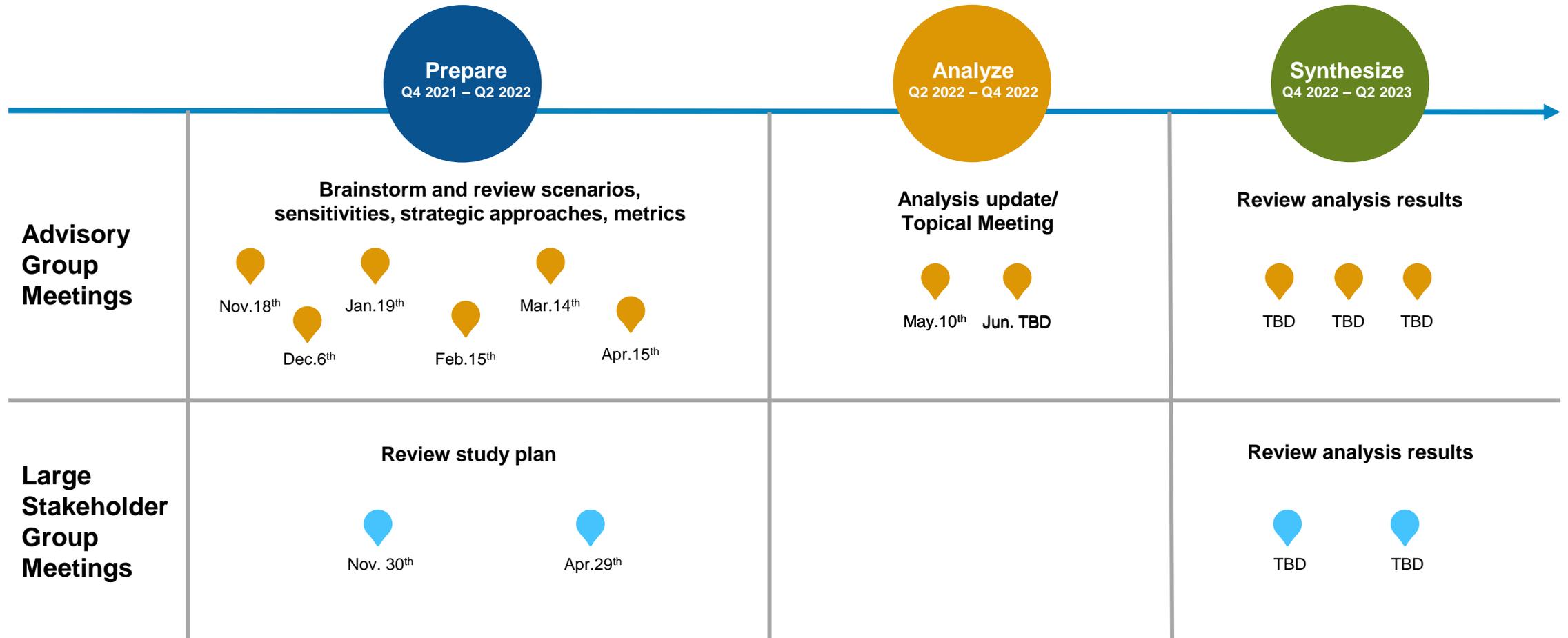
Strategic Approaches

		Technology Neutral	No New Fossil	Min. Coal
Sensitivities	Current Trends	●	●	●
	<i>High, Low, & Volatile Gas Prices</i>	● ● ●	● ● ●	● ● ●
	<i>High & Low Technology Costs</i>	● ●	● ●	● ●
	<i>High Demand Response</i>	●	●	●
	<i>High Energy Efficiency</i>	●	●	●
	<i>High DG Adoption</i>	●	●	●
	<i>Increased Load Management</i>	●	●	●
	<i>RTO Assessment</i>	●	●	●
Scenarios	Desert Contraction	●	●	●
	Desert Boom	●	●	●
	Strong Climate Policy	●	●	●

Exploratory Studies

- Next Generation Time of Use (TOU)
- High Regional Interaction
- SRP Storage on Distribution System
- Flexible Coal Operations

Study Schedule



Study Plan Discussion and Feedback

What is your key takeaway from the Study Plan?

Transcribed Index Cards

Lots of dynamic variables – many SRP/stakeholders have little control over; mitigating risk, to the greatest extent possible, is desirable.

There are still so many unknowns

- So many scenarios to study
- No clear picture of what an outage may bring
- How to message to the public – use times?

Planning amid huge uncertainty

This is a lot of data to evaluate. Picking key metrics will be important to evaluate the data. How do we evaluate what parts of the scenarios we have any control over and if there is sensitivity to one or more prediction not meeting the scenario?

The study plan is a great foundation to see the challenges ahead and propose a strategy for examining best “next steps”. Clearly there is much work to be done to broaden the exploration of other options that the ISP will look forward to hearing more about.

Key takeaways:

- Load management and grid flexibility will serve a higher purpose in decarbonization
- Thrilled to have inclusion of mass-based carbon
- C&I has major opportunity for expansion under EE & DR
- RTO and market participation is critical

I appreciate the work that goes into creating 42 system plans and look forward to reviewing all 42.

The depth of commitment to the elimination of coal and other carbon solutions as well as the speed that this is implemented will have the potential to limit reliability and future growth.

You may want to look to some of the education efforts in CT. They had a major campaign for many years (“wait til 8”) and have now had to engage on a major re-education effort. I’d also be interested to hear how APS and SRP are working together to coordinate on customer education.

Metrics Draft Proposal

Jed Cohen

Lead, Integrated System Planning & Support, SRP

Kyle Heckel

Sr. Analyst, Integrated System Planning & Support, SRP

Metrics

Metrics are outputs from the Integrated System Plan modeling ecosystem that allow SRP, customers, and other stakeholders to measure the performance of different system plans.

Metrics in the Integrated System Plan Study Plan

Metrics should...

- Be quantifiable
- Vary across strategic approaches
- Give insight into interesting elements of power system performance

Metrics will be used to...

- Provide information to SRP, customers and other stakeholders
- Evaluate the performance of each strategic approach across scenarios and sensitivities

Metrics Brainstorming Results

Questions

- 1) What are important metrics for reliability, affordability, and sustainability?
- 2) Are there other metrics and/or metric categories to consider?
- 3) What metrics would help SRP determine which system plans are better/worse for customers?

Reliability

- Planning reserve margin

Affordability

- Total costs
- Financial flexibility (fixed costs)
- Cost stability (gas burned)

Sustainability

- Carbon dioxide emissions
- Water use
- Coal ash

Sliding scale (affordability)	Expanded weatherization projects	Power quality (sags, spikes, surges) and reliability	Locational distribution of outages (equity)	Energy Burden (affordability)	Cost of kwh vs. inflation overall (affordability)	Outage numbers (e.g., SAIDI, SAIFI) (reliability)	Other air pollution emissions (PM, SOx, NOx) (sustainability)
Contribution of DSM to peak reliability needs	Assessment of unintended consequences / risks (e.g. bill assistance followed by big spike in bills)	Carbon emissions (not just CO2)	Locational distribution of pollution (equity)	Technology replacement costs	Segment consumption by hour	Equity measures (are outages/pollution impacting some communities more than others?)	Susceptibility to extreme weather events
Timing of carbon emissions	Household income relative to power costs	Customer satisfaction for SRP sustainability measures	Ways to leverage public power status	Review NREL's solar for all tool metrics	Metrics for benefits to customers related to regional markets	Plan options for businesses w/incentive upgrades (affordability)	EE potential
Funds from infrastructure bill leveraged by SRP for sustainability / programs	Public health indicators (asthma, mortality)	Difference made by voluntary bill assistance in communications	EV adoption rates, number of EVs in SRP's territory (sustainability)	Commercial customer participation in energy efficiency, demand response, onsite generation by segment			



What We Heard on Metrics

Advisory Group Top Themes

- ❑ **Affordability performance**
 - ❑ Impact on system cost
 - ❑ Comparing electricity costs compare with indicators such as inflation, household income
- ❑ **Reliability and Resiliency**
 - ❑ Common outage metrics, resilience to extreme weather events, weatherization projects, and contribution of distributed resources to reliability
 - ❑ Power quality metrics (voltage)
- ❑ **Sustainability performance**
 - ❑ GHG emissions over time, GHG emissions beyond CO₂, upstream emissions, impact on public health
- ❑ **Equity and Customer Indicators**
 - ❑ Locational distribution of emissions and outages, as well as more granular consideration of costs for low- and moderate-income customers, energy burden and ability-to-pay
 - ❑ Electric Vehicle and customer program adoption rates

Proposed Metrics



Affordability

What are the system costs to SRP and price impacts to customers?



Sustainability

How does the system impact different environmental considerations?



Reliability

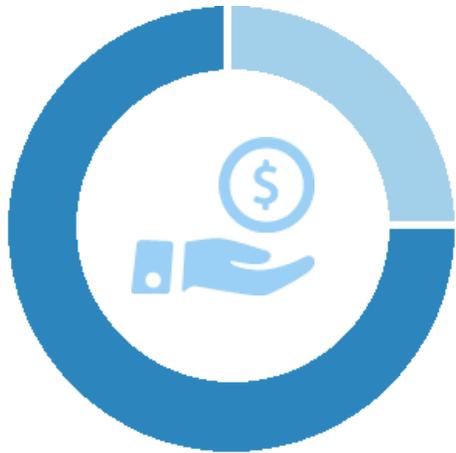
How do different system plans increase or mitigate reliability risks?



Customer Preference

Which system plans do customers prefer?

Affordability Metrics



Total Cost: Net present value of costs from generation, transmission, distribution and customer programs

Average System Rate Impact: Costs normalized (\$/MWh) to remove difference in load forecasts

Average Residential Bill Impact: Average impact to residential bill in absolute terms (\$/month) and relative to inflation.

These metrics consider Advisory Group ideas relating to price increases vs inflation.

Sustainability Metrics



CO₂ Reductions Over Time: Total reductions of CO₂ emissions from power generation on an intensity and mass basis, relative to 2005 levels.

CO₂ Reductions from EE, DR, DG and Electrification: CO₂ reductions associated with various behind-the-meter customer programs.

Carbon-Free Generation: Percentage of energy mix coming from carbon-free resources. Carbon-free resources include solar, wind, hydro, geothermal, hydrogen, nuclear, and biomass.

Capacity Factor for Gas Fleet: Average capacity factor (%) for SRP's gas fleet

Water Use: Water Intensity (gal/MWh) from power generation

Direct Air Emissions: Tons of NO_x, SO₂, and PM10 emitted from power generation

These metrics consider Advisory Group ideas relating to carbon emissions and timing, air quality emissions, and ability of energy efficiency to avoid turning on gas.

Reliability Metrics



Resource Contribution to Reliability: Percentage of system capacity needs met by each resource type.

Reliance on Emerging Technologies: Percentage of system capacity needs met by emerging technologies (e.g., hydrogen, nuclear small modular reactors, carbon capture and storage)

Qualitative Risk Rating Score: Developed through surveys with subject matter experts to capture development and operational risks for each system plan.

*All system plans are designed to meet the same minimum planning reliability criteria

These metrics consider Advisory Group ideas relating to reliability, extreme weather events, and building new nuclear

Customer Preference Metrics



Customer Preference Rating: SRP will design and utilize a survey with residential customers to thoroughly understand how customers value different aspects of the power system.

These metrics consider Advisory Group ideas relating to customer satisfaction

Reasons some suggested metrics were not included

- Operational metrics (outage duration and frequency, power quality, outage distribution)
- Metrics without sufficient data (energy burden, customer ability to pay)
- Metrics that would require major additions to methods and study scope (distribution of air emissions and future outages, upstream emissions)
- Metrics that are very similar (CO₂ versus CO₂e)

Feedback on Metrics Proposal – Roundtable Discussion

Joan Isaacson

Lead Facilitator, Kearns & West

Questions for the Roundtable (facilitated discussion, 35 minutes)

1. What do you like about the proposed Integrated System Plan Metrics?
2. Do the proposed metrics allow us to assess the benefits, costs, and risks of different system plans for the first Integrated System Plan? If not, what else should be considered?

Questions for the Roundtable

Transcribed Sticky Notes

Affordability

- Impact to low-income high energy burden customers
- Seasonality metrics based on usage and cost
- Affordability absent, equity leaves, “affordable to whom?”
- \$/m average impact, expressed as annual average – like to see impact seasonally and monthly (affordability)
- Aggregation of customer energy burden at zip code level

Reliability

- Include loss of load expectation (LOLE) and expected underserved energy (EUE)
- Need better understanding of reserve margin's impact on revenue requirement, if major driver
- I am not entirely clear why some reliability measures (outages, duration) are excluded. Seems SRP collects this info. Likely very important to expending companies.

Sustainability

- Inclusion of PM_{2.5} and ozone for non-attainment reasons
- Reductions in water. Does this factor in AZ economic development strategies?
- Evaluate and consider impact on increasing heat in urban areas
- Lots of debate re: CO₂ impacts of biomass
- Avoided premature deaths and morbidity-related and air pollution
- Clarification of assumed carbon emissions, reduction in each scenario based on emissions reduced as prescribed in climate science

Other

- Assumed political flexible C&I load (targeted DSM)
- Political/regulatory response of flexibility (ability to adjust to or address future policy changes/impacts)
- It can. Key understanding depends on sensitivity analysis
- Customer segmentation analysis to better understand demographics
- Reward survey respondents to get higher response rates
- Sensitivity analysis, what inputs shift models the most? What is the likelihood that we have known impacts?
- Need balance to include benchmarking of AZ utilities across the region comparing similar metrics

Coffee Break

Recap of What We Heard on Metrics – Open Discussion

Nick Schlag
Partner, E3

Suggestions We Heard:

What do you like about the proposed Integrated System Plan Metrics?

- Sense of completeness/ Pretty good set /Sufficient at this point / Comprehensive
- CO2 track by mass over time is a positive
- Customer survey is good
- Importance of equity and echoed in the comments
- Comments on affordability and going a level deeper on specific customer impacts and timing (Geospatial impacts)

Do the proposed metrics allow us to assess the benefits, costs, and risks of different system plans for the first Integrated System Plan? If not, what else should be considered?

- Request for more specifics on level of reliability with Planning Reserve Margin (PRM) and Loss of Load Expectation (LOLE) ; potential risk to the system
- Sustainability goes back to equity as well; more detailed metrics on air pollution
- Emphasis on morbidity and mortality, additional pollutants like PM2 and Ozone

Other comments

- Metrics to quantify flexibility and adaptability over time in an uncertain future

Wrap Up and Next Steps

Joan Isaacson

Lead Facilitator, Kearns & West

Next Steps

Advisory Group Meetings

- **May 10, 2022 9:00AM** – Advisory Group Meeting #7 [Virtual]
- **June TBD** – Joint Integrated System Plan and Sustainability Advisory Group Topical Meeting on Heat Resilience

Large Stakeholder Group Meetings

Open to Large Stakeholder and Advisory Group Members

- **April 29, 2022 8:00AM-10:00AM** – Integrated System Plan Study Plan [Virtual]
- **April 29, 2022 10:15AM-12:00PM** – Technical Working Session #1: Integrated System Plan Study Plan Details [Virtual]



Stakeholder Communication Email:

IntSysPlan@srpnet.com

Integrated System Plan: Informational Portal

<https://srpnet.com/about/integrated-system-plan.aspx>

thank you!