SRP Integrated System Plan Advisory Group Meeting #13

Moving Forward Together Part 1

August 11th, 2023

Welcome

Bobby Olsen
AGM & Chief Planning, Strategy & Sustainability Executive (SRP)

Welcome SRP 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

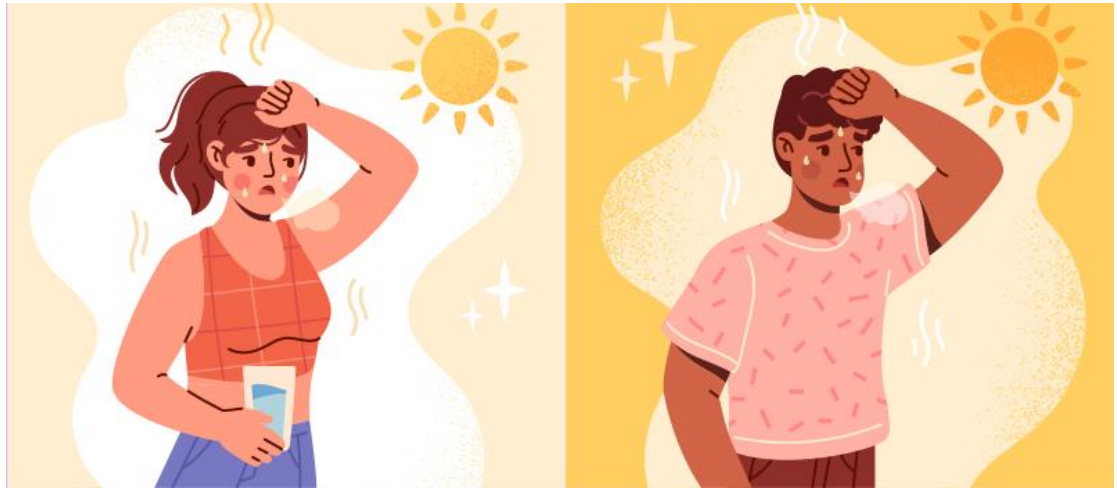
Rocky Shelton
SRP Council Member

Mark Mulligan
SRP Council Member

Safety & Sustainability Minute

Safety

Be aware of warning signs of heat-related illness



Sustainability

Volunteer at community cleanups or donate to causes

SRP Updates

Meeting Objectives:

Advisory Group Meeting #13: Moving Forward Together Part 1

- Review and discuss the results of the Phase 3 Residential Customer Research
- Review ISP metrics including average residential bill impacts
- Review System Strategies to be recommended to the SRP Board
- Share draft Balanced System Plan (resource buildout)
- Share and discuss draft ISP Actions

Advisory Modeling Subgroup Meeting: Technical Q&A Opportunity

- Discuss Technical Q&A for the results from ISP analysis

Agenda:

Advisory Group Meeting #13: Moving Forward Together Part 1

Time		Topics	Presenter
8:30-9:00	**30 min**	Breakfast & Networking	
9:00-9:15	**15 min**	Welcome & SRP Updates	Bobby Olsen (SRP)
9:15-9:20	**5 min**	Opening Remarks and Meeting Orientation	Angie Bond-Simpson (SRP) Joan Isaacson (K&W)
9:20-9:35	**15 min**	Recap of May 19th ISP Advisory Group Meeting & Technical Working Session: Evolving Time-Of-Use Programs Debrief	Maria Naff (SRP) Arne Olson (E3)
9:35-10:35	**60 min**	Phase 3 Customer Research: Key Findings & Residential Customer Preference Metrics	John Sessions (Bellomy) April Smith (Bellomy)
10:35-10:45	**10 min**	Coffee Break	
10:45-11:30	**45 min**	Review of Average Residential Price Impact & Final Reliability and Sustainability Metrics	Kyle Heckel (SRP) Adam Peterson (SRP) Maria Naff (SRP) Nevida Jack (SRP)
11:30-11:40	**10 min**	Review of ISP System Strategies	Angie Bond-Simpson (SRP)
11:40-12:30	**50 min**	Review of Draft ISP Balanced System Plan	Angie Bond-Simpson (SRP)
12:30- 1:00	**30 min**	Lunch	
1:00-1:50	**50 min**	Discussion of Draft ISP Actions w/ Q&A and Engagement Activity	Angie Bond-Simpson (SRP)
1:50-2:00	**10 min**	Next Steps and Wrap Up	Angie Bond-Simpson (SRP)

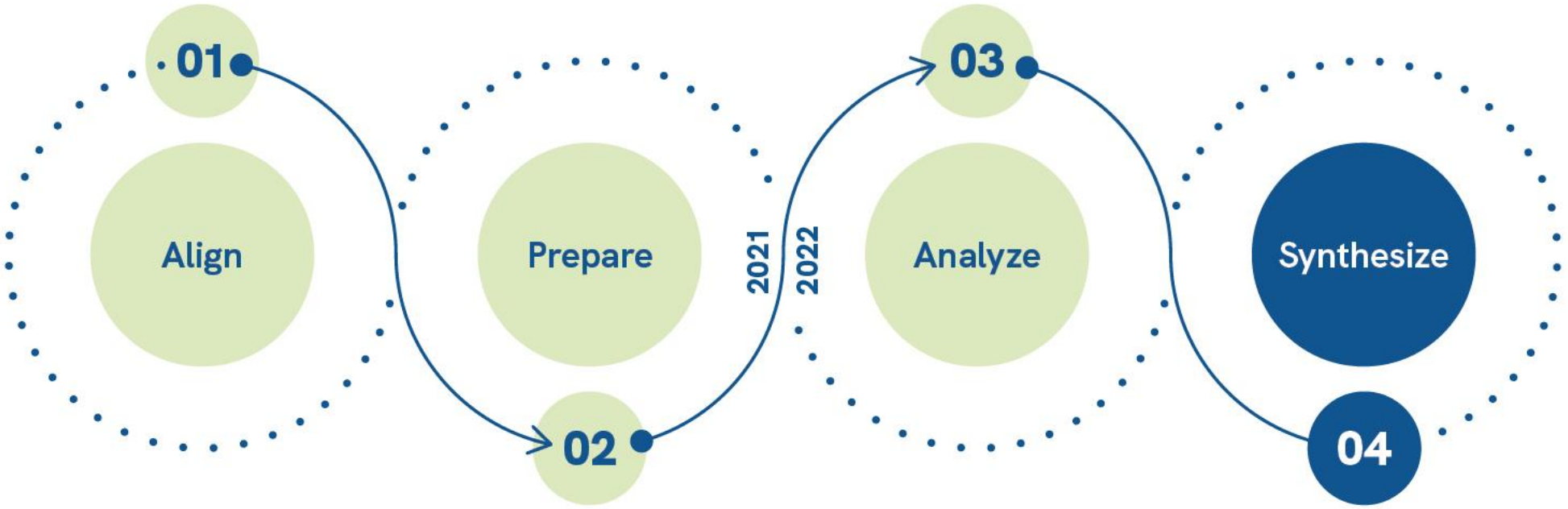
Agenda:

Advisory Modeling Subgroup Meeting: Technical Q&A Opportunity

Time		Topics	Discussion Lead
2:00-2:15	**15 min**	Coffee Break	
2:15-4:00	**105 min**	Technical Q&A Opportunity	SMEs

Guides for Productive Meetings

- Actively participate
- Stand up name tent to indicate wanting to provide input, ask a question, etc.
- Encourage and seek multiple perspectives, including use of multiple engagement methods
- When introducing technical subjects, begin with straightforward definitions and avoid acronyms; create comfortable environment for questions and understanding
- Stay concise so that everyone has time to participate
- Maintain one representative per Advisory Group member organization in meeting discussions
- Enjoy the meeting!



SRP ISP ROADMAP

Stakeholder Engagement and Public Outreach

Align on Objectives of the first ISP

Collaboratively develop Study Plan:
Scenarios & Sensitivities
Strategic Approaches
Metrics

Gather input data

Perform system analysis

Validate and share results

Recommend new SRP system strategies

Recommend near term actions

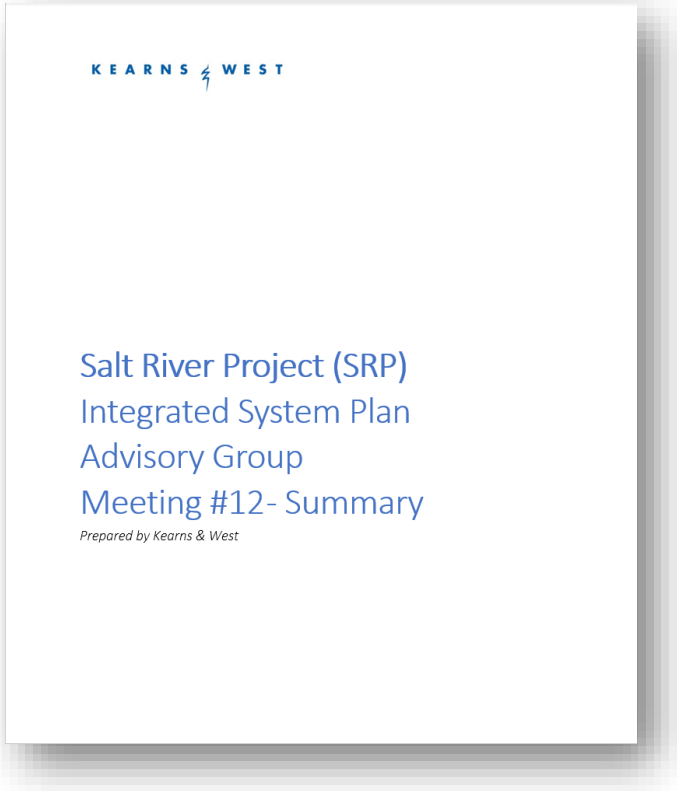
Recap of May 19th Advisory Group Meeting & Technical Working Session: Evolution of Time-of-Day Programs Debrief

Maria Naff
Manager, Integrated Planning (SRP)

Arne Olson
Senior Partner, Energy + Environmental Economics (E3)

May 19th Discussion Themes

- Share and discuss key findings for affordability metrics from the ISP analysis
- Share and discuss draft ISP System Strategies
- Themes of ideas for implementation from Advisory Group members
  - Flexibility and Innovation
  - Proactive Moves
  - Maximize Efficiency/Minimize Investments
  - Customer Programs and Time-of-Day Programs
  - Policy and Advocacy



July 12th Evolution of Time-of-Day Programs: E3 Summary of Presentations

Moderator - Arne Olson

Senior Partner

Energy + Environmental Economics

Debra Lew

Associate Director

Energy Systems Integration Group (ESIG)

Aligning Grid Needs with Retail Pricing

- Increased variable renewable penetration and new electrification loads create the need for greater system flexibility.
- Time-of-Day (TOD) pricing can incentivize flexibility and offset other flexible resources like storage and peaker plants.
- ESIG white papers have evaluated key TOD design questions related to timing, spatial resolution, magnitude and more.

Mark LeBel

Senior Associate

Regulatory Assistance Project (RAP)

Advancing Time-Varying Rates

- Rates should be designed with core ratemaking principles and policy goals (e.g., efficiency and affordability).
- Imperfect metrics (e.g., demand and energy use) have created challenges in allocating costs across customer classes.
- Ensuring customer understanding of and engagement with rates is crucial but may face tradeoffs with efficiency.

Paul Phillips

Supervisor, Electric Rates Energy Division

California Public Utilities Commission (CPUC)

California TOD Rates and Pricing Designs for the Grid of the Future

- Facing a deepening duck curve, growing electrification, and stark geography-based class differences, California's transition to TOD has been gradual and conservative but has led to effective load shifting during critical periods.
- With the TOD foundation, California is proceeding towards more sophisticated rate structures to incentivize greater efficiency and demand flexibility while protecting low-income customers.

Alcides Hernandez

Revenue Strategy Manager

Sacramento Municipal Utility District (SMUD)

SMUD's Time-of-Day Rate

- SMUD has evolved rates towards a TOD design over a decade, recently adding critical peak pricing.
- Prioritizing simplicity over complexity, strong customer engagement and program testing have helped contribute to high customer participation and have resulted in lower costs and carbon emissions than initially predicted.

E3 takeaways from panel discussion

Time-of-day (TOD) pricing is **an important tool** in an **evolving grid.**

- As variable renewable penetration increases and electrification loads grow, TOD pricing can encourage load shifting that helps with grid balancing and resource adequacy.

TOD pricing could help SRP **mitigate or defer** new resources and grid infrastructure.

- TOD pricing can reduce needs for flexible resources (e.g., storage and peaker plants) by shifting load to lower-cost time periods.
- Future ISPs could evaluate the impacts of new TOD pricing on the need for flexible resources and transmission and distribution investments.

TOD plans are **most effective** when clear and **understandable to customers.**

- Clear messaging and outreach help drive customer engagement.
- Plans should not be so complex that customers forgo participating in or do not understand how to shift usage to minimize their bill.
- Gradual transitions can help with customer understandability and comfortability.

More **dynamic pricing** models, such as real-time pricing, could provide benefits in the future when paired with enabling technologies.

- The emergence of energy management service providers can help protect customers from sudden price spikes and volatile energy prices.

ISP RESIDENTIAL CUSTOMER RESEARCH

Advisory Group Meeting | August 11, 2023

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

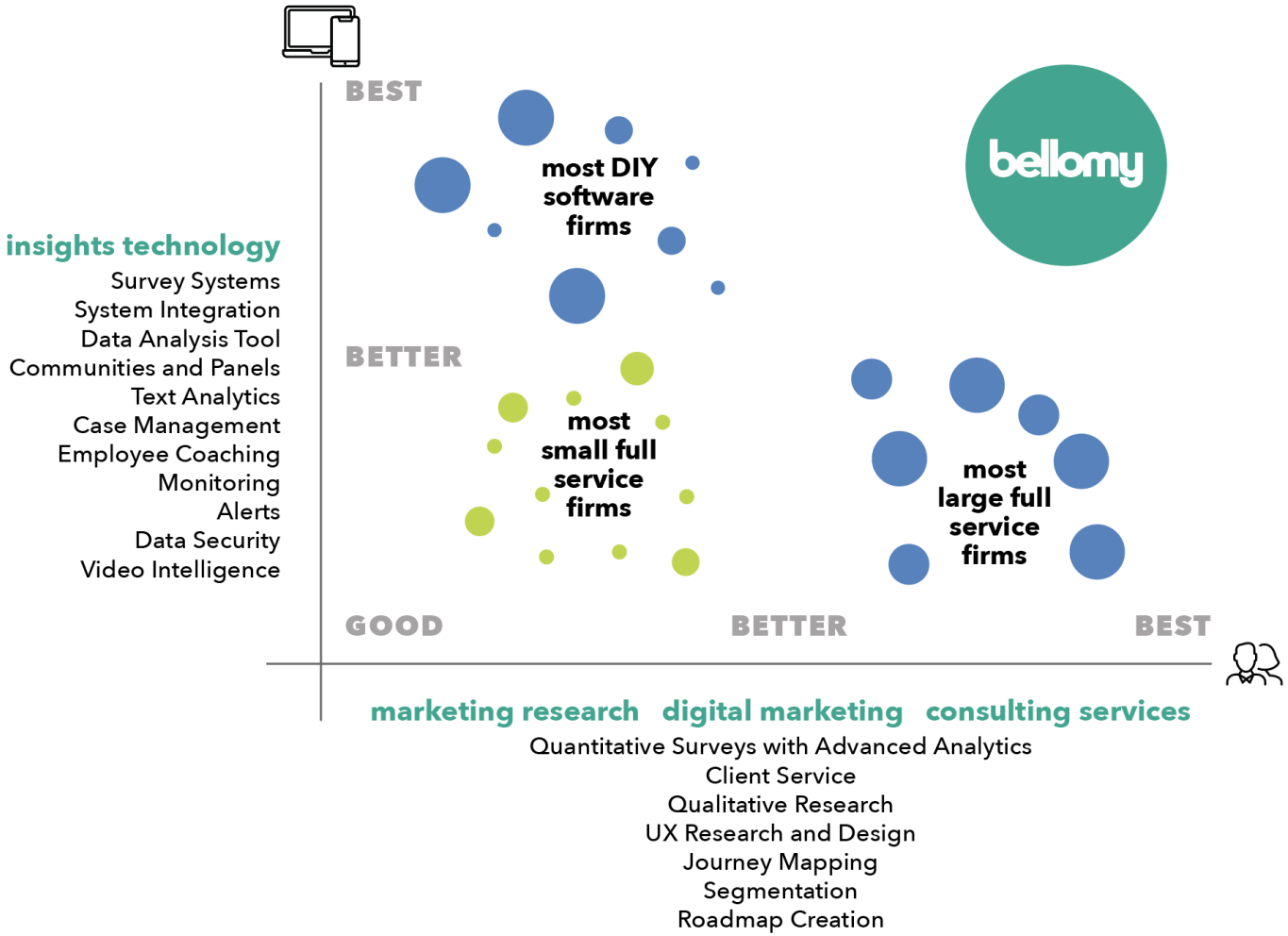
PREPARED FOR

SRP
Delivering water and power®

bellomy

About Bellomy

Insights
Technology
Designed +
Developed
by Insights
Professionals



bellomy

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

bellomy

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

bellomy

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

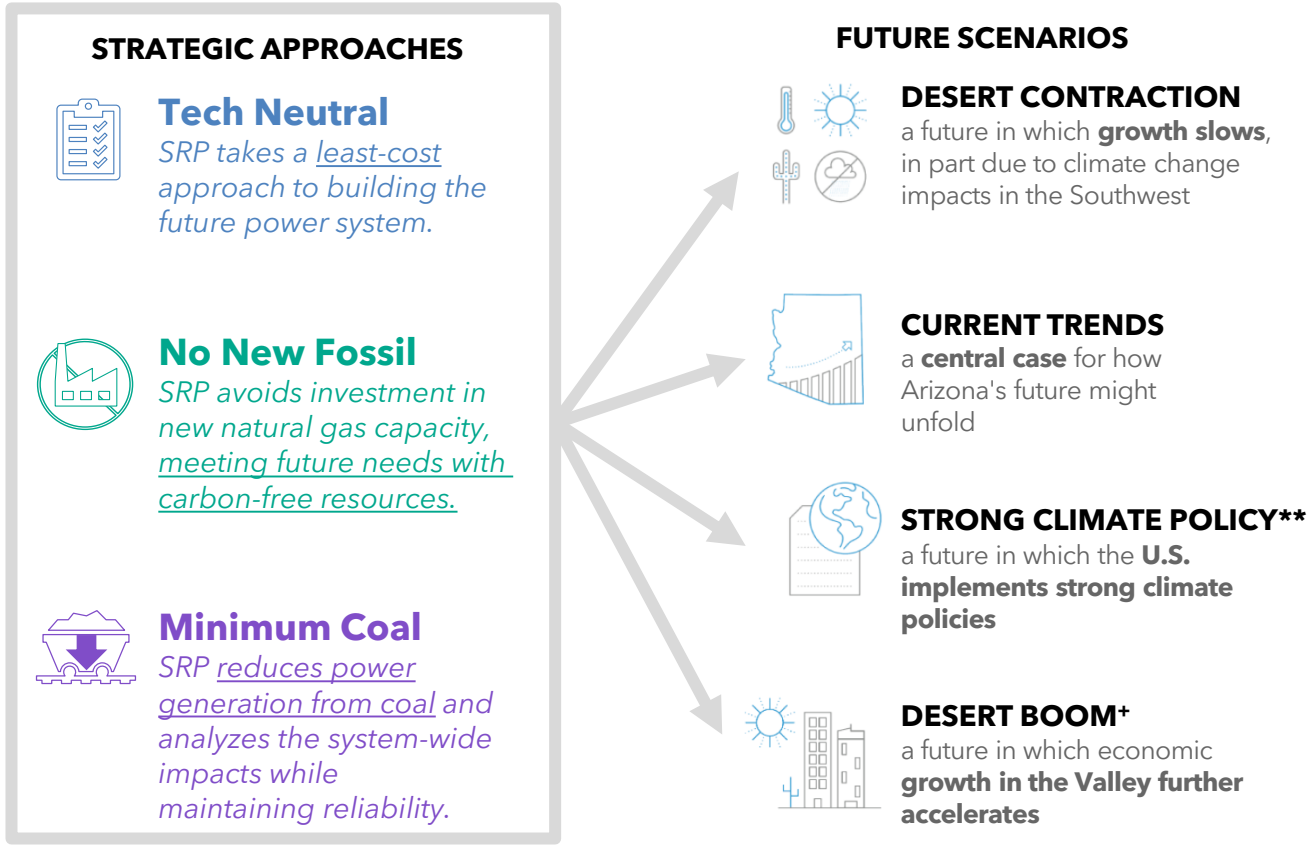
Choice Exercise Survey

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.

bellomy

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.

bellomy

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

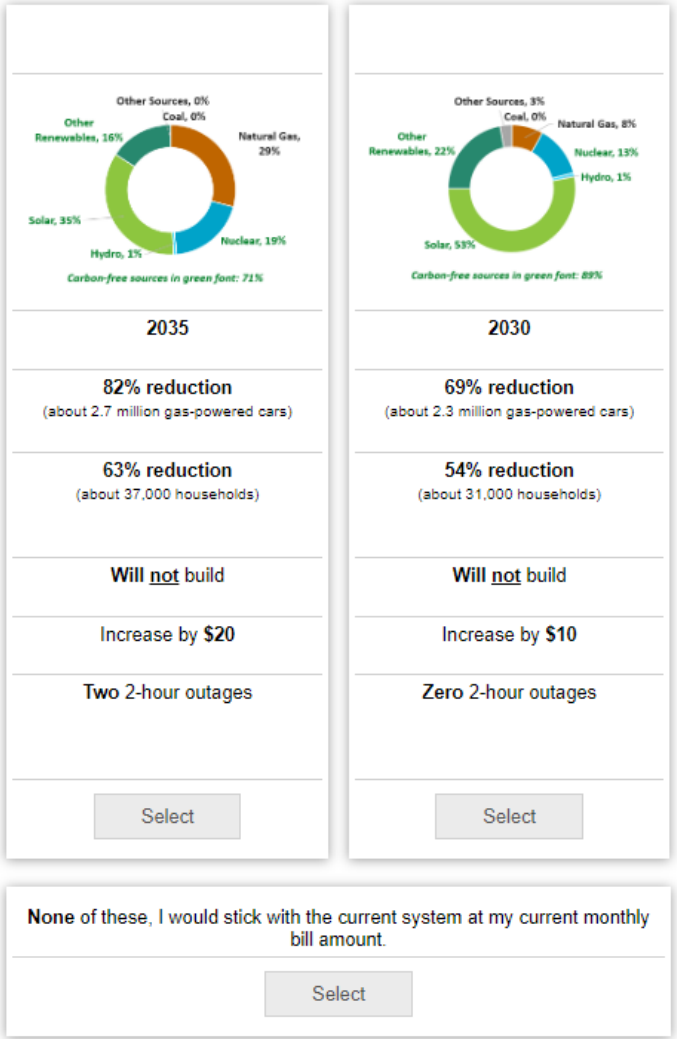
Inputs Were Used in a Choice Exercise

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

bellomy

EXECUTIVE SUMMARY

Executive Summary

Top factors: affordability & bill impacts

- In each phase of this 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**.

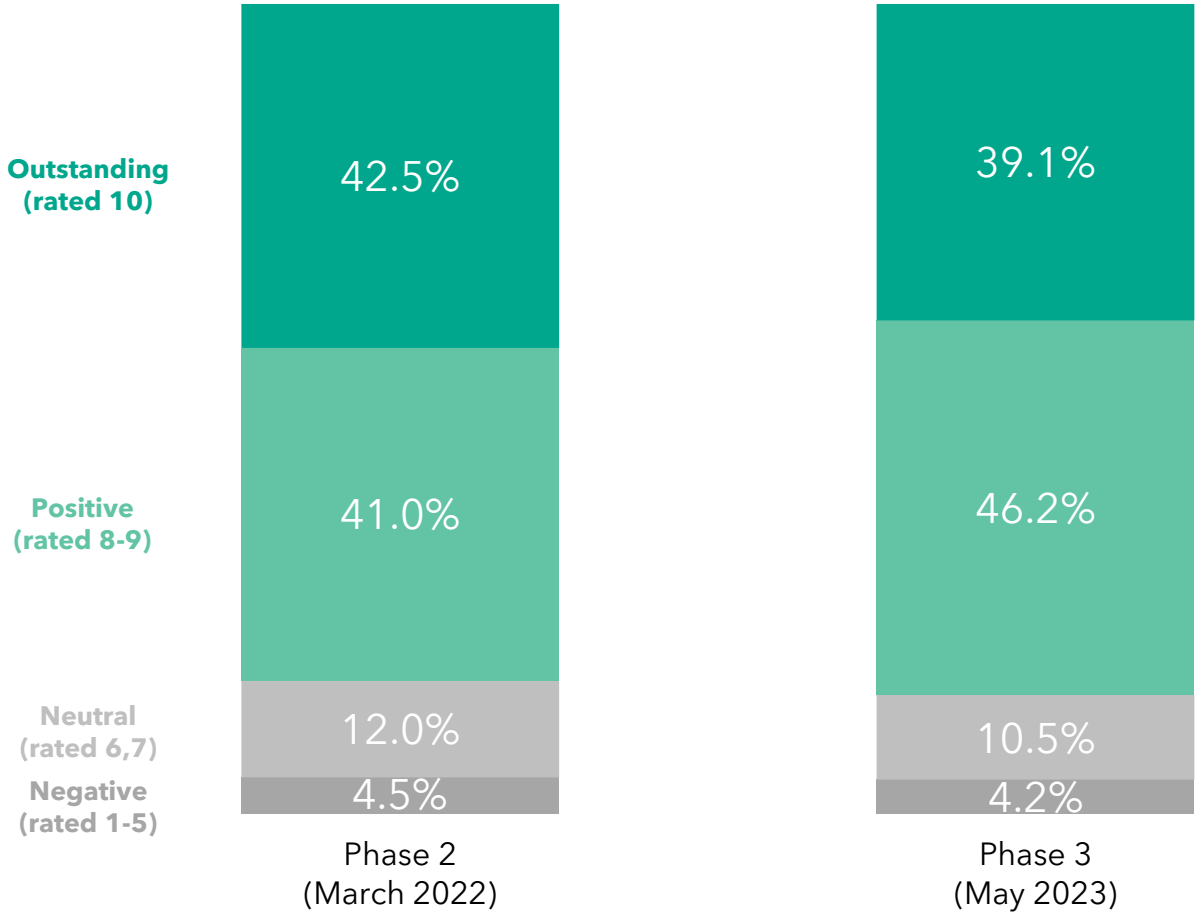
Customer understanding and openness to change

- Customers recognized that **challenges are interrelated** and pose **risks to sustainability, the economy and overall quality of life**.
- In general, **lower cost strategic approaches 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**.

CURRENT EXPERIENCE WITH SRP + PRIORITIES

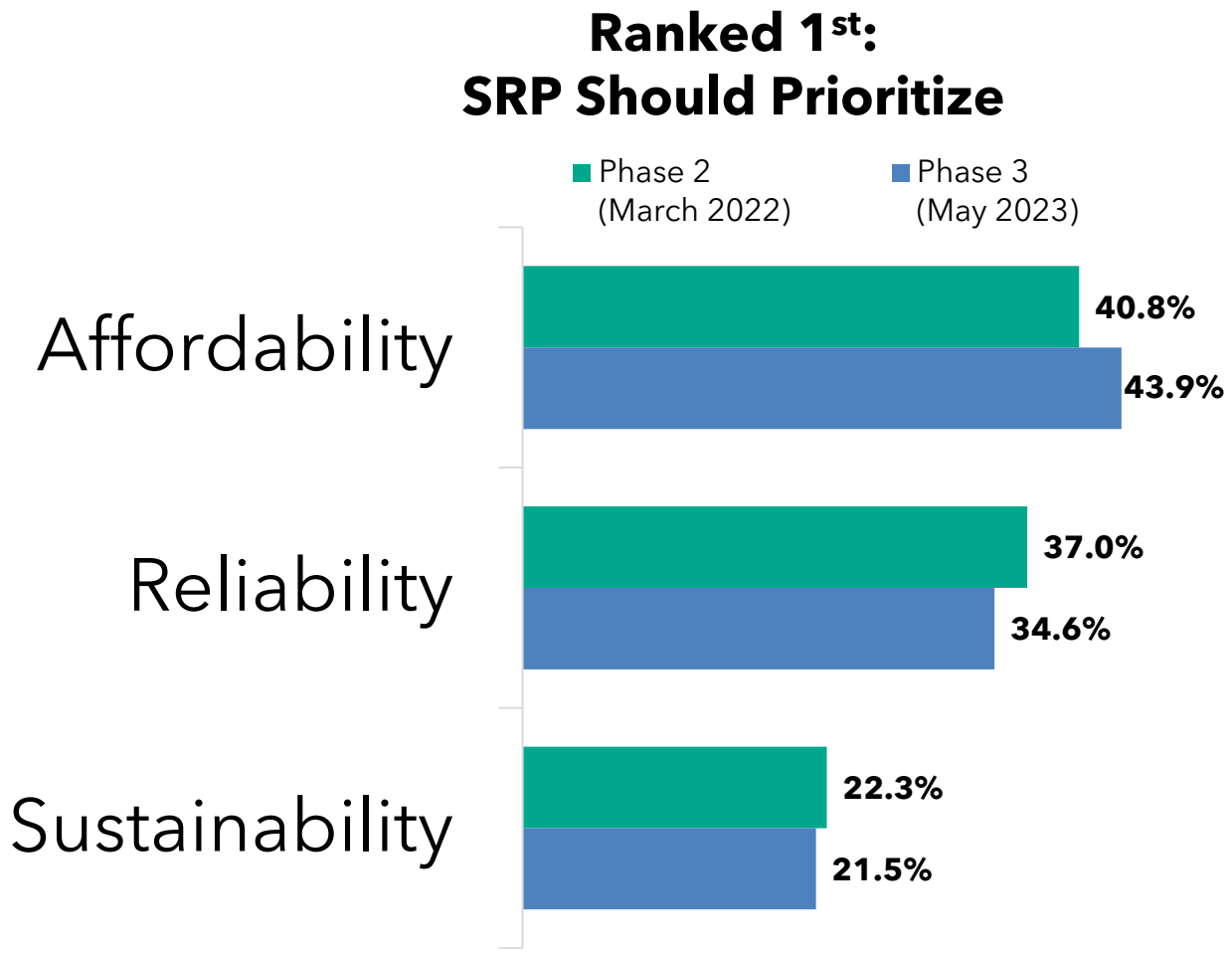
Most rated their experience with SRP positively

Overall Experience with SRP



bellomy

Affordability and reliability were most often ranked 1st



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

bellomy

SYSTEM PLAN PREFERENCES
(FROM MAY 2023 SURVEYING)

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**:

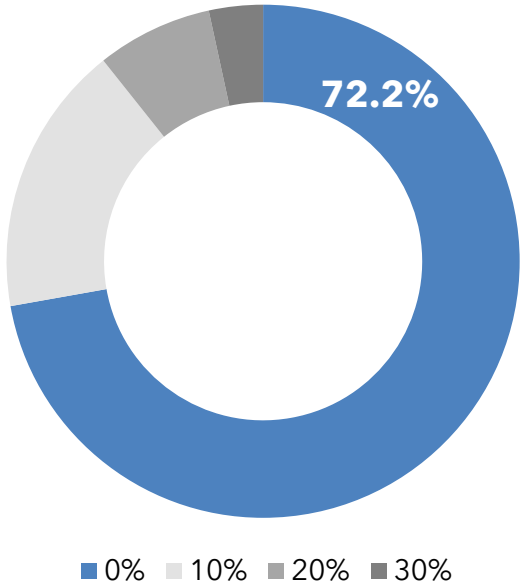
- Affordability – 31% ranked 1st
- Reliability – 36% ranked 1st
- Sustainability – 34% ranked 1st

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

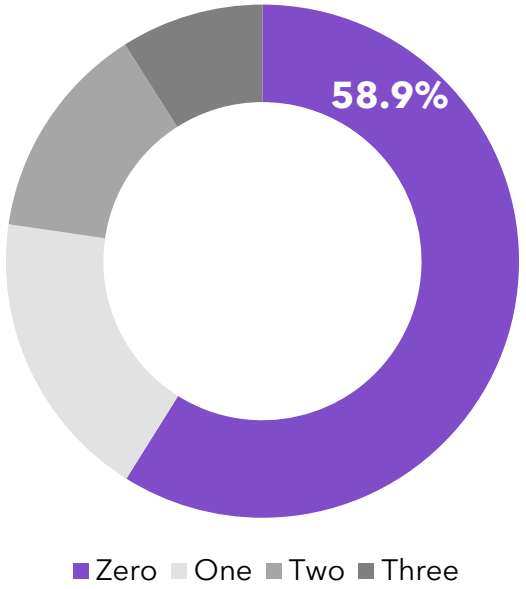
Choices indicate a desire to “have it all”

Summed Share of Preference by Attribute

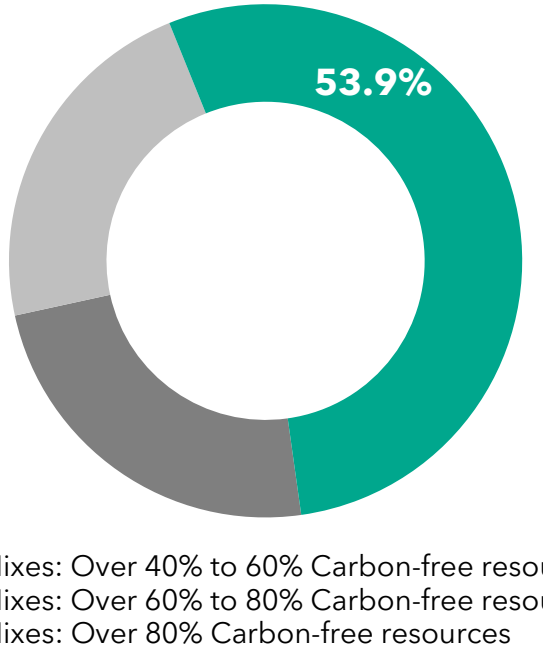
Monthly Bill Impact



Number of 2-Hour Outages



Energy Mix



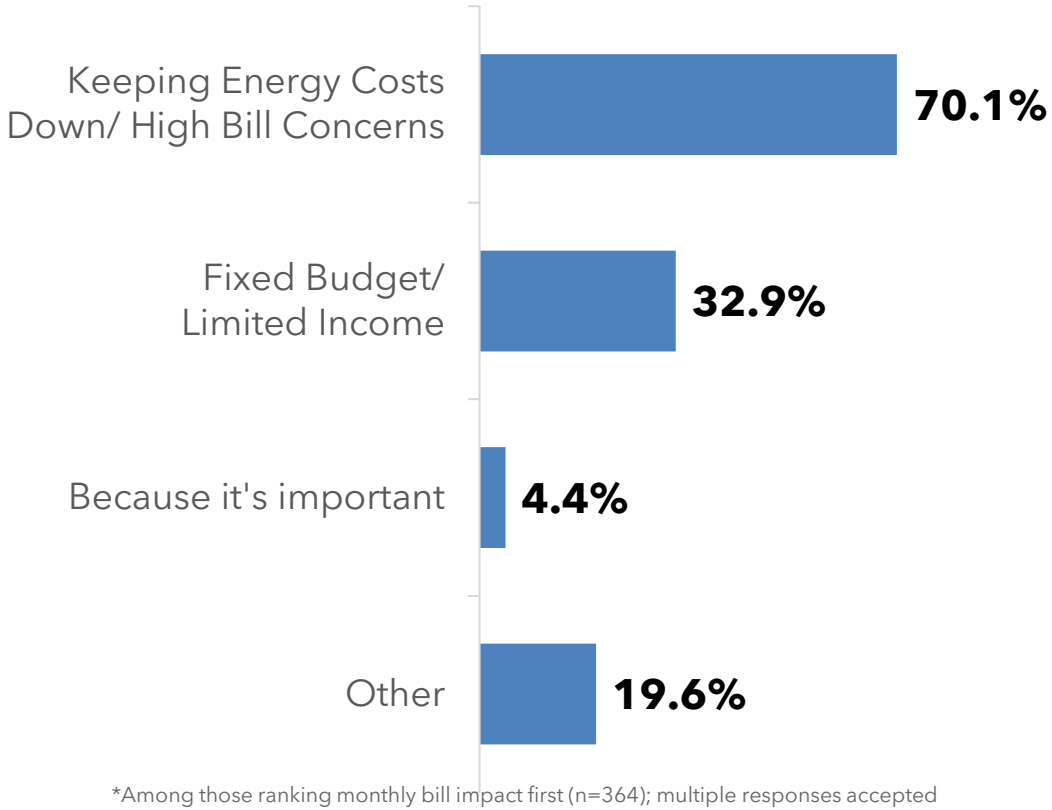
bellomy

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

Reasons Why Monthly Bill Impact Most Important*

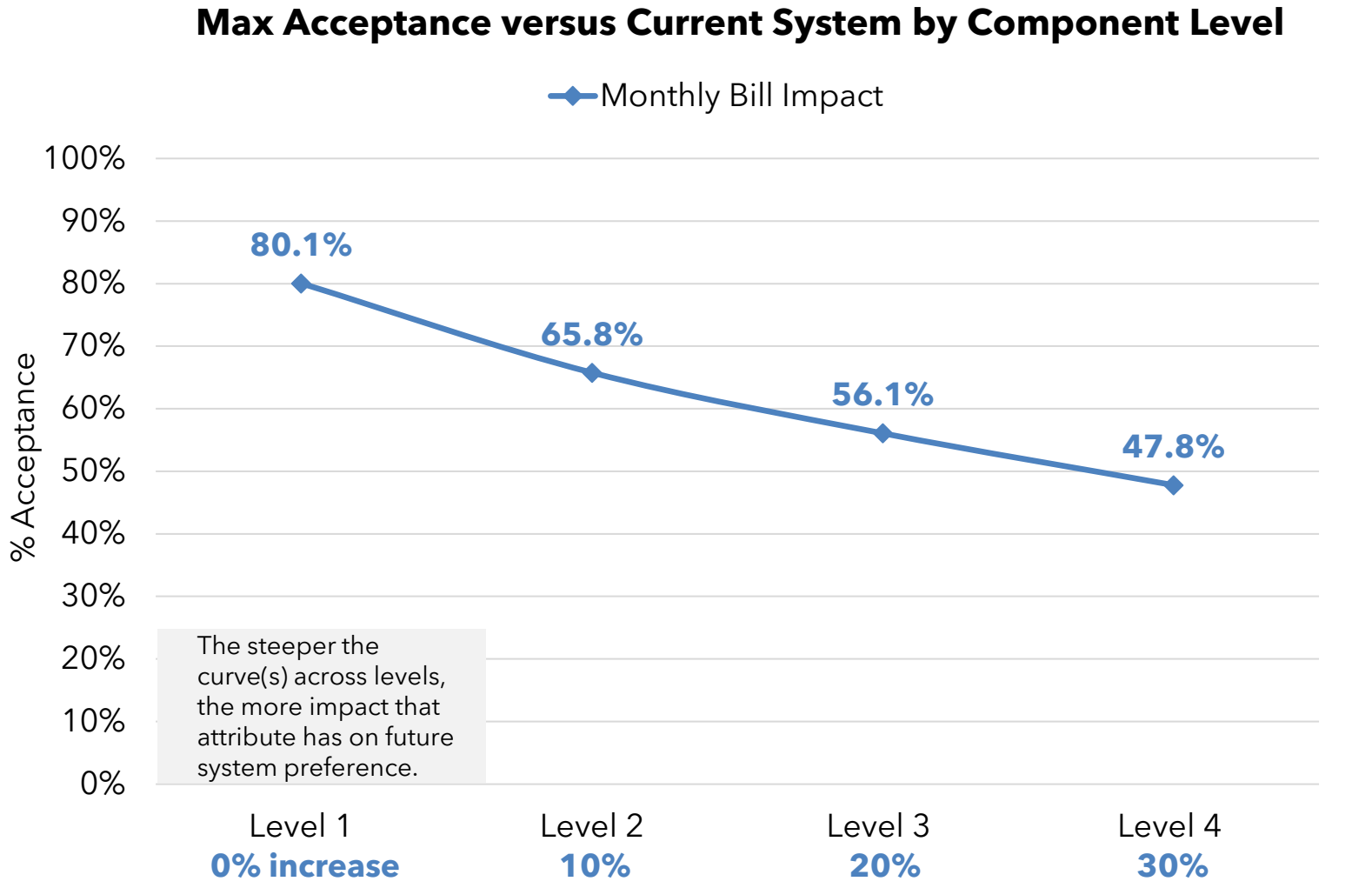


*Among those ranking monthly bill impact first (n=364); multiple responses accepted

bellomy

Acceptance declines above 0% bill impact

Sharp declines in acceptance
beginning at 10% monthly bill increase

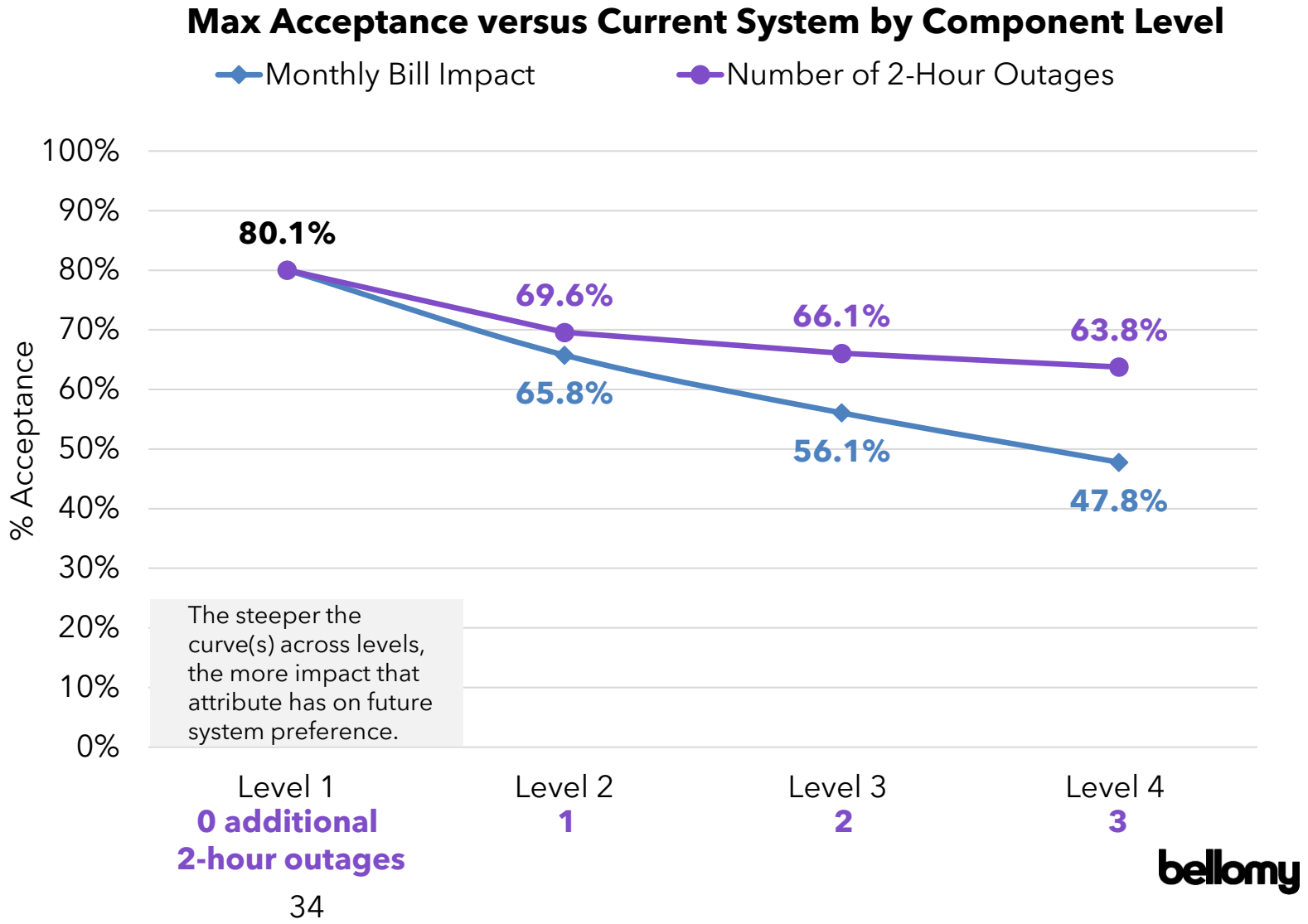


bellomy

Acceptance declines above 0% bill impact

Sharp declines in acceptance beginning at 10% monthly bill increase

Declines **less steep for the number of 2-hour outages**

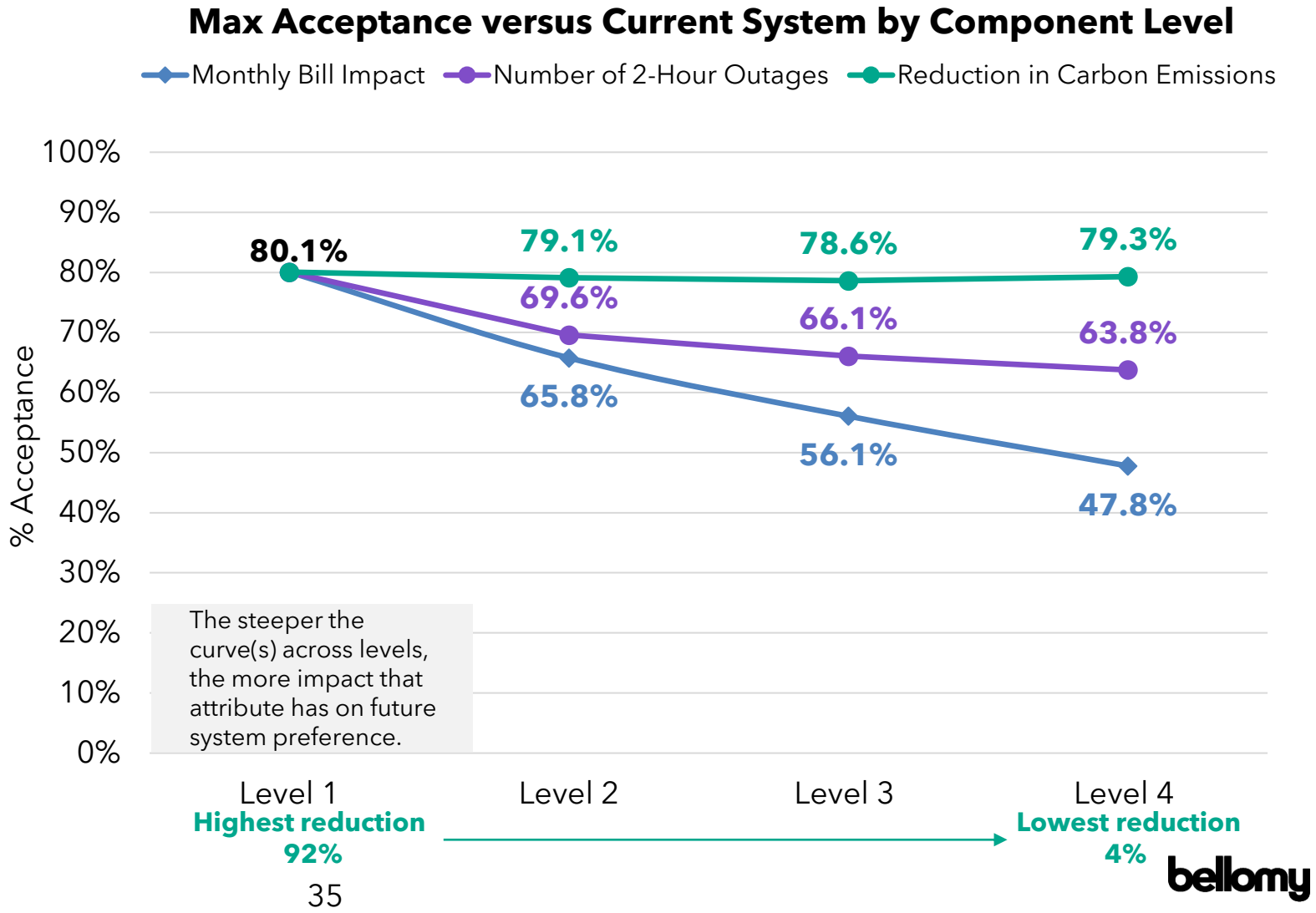


Acceptance declines above 0% bill impact

Sharp declines in acceptance beginning at 10% monthly bill increase

Declines less steep for the number of 2-hour outages

Acceptance **relatively unchanged as the level of reduction in carbon emissions increases**



bellomy

Acceptance declines above 0% bill impact

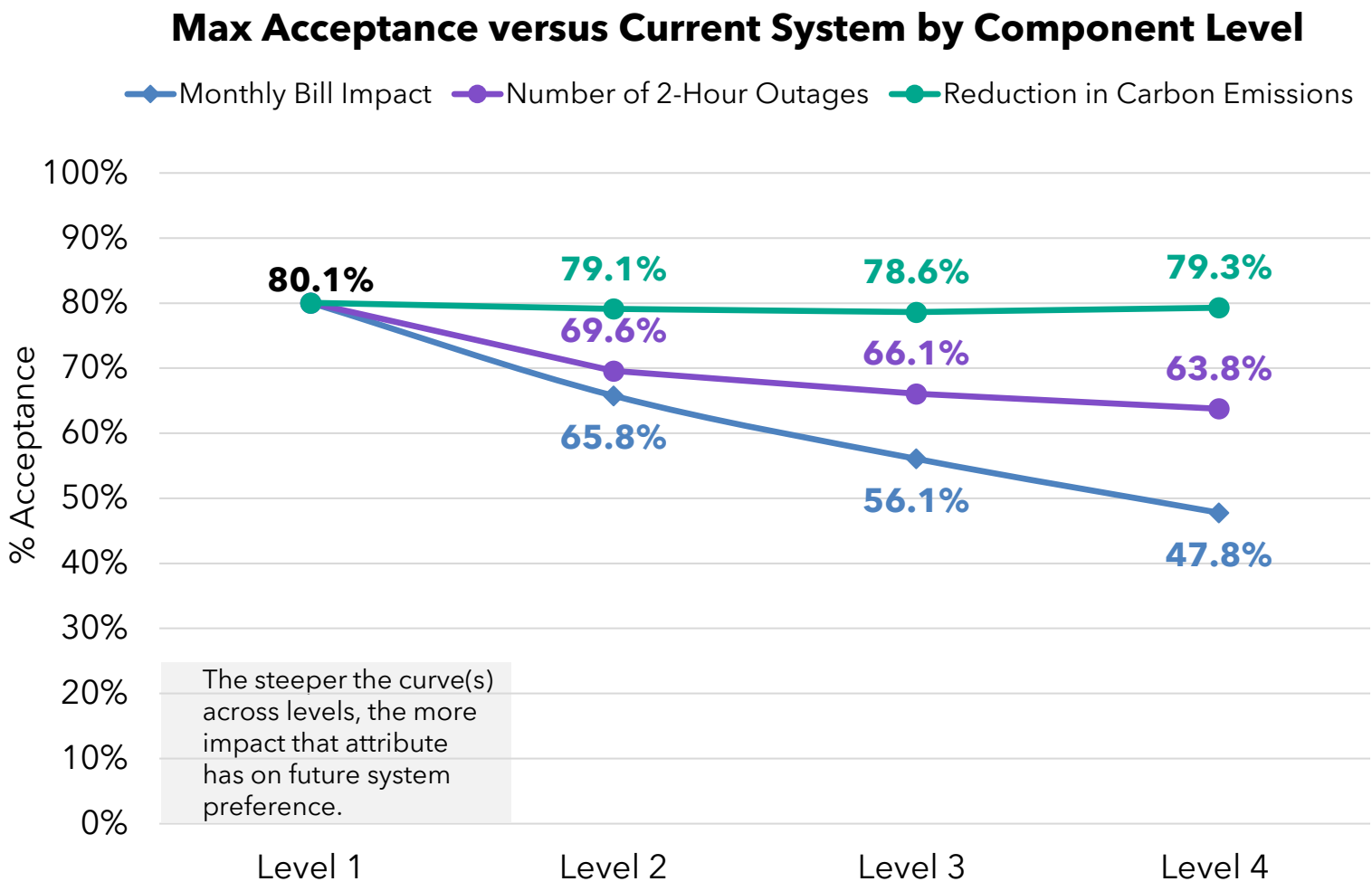
Sharp declines in acceptance beginning at 10% monthly bill increase

Declines less steep for the number of 2-hour outages

Acceptance relatively unchanged as the level of reduction in carbon emissions increases

Suggesting…

- **Less acceptance** of price increases
- **Greater tolerance** of minimal additional 2-hour outages
- Relatively **little impact** of variations in carbon reduction



bellomy

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**
- Include a diverse mix to **ensure reliability**
- Provide the cleanest, **most sustainable energy without exceeding a 10% bill increase**

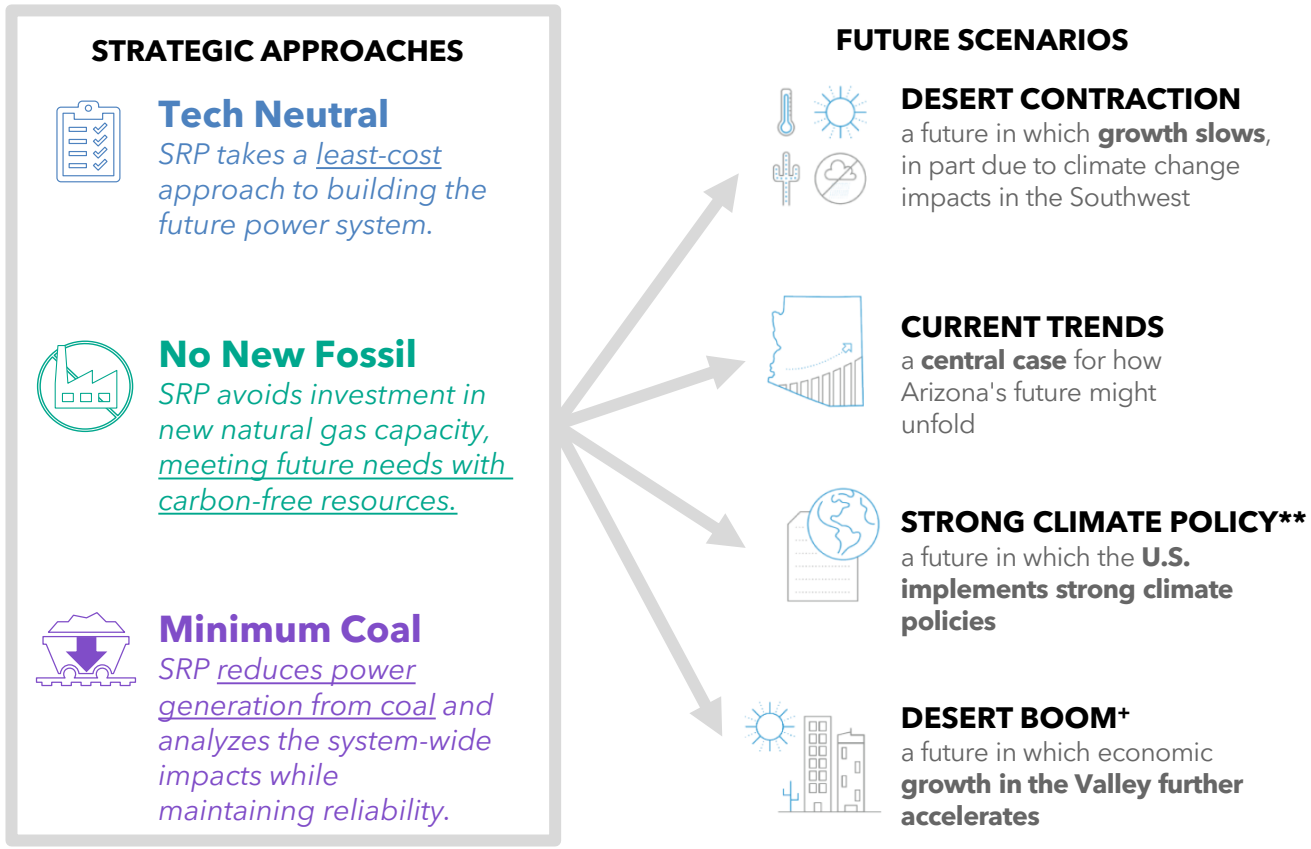
bellomy

CUSTOMER PREFERENCE RATINGS

(FROM MAY 2023 SURVEYING)

Evaluating Potential Energy System Plans

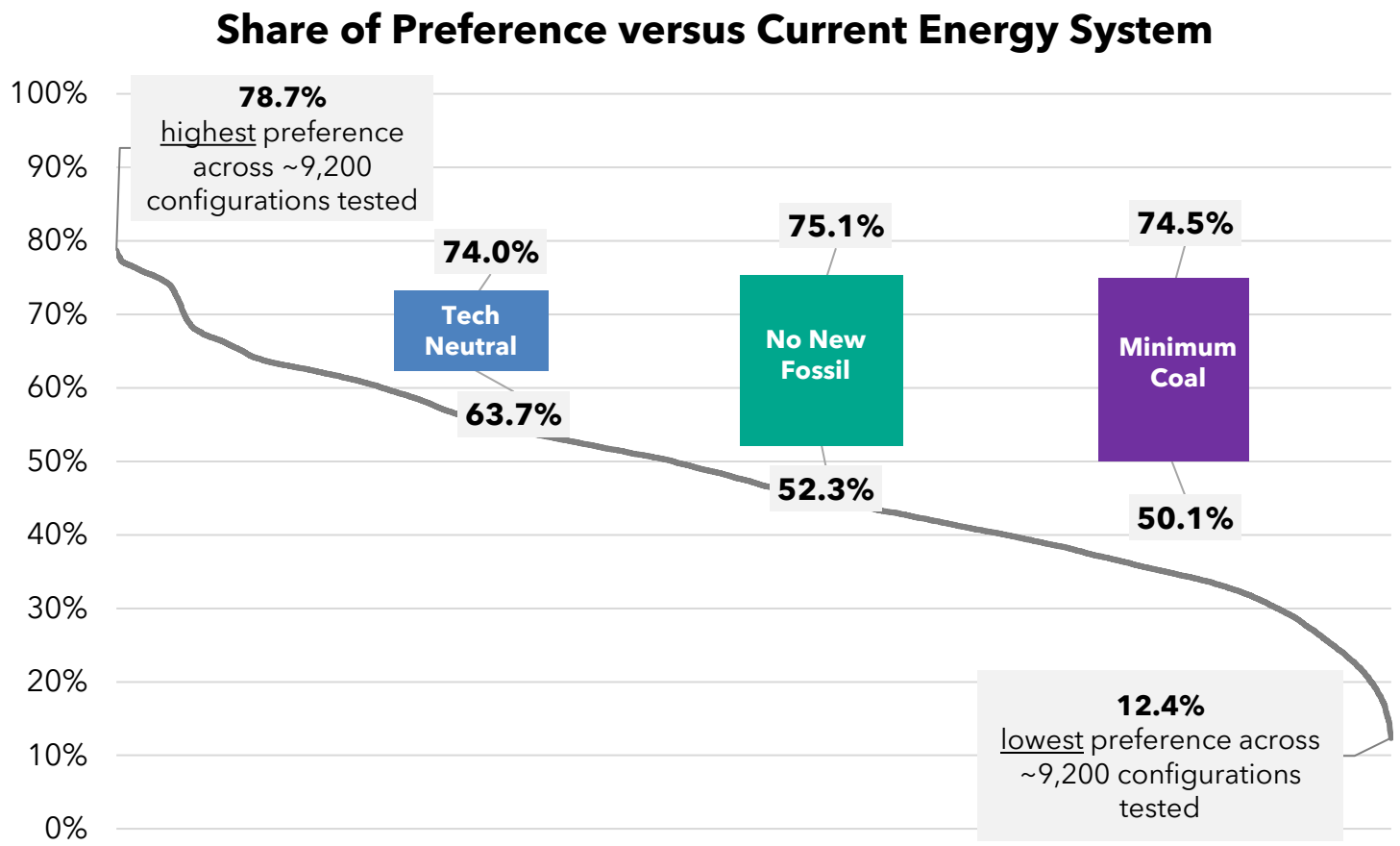
Preference ratings provide an understanding of **how customers prefer the future system be built across the various future scenarios** being analyzed in the ISP.



**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.

bellomy

Strategic Approaches Preferred Versus Current



Preference **ranged between 12% and 79%** versus the current system

Systems representing the strategic approaches **achieved preference over 50%**

More consistent preference for Tech Neutral across futures

bellomy

Customer Preference: Key Learnings

- Preference is **highly dependent on external factors** in each scenario
- Especially when external **factors impact costs**
- **Tech Neutral:** Most favorable in futures with **higher load growth**
- **Minimum Coal and No New Fossil:** Greater preference in futures where…
  - Load growth was low
  - **Federal incentives** for carbon-free and hydrogen technologies were assumed

RECOMMENDATIONS

As discussed, the future energy system should…

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

bellomy

Recommendations

85%
Rated SRP Positively

Strong positive customer perceptions of SRP can be leveraged in the ISP's communication efforts

Focus investments on a least-cost portfolio

With cost the top driver of customer preference, it will be critical to **ensure system costs are managed and explained to customers proactively and transparently**.

Highlight and maintain grid readiness and resiliency

Reliability was the second highest ranked priority. Communications about investments in infrastructure should be designed to **address how they benefit the customer in terms of reliability, while also managing cost**.

THANK YOU

Questions

Using the Customer Research Results in the Integrated System Plan

Roundtable Discussion

- What surprised you?
- What is your main takeaway?
- What did you notice about how residential customers balanced the potential tradeoffs across sustainability, reliability and affordability?

Review of Average Residential Price Impact & Final Reliability and Sustainability Metrics

Kyle Heckel
Sr. Engineer, Integrated Planning (SRP)

Adam Peterson
Director, Corporate Pricing (SRP)

Maria Naff
Manager, Integrated Planning (SRP)

Nevida Jack
Manager, System Integration (SRP)

Q&A on Metrics

Now: Clarifying questions

Afternoon: Technical Q&A

Integrated System Plan Metrics

Affordability

Total System Costs

Average System Costs

Average Residential Price Impact

Sustainability

CO_2 Reductions

Water Use

Carbon-Free Generation

Capacity Factor for Gas Fleet

Direct Air Emissions (NOx, SO_2, 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 (presented by Bellomy)

CO_2 reductions from energy efficiency, demand response, distributed generation and electrification

Bold items indicate metrics for review & discussion today

Affordability

Metric to Review

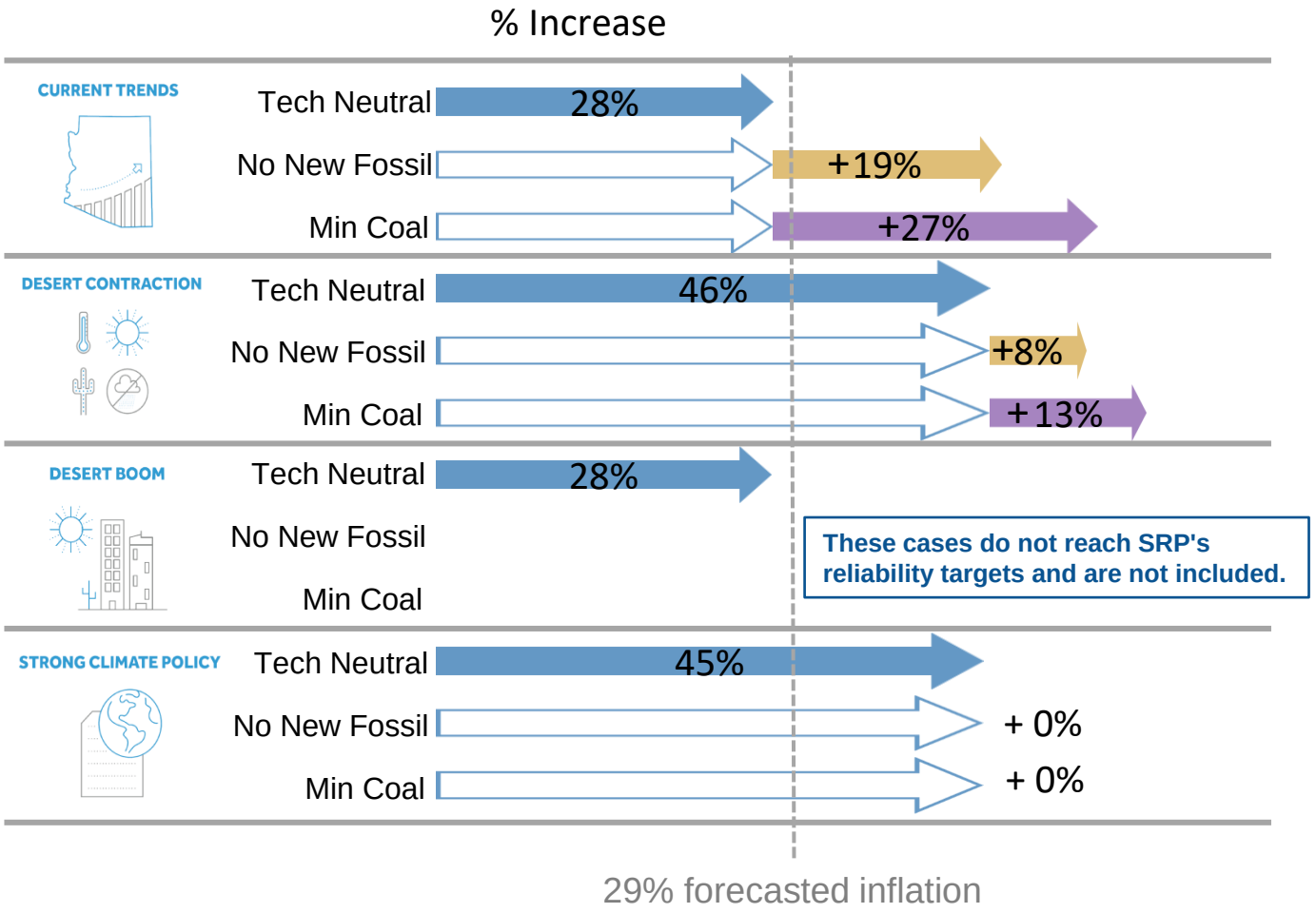
- Average Residential Price Impact

Maintaining affordability for customers is a fundamental component of SRP's mission.

Estimating affordability metrics for different system plans helps with assessing financial opportunities and risks across different cases analyzed.

Average Residential Price Impact

Average relative increase in residential customer's prices between 2023-2035



Draft ISP Takeaways:

- Tech Neutral results in lowest impact to customer prices
- No New Fossil and Minimum Coal strategic approaches result in greater increases to customer prices in scenarios with higher load growth (higher in Current Trends than Desert Contraction)

These are representative results based on ISP analysis modeling, NOT projections of SRP's future prices, and are not inclusive of factors beyond the scope of ISP analysis.

Draft Subject to change

Reliability

Qualitative Risk Ratings

- Development Risk
- Operational Risk

Maintaining reliability is a fundamental component of SRP's mission.

Reliability metrics help SRP understand different system plan's ability to meet customer energy demand and the risk level associated with operating and developing each system plan.

Development Risk

Measure of how difficult it may be for SRP to develop the infrastructure necessary to enable each system plan

Development Risk Rating Scale

Development Risk Rating Scores

	Tech Neutral	No New Fossil	Minimum Coal
Current Trends	3*	4	4
Desert Contraction	2	3	3
Desert Boom	4	These cases do not meet reliability standards and were not evaluated	
Strong Climate Policy	4	4	5

* Tech Neutral/Current Trends was the baseline case to which the development risk for all other cases were compared

Draft ISP Takeaways:

- All generation technologies have risks associated with them.
- As a result, risk rating scores closely correlate with the amount of infrastructure required in each case.

Risk factors considered included permitting and siting, land acquisition, supply chain challenges, fuel supply development, reliance on emerging technologies, reliance on customer adoption of programs and interconnections.

Draft Subject to change

Operational Risk

Measure of how difficult it may be for SRP to operate the system reliably under each system plan

Operational Risk Rating Scale

Operational Risk Rating Scores

	Tech Neutral	No New Fossil	Minimum Coal
Current Trends	3 *	4	4
Desert Contraction	2	2	2
Desert Boom	4	These cases do not meet reliability standards and were not evaluated	
Strong Climate Policy	4	4	4

* Tech Neutral/Current Trends was the baseline case to which the operational risk for all other cases were compared

Draft ISP Takeaways:

- Operational risk increases with the pace of transformation.
- Flexible resources such as pumped hydro, batteries and natural gas help mitigate operational risk.

Risk factors considered included renewable energy capacity, battery operations, plant operations and fuel usage, and electricity purchases from the market.

Draft Subject to change

Sustainability

Metric to Review

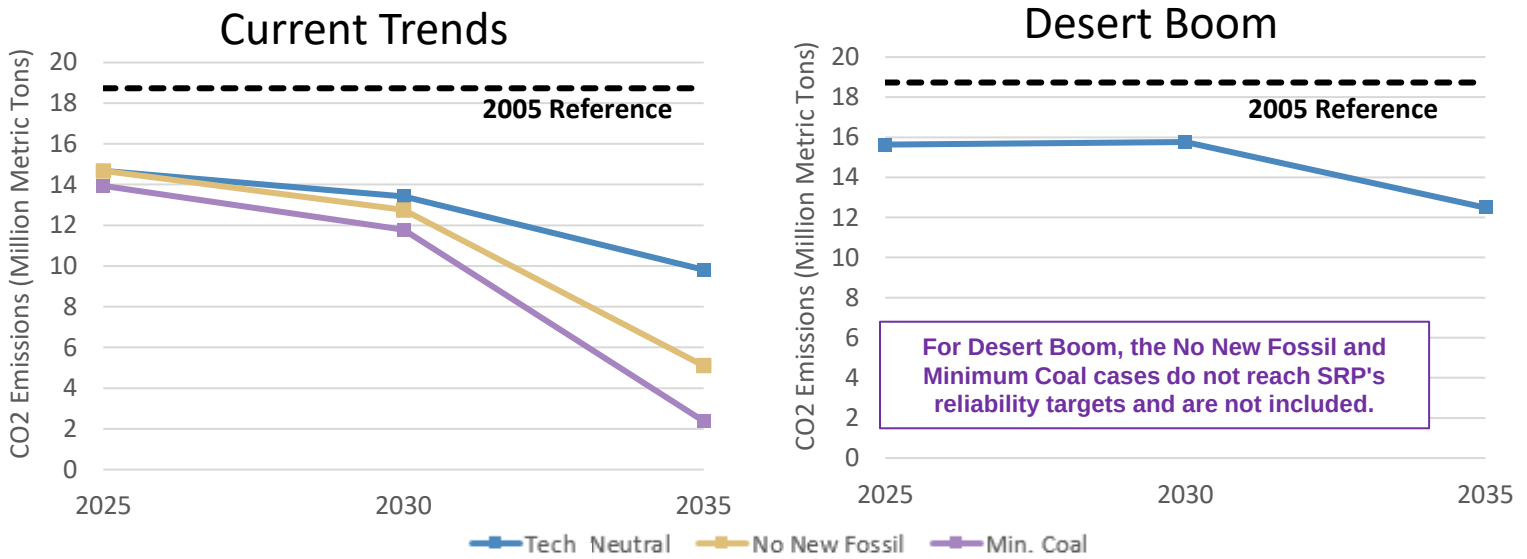
- CO_2 Reductions

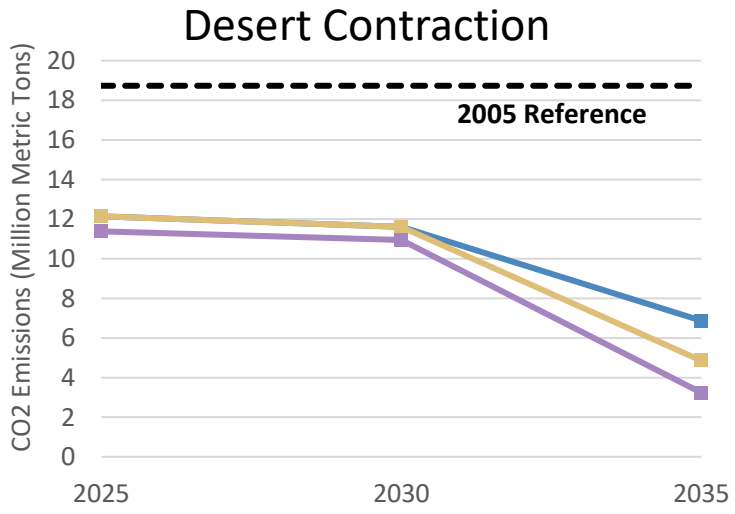
Increasing sustainability is a fundamental component of SRP's mission.

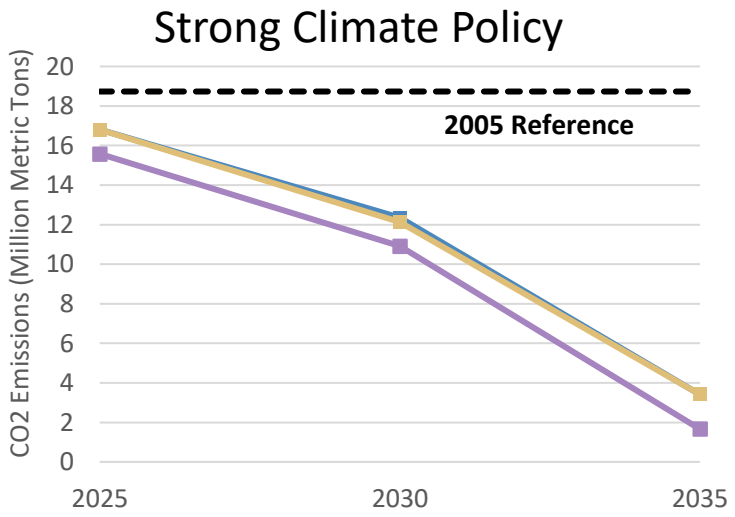
Sustainability metrics help us understand different system plan's environmental impact and their effectiveness at helping SRP achieve or exceed our 2035 Sustainability Goals.

CO_2 Reductions (Mass)

Direct CO_2 emissions from SRP's power generation resources for sales to retail customers







Draft ISP Takeaways

- Coal retirements, coupled with renewable and storage additions, drive significant carbon mass reductions in all cases.
- No New Fossil and Minimum Coal lead to greater carbon reductions.
- Carbon emissions are generally correlated with load growth (lower in Desert Contraction, higher in Desert Boom).

All cases achieve SRP's 2035 Sustainability goal of a 65% carbon intensity reduction.

Draft Subject to change

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.

ISP System Strategies

Angie Bond-Simpson
Sr. Director, Resource Management (SRP)

Draft Products of the ISP

- Review metrics
- Discuss trends, tradeoffs & findings
- View outcomes through Guiding ISP Principles

1. Develop System Strategies

2. Draft a Balanced System Plan

3. Identify ISP Actions

System Strategies

The System Strategies are the key points of focus SRP management will recommend to the Board for planning and operating the power system through 2035.

How they will be used:

- Provide **guidance and priority** for how to plan and operate the system in the future.
- Provide **transparency** to customers and other stakeholders of what strategies SRP plans to employ to evolve its system.
- The System Strategies will also be used as **the starting point** for developing other Integrated System Plan deliverables.

Integrated System Plan: System Strategies

Energy Investments

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

Integrated System Plan: System Strategies

Energy Investments

Invest in renewable resources and storage to manage fuel consumption, 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.

Integrated System Plan: System Strategies

Energy Investments
Invest in renewable resources and storage to manage fuel consumption, 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.

Integrated System Plan: System Strategies

Energy Investments
Invest in renewable resources and storage to manage fuel consumption, 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.

Integrated System Plan: System Strategies

Energy Investments
Invest in renewable resources and storage to manage fuel consumption, 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.

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

Integrated System Plan: System Strategies

Energy Investments
Invest in renewable resources and storage to manage fuel consumption, 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.

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.

Integrated System Plan: System Strategies

Energy Investments
Invest in renewable resources and storage to manage fuel consumption, 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, 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

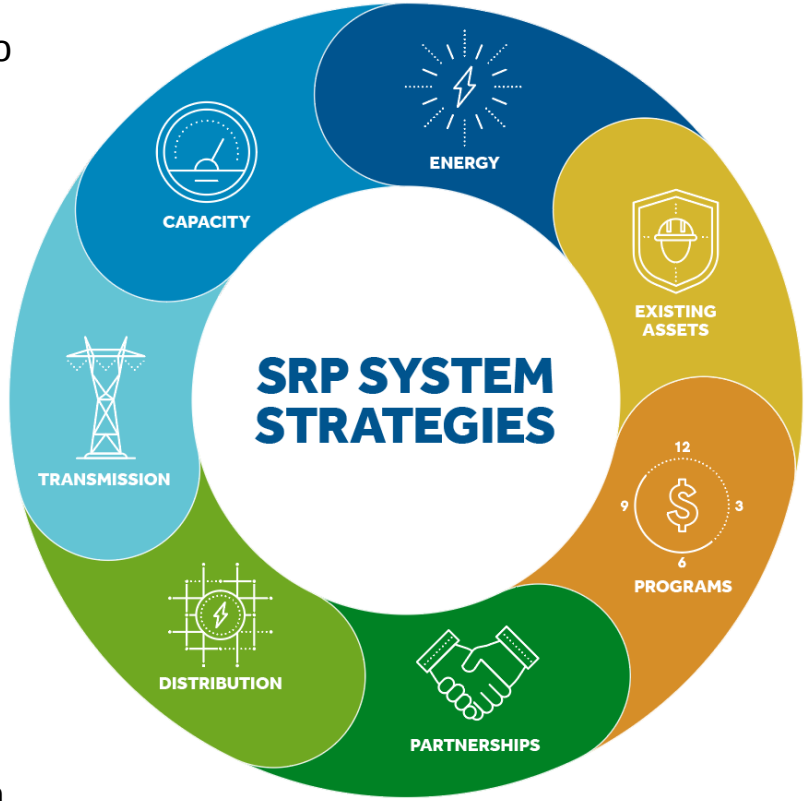
Integrated System Plan: System Strategies

Energy Investments
Invest in renewable resources and storage to manage fuel consumption, 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, 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.

Draft
ISP Balanced System Plan

Angie Bond-Simpson
Sr. Director, Resource Management (SRP)

Products of the ISP

- Review metrics
- Discuss trends, tradeoffs & findings
- View outcomes through Guiding ISP Principles

1. Develop System Strategies

2. Draft a Balanced System Plan

3. Identify ISP Actions

Balanced System Plan

The Balanced System Plan will provide an **illustrative system plan through FY2035** that reflects SRP implementing the System Strategies.

How it will be used:

- The Balanced System Plan will provide customers and other stakeholders with a **tangible vision** for how the system could look through 2035.
- The Balanced System Plan will provide a **system-wide view** for how all parts of the system could evolve in an integrated manner.
- Together with System Strategies, the Balanced System Plan guides development of ISP Actions.

Balanced System Plan Objectives

The Balanced System Plan serves as an *illustrative path* for SRP's system that is consistent with the ISP System Strategies.

- Achieves SRP's reliability requirements
- Achieves SRP's 2035 Sustainability Goals
- Informed by the breadth of analysis in the ISP
- Balances risks, including financial, development and operational
- Considers customer preferences and stakeholder input

The System Strategies Inform the Balanced System Plan

Energy Investments
The draft Balanced System Plan adds mostly renewable and storage resources to manage fuel consumption, drive carbon and water reductions.

Capacity Investments
The draft Balanced System Plan includes new natural gas capacity to support reliability and manage affordability.

Proactive Transmission
(SRP is still identifying the full set of transmission components in the draft Balanced System Plan.)

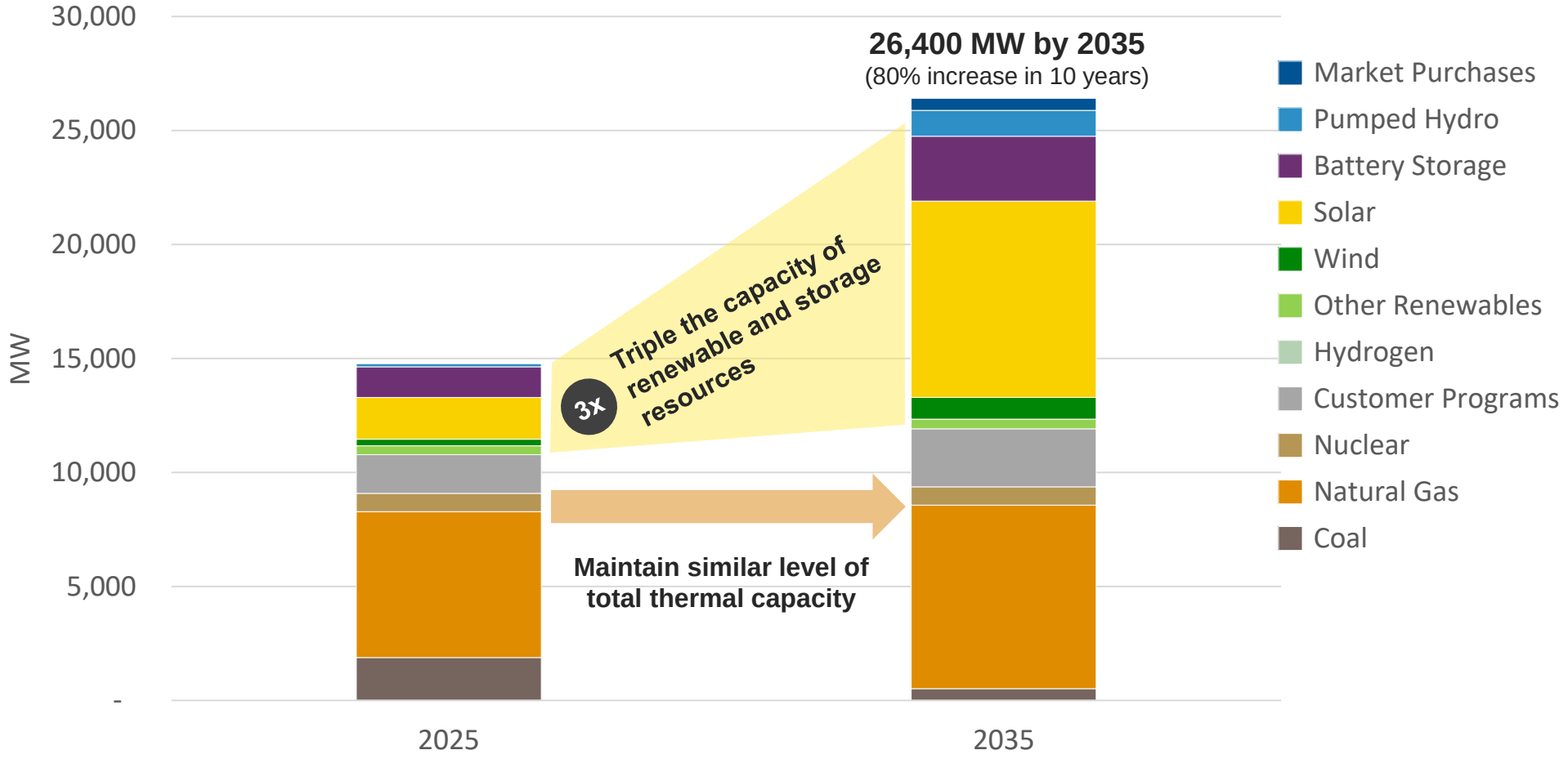
Distribution Innovation
(SRP is still identifying the full set of distribution components in the draft Balanced System Plan.)

Strategic Investment & Reinforcement of Existing Assets
The draft Balanced System Plan maintains existing system infrastructure, barring resources with planned retirement dates.

Evolution of Customer Programs & Pricing
The draft Balanced System Plan grows customer programs through 2035. The draft Balanced System Plan doesn't include the impacts of changes to pricing, but SRP anticipates that could mitigate some system needs.

Partnerships & Suppliers
(As an illustrative plan, the draft Balanced System Plan does not get into the specificity of partnerships and suppliers.)

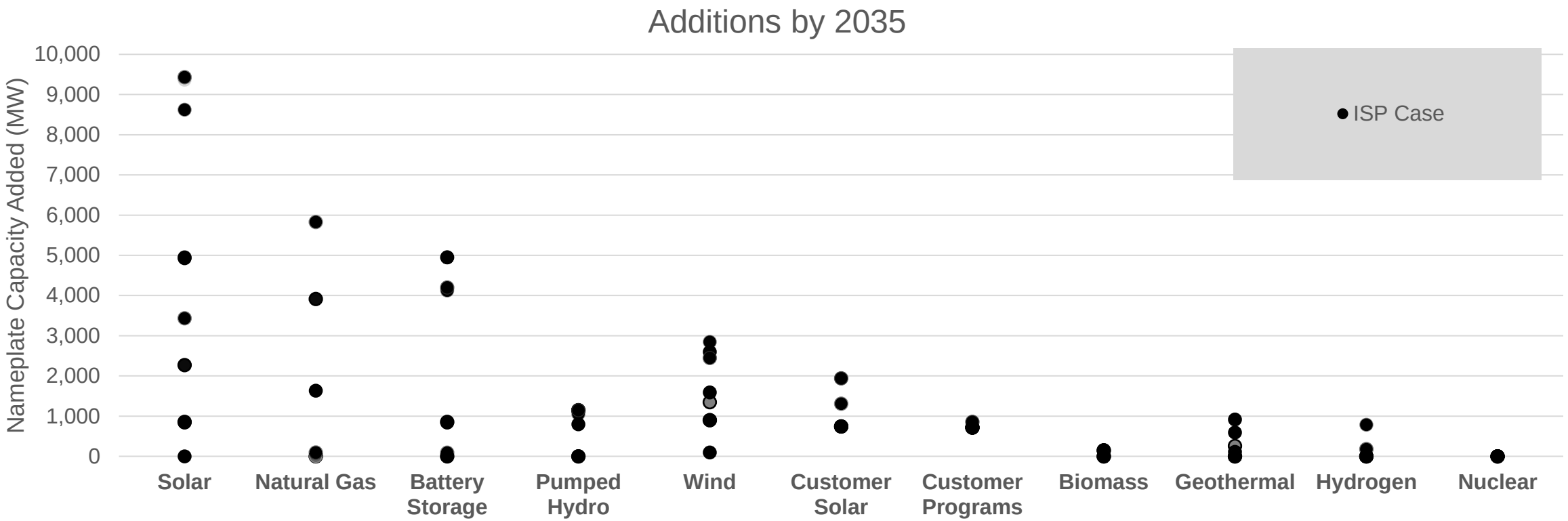
Draft Balanced System Plan: 2025 and 2035 Total Capacity



Draft Subject to change

Considerations for Balance

Assumptions within each scenario drove varying levels of generation resource and customer technology deployment across the ISP cases.

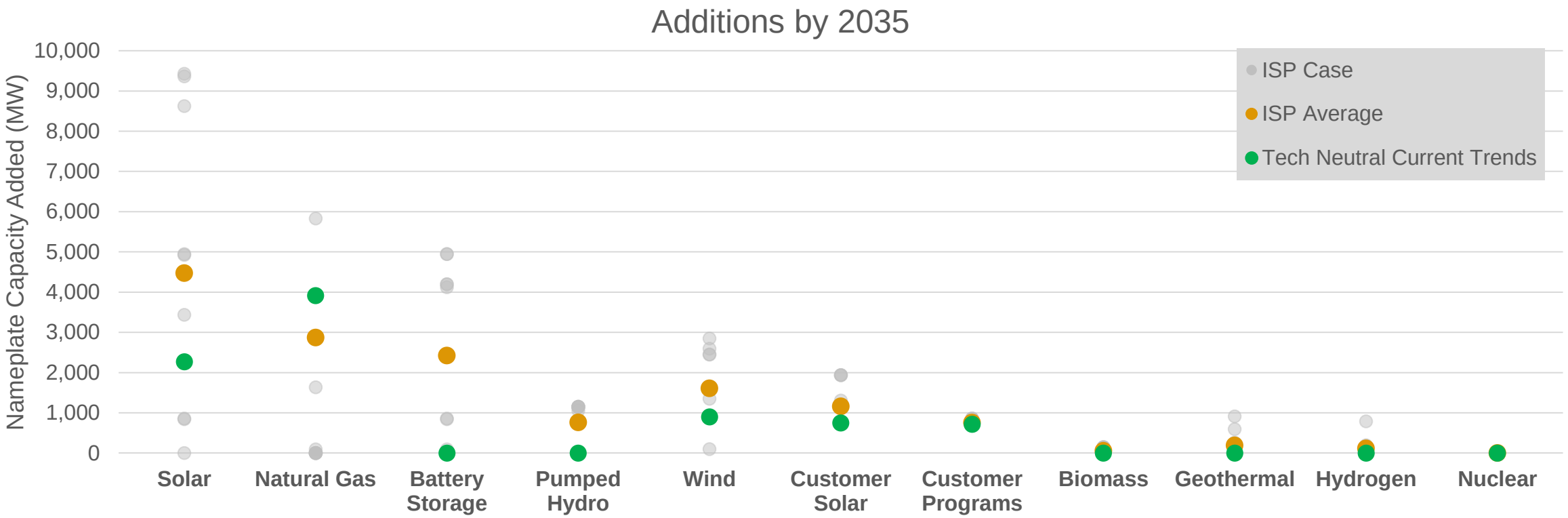


Notes:

1) ISP Average for natural gas includes only Tech Neutral cases where natural gas was allowed.
2) The draft Balanced System Plan includes 1,360 MW coal retirements and the expiration of a 975 MW gas toll.
3) Customer Programs reflect growth in demand response (DR) and estimated peak reductions from additional energy efficiency (EE). Customer Solar includes forecasted adoption of customer solar and storage.

Considerations for Balance

For reference, Tech Neutral and an average of ISP cases in the spectrum of the ISP results

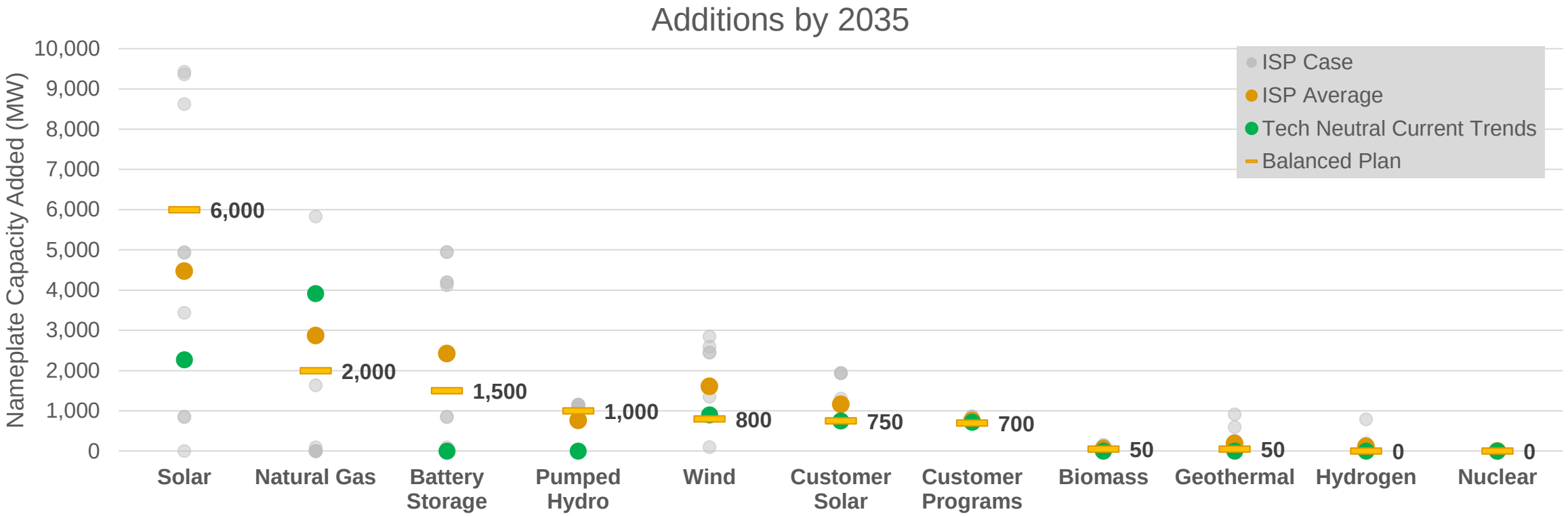


Notes:

1) ISP Average for natural gas includes only Tech Neutral cases where natural gas was allowed.
2) The draft Balanced System Plan includes 1,360 MW coal retirements and the expiration of a 975 MW gas toll.
3) Customer Programs reflect growth in demand response (DR) and estimated peak reductions from additional energy efficiency (EE). Customer Solar includes forecasted adoption of customer solar and storage.

Considerations for Balance: Diversified Resource Additions

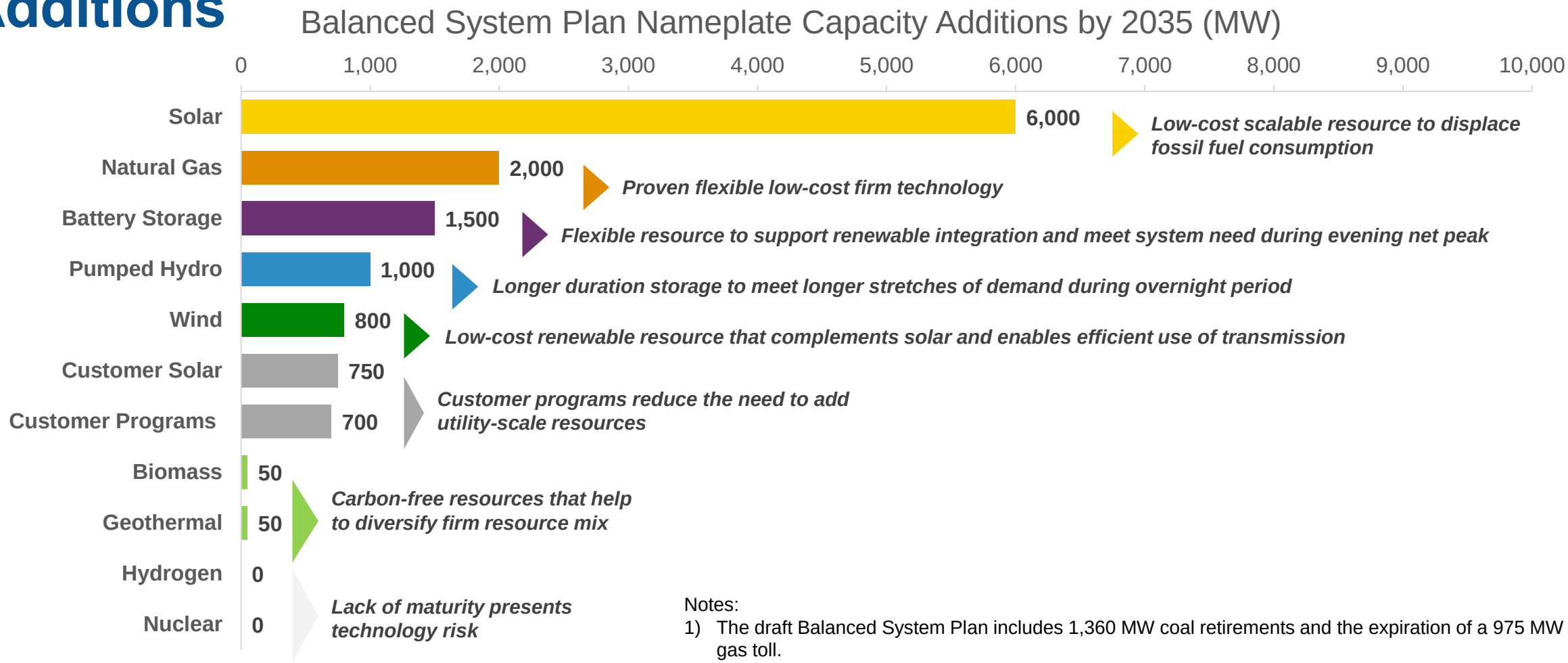
The draft Balanced System Plan adds a diverse set of resources to navigate key uncertainties (e.g., technology pricing, development timelines, transmission access, technology viability). The Balanced System Plan serves as an illustrative vision consistent with SRP implementing the ISP System Strategies.



Notes:

1) ISP Average for natural gas includes only Tech Neutral cases where natural gas was allowed.
2) The draft Balanced System Plan includes 1,360 MW coal retirements and the expiration of a 975 MW gas toll.
3) Customer Programs reflect growth in demand response (DR) and estimated peak reductions from additional energy efficiency (EE). Customer Solar includes forecasted adoption of customer solar and storage.

Draft Balanced System Plan: Diversified Resource Additions



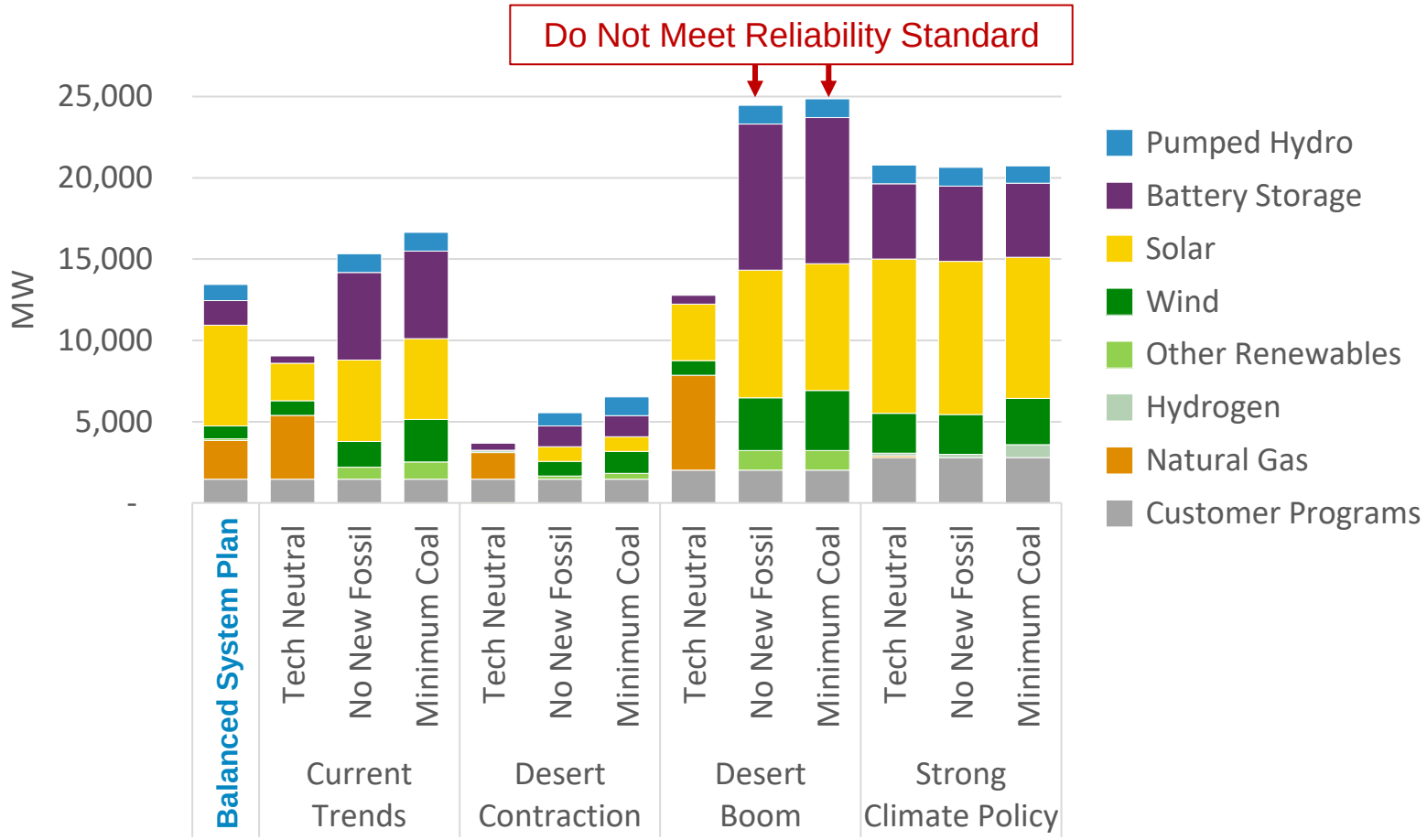
Notes:

1) The draft Balanced System Plan includes 1,360 MW coal retirements and the expiration of a 975 MW gas toll.
2) Customer Programs reflect growth in demand response (DR) and estimated peak reductions from additional energy efficiency (EE). Customer Solar includes forecasted adoption of customer solar and storage.

Draft Subject to change

Draft Balanced System Plan: 2025-2035 Capacity Additions

The Balanced System Plan adds a diverse mix of resources, including storage, renewables, natural gas and customer programs.

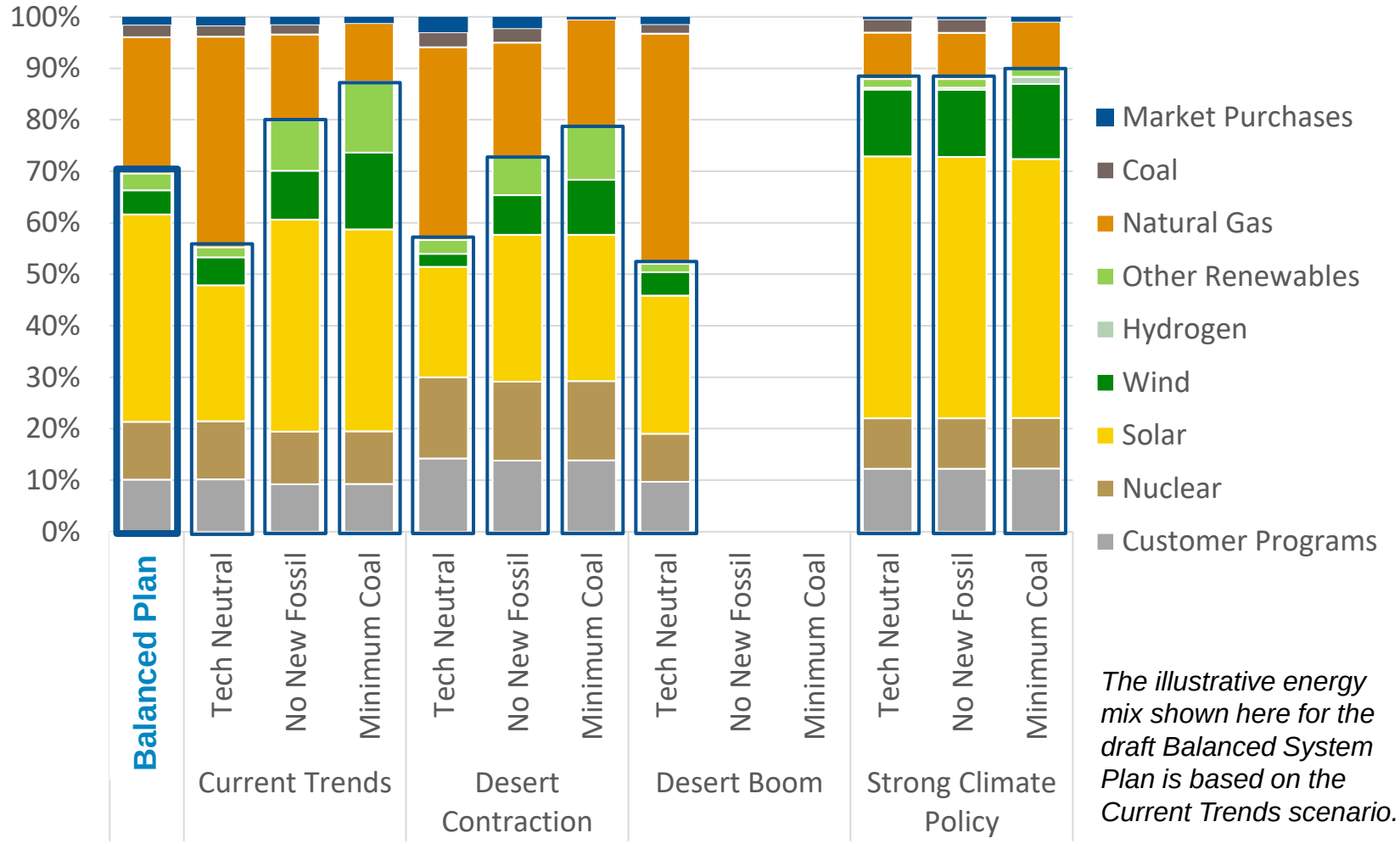


Note: Capacity additions shown above are incremental to resources modeled as existing or planned in the ISP.

Draft Subject to change

Draft Balanced System Plan: 2035 Energy Mix

In the Balanced System Plan, Customer Programs would meet 10% of energy demand, and carbon-free energy would meet 66% of remaining energy needs.



The illustrative energy mix shown here for the draft Balanced System Plan is based on the Current Trends scenario.

Draft Subject to change

Intended Use of the Balanced System Plan

- The Balanced System Plan maps out an illustrative path through 2035. It provides a tangible, unified vision that reflects the ISP System Strategies.
- The Balanced System Plan will provide a common starting point for future planning efforts and serve as a basis for various external reporting and communication activities
- SRP will continue to monitor factors impacting system planning, including but not limited to factors listed below, and may deviate from this illustrative path as necessary to adapt to change.
    - Population and economic growth
    - Climate change
    - Evolving customer needs
    - Technological advancements
    - Fuel costs
    - Supply chain risk
    - Inflation Reduction Act implementation progress
    - Regulatory changes

Questions

Guiding Integrated System Plan (ISP) Principles

The purpose of the Guiding ISP Principles is to balance all important considerations in developing an Integrated System Plan. SRP strives to understand the inherent tradeoffs between reliability, affordability and sustainability for the principles and seeks to establish an Integrated System Plan in accordance with these Guiding ISP Principles.

Integrated Long-Term View

Develop a holistic view, including resources, transmission, distribution and customer program perspectives for meeting evolving customer needs and achieving our Corporate Goals for 2035 and beyond. The long-term view ensures that SRP is making the right decisions today to support its customers and stakeholders in the future.

Transparency

Engage customers and other stakeholders in a system planning process that is responsive to questions and input.

Measure Success Through the Eyes of Our Customers

Maintain industry leading customer satisfaction by responding to evolving customer needs by providing sustainable, safe, reliable, and affordable power while equitably recognizing the different needs, challenges, and perspectives of our customers.

Manage Costs

Deliver exceptional system and energy value by minimizing impacts from additional grid needs and future uncertainties to average retail prices, while maximizing customer value through diligent, long-term oriented cost management.

Build an Adequate and Reliable Power System

Meet, and in some cases, exceed industry standards to provide a dependable supply of electricity to all SRP customers. Provide a reliable grid that is able to prepare for and recover from both anticipated and unanticipated disruptions to ensure energy availability.

Adapt Toward a More Sustainable Future

Meaningfully reduce carbon emissions and generation water usage to achieve SRP's 2035 Sustainability Goals to help address climate change and create less waste.

Draft Balanced System Plan – "Temperature Reading"

The Draft Balanced System Plan:

5 – Optimizes the Guiding ISP Principles.

4 – Sufficiently reflects the Guiding ISP Principles.

3 – Nearly achieves the Guiding ISP Principles.

2 – Inadequately achieves the Guiding ISP Principles.

1 – Is incompatible with the Guiding ISP Principles.

On a card, identify the number that best represents your perspective on the draft Balanced System Plan and explain why.

Lunch

Draft ISP Actions with Engagement Activity & Report Out

Angie Bond-Simpson
Sr. Director, Resource Management (SRP)

Draft Products of the ISP

- Review metrics
- Discuss trends, tradeoffs & findings
- View outcomes through Guiding ISP Principles

1. Develop System Strategies

2. Draft a Balanced System Plan

3. Identify ISP Actions

ISP Actions

ISP Actions are a **set of near-term actions** that SRP will complete following the publication of the ISP.

How they will be used:

- The ISP Actions will kick start **implementation of the System Strategies** and make **progress toward the 2035 Corporate Goals**.
- Include a **diverse set of actions**, such making progress on specific investments, performing a study or pilot, or implementing a new planning methodology.
- As a **commitment** to pursue these actions and to provide progress updates to stakeholders.

DRAFT – Subject to Change

Review of Draft ISP Actions

Take 10 minutes to review the draft ISP Actions

Discussion Questions

- What are the strengths of the draft ISP Actions?
- Is there anything missing that would better balance all considerations?
- What questions do you still have about the draft ISP Actions?

Guiding Integrated System Plan (ISP) Principles

The purpose of the Guiding ISP Principles is to balance all important considerations in developing an Integrated System Plan. SRP strives to understand the inherent tradeoffs between reliability, affordability and sustainability for the principles and seeks to establish an Integrated System Plan in accordance with these Guiding ISP Principles.

Integrated Long-Term View

Develop a holistic view, including resources, transmission, distribution and customer program perspectives for meeting evolving customer needs and achieving our Corporate Goals for 2035 and beyond. The long-term view ensures that SRP is making the right decisions today to support its customers and stakeholders in the future.

Transparency

Engage customers and other stakeholders in a system planning process that is responsive to questions and input.

Measure Success Through the Eyes of Our Customers

Maintain industry leading customer satisfaction by responding to evolving customer needs by providing sustainable, safe, reliable, and affordable power while equitably recognizing the different needs, challenges, and perspectives of our customers.

Manage Costs

Deliver exceptional system and energy value by minimizing impacts from additional grid needs and future uncertainties to average retail prices, while maximizing customer value through diligent, long-term oriented cost management.

Build an Adequate and Reliable Power System

Meet, and in some cases, exceed industry standards to provide a dependable supply of electricity to all SRP customers. Provide a reliable grid that is able to prepare for and recover from both anticipated and unanticipated disruptions to ensure energy availability.

Adapt Toward a More Sustainable Future

Meaningfully reduce carbon emissions and generation water usage to achieve SRP's 2035 Sustainability Goals to help address climate change and create less waste.

Managing Costs & Partnerships with Customers

Ideas Shared by Advisory Group:

- Ideas of maximizing efficiency
- Using time-of-day pricing to shift load
- Partnerships with and education of all SRP customer types

Managing Costs & Partnerships with Customers

ISP Action #1:

Complete a residential time-of-use price plan pilot and perform customer research to evaluate customer's response to new time-of-use peak periods and a super off-peak period in the middle of the day which will inform SRP's load forecast for long-term system planning and SRP's price process.

ISP System Strategies Alignment

Evolution of Customer Programs & Pricing

Partnerships & Suppliers

Energy Investments

Managing Costs & Partnerships with Customers

ISP Action #2:

Engage commercial, large industrial, and residential customers and stakeholders to inform them of how the evolving grid will impact time-of-use periods and develop a roadmap for implementing new time-of-use periods.

- Undertake a Pricing Process informed by the ISP as to how time-of-use plans need to evolve. Propose new time-of-use hours including a super off-peak period when the cost to serve customers' needs is lowest and on-peak hours updated for the modern grid.
- Develop communication plan for customers to educate on any new time-of-use price plans.

ISP System Strategies Alignment

Evolution of Customer Programs & Pricing

Energy Investments

Managing Costs & Partnerships with Customers

ISP Action #3:

Continuously refresh program plans and drive participation in customer programs at levels consistent with those planned for in the ISP, representing a meaningful increase from SRP's initial 2035 Sustainability Goal for Energy Efficiency.

- Evaluate the cost-effectiveness and emissions impacts of different customer program measures using the avoided costs and emissions impacts results from the ISP. Determine whether any changes to the customer programs portfolio are warranted based on this information, considering that these results must be weighed against other important factors such as customer access, equity, cost and satisfaction.

ISP System Strategies Alignment

Partnerships & Suppliers

Evolution of Customer Programs & Pricing

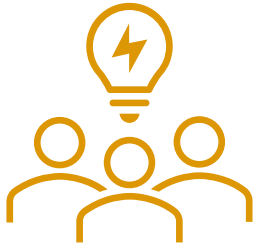
Energy Investments

Distribution Innovation

Paving the Path for Electrification

Ideas Shared by Advisory Group:

- Ideas around SRP taking a proactive stance
- Process improvement to promote and enable electrification
- Being prepared for very rapid evolution of customer expectations



Paving the Path for Electrification

ISP Action #4:

Develop a roadmap by evaluating customer needs and system impacts and assessing viable pathways for managing electric vehicle charging through price plans, customer programs and educational efforts to align with time periods that are lower-cost and minimize additional infrastructure needs.

ISP System Strategies Alignment

Energy Investments

Strategic Investment & Reinforcement of Existing Assets

Evolution of Customer Programs & Pricing

Paving the Path for Electrification

ISP Action #5:

Analyze the benefits and costs of non-EV electrification within SRP's service area, including effects on SRP operations and economy-wide emissions. Assess options for expanding E-Tech program offerings related to residential and commercial electrification.

ISP System Strategies Alignment

Energy Investments

Strategic Investment & Reinforcement of Existing Assets

Evolution of Customer Programs & Pricing

Partnerships & Suppliers

Distribution Innovation

Enabling Future Grid Advancements with Partnerships

Ideas Shared by Advisory Group:

- Ideas clustered around SRP pursuing flexible solutions and encouraging innovation
- Develop new technology with partners
- Adoption of technologies as it relates to an advanced distribution grid.

Enabling Future Grid Advancements with Partnerships

ISP Action #6:

Continue implementing SRP's Distribution Enablement (DE) Roadmap, which includes:

- Deploying the Advanced Distribution Management System (ADMS) and Distributed Energy Resources Management System (DERMS) in 2024. These systems are the foundational platforms needed to integrate distributed energy resources (DERs) with the existing distribution system. Monitor signposts for the need to deploy more advanced capabilities to support the integration of customer-side resources.
- Continue implementing advanced planning tools, such as locational value maps and the ability to anticipate and plan solar, storage and electric vehicle adoption at specific customer locations.
- Advancing the interconnection process to enhance the customer experience and technical integration of customer-sited resource interconnections.
- Executing the DE Research & Development plan, which leverages R&D resources including staff, lab facilities and standardized processes to execute projects that will ensure readiness to onboard new distribution grid capabilities.
- Sharing the Distribution Enablement Strategy with external stakeholders to build awareness and support for SRP's approach to transforming the distribution grid.

ISP System Strategies Alignment

Distribution Innovation

Partnerships & Suppliers

Strategic Investment & Reinforcement of Existing Assets

Effectively Manage the Path to a Lower-Carbon Resource Portfolio

Ideas Shared by Advisory Group:

- Ideas shared about moving toward a carbon-free future
- Optimization of co-located generation and transmission
- Providing closure date for existing fossil fuel plants, specifically coal

Effectively Manage the Path to a Lower-Carbon Resource Portfolio

ISP Action #7:

Issue all-source requests for proposals (RFPs) or requests for information (RFIs) at least once every two years to compare with self-build options and ensure that SRP can agnostically select resource technologies that minimize total system costs while meeting SRP's reliability and 2035 Sustainability Goals.

ISP System Strategies Alignment

Capacity Investments

Energy Investments

Partnerships & Suppliers

Effectively Manage the Path to a Lower-Carbon Resource Portfolio

ISP Action #8:

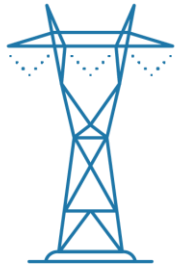
Develop a coal repurposing action plan:

- Coordinate with co-owners to develop a path forward for the Springerville Generating Station, incorporating the need for replacement firm capacity to enable retirement and engagement with the community on a transition plan.
- Prepare a plan or plans for repurposing the Coronado Generation Station site.
- Continue development of system solutions that repurpose transmission following the retirement of coal plants.
- Test strategies for minimizing emissions from coal power plants, including dispatch strategies and seasonal operations, while leveraging their capacity to maintain reliability prior to retirement dates.

ISP System Strategies Alignment

Capacity Investments

Strategic Investment & Reinforcement of Existing Assets



Proactive Transmission

Proactive Community Engagement & Infrastructure Preparedness

Ideas Shared by Advisory Group:

- SRP acquire property and go through any siting processes well in advance of development.
- The example of Eloy was cited in avoiding future siting limitations.
- Proactive stances at the local, state and federal level regarding policy development, with transmission mentioned as a specific area

Proactive Community Engagement & Infrastructure Preparedness

ISP Action #9:

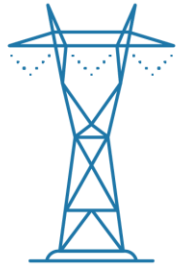
Develop and initiate siting research that considers collaborative community engagement, land, resources, and transmission and distribution to proactively identify, prepare and preserve options for feasible sites for future system infrastructure.

ISP System Strategies Alignment

Partnerships & Suppliers

Capacity Investments

Energy Investments



Proactive Transmission

Distribution Innovation

Proactive Community Engagement & Infrastructure Preparedness

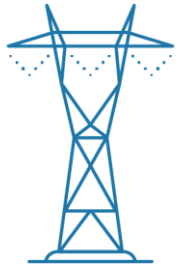
ISP Action #10:

Monitor transmission projects that would enable SRP to access diverse renewable resource options beyond solar, such as wind and geothermal, and engage with project developers, as appropriate.

ISP System Strategies Alignment

Capacity Investments

Energy Investments



Proactive Transmission

Partnerships & Suppliers

Small Group Discussion: Draft Actions

Focus: Consider the metrics available to date, ISP System Strategies, draft Balanced System Plan, and Guiding ISP Principles, and then discuss the draft ISP Actions.

Discuss in Breakout Groups:

- What are the strengths of the draft ISP Actions?
- Is there anything missing that would better balance all considerations?
- What questions do you still have about the draft ISP Actions?

Small Group Discussion: Process

1. As you discuss strengths and any missing elements, consider how the Draft ISP Actions relate to the metrics, ISP System Strategies, draft Balanced System Plan and Guiding ISP Principles.
2. With 2 minutes to go, each person indicates their top five most important ideas for the Draft ISP Actions using sticky dots.
3. Identify a volunteer to report on the five ideas with the most dots.

Report Out

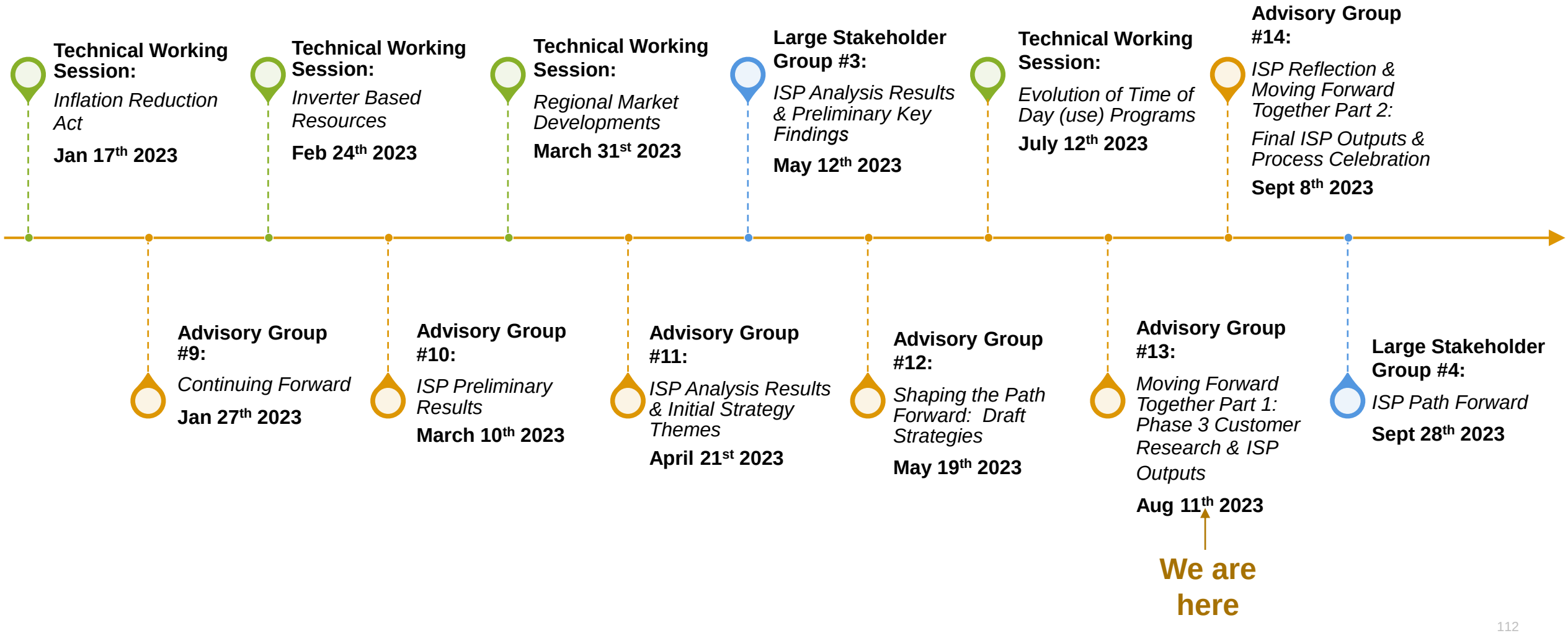
Next Steps and Wrap up

Angie Bond-Simpson
Sr. Director, Resource Management (SRP)

Next Steps

- Fall Advisory Group Meetings (September)
  - **Sept 8th Advisory Group Meeting:** Review Final ISP Actions, review Final Balanced System Plan, and collect stakeholder process feedback
  - **Sept 28th Large Stakeholder Group Meeting**: Review all ISP metrics; inform stakeholders of SRP's Balanced System Plan, System Strategies and Actions; and inform on what's upcoming at SRP
- Advisory Group members provide additional feedback on draft ISP Actions

2023 Engagement Calendar



Next Steps

SRP Team

- Review ISP Advisory Group feedback
- Brief SRP Executive Management
- Brief SRP Elected Officials
- Finalize ISP recommendations

Stakeholder Communication Email:

IntSysPlan@srpnet.com

Integrated System Plan: Informational Portal

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

thank you!

Advisory Modeling Subgroup Meeting :

Technical Q&A Session

August 11th, 2023

Agenda:

Advisory Modeling Subgroup Meeting: Technical Q&A Opportunity

Time		Topics	Discussion Lead
2:00-2:15	**15 min**	Coffee Break	
2:15-4:00	**105 min**	Technical Q&A Opportunity	SRP SMEs

Appendix: Metrics

ISP Metrics

- The ISP analysis considers four different, plausible futures for Arizona for the purpose of analyzing the strengths and risks of system decisions under a wide range of future conditions.
- The metrics packet is intended to transparently share the performance of **strategic approaches** considering those plausible futures.
- This packet is intended as a pre-read for the ISP Advisory Group members **to facilitate discussion or questions** ahead of the August 11th ISP Advisory Group meeting.
- All slides are considered draft.

Integrated System Plan Metrics

Affordability

Total System Costs

Average System Costs

Average Residential Bill Impact

Sustainability

CO_2 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

CO_2 reductions from energy efficiency, distributed generation and electrification

Affordability Metrics

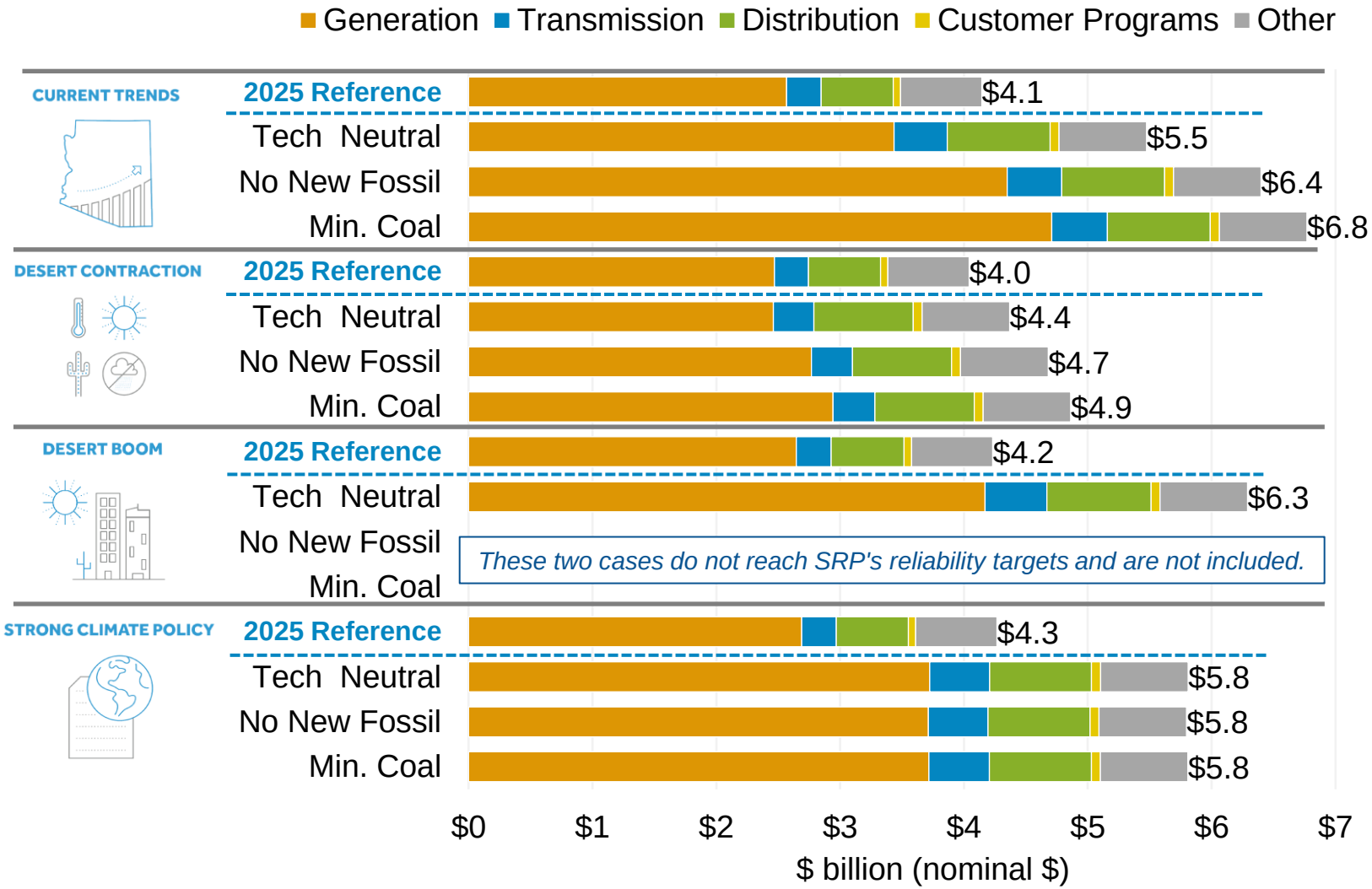
Total System Costs: Total costs in 2035 from generation, transmission, distribution and customer programs

Average System Costs: Costs normalized by the total energy demand ($/MWh)

Average Residential Price Impact: Impacts to the average residential customer's prices in 2035 relative to today.

Total System Costs*

Total costs for SRP's power system in 2035 ($ billion)



Draft ISP Takeaways

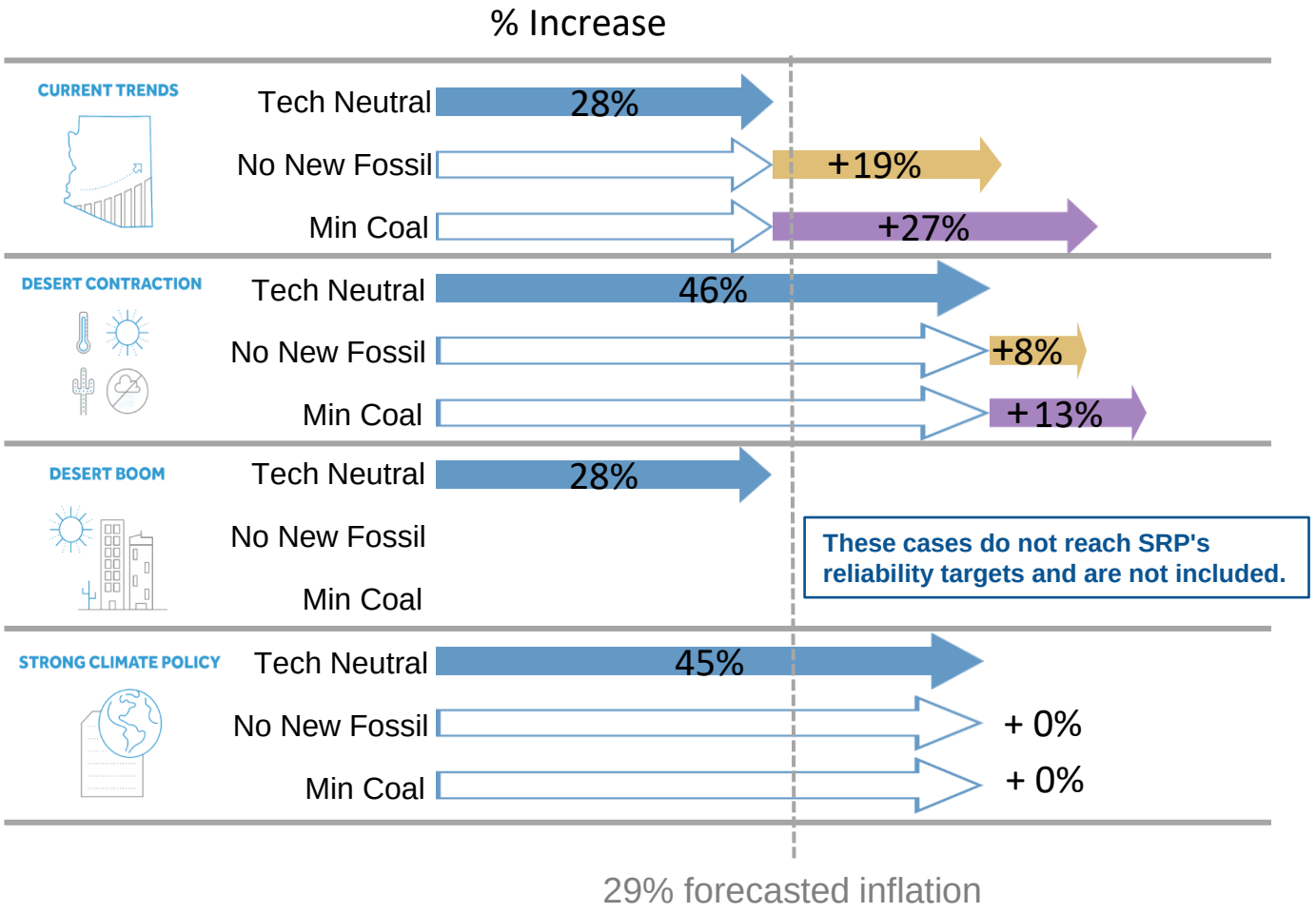
- Tech Neutral is lower cost than other approaches without firm capacity options.
- Generation costs are the largest driver of differences across cases.
- All three strategic approaches have similar costs under the Strong Climate Policy due to availability of hydrogen as a firm capacity resource and the aggressive decarbonization target required in this scenario.

*Calculated using a simplified ISP analysis model. This is not a comprehensive assessment of financial indicators for SRP.

Draft Subject to change

Average Residential Price Impact

Average relative increase in residential customer's prices between 2023-2035



Draft ISP Takeaways:

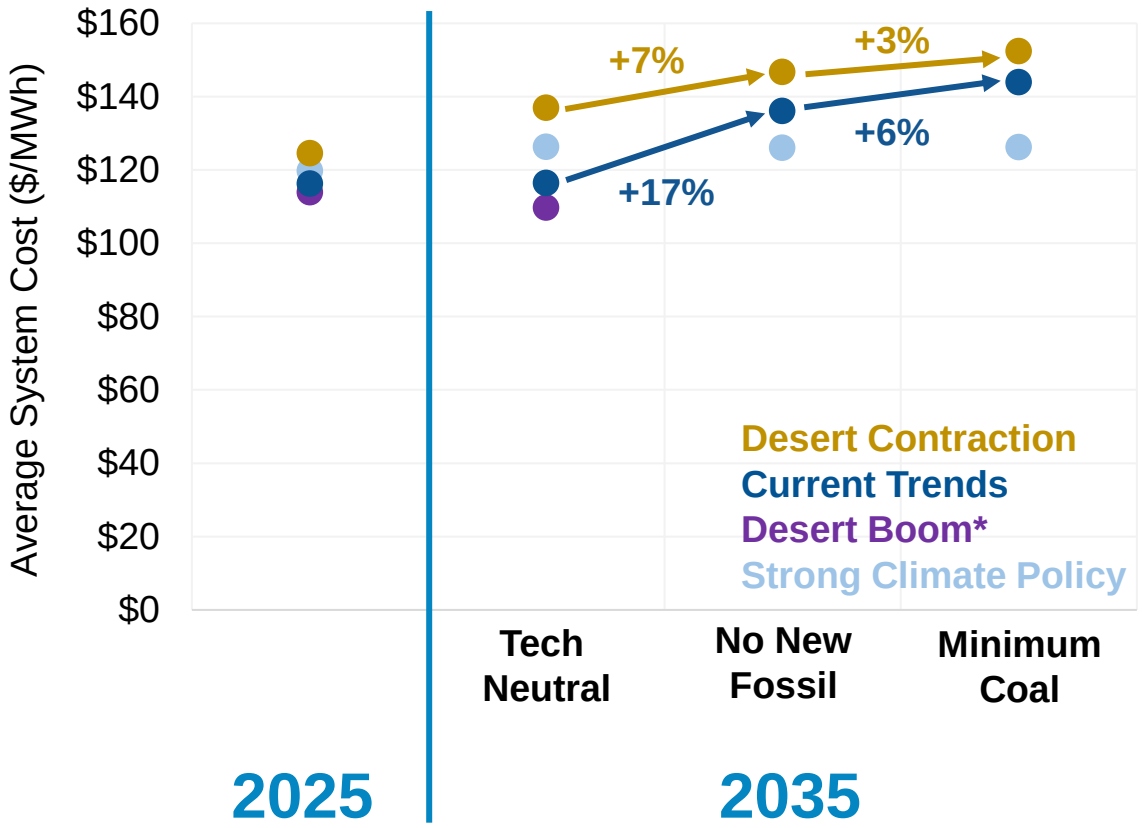
- Tech Neutral results in lowest impact to customer prices.
- No New Fossil and Minimum Coal strategic approaches result in greater increases to customer prices in scenarios with higher load growth (higher in Current Trends than Desert Contraction).

These are representative results based on ISP analysis modeling, NOT projections of SRP's future prices, and are not inclusive of factors beyond the scope of ISP analysis.

Draft Subject to change

Average System Cost

Total system cost divided by total retail sales



*For Desert Boom, the No New Fossil and Minimum Coal cases do not reach SRP's reliability targets and are not included.

Draft ISP Takeaways

- Tech Neutral is lower cost than other approaches without firm capacity options.
- No New Fossil and Min Coal lead to a greater cost increase relative to Tech Neutral when load growth is higher.

Draft Subject to change

Sustainability Metrics

CO_2 Reductions: Total reductions of CO_2 emissions from power generation on an intensity and mass basis, relative to 2005 levels

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

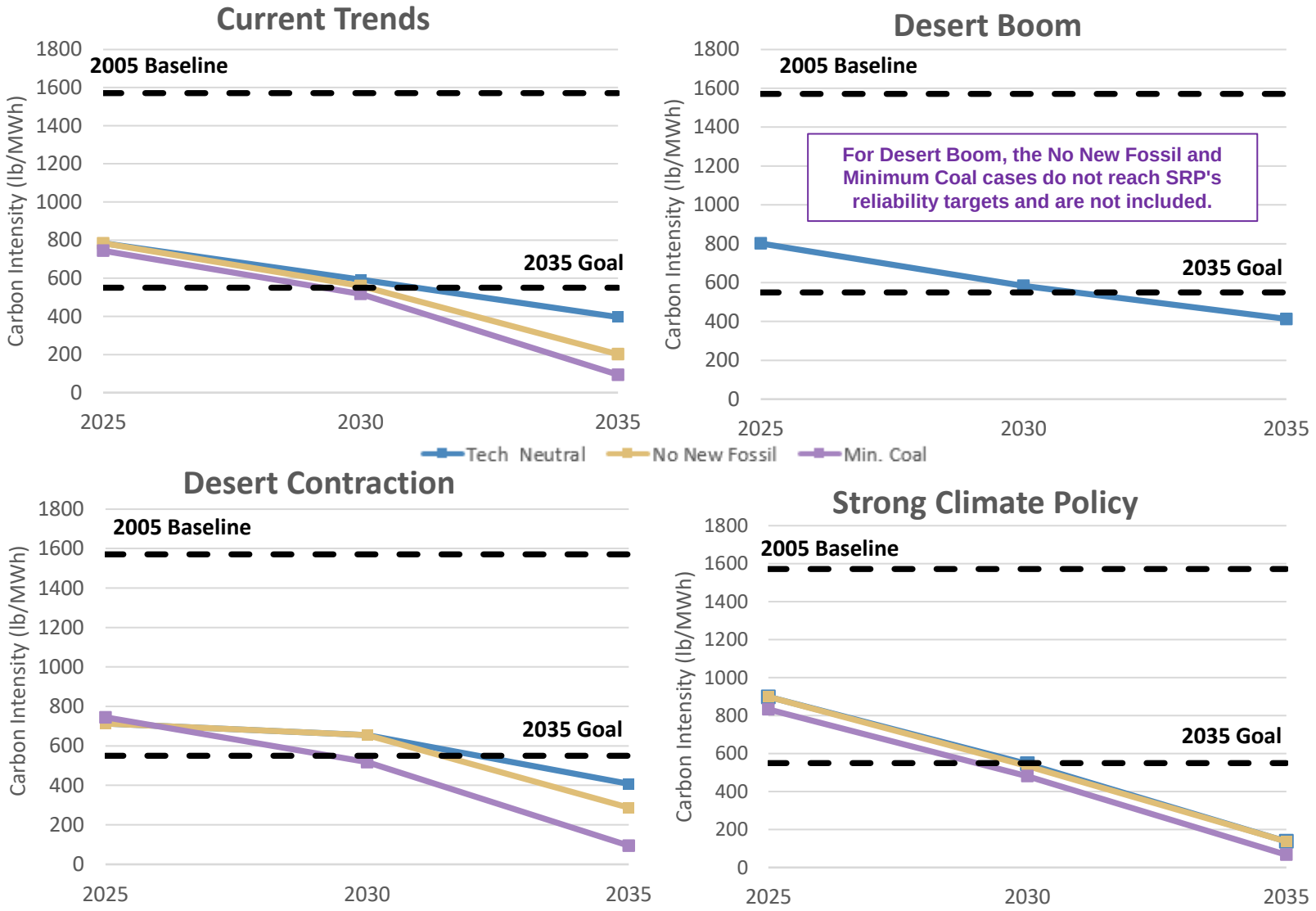
Carbon-Free Generation: Percentage of energy mix coming from carbon-free resources. Carbon-free resources include solar, wind, hydro, geothermal, hydrogen, nuclear and biomass.

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

Direct Air Emissions: Tons of NO_x, SO_2, PM, and VOC emitted from power generation

CO_2 Reductions (Intensity)

Direct CO_2 emitted by power generation resources per unit of energy sold to retail customers



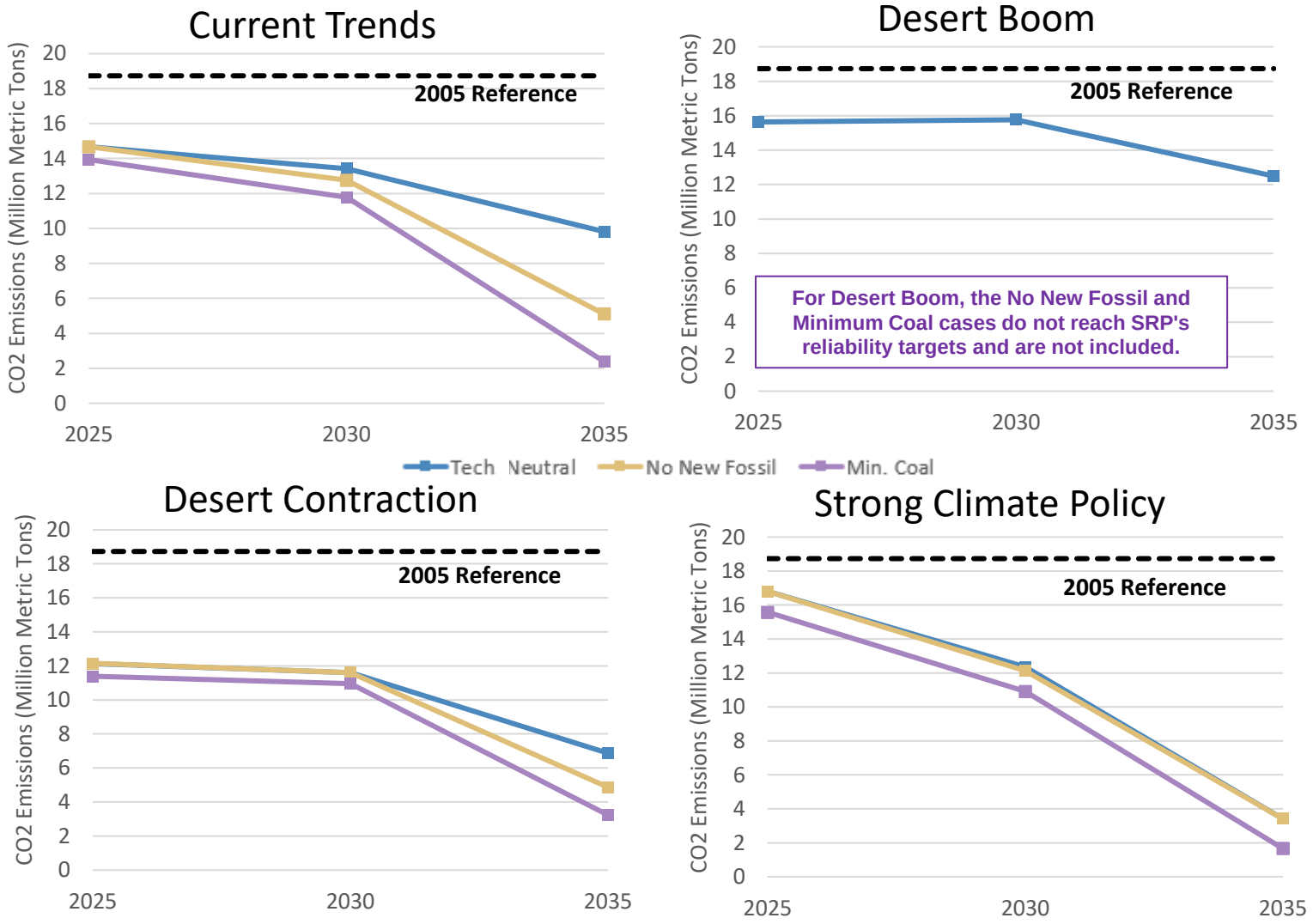
Draft ISP Takeaways

- All cases achieve SRP's 2035 Sustainability goal of reducing carbon emissions intensity by 65%.
- Coal retirements, coupled with renewable and storage additions, drive significant carbon reductions in all cases.
- No New Fossil and Minimum Coal lead to greater carbon reductions.

Draft Subject to change

CO_2 Reductions (Mass)

Direct CO_2 emissions from SRP's power generation resources for sales to retail customers



Draft ISP Takeaways

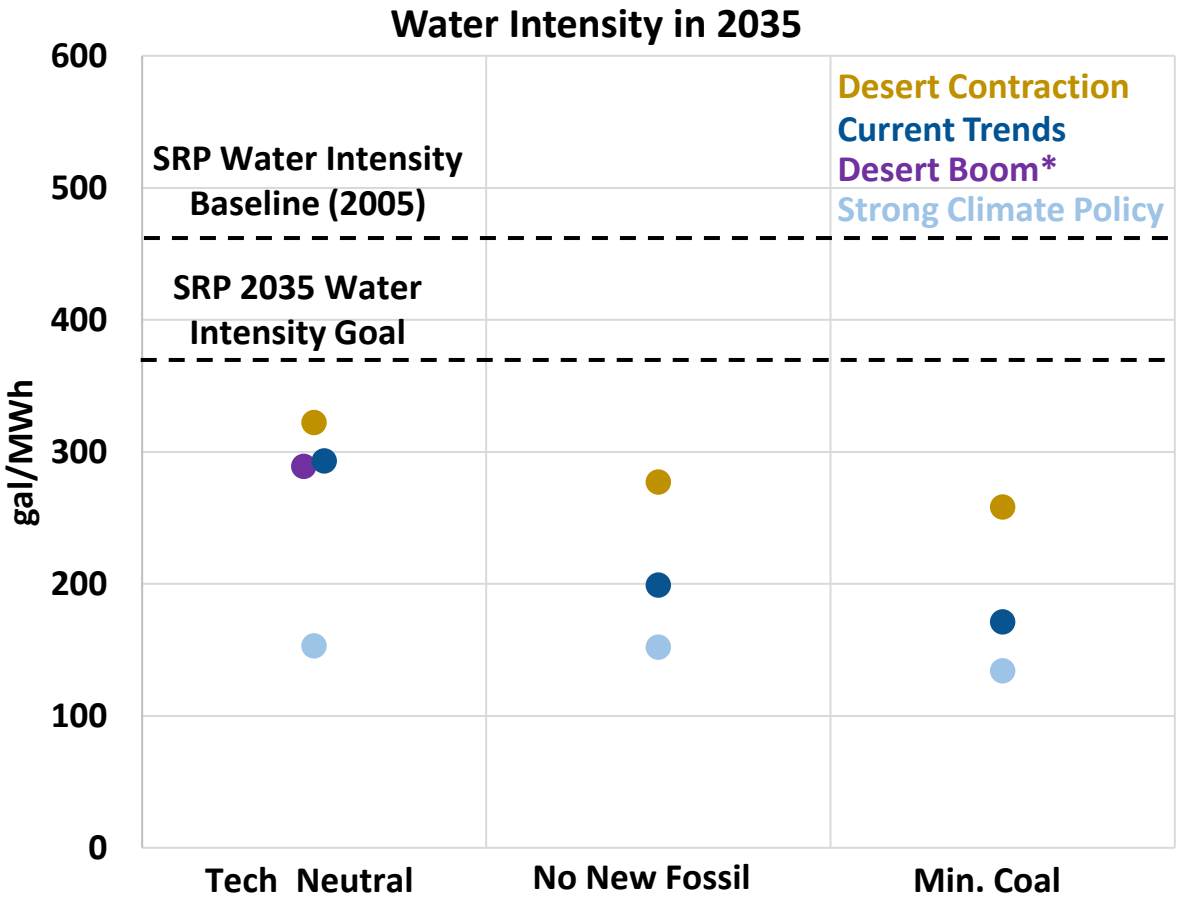
- Coal retirements, coupled with renewable and storage additions, drive significant carbon mass reductions in all cases
- No New Fossil and Minimum Coal lead to greater carbon reductions
- Carbon emissions are generally correlated with load growth (lower in Desert Contraction, higher in Desert Boom)

All cases achieve SRP's 2035 Sustainability goal of a 65% carbon intensity reduction.

Draft Subject to change

Water Use

Water consumed from power generation per unit of energy produced



*For Desert Boom, the No New Fossil and Minimum Coal cases do not reach SRP's reliability targets and are not included.

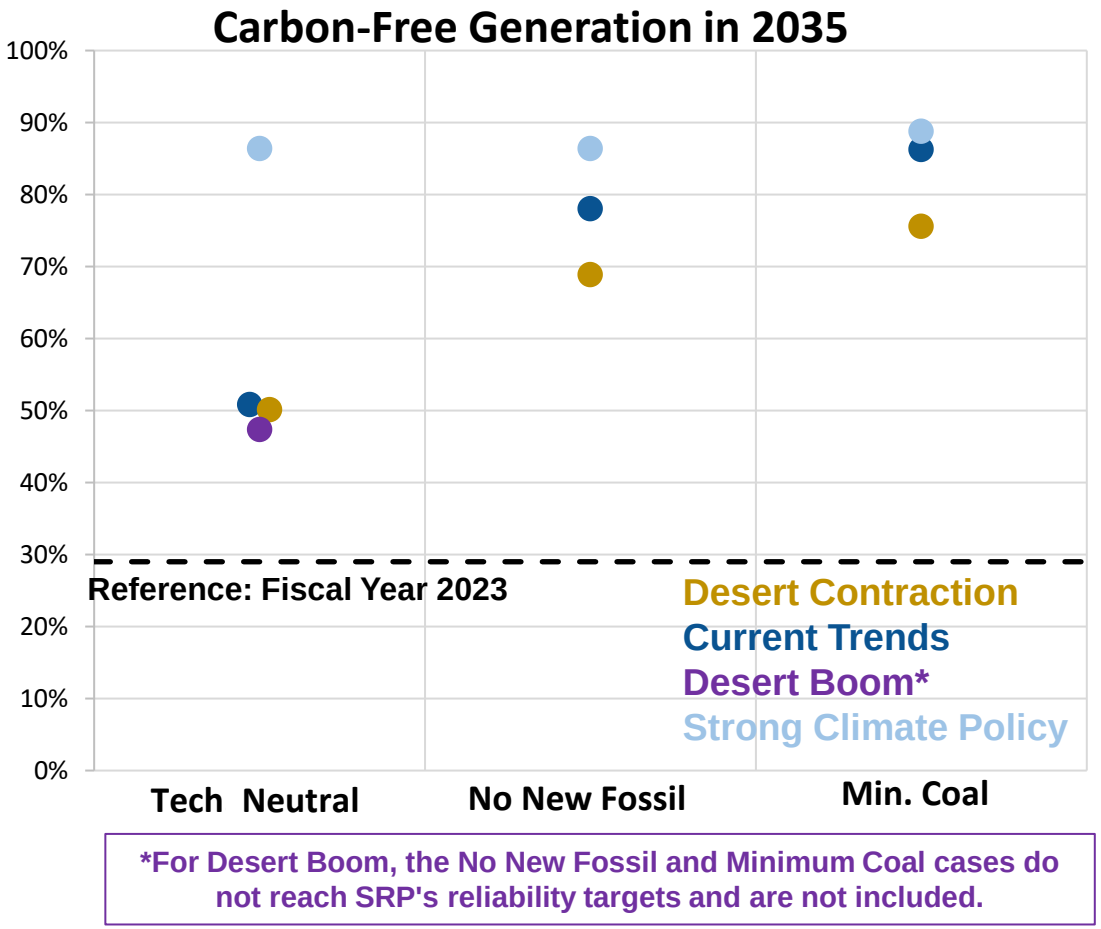
Draft ISP Takeaways

- SRP is poised to surpass its 2035 Water Intensity goal in all cases.
- No New Fossil and Minimum Coal lead to greater water intensity reductions.

Draft Subject to change

Carbon-Free Generation

Amount of power generated from carbon-free resources, which include solar, wind, biomass, hydro, geothermal and nuclear.



*For Desert Boom, the No New Fossil and Minimum Coal cases do not reach SRP's reliability targets and are not included.

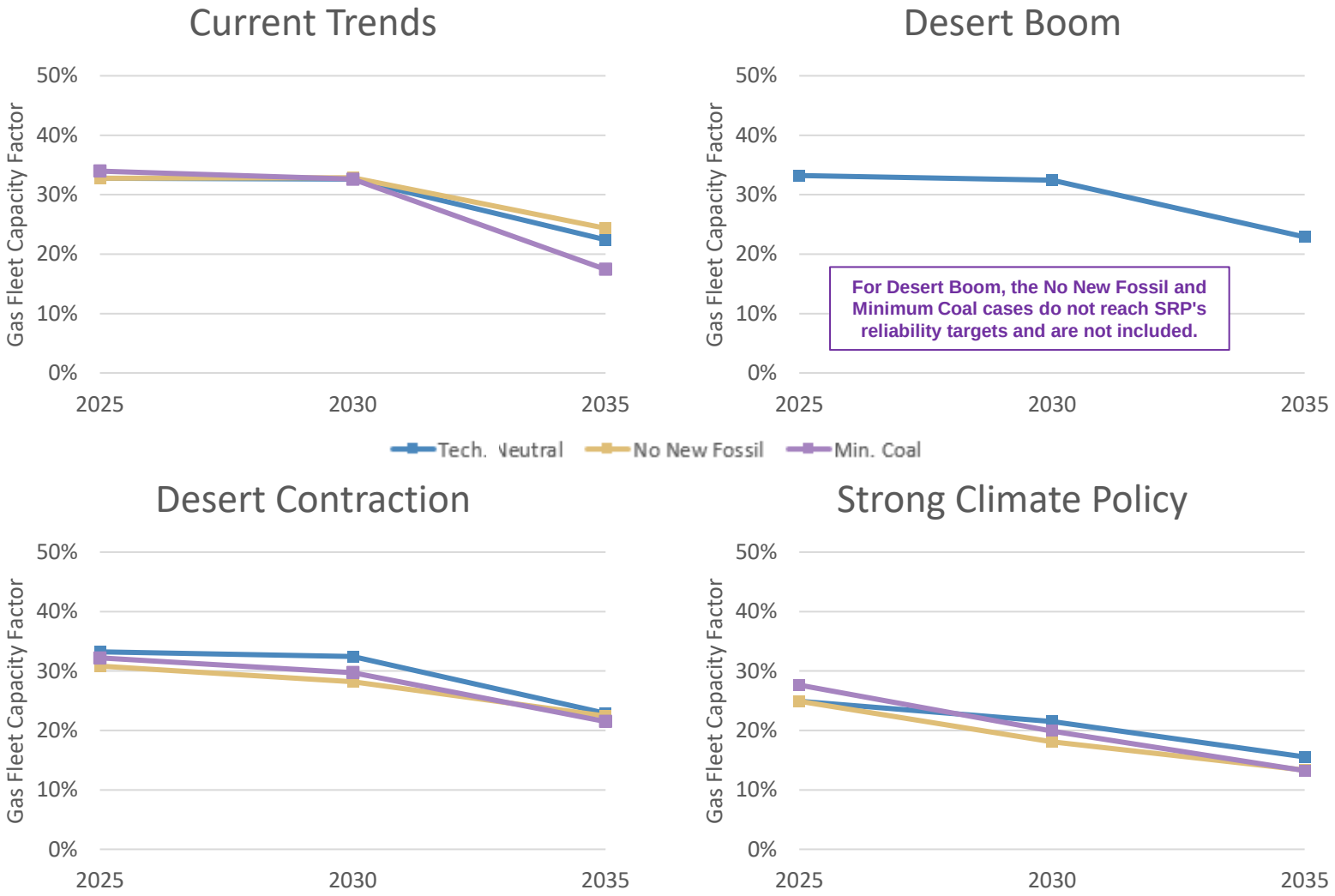
Draft ISP Takeaways

- Generation from carbon-free resources increases in all cases, relative to fiscal year 2023.
- No New Fossil and Minimum Coal result in additional carbon-free generation.

Draft Subject to change

Capacity Factor for Gas Fleet

Amount gas units generate relative to nameplate capacity, averaged over the gas units



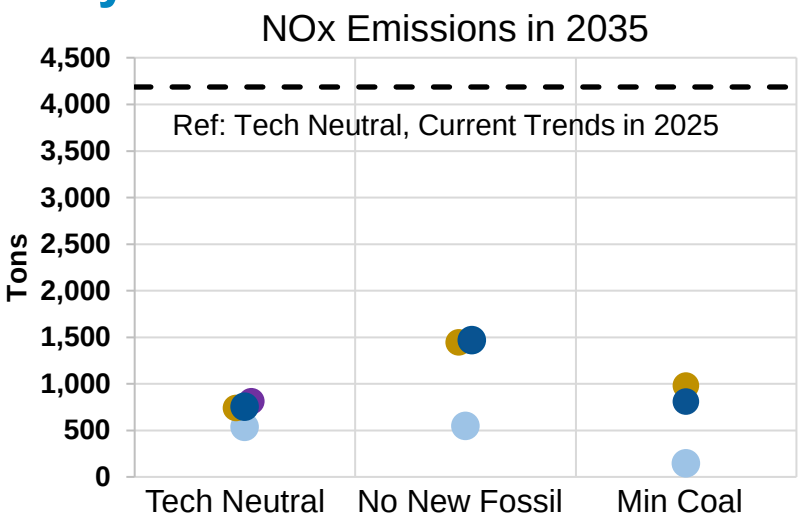
Draft ISP Takeaways

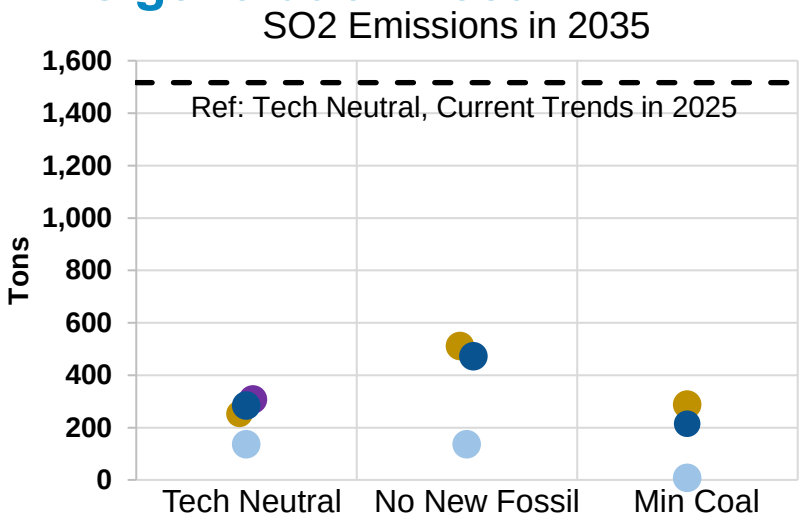
- Utilization of SRP's gas units is projected to decline in all cases.
- Small differences between strategic approaches indicate that gas is increasingly used to meet peak and reserve needs.

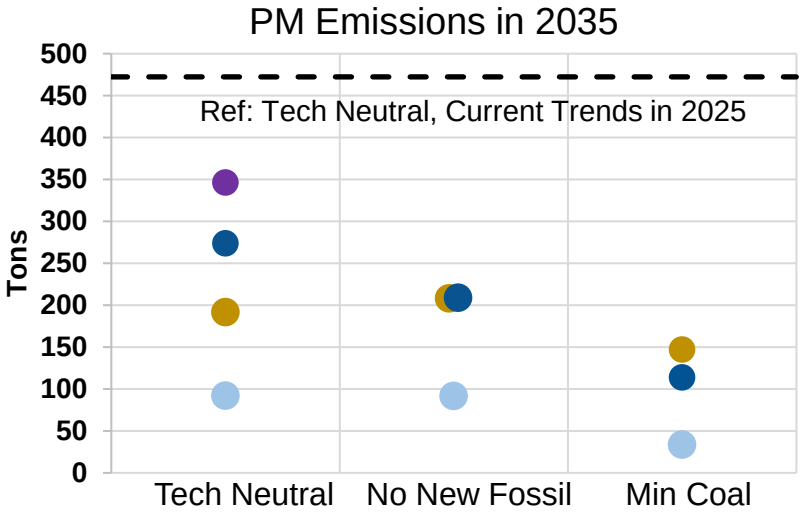
Draft Subject to change

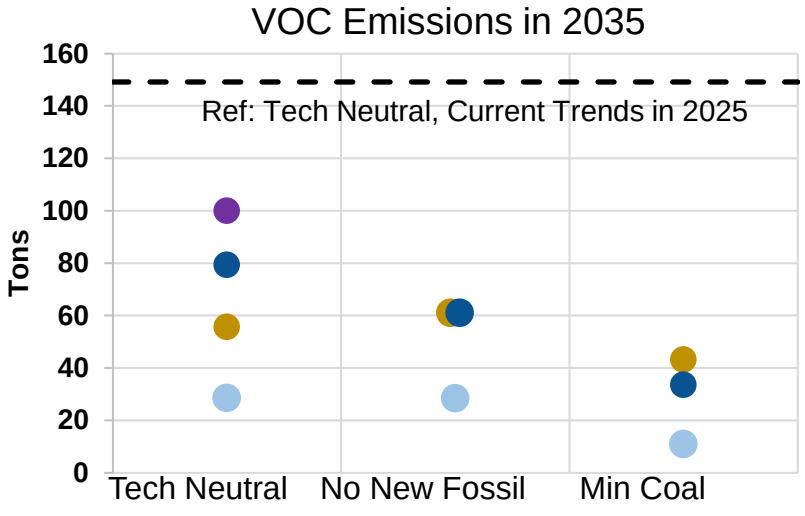
Direct Air Emissions

System wide emissions from SRP's generation fleet









Draft ISP Takeaways

- Nitrous Oxides (NOx), Sulfur Dioxide (SO2), Particulate Matter (PM) and Volatile Organic Compounds (VOC) all decline substantially by 2035.
- New biomass causes higher levels of NOx and SO2 emissions in the No New Fossil and Minimum Coal strategic approaches.

Desert Contraction **Strong Climate Policy**

Current Trends **Desert Boom***

For Desert Boom, the No New Fossil and Minimum Coal cases do not reach SRP's reliability targets and are not included.

Draft Subject to change

Reliability Metrics

Planning Reserve Margin: Resource adequacy metric used to determine whether SRP will be able to reliably serve power to meet projected customer needs

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

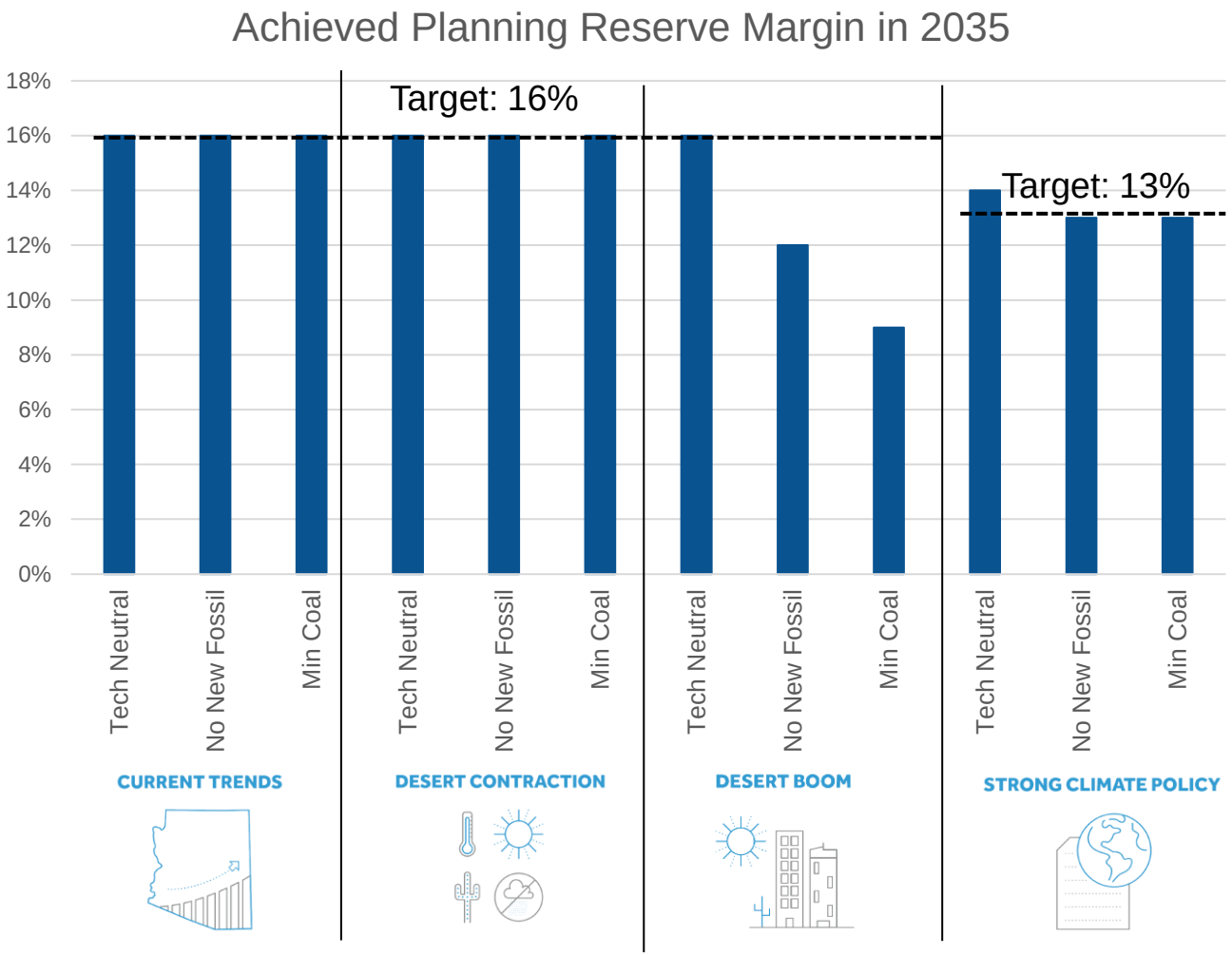
Reliance on Emerging Technologies: Percentage of system capacity needs met by emerging technologies (e.g., hydrogen, nuclear small modular reactors, carbon capture and storage)

Qualitative Risk Ratings: Developed through surveys with SRP 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

Planning Reserve Margin

Margin of total reliable capacity above expected peak load



Draft ISP Takeaways:

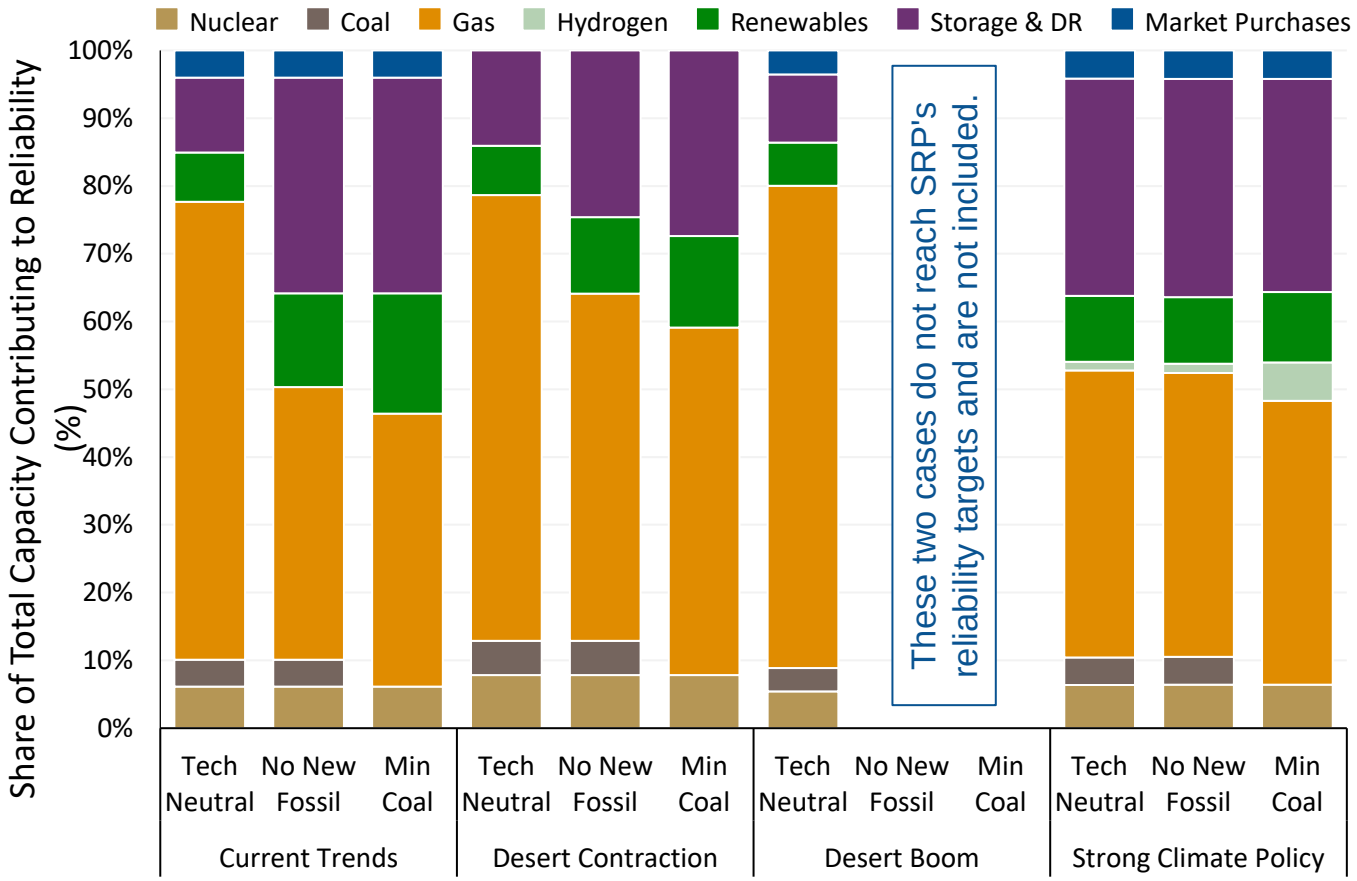
- SRP would be able to reliably serve power in all cases except No New Fossil and Minimum Coal in the Desert Boom scenario.

SRP's target planning reserve margin is 16%. For the Strong Climate Policy scenario, the planning margin was reduced to 13% as a proxy to estimate impacts from expanded regional markets.

Draft Subject to change

Reliability Mix in 2035

Mix of capacity available to meet peak load plus the planning reserve margin in order to maintain system reliability



Note: Renewables includes solar, wind, geothermal, biomass and hydro. Storage & DR includes battery storage, pumped hydro and demand response (DR).

Draft ISP Takeaways

- Existing resources play a key role in ensuring reliability across all strategic approaches, including ones that don't allow for new firm capacity resources.
- New renewable and storage resources help contribute to reliability in all cases.
- New firm capacity resources (gas and/or hydrogen), when allowed, are selected to help meet reliability needs at least cost.

Reliance on Emerging Technologies

Amount of SRP capacity needs met using emerging technologies

Scenario	Strategic Approach: Tech Neutral	Strategic Approach: No New Fossil	Strategic Approach: Minimum Coal
Current Trends	**No Emerging Technology Additions** Green hydrogen and nuclear SMR not available by 2035 CCS only available by 2035 in Tech Neutral		
Desert Contraction			
Desert Boom			
Strong Climate Policy	178 MW Green Hydrogen	195 MW Green Hydrogen	790 MW Green Hydrogen

Notes:
1) Emerging Technologies include green hydrogen, nuclear small modular reactors (SMR) and gas with carbon capture and sequestration (CCS).
2) Any hydrogen capacity additions would require the development of hydrogen supply, underground storage and new pipelines, which would take time to develop, permit, and install.

Draft ISP Takeaways

- Emerging technologies play a role in all strategic approaches under the Strong Climate Policy scenario.
- 790 MW of green hydrogen in Strong Climate Policy, Minimum Coal represents a significant reliance on green hydrogen and would require the technology to be well-developed.

Development Risk

Measure of how difficult it may be for SRP to develop the infrastructure necessary to enable each system plan

Development Risk Rating Scale

Development Risk Rating Scores

	Tech Neutral	No New Fossil	Minimum Coal
Current Trends	3*	4	4
Desert Contraction	2	3	3
Desert Boom	4	These cases do not meet reliability standards and were not evaluated	
Strong Climate Policy	4	4	5

* Tech Neutral/Current Trends was the baseline case to which the development risk for all other cases were compared

Draft ISP Takeaways:

- All generation technologies have risks associated with them.
- As a result, risk rating scores closely correlate with the amount of infrastructure required in each case.

Risk factors considered included permitting and siting, land acquisition, supply chain challenges, fuel supply development and reliance on emerging technologies

Operational Risk

Measure of how difficult it may be for SRP to operate the system reliably under each system plan

Operational Risk Rating Scale

Operational Risk Rating Scores

	Tech Neutral	No New Fossil	Minimum Coal
Current Trends	3 *	4	4
Desert Contraction	2	2	2
Desert Boom	4	These cases do not meet reliability standards and were not evaluated	
Strong Climate Policy	4	4	4

* Tech Neutral/Current Trends was the baseline case to which the operational risk for all other cases were compared

Draft ISP Takeaways:

- Operational risk increases with the pace of transformation
- Flexible resources such as pumped hydro, batteries, and natural gas help mitigate operational risk

Risk factors included renewable energy capacity, battery operations, plant operations and fuel usage, and electricity purchases from the market.

Draft Subject to change

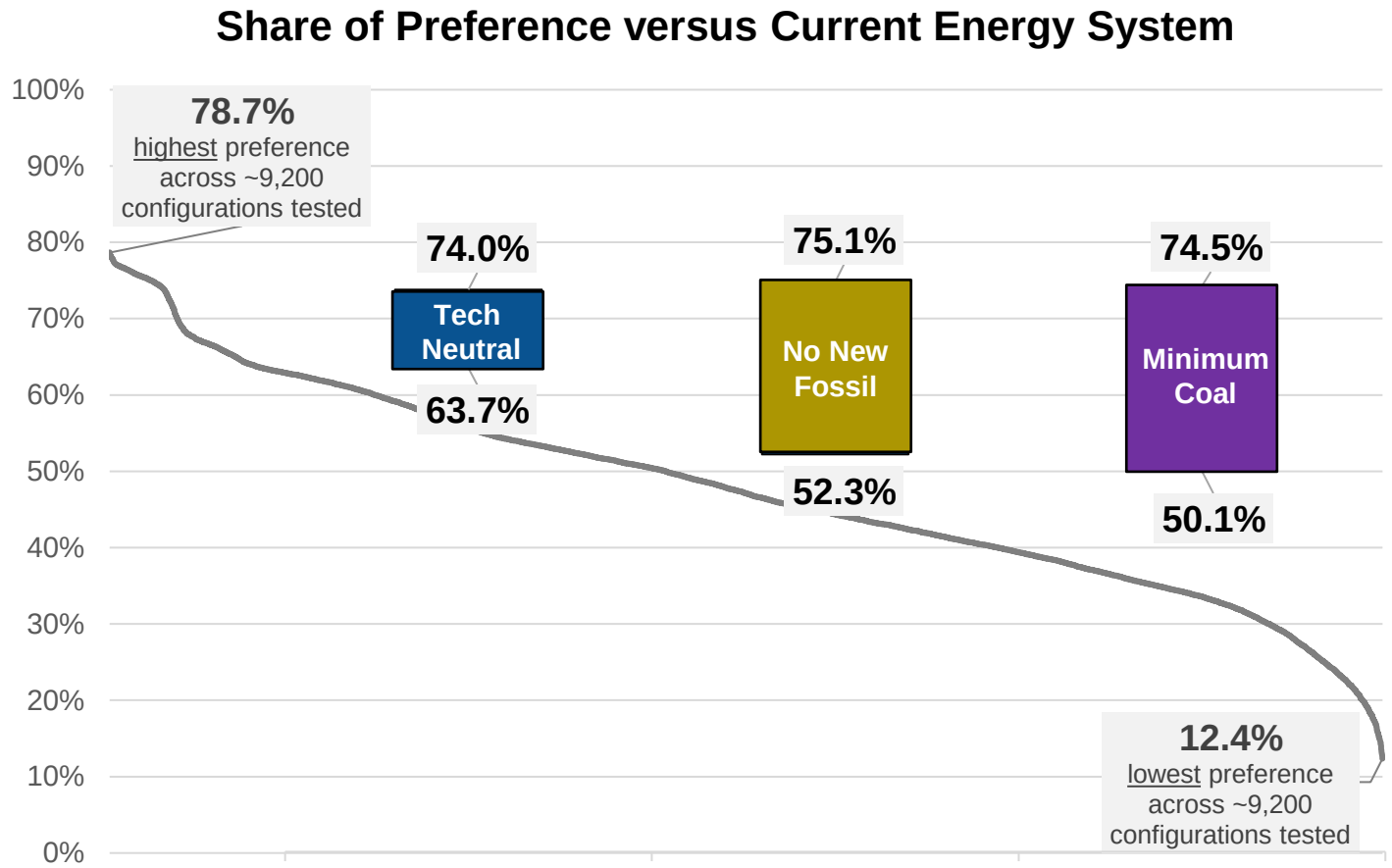
Customer Focused Metrics

Customer Preference Rating: Developed using over 1,000 residential customers' responses in a conjoint survey designed to understand how they value different aspects of the power system.

CO_2 Reductions from energy efficiency, distributed generation and electrification: CO_2 reductions associated with various behind-the-meter customer programs.

Residential Customer Preference Rating

Percentage by which customers expressed preferences relative to SRP's current system



Note: 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. No New Fossil and Minimum Coal cases were not tested in Desert Boom because they did not reach reliability targets.

Draft ISP Takeaways:

- Preference ranged between 12% and 79% versus the current system.
- Systems representing the ISP strategic approaches all achieved preference over 50%.
- More consistent preference for Tech Neutral across futures.

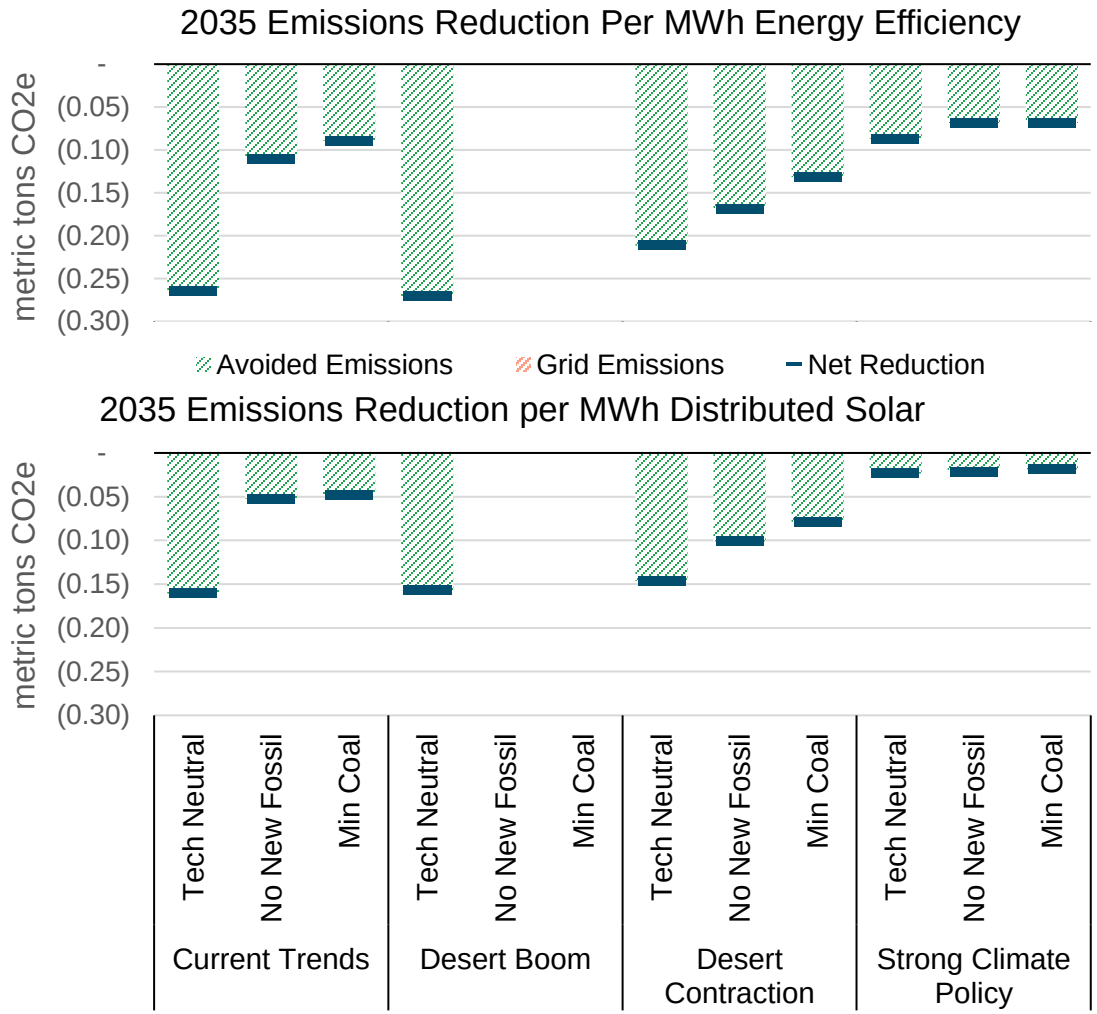
Customer Preference: Key Learnings bellomy

- Preference is **highly dependent on external factors** in each scenario
- Especially when external **factors impact costs**
- **Tech Neutral:** most favorable in futures with **higher load growth**
- **Minimum Coal and No New Fossil:** greater preference in futures where…
  - Load growth was low
  - **Federal incentives** for carbon free and hydrogen technologies were assumed

Draft Subject to change

Avoided CO_2 from Energy Efficiency and Distributed Generation

Reduction in grid CO_2 emissions in 2035 from energy efficiency programs and distributed generation



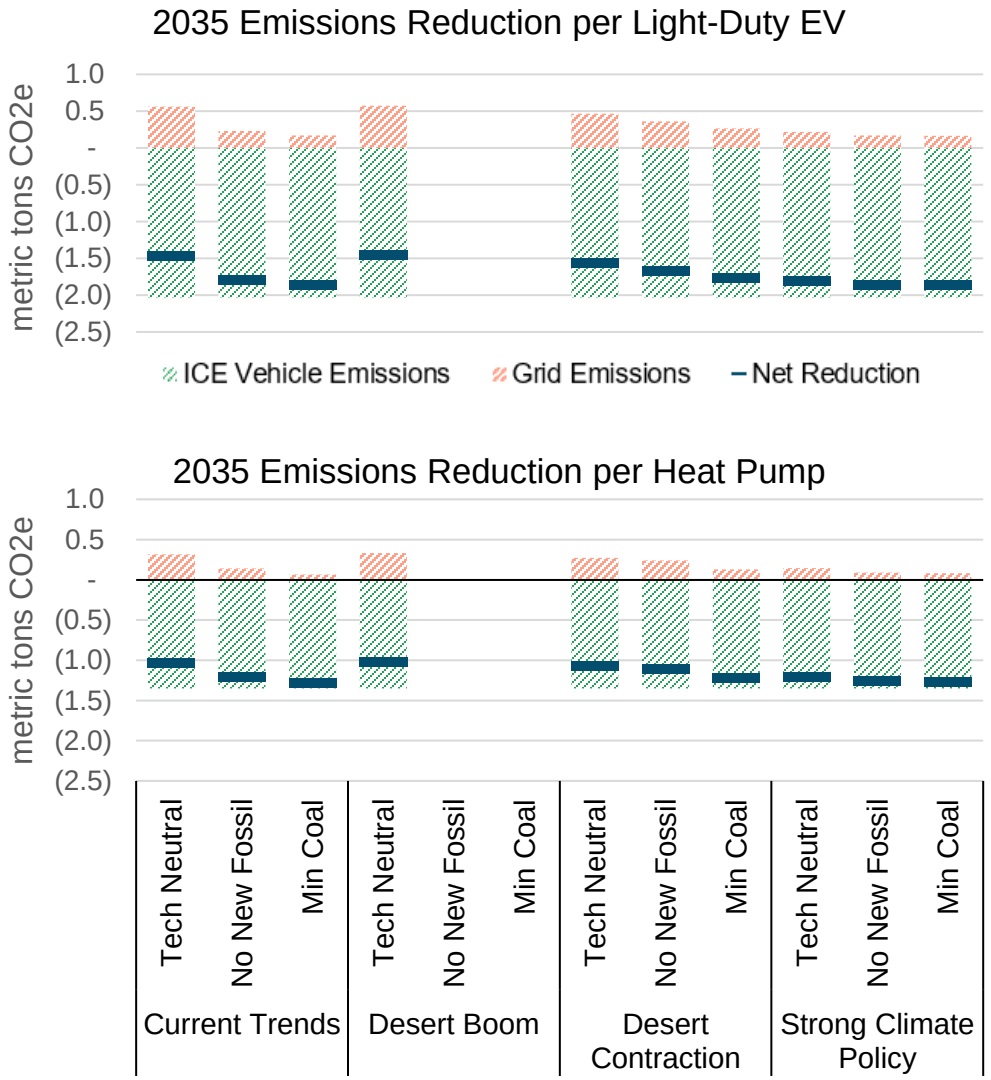
Draft ISP Takeaways:

- Energy efficiency and distributed generation drive more emission reductions in cases with more gas generation.
- As the grid emissions decline, the emissions reduction impact declines.
- Continuing to offer programs that reduce load during high-demand hours can lead to additional emissions reductions.

Draft Subject to change

Avoided CO_2 from Electric Vehicles and Heat Pumps

Reduction in economy-wide CO_2 emissions in 2035 from vehicle and building electrification



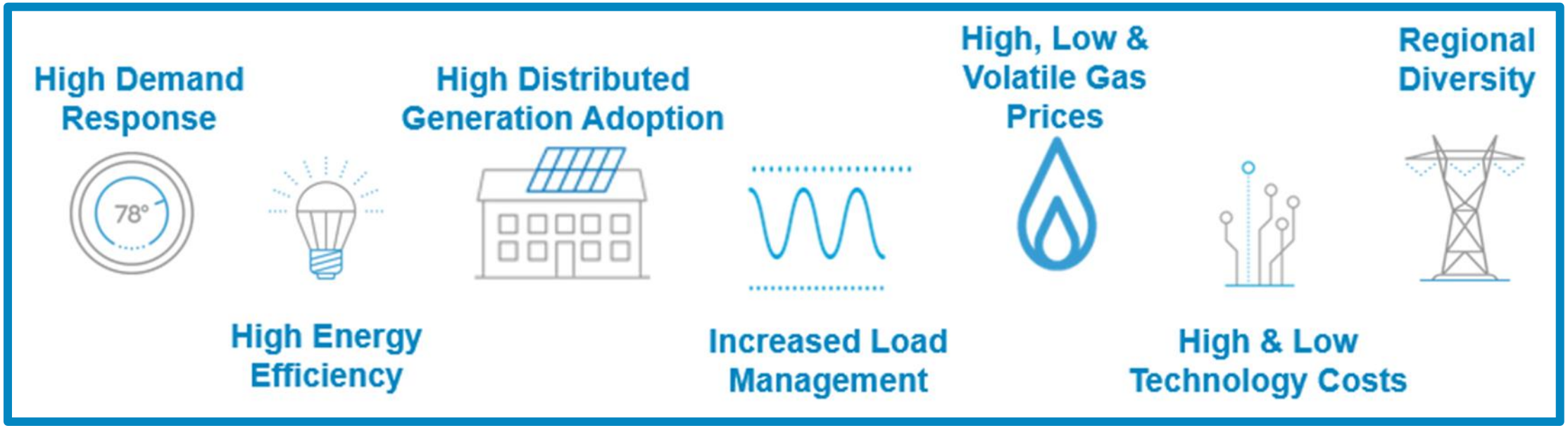
Draft ISP Takeaways:

- The adoption of electric vehicles (EVs) and heat pumps results in meaningful economy-wide emissions reductions, even with additional grid emissions from electrification.
- Shifting EV charging to daytime periods, when emissions are lower, through managed charging programs and/or pricing plans can lead to further emissions reductions.

Draft Subject to change

Appendix: LTCE Sensitivities

Sensitivities



Added in Response to Advisory Group Discussions

Sensitivities allow SRP to understand the impact of a single assumption on the overall system plan.

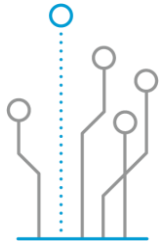
ISP Sensitivities: Tech Costs and Natural Gas Prices

Relative additions of natural gas and renewable/storage resources depend on gas prices and technology costs, but in all cases both new renewables and firm capacity are part of a least-cost portfolio.

High and Low Gas Prices

Natural gas prices per 2022 EIA AEO High / Low Oil & Gas Supply Cases

- Higher natural gas prices (HGP) increase total capacity additions, driving increases for solar, wind and storage, while offsetting some gas capacity.
- Lower natural gas prices (LGP) reduce total capacity additions, driving slightly higher additions of natural gas while offsetting solar and wind additions.



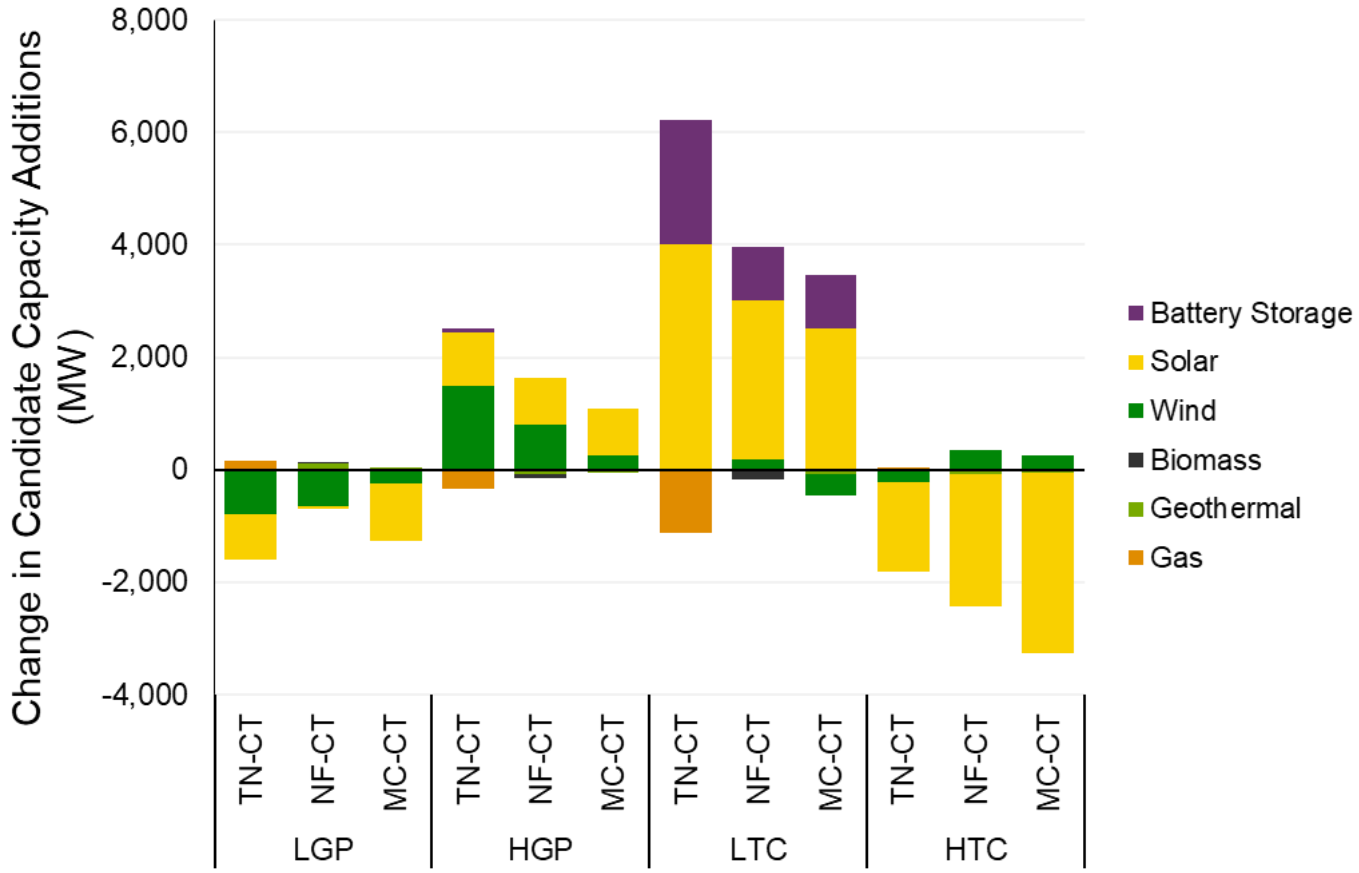
High and Low Tech Costs

Renewables & storage tech costs per 2022 NREL ATB High / Low Cases

- Higher technology costs (HTC) reduce total capacity additions, driving slightly higher additions of natural gas while primarily offsetting solar additions.
- Lower technology costs (LTC) increase total capacity additions, driving increase of solar & battery storage while offsetting some natural gas capacity.

Key Findings from Gas Price and Tech Cost Sensitivities

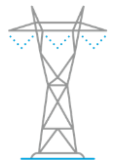
Relative additions of natural gas and renewable/storage resources depend on gas prices and technology costs, but in all cases new renewables and firm capacity are part of a least-cost portfolio.



- High technology costs (HTC) and low natural gas prices (LGP) reduce total capacity additions, driving slightly higher additions of natural gas (when allowed), while primarily offsetting solar additions (and wind in LGP).
- Low technology costs (LTC) and high natural gas prices (HGP) increase total capacity additions, driving an increase in solar and wind in HGP and an increase in solar and battery storage in LTC while offsetting some natural gas capacity in the Tech Neutral cases.

Draft Subject to change

ISP Sensitivities: Customer Programs



Regional Diversity

Target PRM decreased from 16% to 13% (338 MW reduction by 2035)

- Reduces gas peaker builds (Tech Neutral case) and otherwise battery storage and renewable builds

High Energy Efficiency

+700 GWh of energy efficiency added by 2035 (395 MW of peak reduction)

- Reduces gas builds (Tech Neutral case) and otherwise battery storage and renewable (mostly solar) builds

Increased Load Management

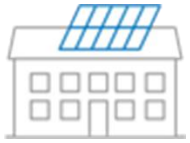
+200 MW of load management

- Largely displaces capacity resources (gas builds in Tech Neutral case, battery storage in other cases)

High Demand Response

+100 MW of demand response by 2035

- Largely displaces capacity resources (gas builds in Tech Neutral case, battery storage in other cases)



High Distributed Generation

+960 MW of distributed solar and +175 MW of distributed storage by 2035

- Increased distributed solar largely displaces utility-scale solar, and increased distributed storage displaces some gas and/or batteries, depending on the case.

Draft Subject to change

Regional Diversity

Target planning reserve margin (PRM) decreased from 16% to 13% (338 MW reduction by 2035)

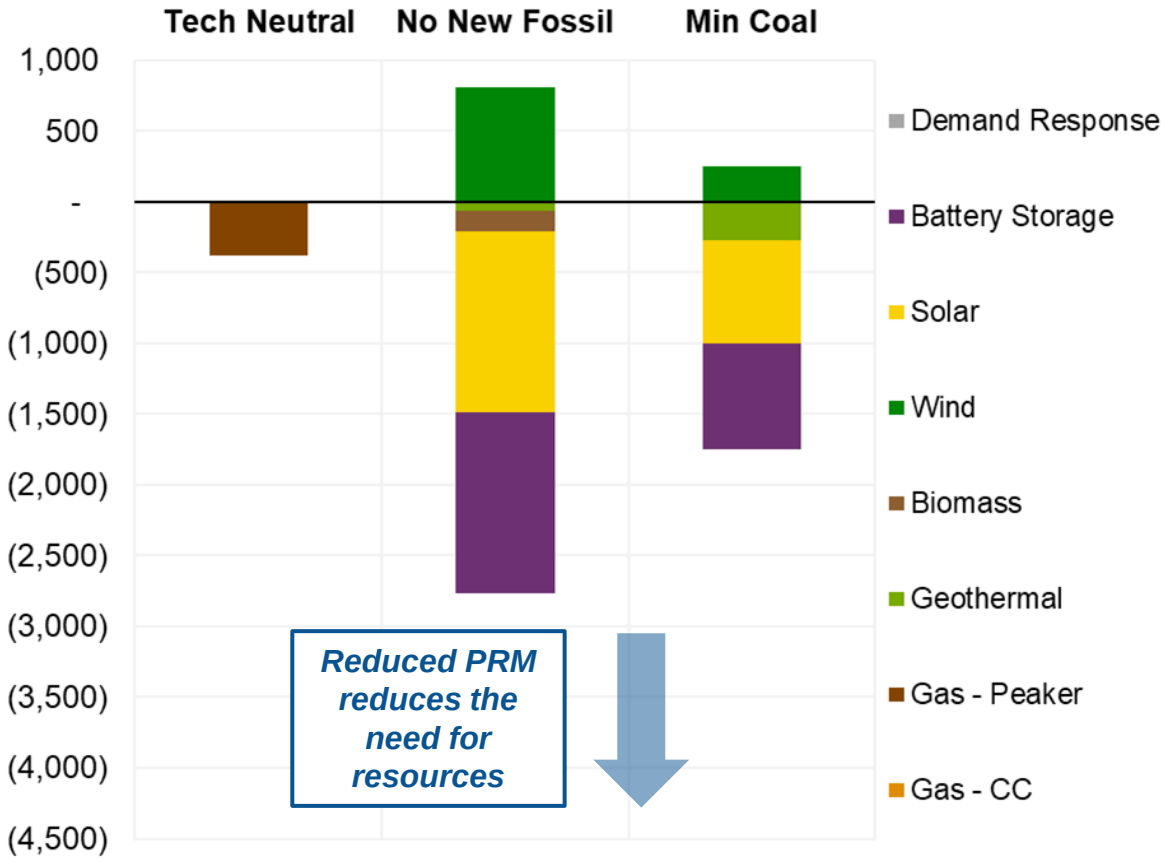
Key Takeaways

- **Tech Neutral** – There are lower gas peaker builds.
- **No New Fossil & Minimum Coal** – There are significantly lower builds, particularly batteries (due to the lower total planning reserve margin requirement) and solar (which is less economic to add with fewer batteries to integrate the solar).

Caveats

- The 3% PRM reduction is hypothetical.
- This sensitivity does not consider any tradeoffs or costs to realize greater regional diversity benefits for capacity planning.

Change in resource builds by 2035 (MW)



Draft Subject to change

High Energy Efficiency

Additional ~700 GWh of energy efficiency added by 2035 with 395 MW of peak reduction

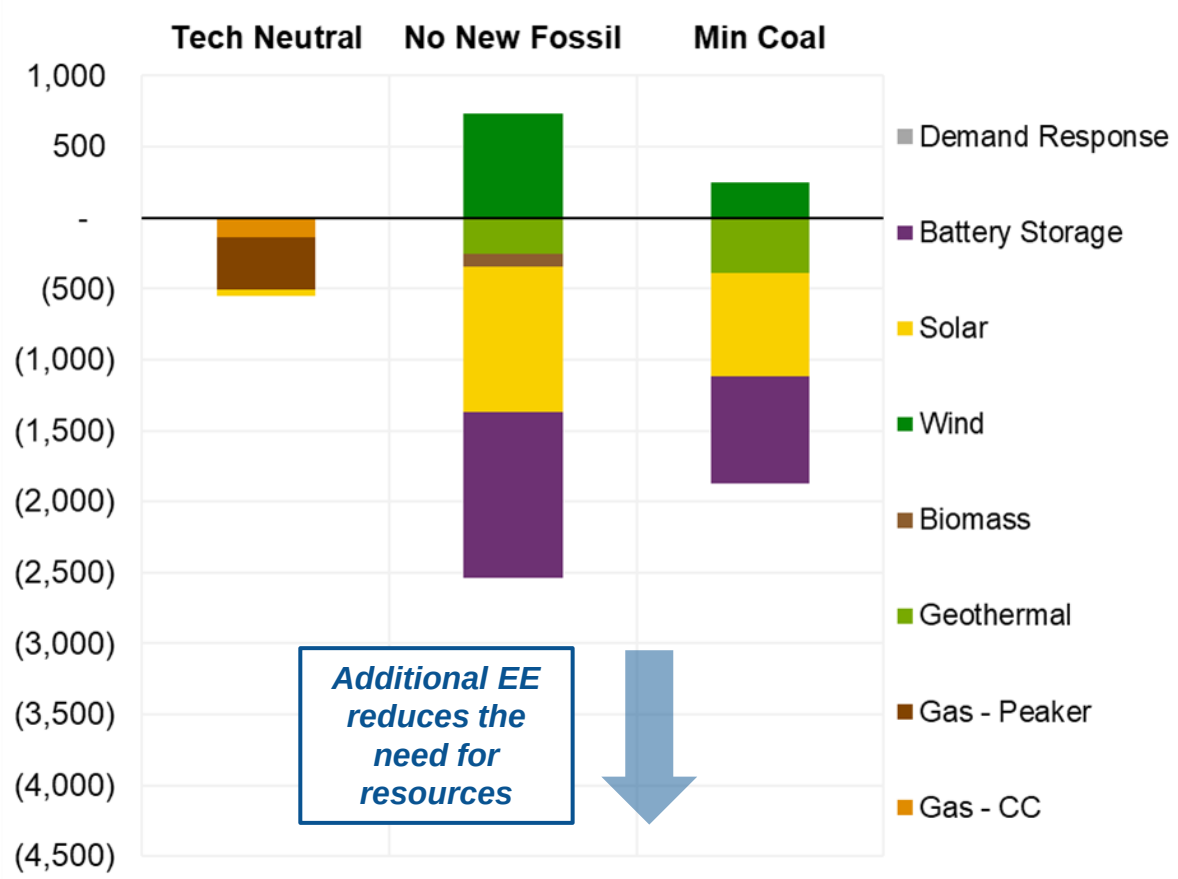
Key Takeaways

- **Tech Neutral** – There are lower gas builds.
- **No New Fossil & Minimum Coal** – There are significantly lower builds, particularly batteries (due to the lower total planning reserve margin requirement) and solar (which is less economic to add with fewer batteries to integrate the solar).

Caveats

- This sensitivity does not evaluate costs such as equipment, installation, and program overhead costs, nor incentive payments or lost revenue that would be captured in the Ratepayer Impact Measure test.

Change in resource builds by 2035 (MW)



Draft Subject to change

Increased Load Management

Include 200 MW of load management

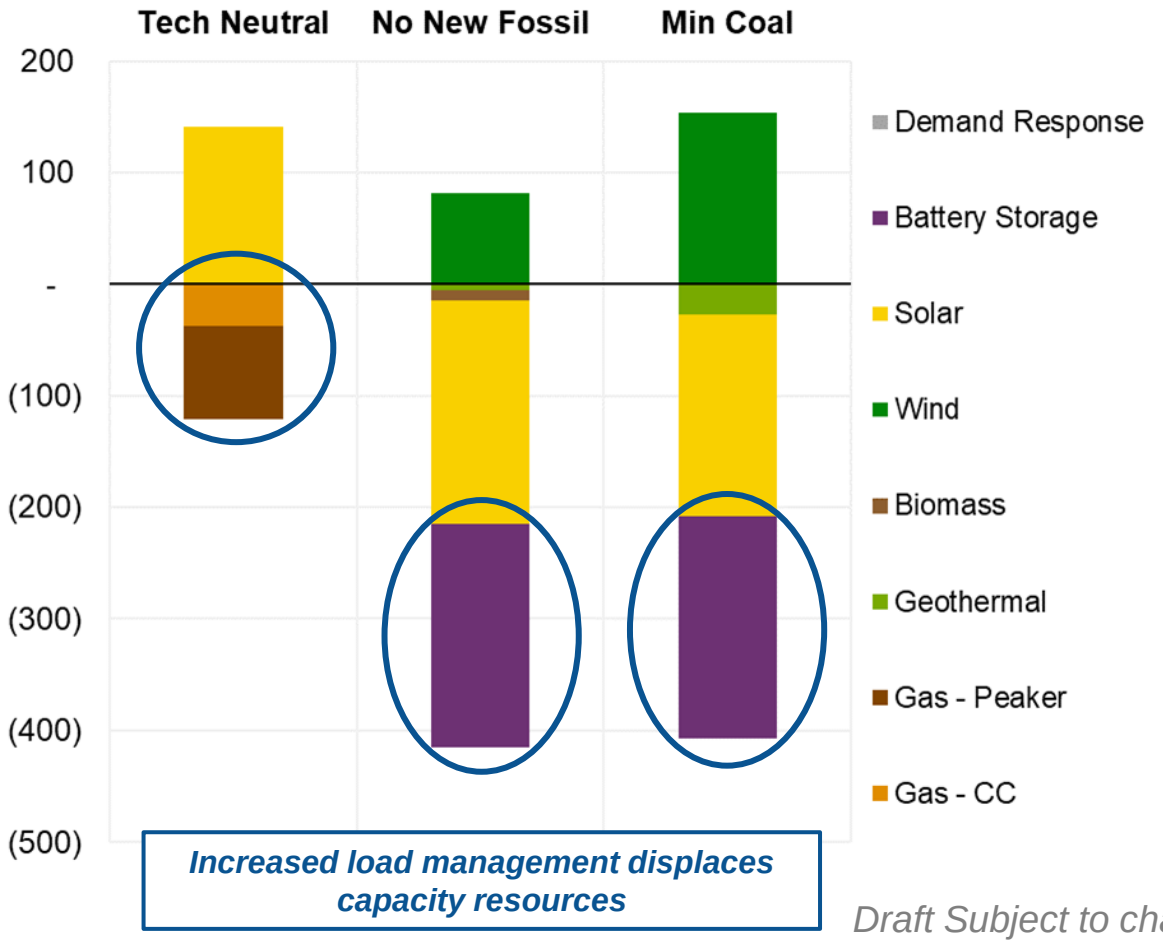
Key Takeaways

- **Tech Neutral** – Load management reduces gas builds and helps integrate more solar capacity.
- **No New Fossil & Minimum Coal** – Load management substitutes one-for-one for battery storage capacity.

Caveats

- This sensitivity assumes that SRP has sufficient control or can incentivize customers to get desired performance.
- This sensitivity does not evaluate costs to enable increased load management.

Change in resource builds by 2035 (MW)



Draft Subject to change

High Demand Response

Additional 100 MW of demand response added by 2035

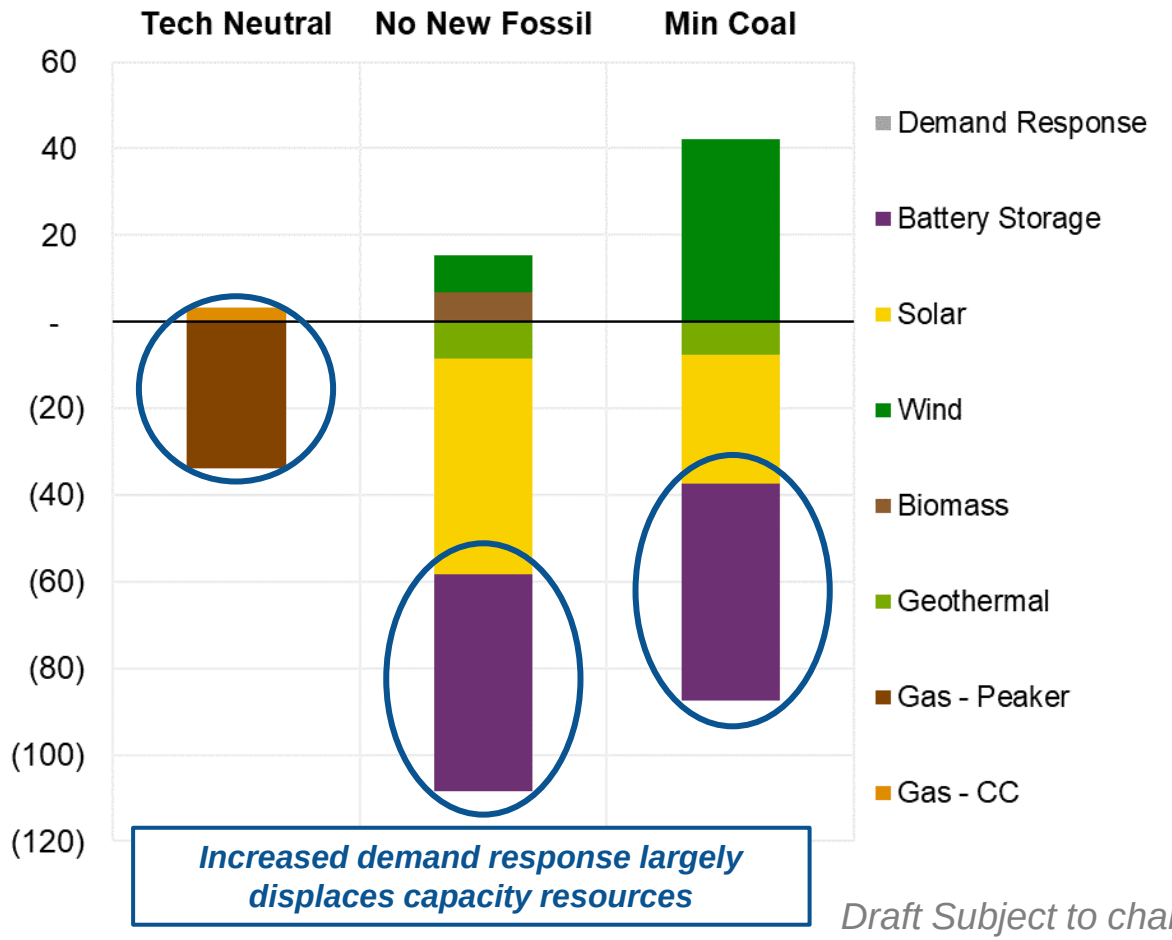
Key Takeaways

- **Tech Neutral** – Increased demand response offsets gas builds.
- **No New Fossil & Minimum Coal** – Load management substitutes for 50 MW (half) battery storage builds.

Caveats

- This sensitivity assumes as a first estimate that demand response provides half of the reliability capacity to the system as batteries.
- This sensitivity does not evaluate costs to enable additional demand response.

Change in resource builds by 2035 (MW)



Draft Subject to change

High Distributed Generation Adoption

Additional ~960 MW of distributed solar and ~175 MW of distributed storage added by 2035

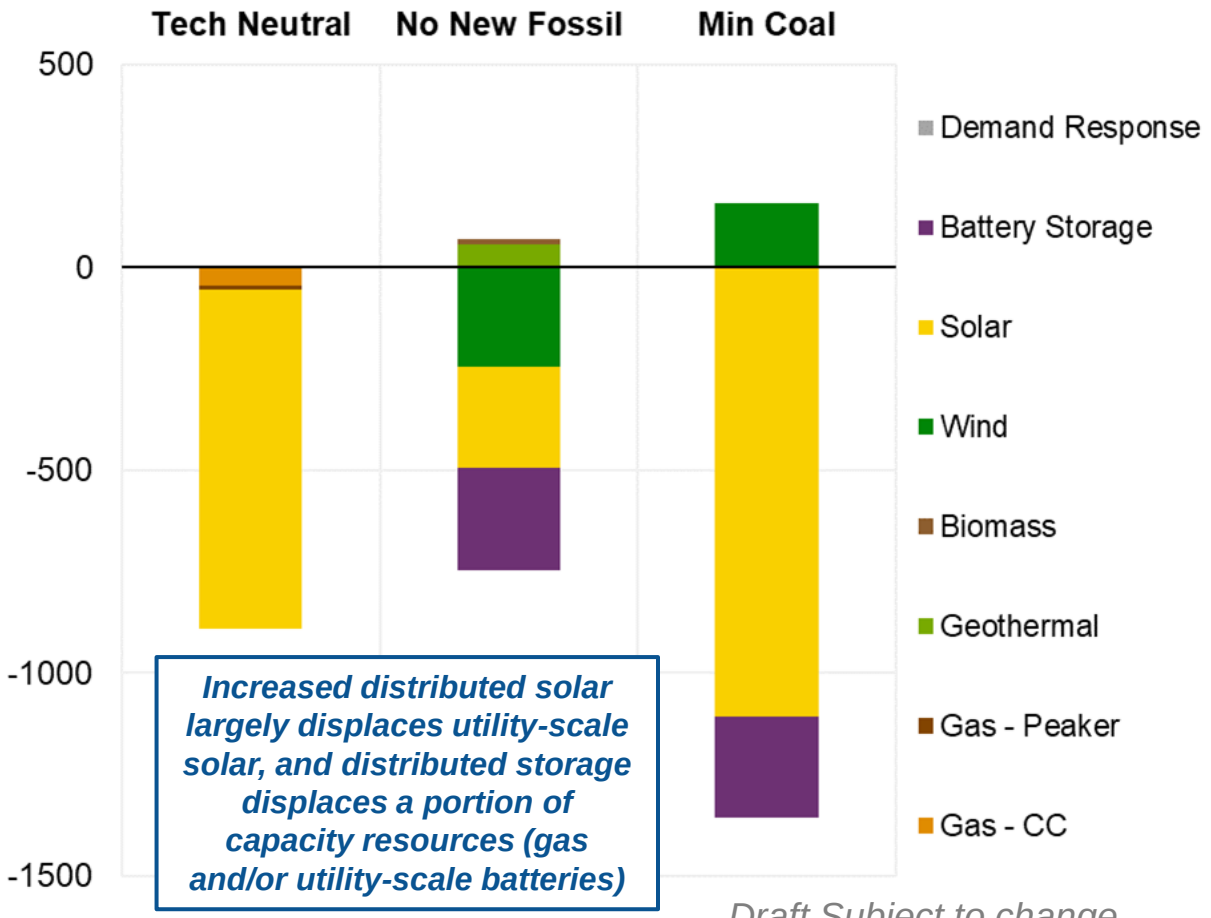
Key Takeaways

- **Tech Neutral** – Increased distributed solar primarily displaces utility-scale solar. Distributed storage displaces some gas capacity.
- **No New Fossil & Minimum Coal** – Increased distributed resources primarily displace utility-scale solar and storage.

Caveats

- There is uncertainty in how well distributed storage dispatch would align with grid needs.
- This sensitivity does not evaluate costs.

Change in resource builds by 2035 (MW)



Draft Subject to change