Integrated System Plan (ISP) Overview: Day 1

ISP Board and Council Study Session

Angie Bond-Simpson, Sr. Director | August 29, 2023

Safety & Sustainability Minute

Welcome

Bobby Olsen
AGM & Chief Planning, Strategy & Sustainability Executive

Meeting Objectives

Day 1

- Introduce Integrated System Planning (ISP)
- Review collaborative study plan and engagement processes

Day 2

- Present ISP recommended System Strategies based on key findings from the analysis
- Illustrate Management's ISP Implementation Steps
- Address questions with SRP Subject Matter Experts

Agenda

Time (incl. Q&A)		Topics	Presenter
DAY 1	**DAY 1**		
9:30-9:40	10 min	Welcome, Opening Remarks and Meeting Objectives	Bobby Olsen
9:40-10:10	30 min	Introduction to the Integrated System Plan (ISP)	Angie Bond-Simpson
10:10-10:40	30 min	ISP Study Plan & Stakeholder Engagement	Kyle Heckel
10:40- 11:35	55 min	Voice of the Residential Customer Research	April Smith (Bellomy)
11:35-12:00	25 min	Key Findings and ISP Strategy Development	Angie Bond-Simpson
12:00-12:30	30 min	Lunch	
DAY 2	**DAY 2**		
9:30-9:40	10 min	Welcome and Day One Recap	Bobby Olsen Angie Bond-Simpson
9:40-10:20	40 min	ISP Recommendation: System Strategies Including Key Findings that Support the Recommendation	Angie Bond-Simpson Nick Schlag (E3)
10:20-10:45	25 min	ISP Implementation Steps: Balanced System Plan	Angie Bond-Simpson
10:40- 11:15	35 min	ISP Implementation Steps: ISP Actions	Adam Peterson Dan Dreiling Vanessa Kisicki Grant Smedley Bryce Nielsen
11:15-12:00	45 min	Q&A	All
11:55-12:00	5 min	Wrap Up & Next Steps	Angie Bond-Simpson
12:00-12:30	30 min	Lunch	

Introduction to the ISP

Angie Bond-Simpson
Sr. Director, Resource Management

Outline

- What is an ISP?
- Why is an ISP needed?
- What is the process for the first ISP?
- Who is involved in the first ISP?

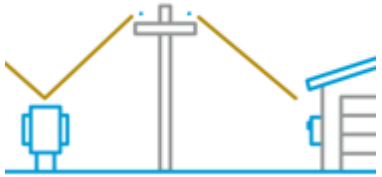
SRP’s Integrated System Plan

An Integrated System Plan is the holistic **roadmap** for the **power system of the future** which considers **evolving customer needs** for **reliability, affordability,** and **sustainability** and achieves our 2035 goals.

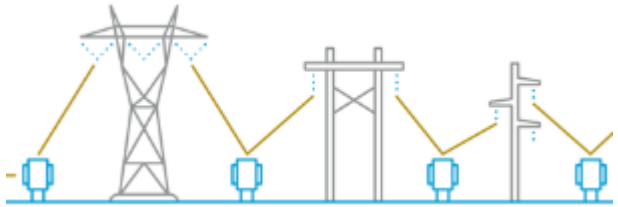
Traditional Utility Planning

Parallel Planning Processes

Customer Programs Design



Distribution Planning

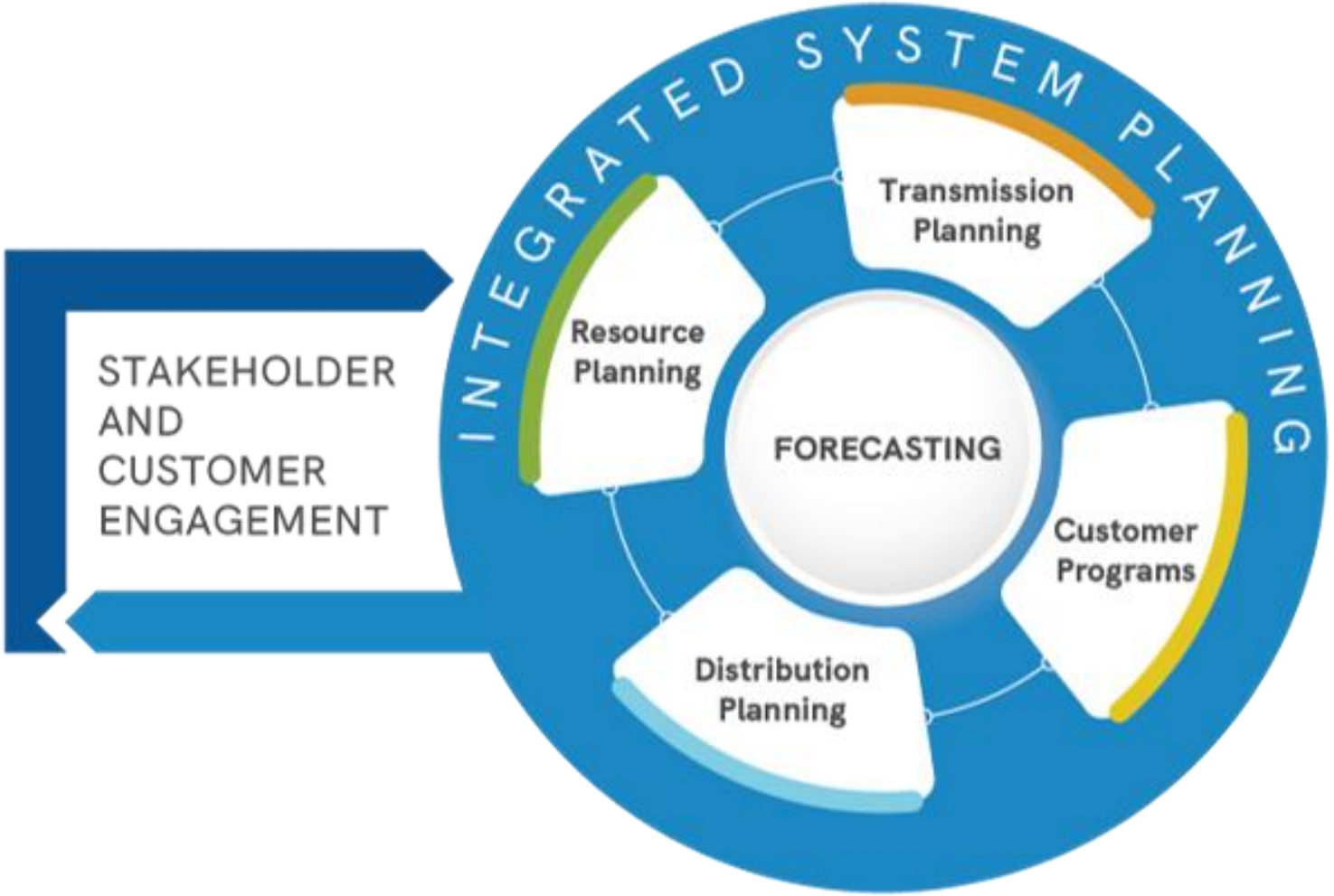


Transmission Planning

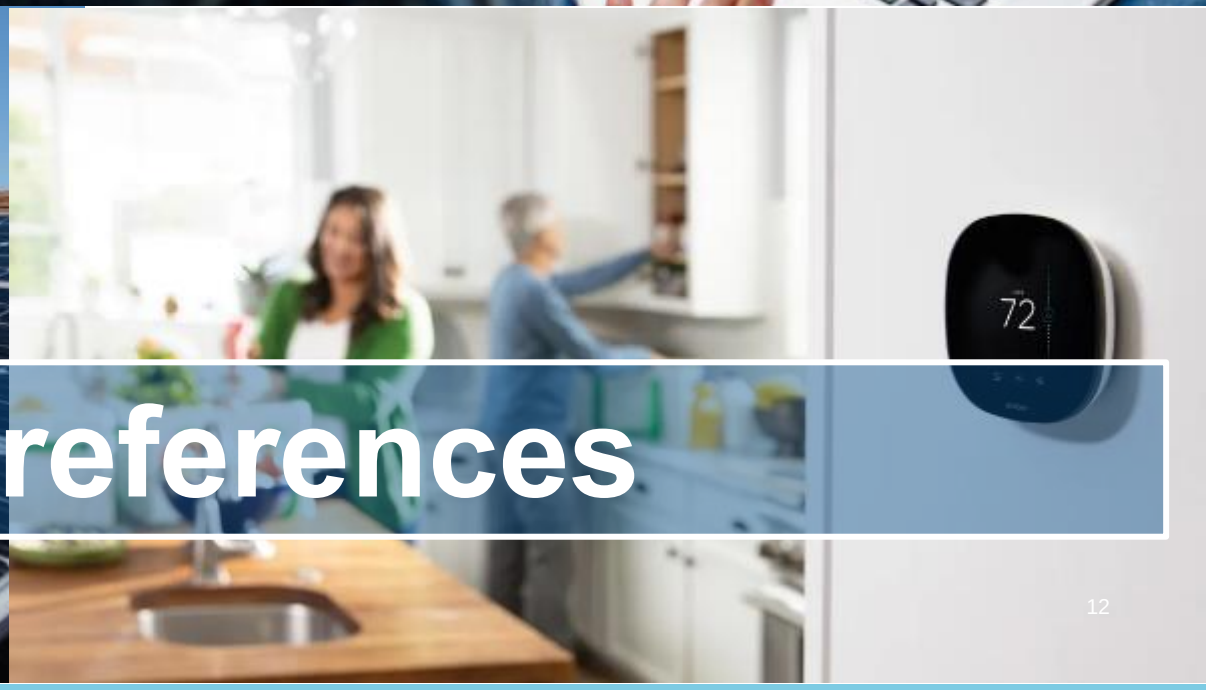
Resource Planning

Integrated System Planning

Interactive Planning Process

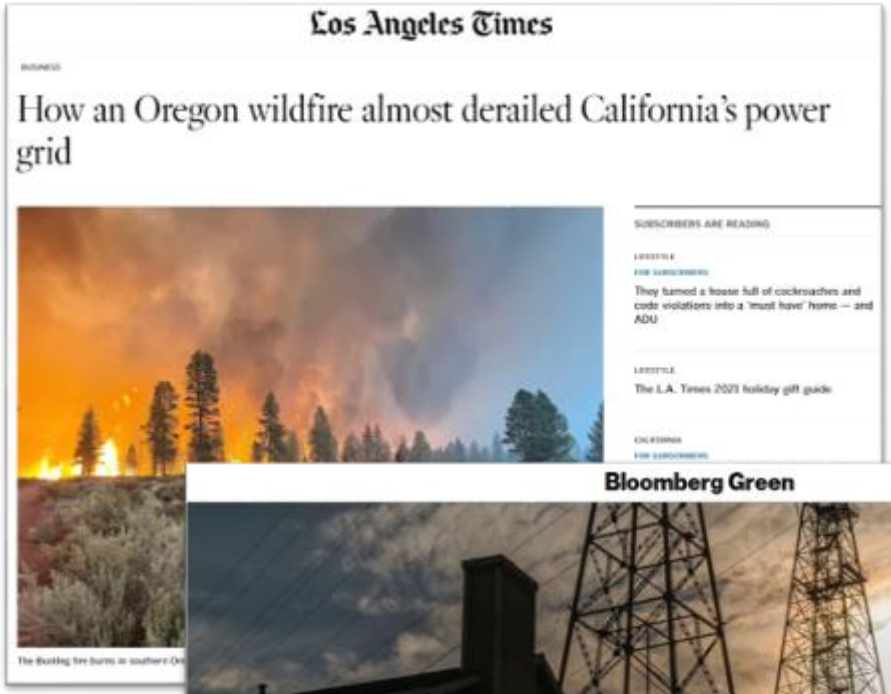


Why move to an Integrated System Planning Process?



Evolving customer preferences

Technology advancements and supply chain impacts



Los Angeles Times

How an Oregon wildfire almost derailed California's power grid

Bloomberg Green

Energy & Science

Blackouts Threaten Entire U.S. West This Summer as Heat Awaits

Outages are possible from Washington to New Mexico, with drought and searing temperatures forcing states to compete for electricity

By Naureen S Malik, David R Baker, and Mark Chediak
May 13, 2021, 4:15 AM MST *Updated on May 13, 2021, 11:59 AM MST*

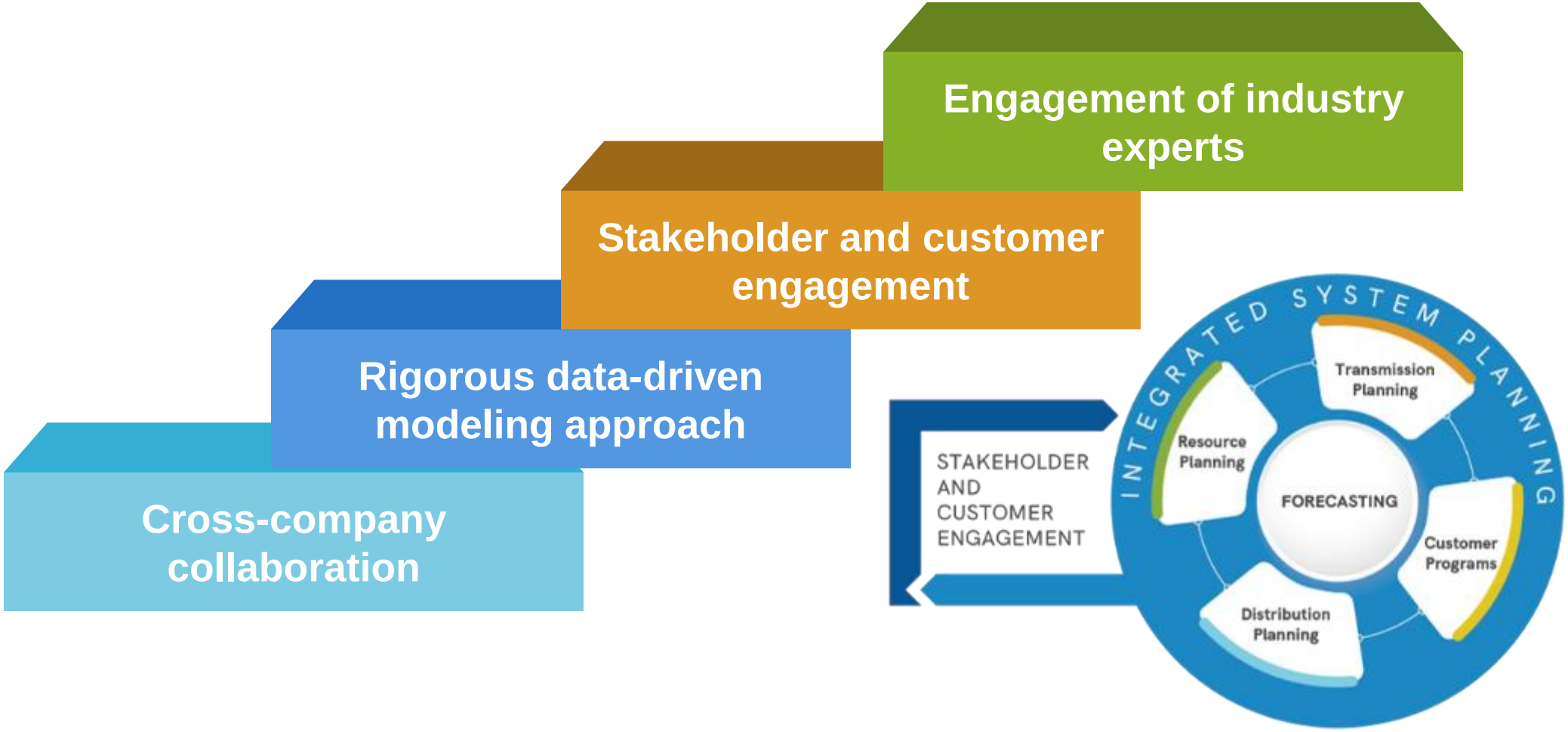
Regional Trends

Climate risk and regulations

Planning a System That's Affordable, Reliable, Sustainable

The Integrated Planning Process

Major Building Blocks of the ISP

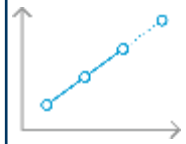


ISP Project Team

Key Contributing Departments

Integrated System Planning & Support

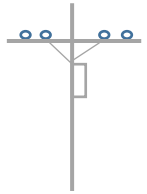
Forecasting & Load Research



Resource Planning & Development

Transmission Planning, Strategy & Develop

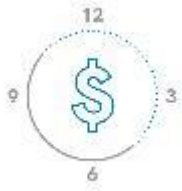
Distribution Planning & Strategy



Customer Programs

Financial Planning & Analysis

Pricing



Strategic Research & Insights

Coordination, Leadership Guidance, Analysis & Support

Leadership Guidance & Analysis Teams

Customer Research Team

Consultants:

Energy+Environmental Economics

KEARNS WEST

Consultant:

bellomy

ISP Stakeholder and Customer Engagement

14 Meetings

23 Community Organizations

600+ Points of Feedback & Questions Answered

4 Topical Sessions

20 External Expert Panelists

169 External Stakeholder Attendees

Advisory Group

Focused engagement from a smaller diverse group

Large Stakeholder Group

Large-scale public platform

Engagement Objectives

Inform & Provide Learning Opportunities

Consider Feedback

Build Support

Technical Working Sessions

Open to all stakeholders and convened on specific topics with topical experts

Customer Research

Multi-pronged approach to include the customer voice

Meetings 8

Community Organizations 140+

Points of Feedback & Questions Answered 500+

90-Minute Focus Groups 4

Customer Respondents to Phase 2 Survey 400

Customer Respondents to Phase 3 Survey 1,011

ISP Board and Council Observers

John Hoopes
SRP Association Vice President

Chris Dobson
SRP District Vice President

Anda McAfee
SRP Board Member

Jack White
SRP Board Member

Larry Rovey
SRP Board Member

Krista O'Brien
SRP Board Member

Suzanne Naylor
SRP Council Member

Rocky Shelton
SRP Council Member

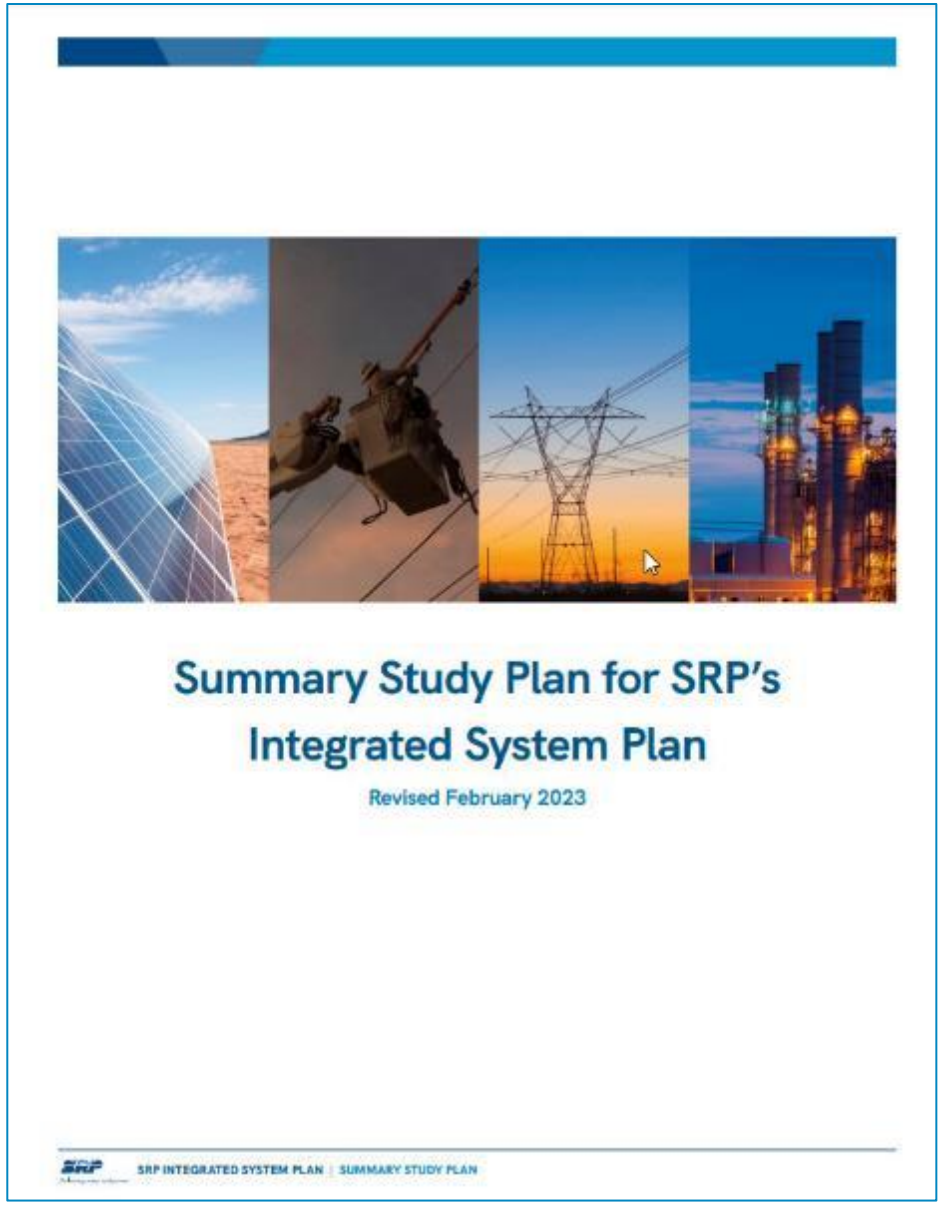
Mark Mulligan
SRP Council Member

ISP Study Plan & Engagement Processes

Kyle Heckel
Sr. Engineer, Integrated Planning

The ISP Study Plan

- Considers wide-ranging perspectives of what may happen in the future
- Assesses SRP's future system through a variety of strategic planning options
- Is designed to evaluate trends and tradeoffs in affordability, reliability, and sustainability
- Reflects customer and community stakeholder input



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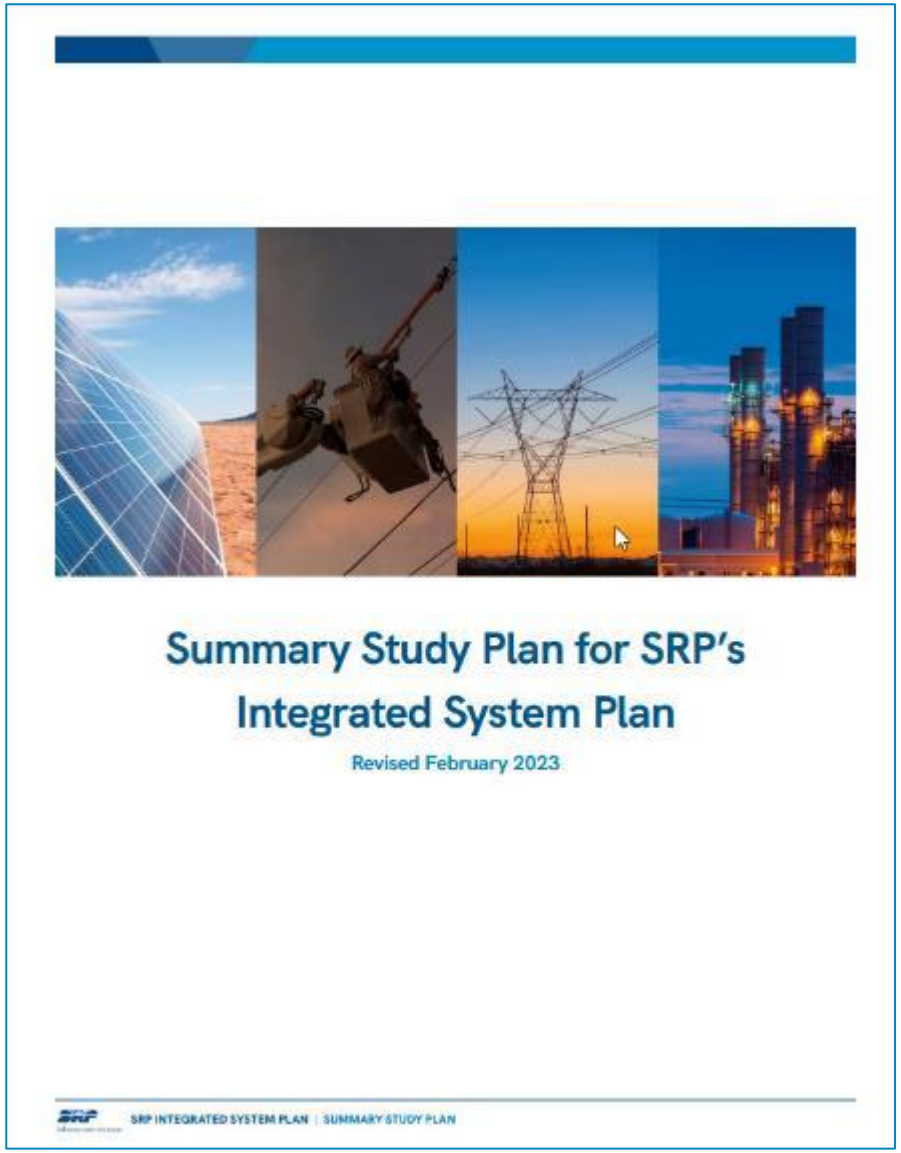


Considering Wide-Ranging Perspectives for the Future

What if climate change makes the desert a less favorable place to live?

DESERT CONTRACTION

What happens if SRP experiences strong load growth, and renewable costs continue to decline?

CURRENT TRENDS

What if the U.S. passes increasingly aggressive climate policy?
What if renewables are cheaper and emerging tech available sooner?

STRONG CLIMATE POLICY

What if Arizona becomes an employment and data hub resulting in explosive load growth?

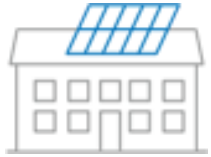
DESERT BOOM

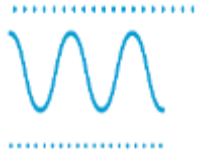
Additional Sensitivities in the ISP Study Plan

High Demand Response

High Energy Efficiency

High Distributed Generation Adoption





Increased Load Management

High, Low & Volatile Gas Prices

High & Low Technology Costs

Regional Diversity

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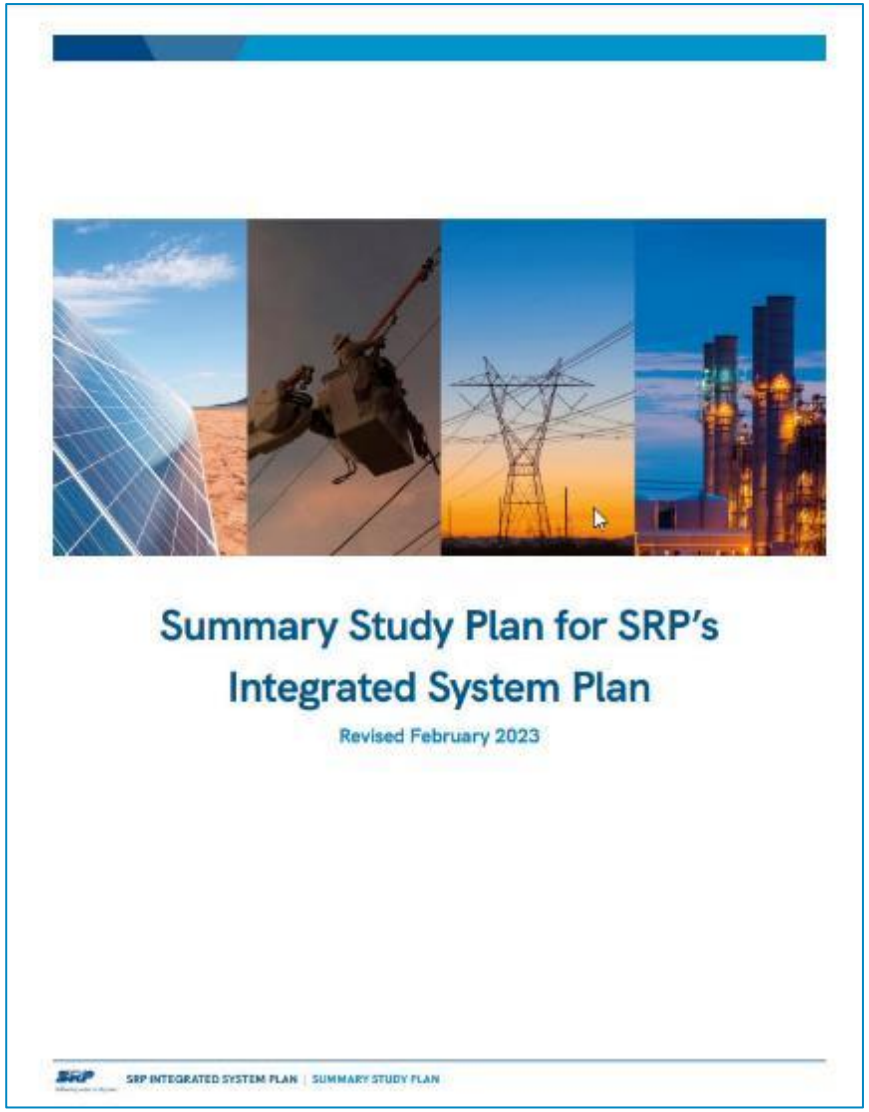
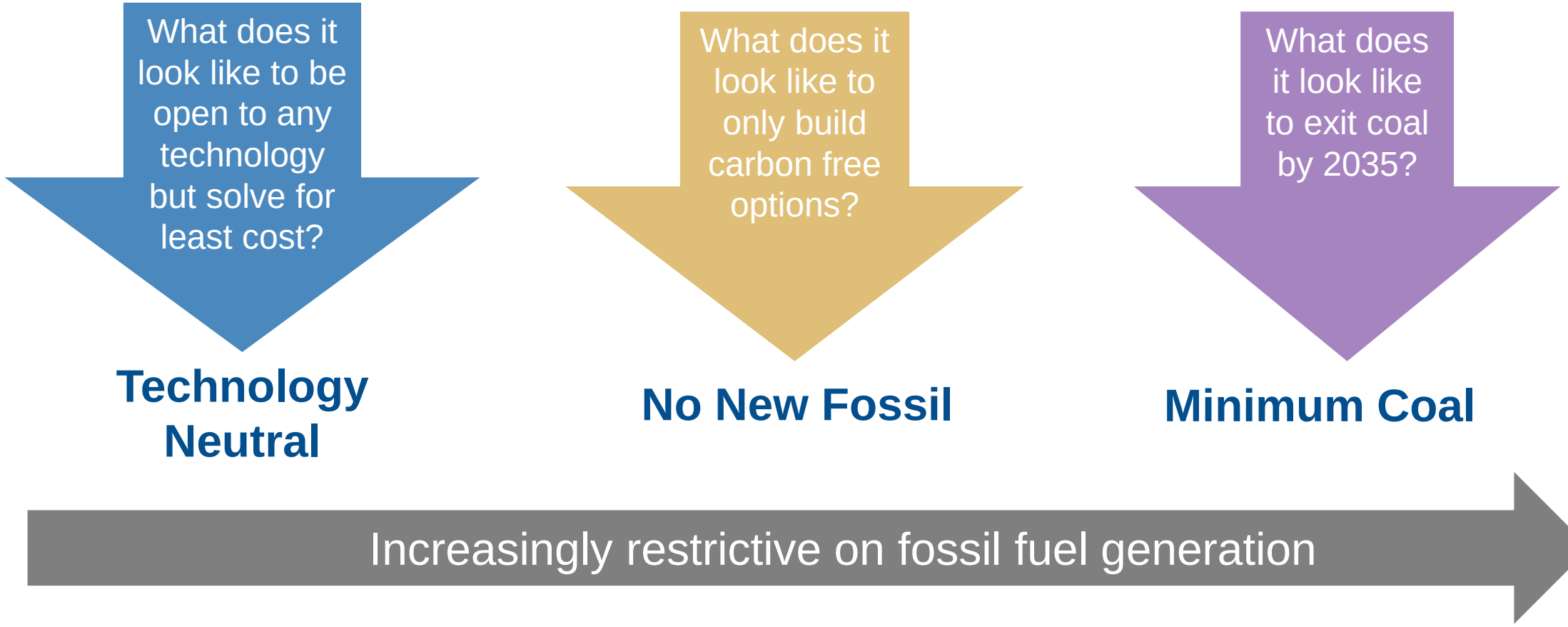
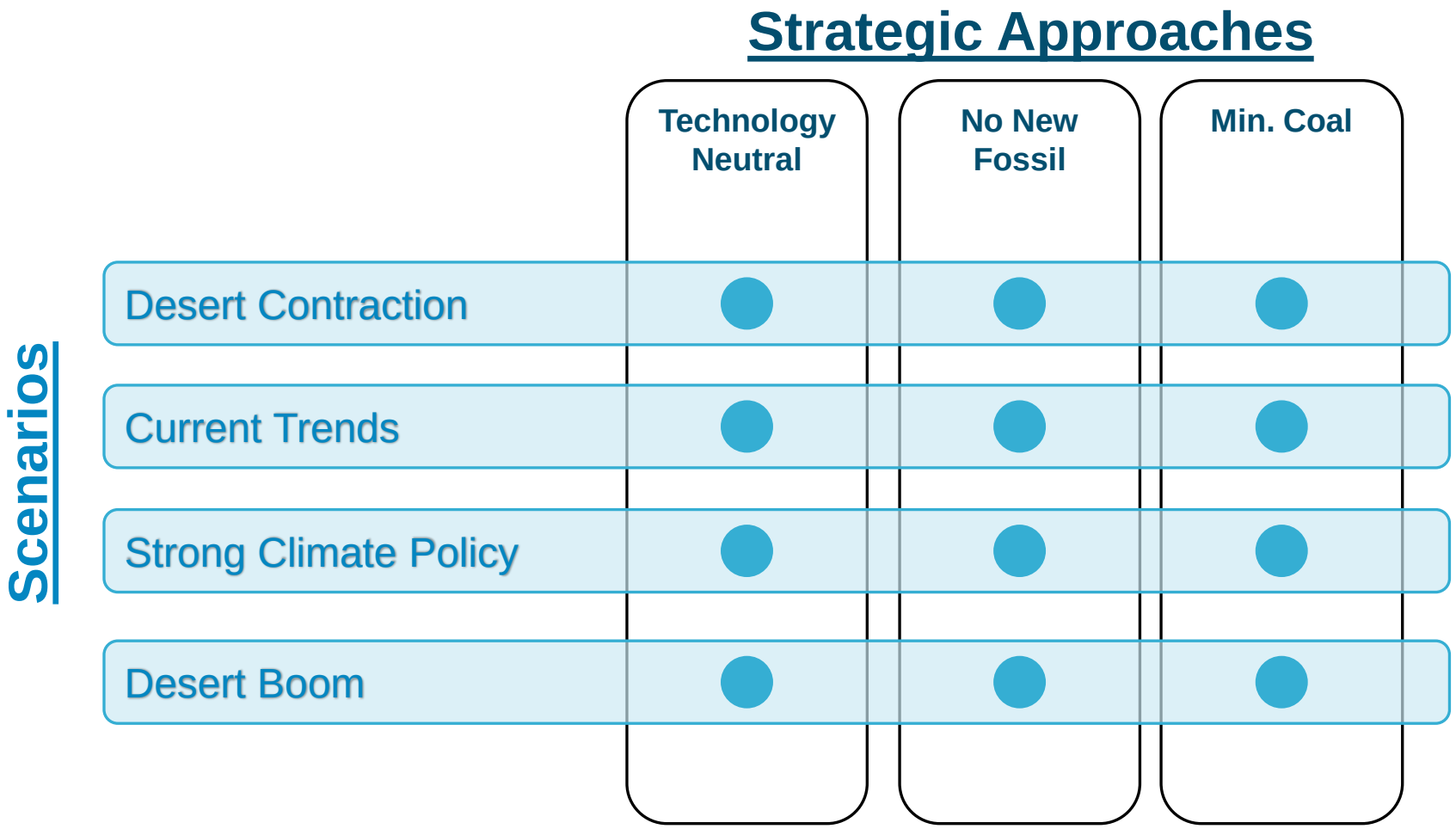


The Strategic Approaches in the ISP Study Plan



System-Wide Analysis



12 Scenario-Based System Plans

+

30 Sensitivity Cases

The ISP Study Plan

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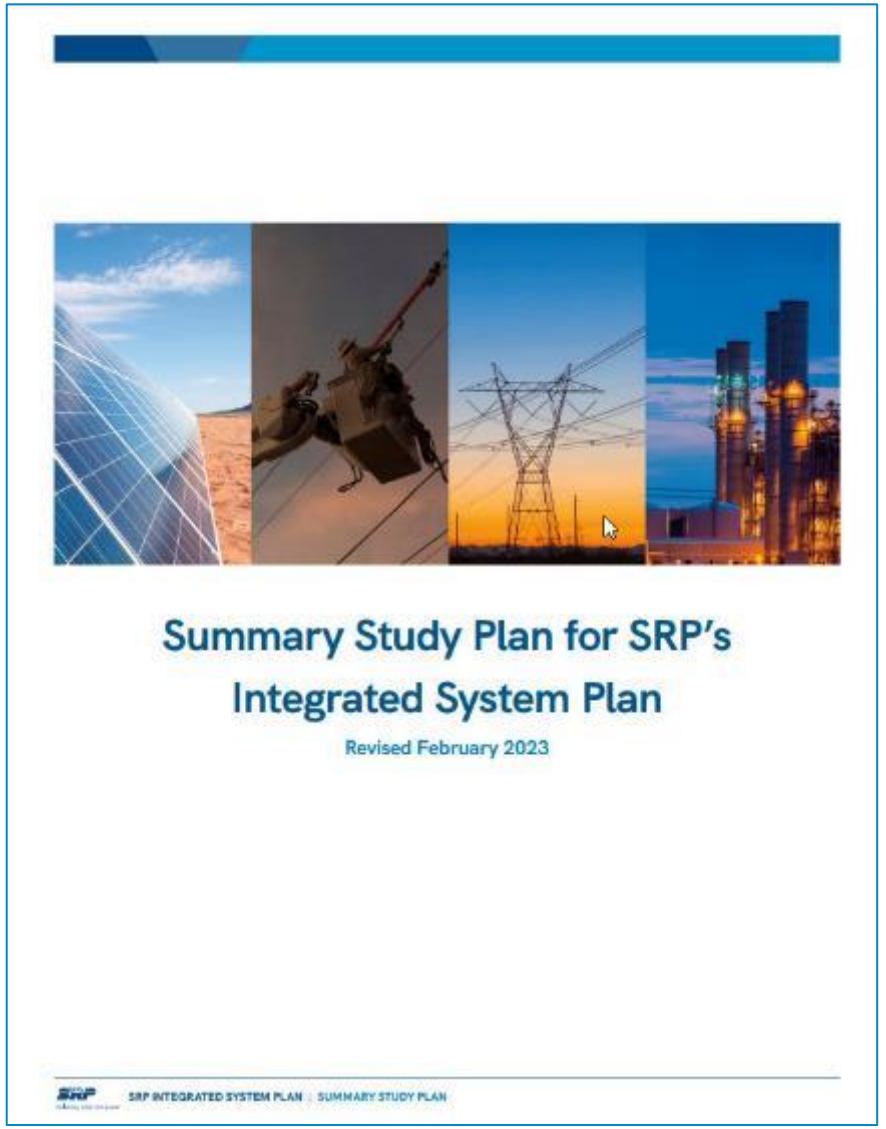
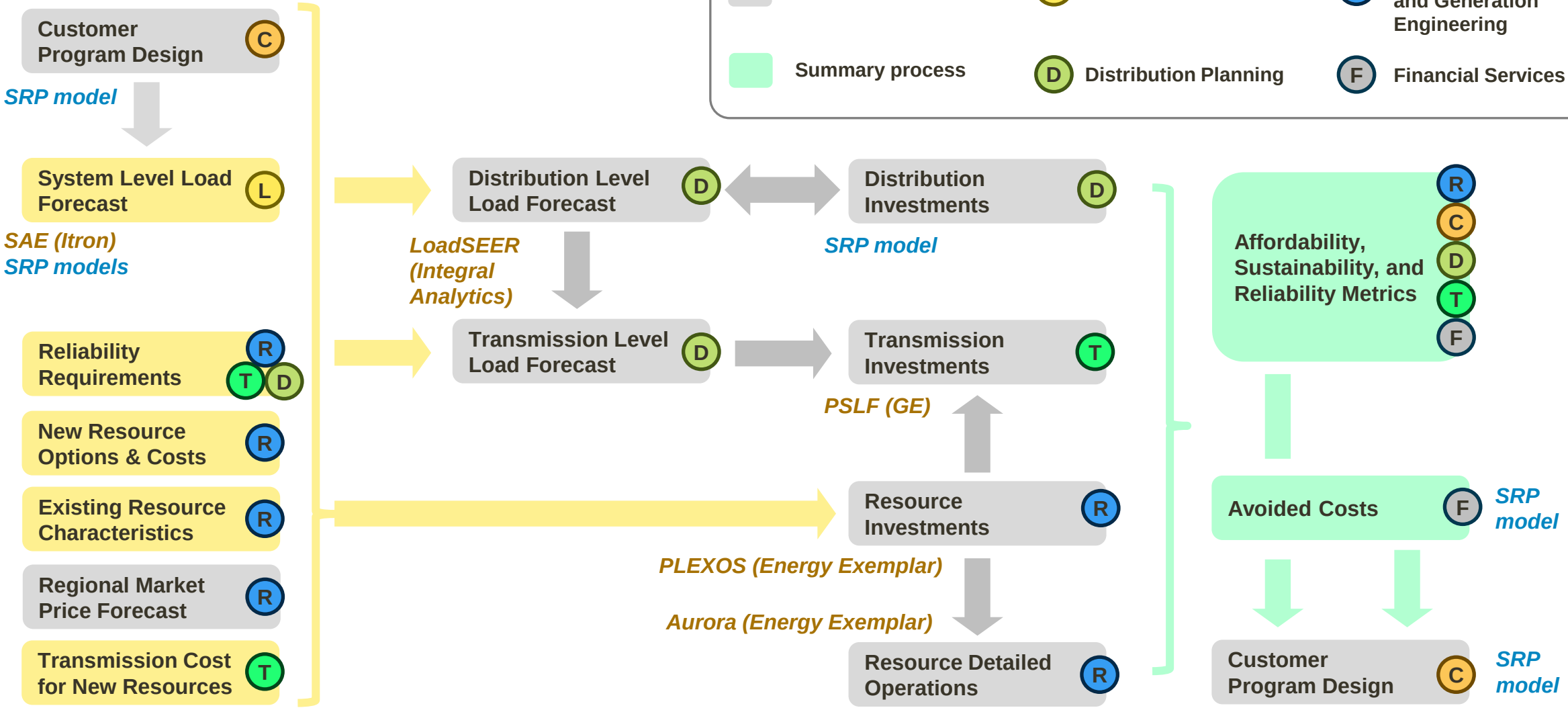


Integrated System Plan

SRP and third-party models



Integrated System Plan Metrics

Affordability

Total System Costs

Average System Costs

Average Residential Price Impact

Sustainability

CO2 Reductions

Water Use

Carbon-Free Generation

Capacity Factor for Gas Fleet

Direct Air Emissions (NOx, SO2, PM, VOC)

Reliability

Resource Contribution to Reliability

Reliance on Emerging Technologies

Qualitative Risk Ratings (Development Risk and Operational Risk)

Planning Reserve Margin

Customer Focus

Customer Preference Rating

CO2 Reductions from energy efficiency, demand response, distributed generation, and electrification

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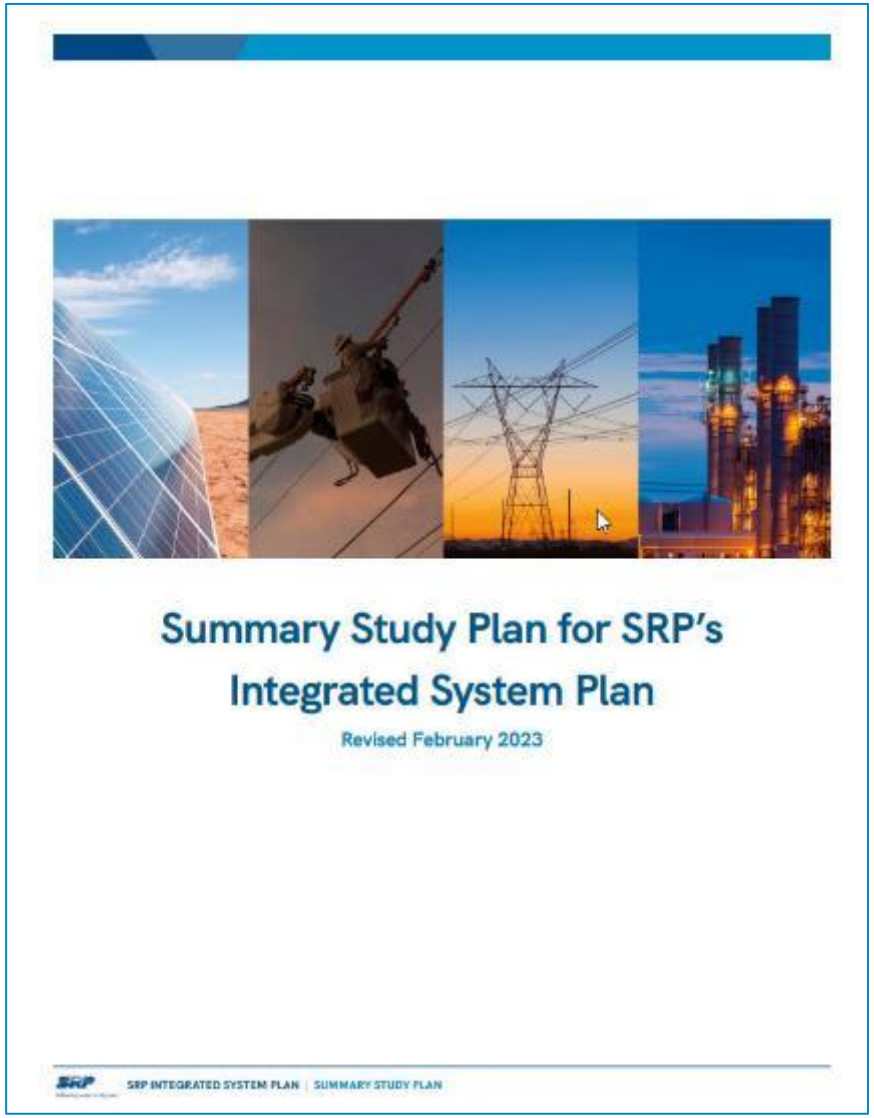


ISP Study Plan Stakeholder Engagement

SRP used a multi-step process with ISP stakeholders to collaboratively develop each study plan component (e.g., scenarios, strategic approaches, and metrics)

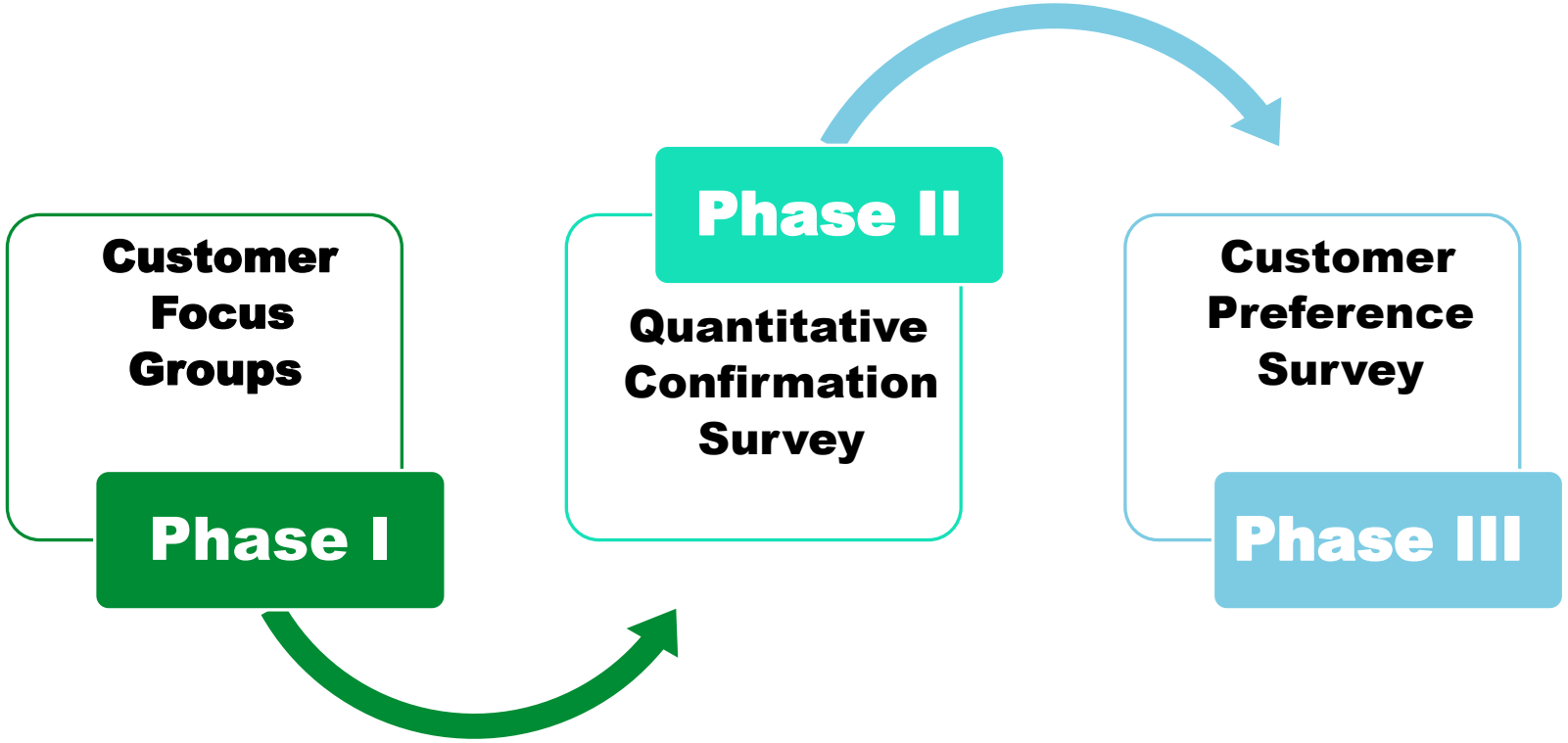
7 Advisory Group Meetings

3 Modeling Subgroup Meetings

2 Large Stakeholder Group Meetings

Residential Customer Research:
Bringing the Voices of Our Customers into the System Plan

Three Phases of Residential Customer Research



ISP RESIDENTIAL CUSTOMER RESEARCH

Board & Council Study Session| August 29, 2023

John Sessions, CEO
April Smith, Director Client Services
Bellomy Market Intelligence

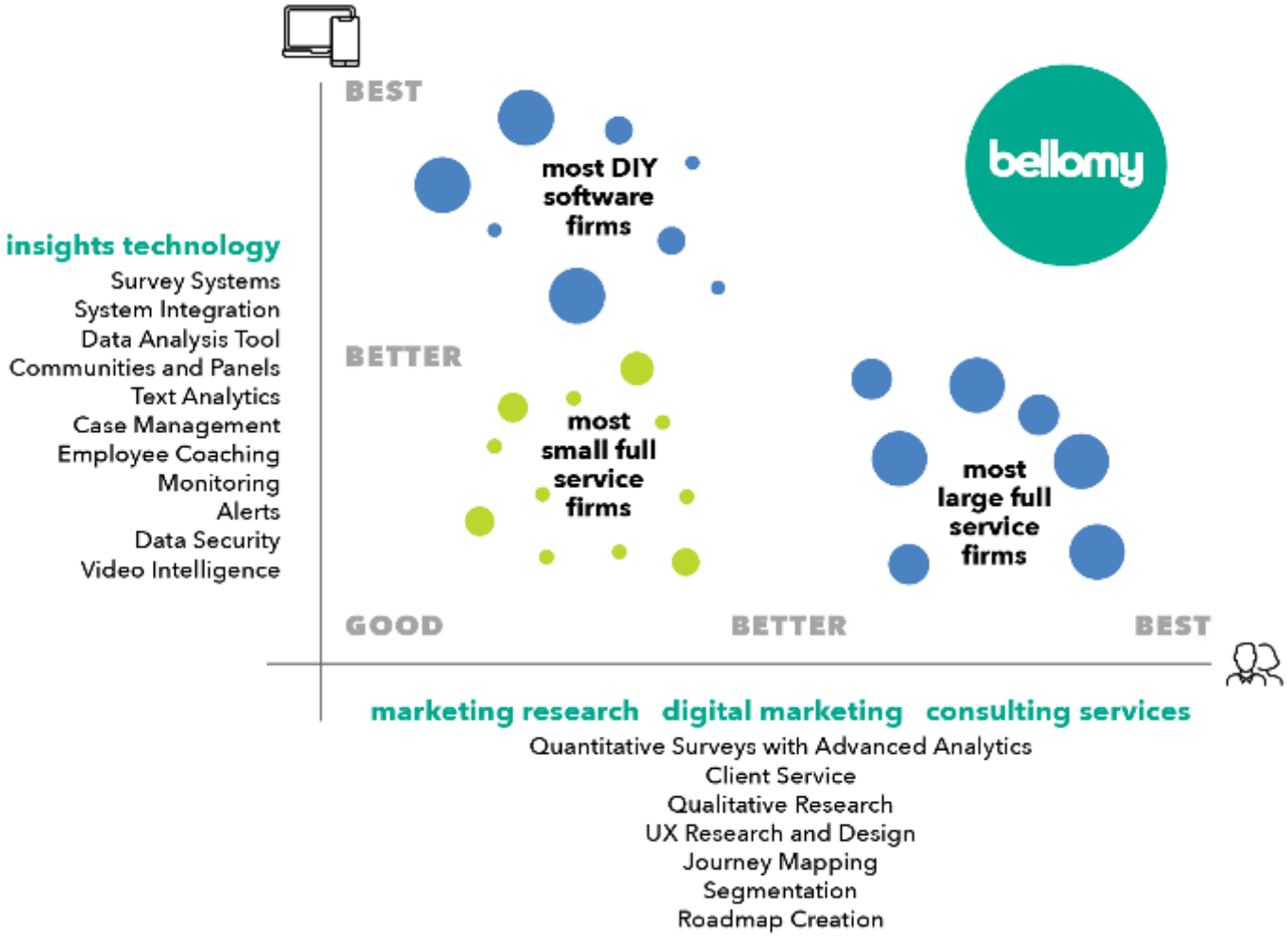
PREPARED FOR

SRP
Delivering water and power®

bellomy

About Bellomy

Insights Technology **Designed + Developed** by Insights Professionals



About Bellomy

OUR GUARANTEE

We will be the best team you've ever worked with

COMPANY STATS

- Full-service market research firm with a digital marketing agency in-house
- Founded in 1976
- Headquartered in Winston-Salem, NC
- 100+ person company, with in-house researchers, designers, strategists, and developers across 14 states
- Ranked among the Top 50 market research firms in the US for the last 10+ years

SOME OF OUR ENERGY CLIENTS

Fueling digital acceleration through research + design

Background + Objectives

Bring the **voice of SRP's residential customers** into the planning of the future energy system

Create a **residential customer preference metric** for consideration in the ISP's decision-making process

Methodology: Multi-Phased Approach

A three-phased research approach was applied.

Virtual Focus Groups

4
90-minute focus groups
December 13 & 14, 2021

Confirmation Survey

400
respondents
March 7 –14, 2022

Choice Exercise Survey

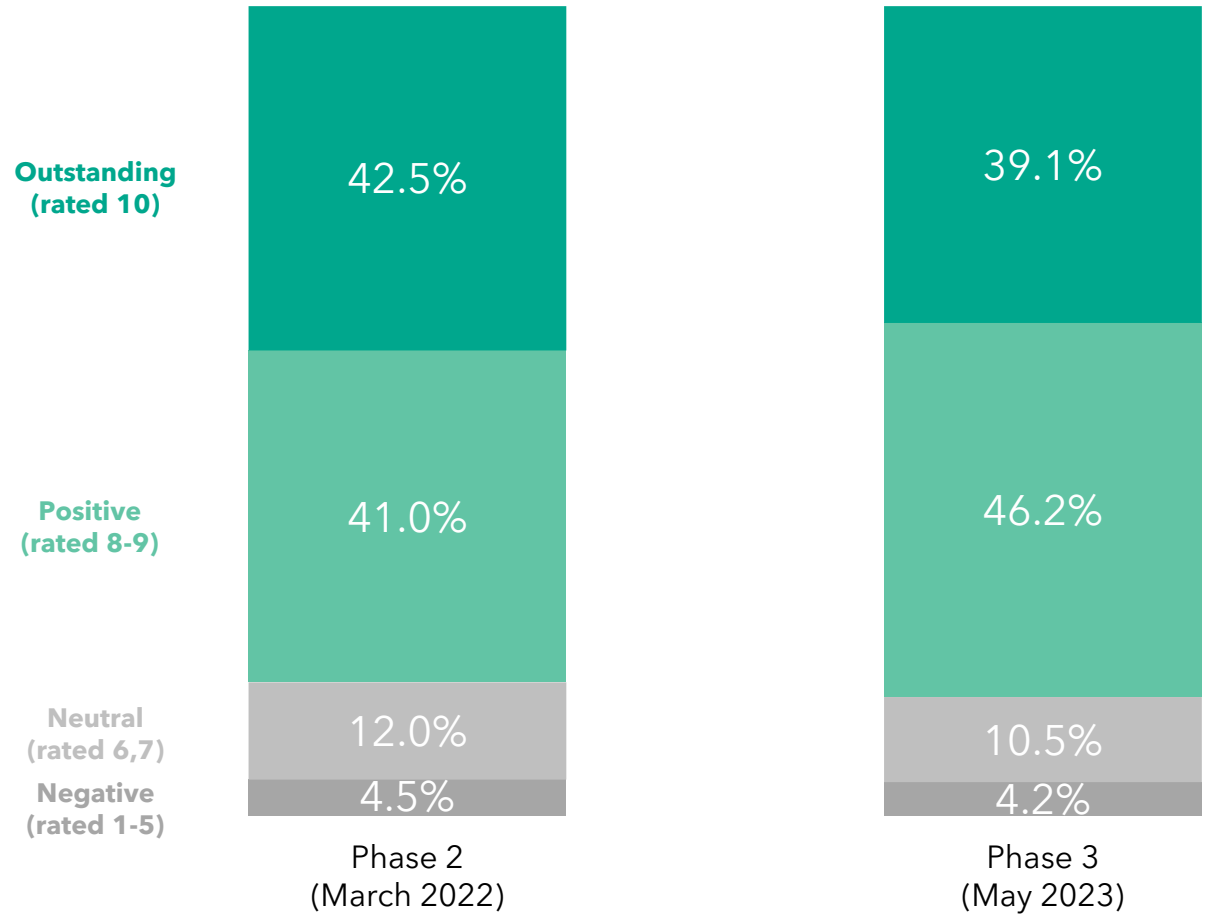
1,011
respondents
May 9 – 29, 2023

All respondents were: SRP customers, aged 18 or older, energy decision makers, and did not work for a related industry.
Quotas set to ensured results were representative of SRP's residential customer base.

EXPERIENCE WITH SRP, CONCERNS, & PRIORITIES

Most rated their experience with SRP positively

Overall Experience with SRP

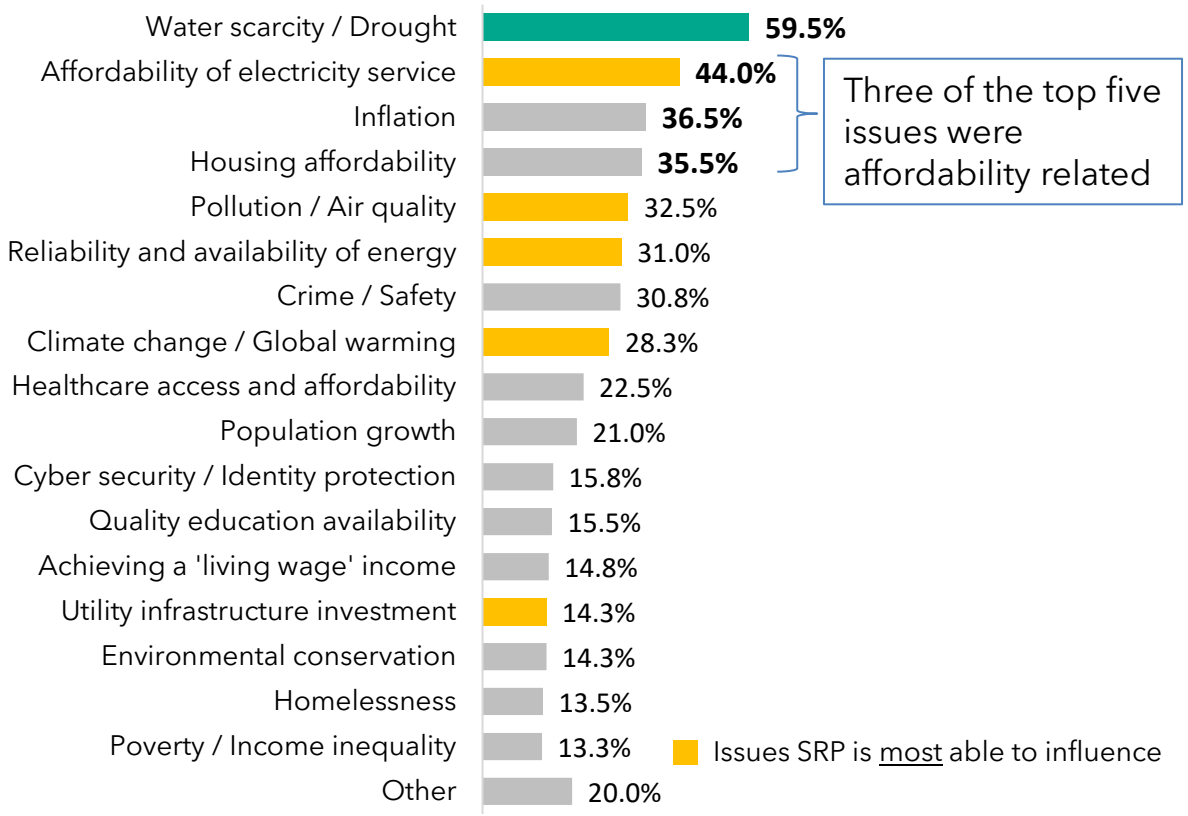


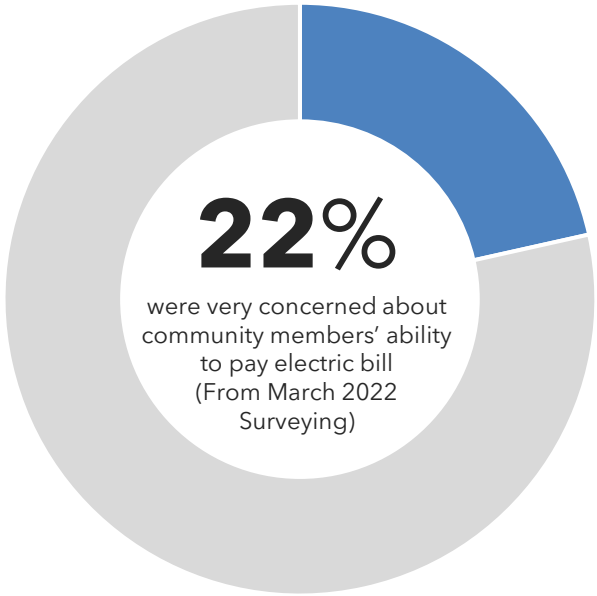
In qualitative findings, customers noted a highly positive perception of SRP, specifying the reliability of service along with helpful customer service were key factors.

Customers demonstrated affordability concerns

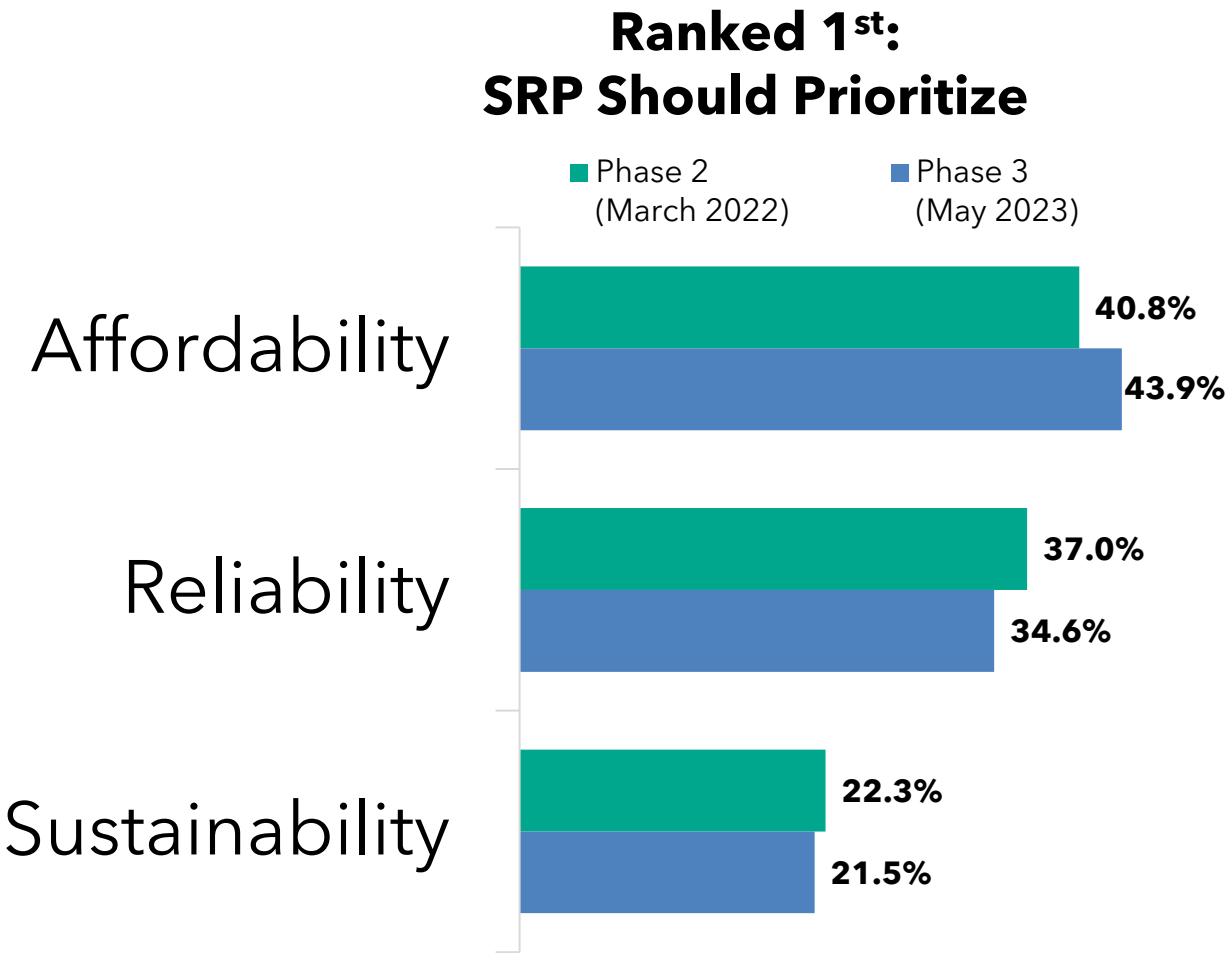
Future Issues Facing Arizona

(From March 2022 Surveying)





Affordability and Reliability were most often ranked 1st



While a majority of customers ranked reliability first in the focus groups, they discussed a tough tradeoff between reliability and affordability.

Groups **more likely** to rank **affordability first** included:

- **Limited income** customers (200% of HHS Poverty Guidelines)
- Those enrolled in **M-Power for Pre-Pay**

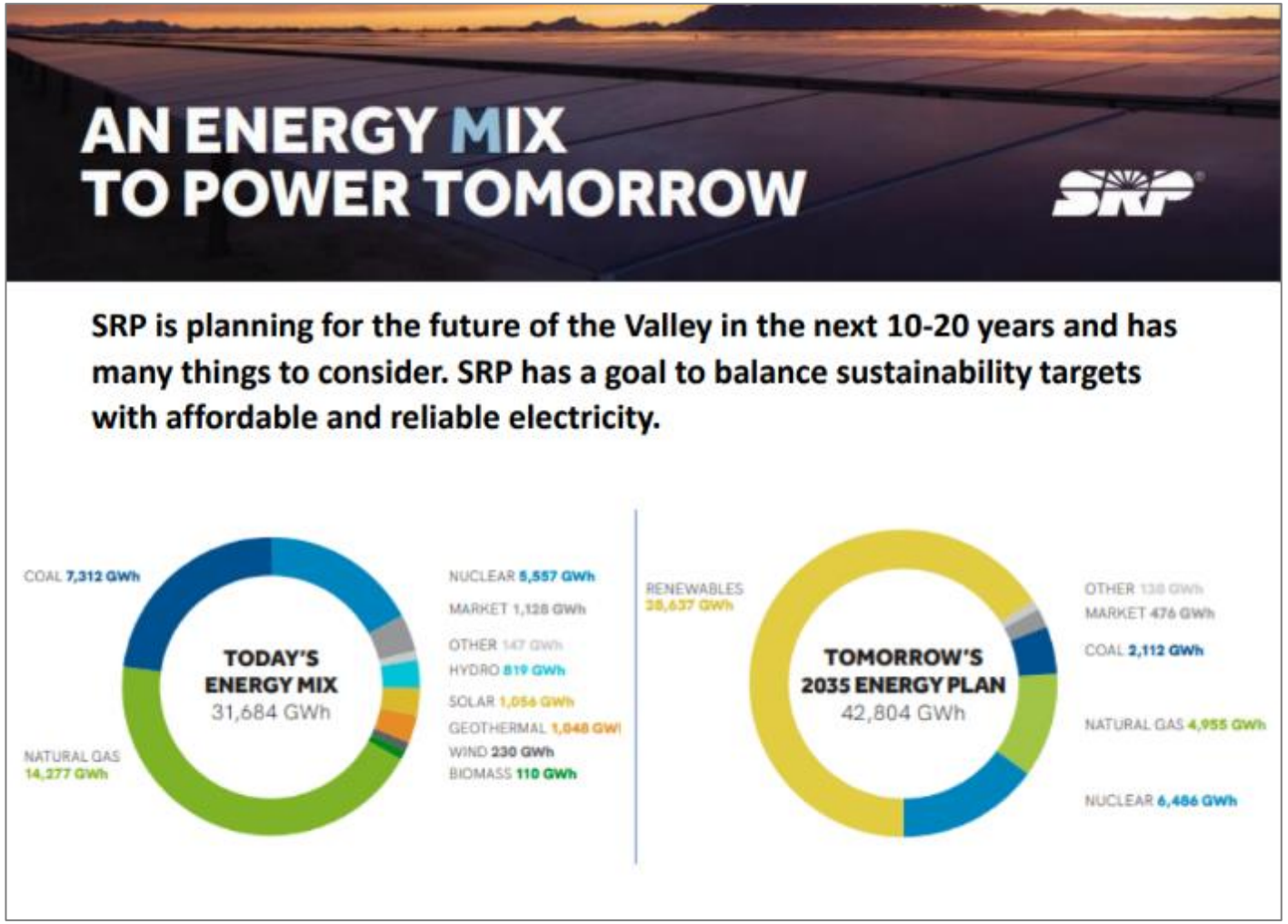
Represents **about a third** of SRP's residential customer base

INITIAL ENERGY PLAN REACTIONS
(PHASE I & II)

Illustrative Energy Plan

Customers evaluated an illustrative SRP energy mix, which could take place in the next 10-20 years.

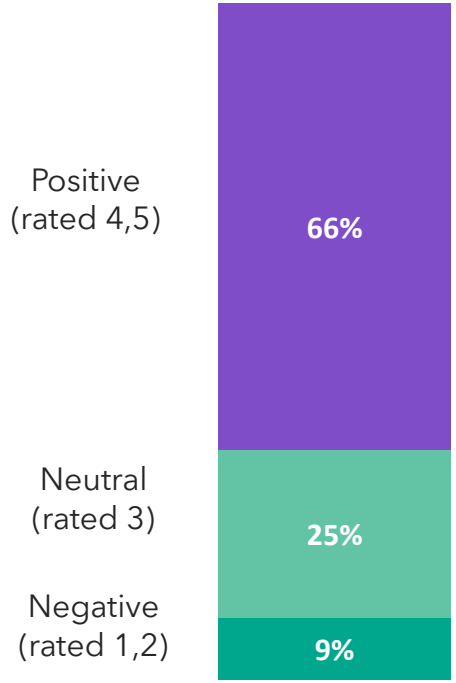
Customers were given background on SRP's priorities to ensure power quality continues to improve.



Two thirds rated the energy plan positively

Overall Opinion of the Illustrative Plan

(From March 2022 Surveying)



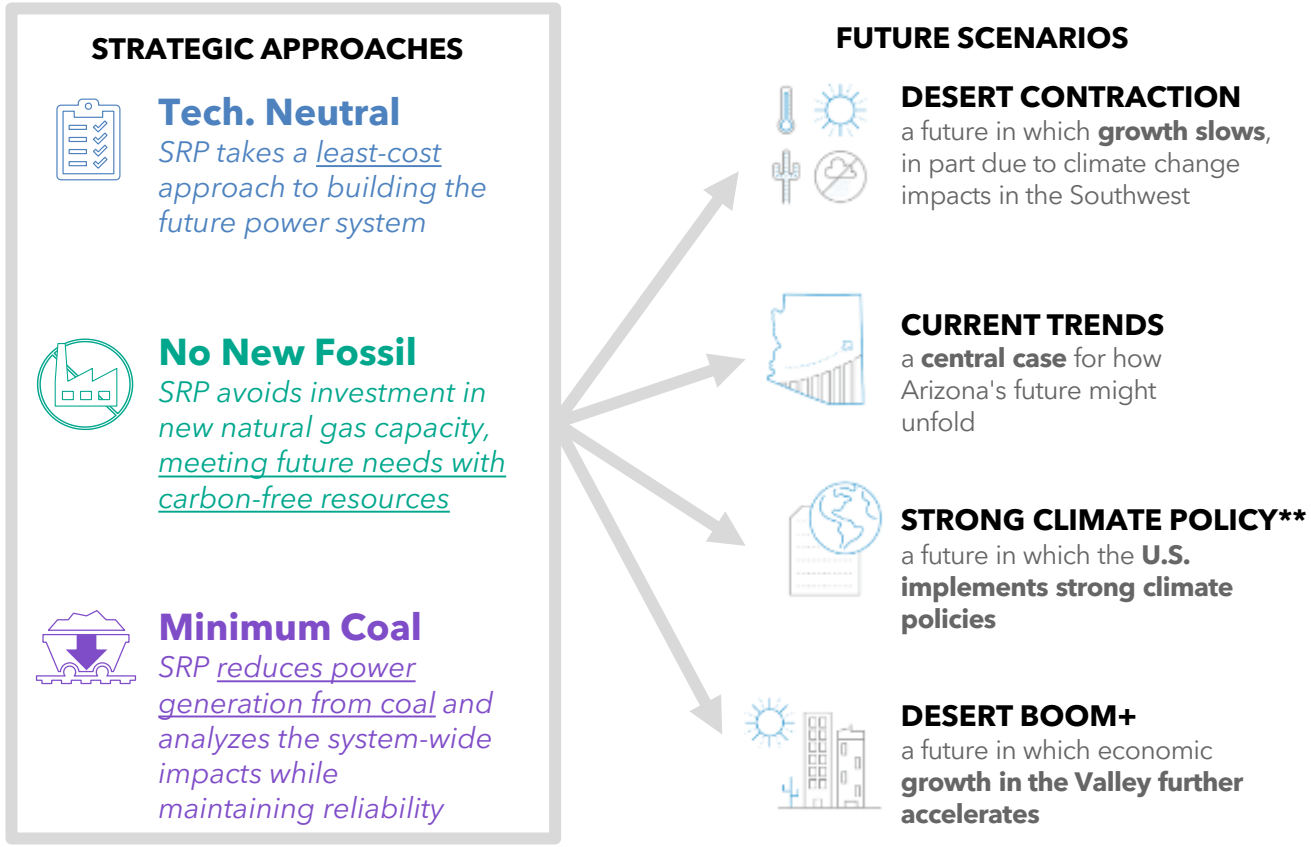
26% **Excellent (rated 5)**

Focus group participants suggested some initial opportunities, such as:

- **The amount of time needed to implement the plan**
- **Getting customer buy-in and being transparent**
- **Ensuring SRP's accountability for changes**
- **Clarifying how this would affect rates**

CHOICE EXERCISE DESIGN
(BASED ON ISP ANALYSIS RESULTS)

ISP's Analytical Framework



**Within the Strong Climate Policy scenario, cases for Tech. Neutral and No New Fossil are identical. Only one illustrative mix was shown to customers to represent both cases, thus data shown are identical for these two cases.
+Within the Desert Boom scenario, Tech. Neutral was the only strategy tested; No New Fossil and Minimum Coal cases do not reach reliability targets.

Informed The Following System Inputs:

- Illustrative **energy mix** (9 mixes)
- When SRP will **meet its sustainability goals** (2030/ 2035)
- % reduction in **carbon emissions*** (4 levels)
- % reduction in **water usage*** (4 levels)
- If SRP will **build new gas power plants** (Yes/ No)
- Monthly **bill impact** (4 levels)
- Number of **2-hour power outages** (4 levels)

Variation in levels resulted in evaluation of ~9,200 possible system configurations.

*Levels were conditional on the energy mixes shown

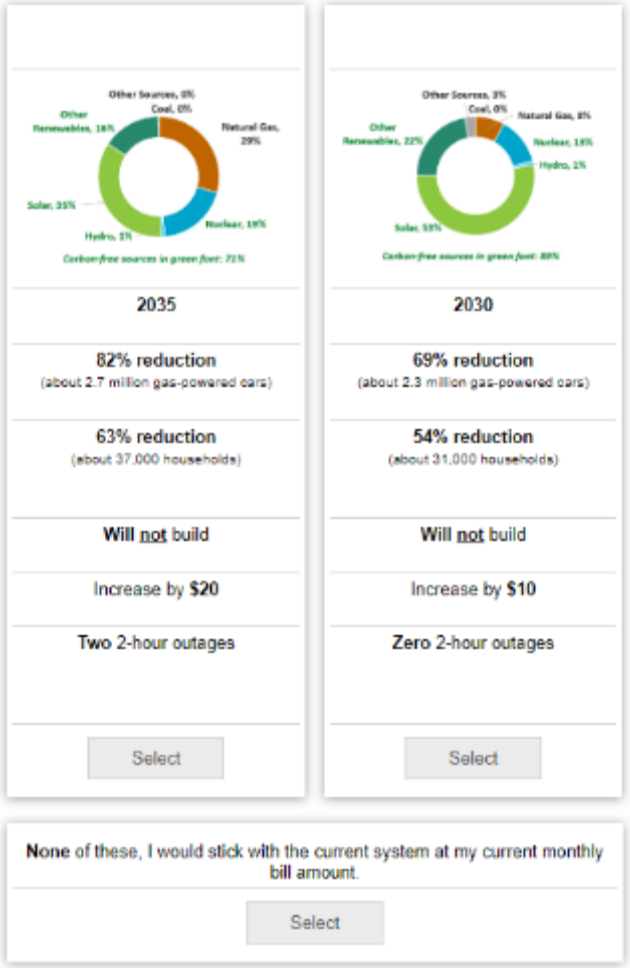
Inputs Were Used in a Choice Exercise

Conjoint methodology was used to understand customer preference

11 screens showing **2 energy plans** and a "none of these" option were shown

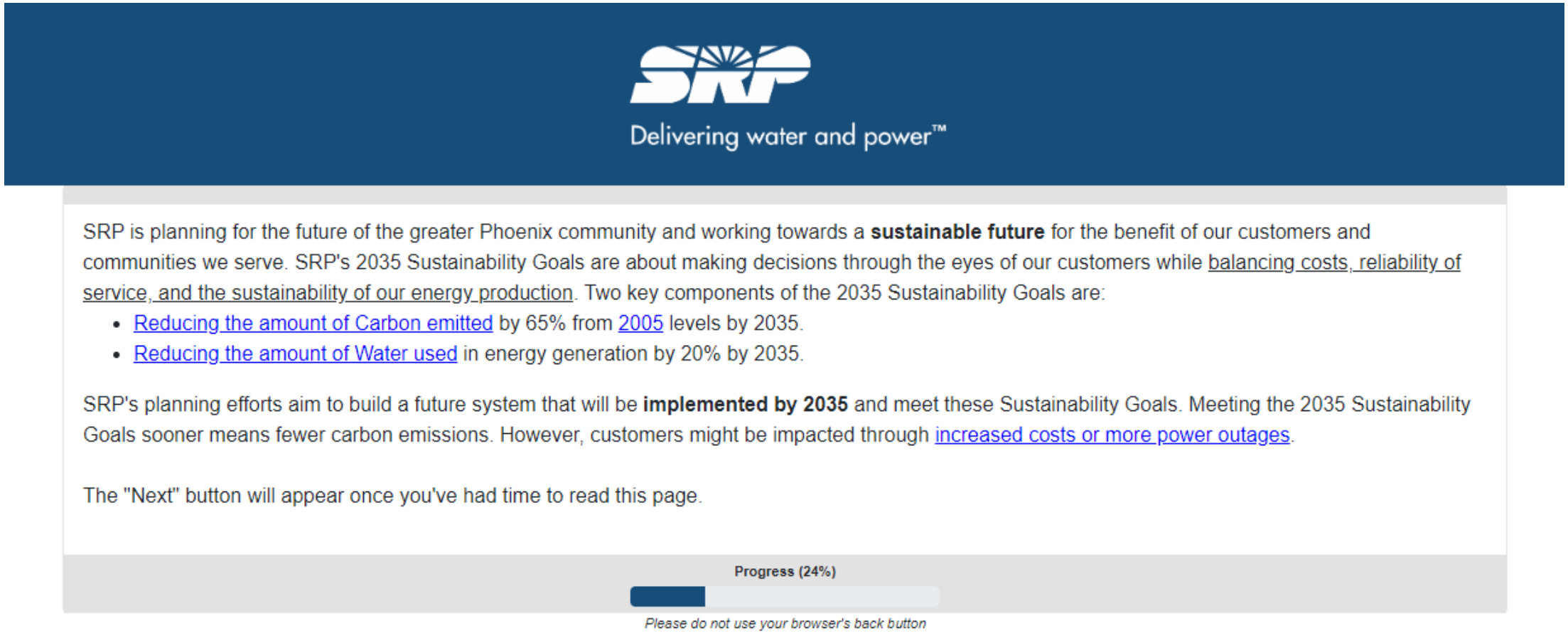
Customer preference ratings were produced for each potential future energy system

- Energy Mix
- Timing
- Carbon Emissions
- Water Usage
- Build Gas Plants
- Bill Impact
- 2-hour power outages



An example survey screen is shown to the right

Educational Information Included In Survey



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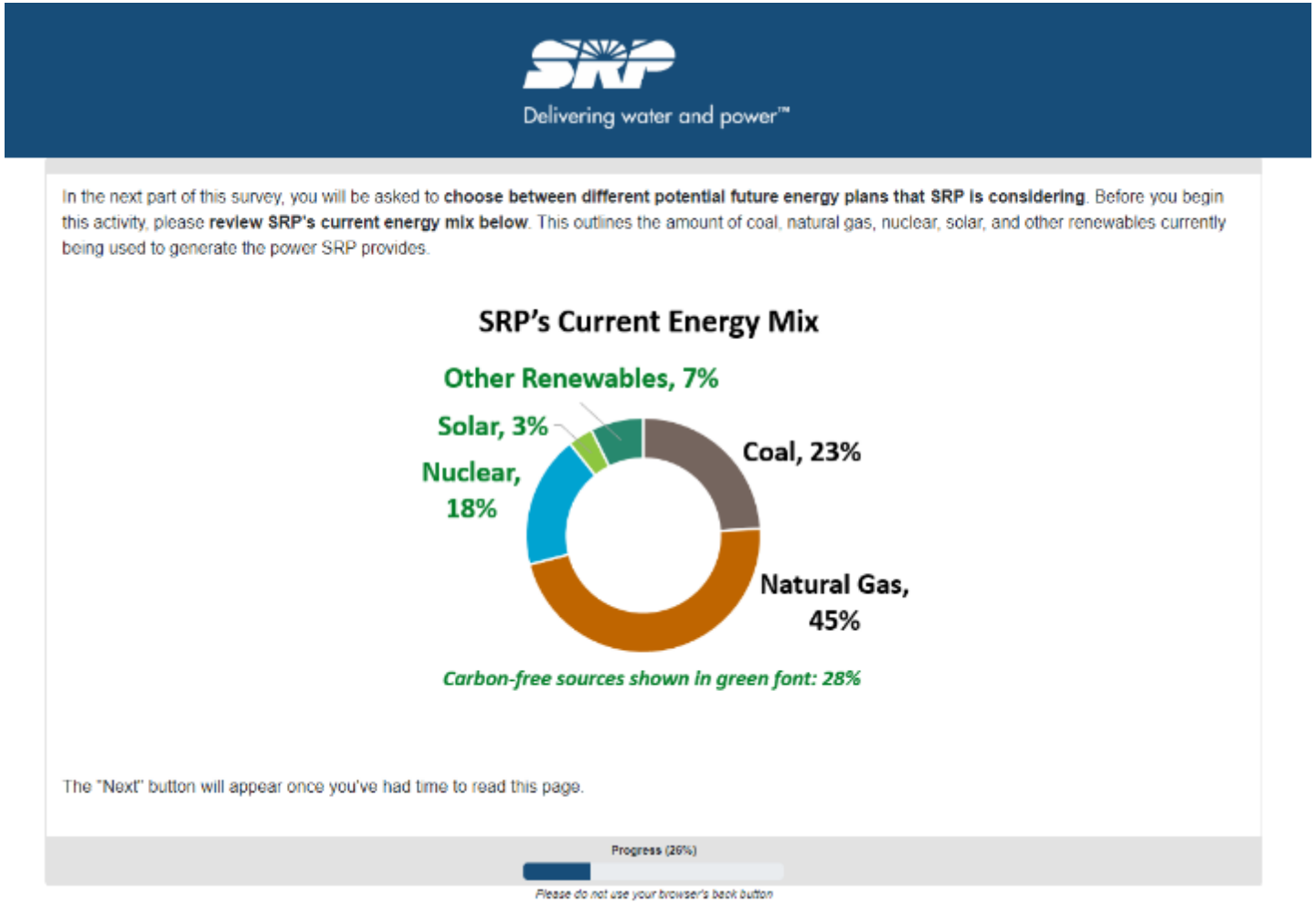


Explanation and Example Provided

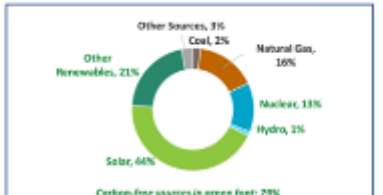
Delivering water and power™

Before you start this activity, we'd like to show you an **example of a future energy plan**, like the ones you will review shortly.

Please reference the following on how to understand the energy mix and the impacts of the plan *(For each of these potential impacts, the effects are hypothetical)*:

- **Timing:** SRP is planning to reach the Sustainability Goals and implement a new energy mix by 2035.
- **Carbon reduction:** The mass amount of carbon reduced by this possible future energy mix has been translated to the amount of carbon produced by cars. In the energy plan below, the carbon reduction is equal to the number of gas-powered cars removed from the road each year.
- **Reduction in water usage:** The decrease in water used in generating power for the possible future energy mix has been translated from gallons to the amount of water used by an average 4-person household in one year. In the example below, the amount of water reduced is equal to the number of households it would take to use that water in one year.
- **Building new infrastructure:** Some possible future energy mixes will require SRP to build new natural gas power plants, while others will not. This will vary across possible future energy mixes.
- **Bill impact:** Each possible future energy mix will have added costs from using new energy sources and transitioning to them by 2035. Customers might have higher monthly bills as the cost is passed along in part on SRP bills.
- **Number of power outages:** SRP is designing a future energy system with zero outages caused by a lack of energy supply each year. However, SRP wants to understand how you would evaluate an energy plan that has the possibility of one to three 2-hour outages. These outages would occur during times with high energy demand, like a hot summer's day, and would not be caused by storms.

Energy Mix:

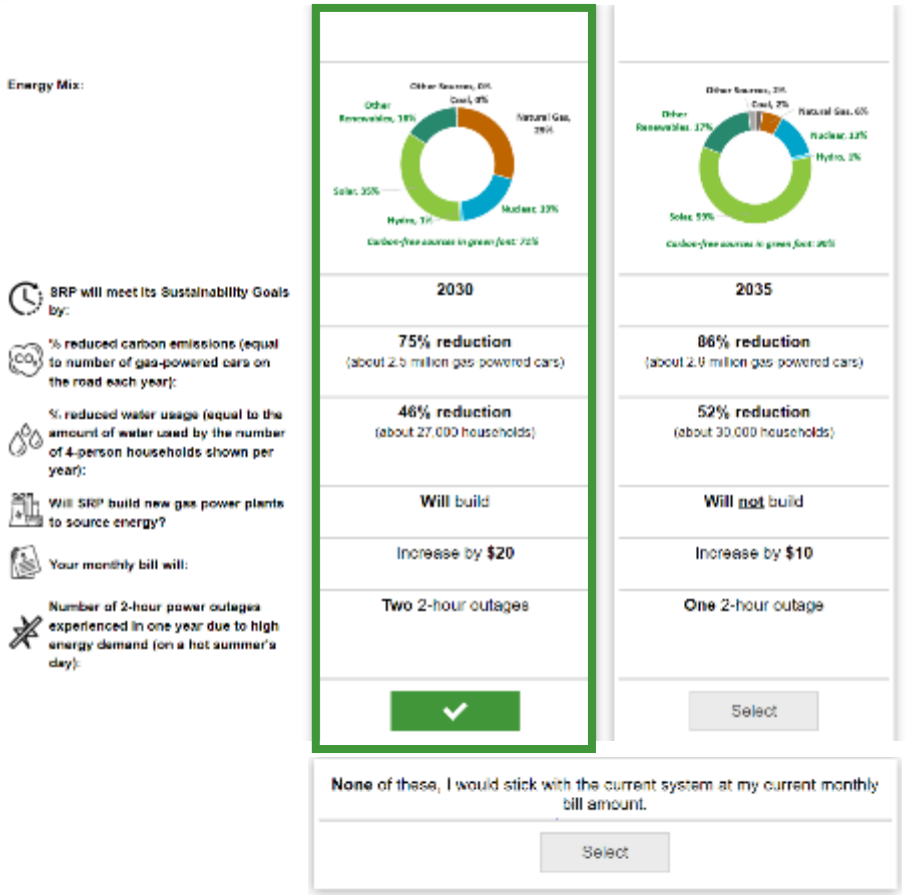


SRP will meet its Sustainability Goals by:	2035
% reduced carbon emissions (equal to number of gas-powered cars on the road each year):	10% reduction (about 275,000 gas-powered cars)
% reduced water usage (equal to amount of water used by the number of 4-person households shown per year):	25% reduction (about 31,000 households)
Will SRP build new gas power plants to source energy?	Will not build
Your monthly bill will:	Increase by $10
Number of 2-hour power outages experienced due to high energy demand (on a hot summer's day):	Two 2-hour outages

Conjoint Exercise Screens

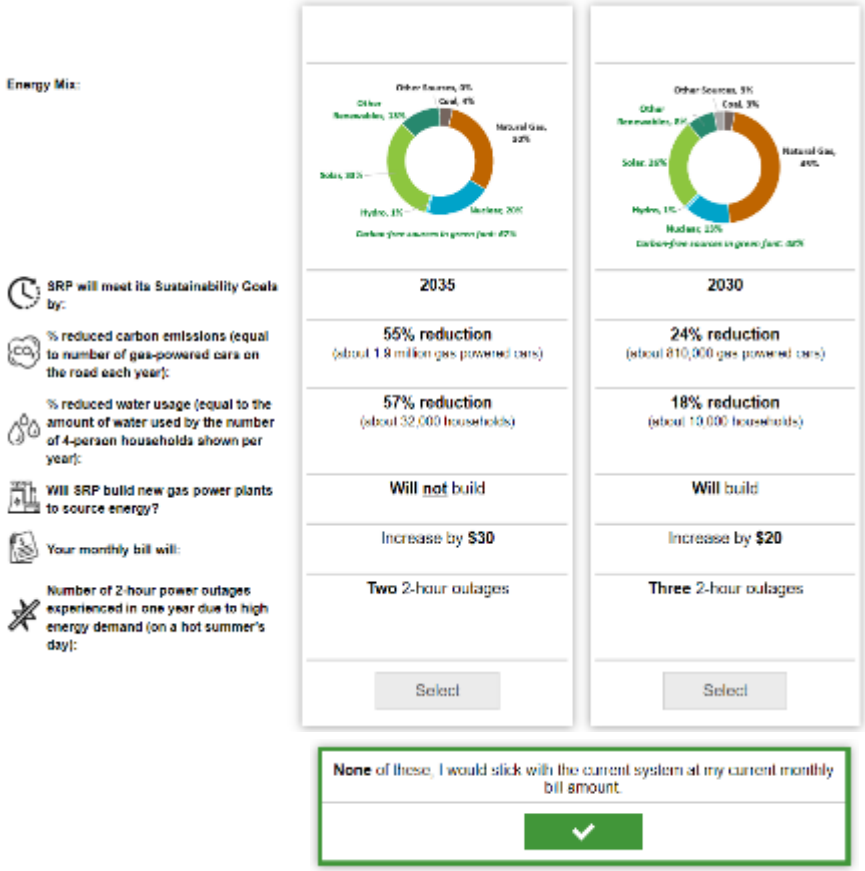
Which of these hypothetical future energy systems would you prefer SRP implement
Please read through each plan carefully and select the plan you most prefer.

Click here to view a glossary of terms. This will open in a new browser and you can come back to this page to complete the activity.



Which of these hypothetical future energy systems would you prefer SRP implement
Please read through each plan carefully and select the plan you most prefer.

Click here to view a glossary of terms. This will open in a new browser and you can come back to this page to complete the activity.



SYSTEM PLAN PREFERENCES
(PHASE III)

Monthly bill impact of greatest importance

Attribute	Ranked 1st Most Important
Monthly bill impact	36.8%
Reduction in carbon emissions	15.9%
Number of 2-hour power outages	14.5%
Energy mix	13.9%
Reduction in water usage	11.4%
If SRP will build new gas power plants	5.0%
When SRP will meet its sustainability goals	2.5%

Among those ranking the **energy mix first**, top ranked **priorities were evenly split**:

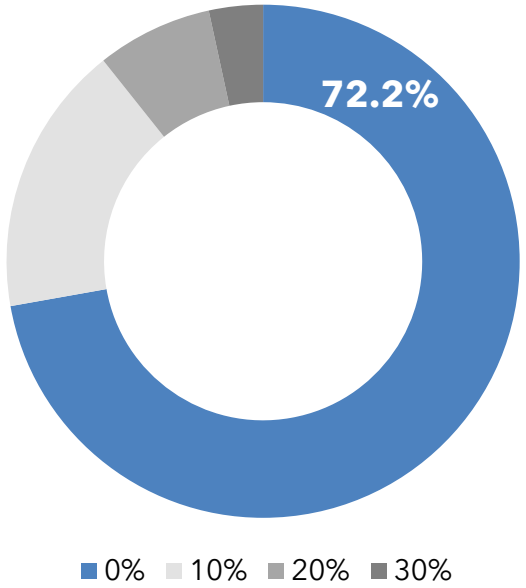
- Affordability – 31% ranked 1st
- Reliability – 36% ranked 1st
- Sustainability – 34% ranked 1st

Suggesting energy mix was seen as a **component related to all three priorities.**

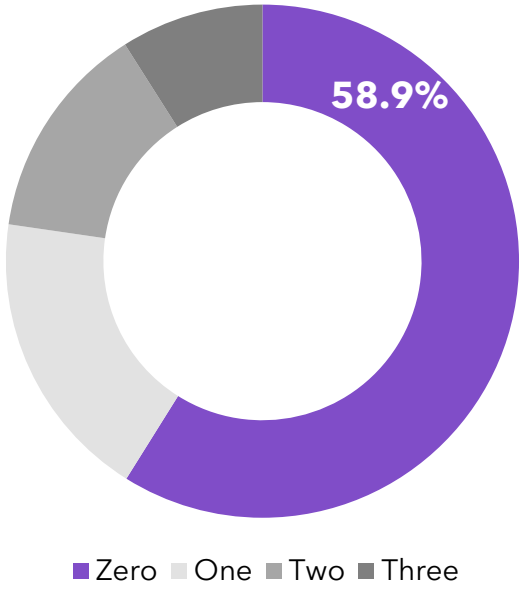
Choices indicate a desire to “have it all”

Summed Share of Preference by Attribute

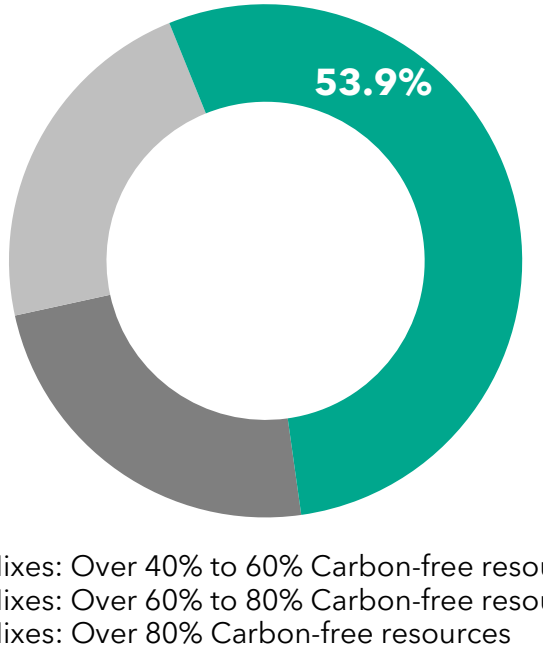
Monthly Bill Impact



Number of 2-Hour Outages



Energy Mix



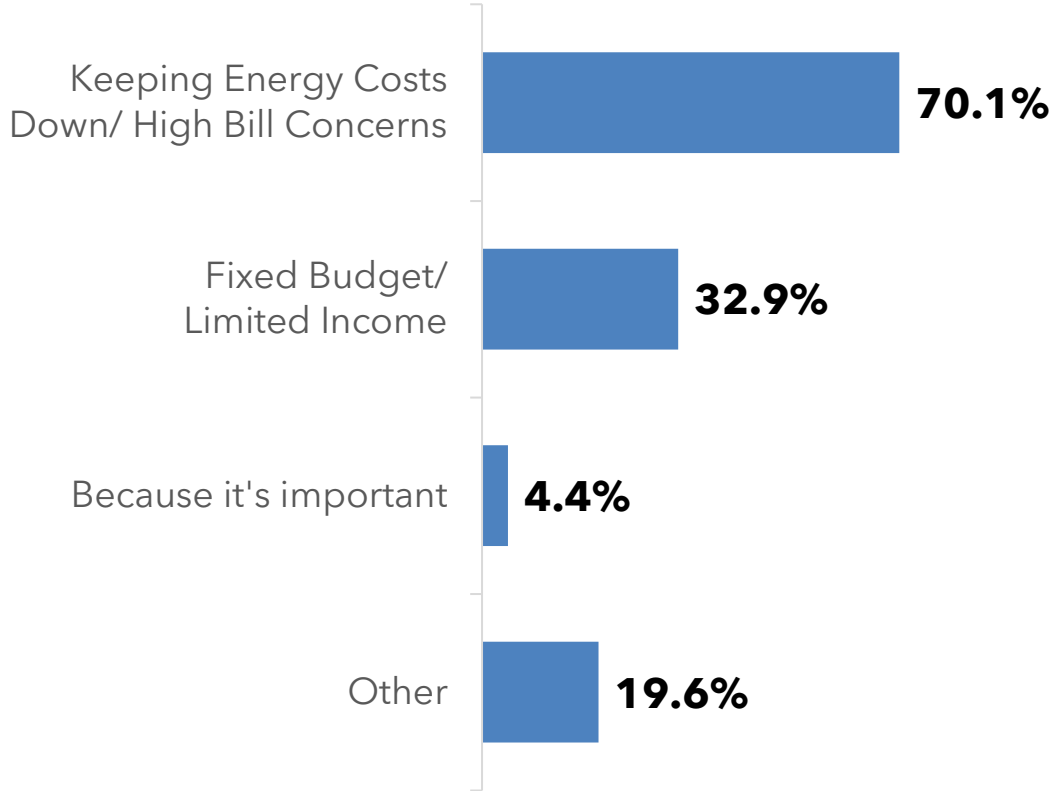
Real-world cost constraints force tradeoffs

Limitations on how much customers feel they can **invest in the "greater good"**

Fixed incomes and limited budgets constrain the degree to which they can prioritize sustainability

Price sensitivity analysis revealed a sharp decline in energy plan acceptance as levels increase **above a 10% monthly bill impact**

Reasons Why Monthly Bill Impact Most Important*



*Among those ranking monthly bill impact first (n=364); multiple responses accepted

Customers' optimal future energy system

Findings revealed that from the residential customer's perspective the **ideal future energy system should**...

- **Manage cost, first and foremost**
- Keep monthly bill impacts **below a 10% increase** (from current bill)
- Include a diverse mix to **ensure reliability**
- Provide the cleanest, **most sustainable energy without exceeding a 10% bill increase** (from current bill)

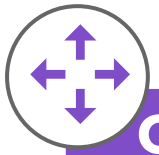
Executive Summary

66%
Rated Positively

Most customers reacted positively to SRP's proposed path forward, and a quarter felt it was excellent
A majority agreed the plan should be prioritized by SRP

Top factors: affordability & bill impacts

- In each quantitative phase of research, **affordability surpassed reliability slightly in importance**.
- Those with **limited incomes put greater emphasis on affordability**.
- When choosing a future energy system customer selections revealed **monthly bill impact as the top driver of preference**.



Customer understanding and openness to change

- Customers recognized that **challenges are interrelated** and pose **risks to sustainability, the economy, and overall quality of life**.
- In general, **lower-cost plans were more preferred**.
- Customers recognized the need for and expressed interest in SRP's investment in sustainable energy, but they **do not want to bear the cost of that investment**.

Key ISP Findings

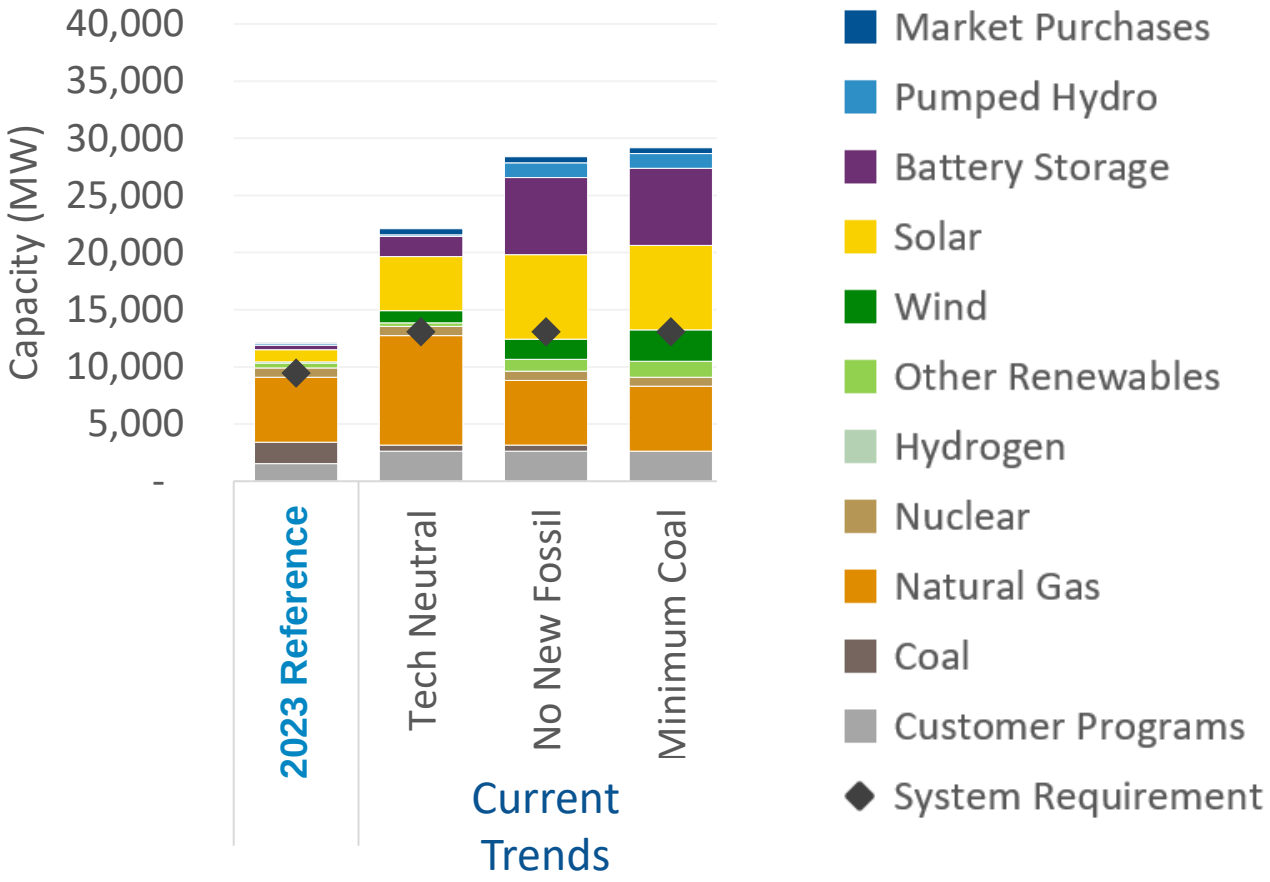
Angie Bond-Simpson
Sr. Director, Resource Management

ISP Results: Investments Needed at a Rapid Pace

- SRP will likely need to **double** or **triple** resource capacity in the **next decade** to serve customers while achieving reliability and sustainability goals. This will be at an unprecedented pace.
  - New renewables **and** firm capacity are part of a least-cost portfolio, even under a wide range of gas price and technology cost sensitivities.
  - When **paired** with firm capacity, solar and wind contribute to a least-cost portfolio while being able to help reduce carbon emissions.
- Without **new firm generation capacity**, the system cannot satisfy reliability requirements under a high load growth scenario. Higher levels of renewables and storage, including pumped storage are required in lower load growth scenarios.
- **Hundreds of miles** of new or upgraded transmission lines and nearly double the number of 500/230 kV transformers could be needed relative to today.
- Location of generation matters and plays a significant role in the buildout of the **500 kV transmission system.**

ISP Analysis: Total Nameplate Capacity of Resource and Customer Programs, 2035 (MW)

Key Takeaway: SRP will likely need to **double** or **triple** resource capacity in the **next decade** to serve customers while achieving reliability and sustainability goals. This will be at an unprecedented pace.



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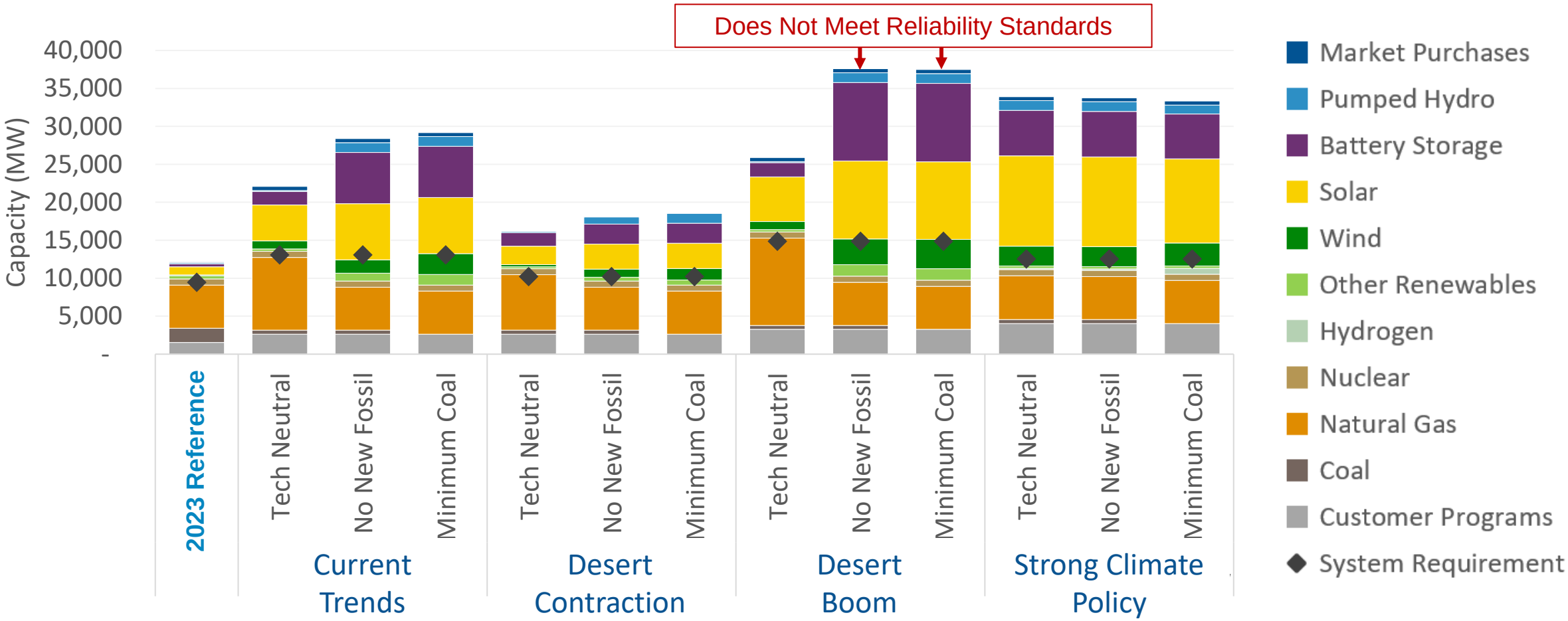
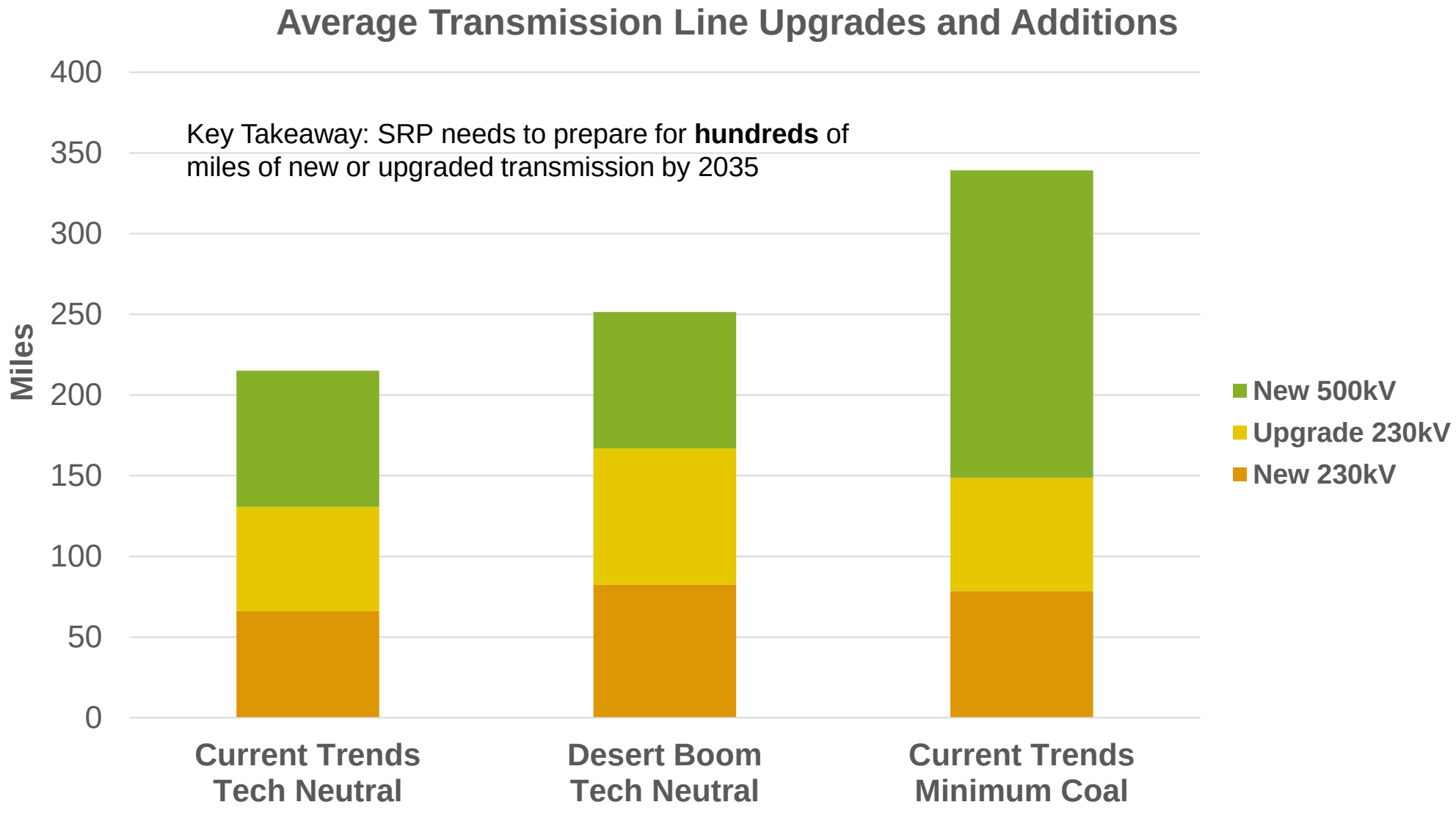


ISP Analysis: Future Transmission Needs



Metrics Takeaways: The Need for Balance

Affordability

A Tech Neutral strategic approach results in lowest system cost and lower bill impacts.

Sustainability

A Minimum Coal strategic approach results in greater emissions reductions and lower water use.

Reliability

A Tech Neutral strategic approach results in paced infrastructure development and is the only approach able to meet reliability under high customer demand conditions.

Customer Focus

Residential customer are sensitive to bill impacts.

Customer programs potentially unlock greater economy wide carbon reductions.

Integrated System Plan: System Strategies

Energy Investments
Invest in renewable resources and storage to manage fuel consumption, and drive carbon and water reductions.

Capacity Investments
Invest in firm generation, including natural gas, to support reliability and manage affordability, while also supporting advancement of emerging firm technologies.

Proactive Transmission
Proactively plan to expand transmission infrastructure to enable generator interconnections and load growth.

Distribution Innovation
Ensure distribution grid readiness to maintain reliability and enable customer innovations to drive carbon reductions.

Strategic Investment & Reinforcement of Existing Assets
Reinforce and maximize value of existing infrastructure with strategic investments to manage affordability, and ensure future performance, grid security and resilience.

Evolution of Customer Programs & Pricing
Evolve pricing and customer programs to improve economy-wide carbon reductions and pace infrastructure development, while recognizing customers' diverse needs.

Partnerships & Suppliers
Explore partnerships, supply chain and development solutions that manage cost and availability to meet the pace of transformation.

Day One Wrap Up

Angie Bond-Simpson
Sr. Director, Resource Management

Lunch