

SALT RIVER PROJECT AGRICULTURAL IMPROVEMENT AND POWER DISTRICT MEETING NOTICE AND AGENDA

POWER COMMITTEE Thursday, May 25, 2023, 9:30 AM

SRP Administration Building
1500 N. Mill Avenue, Tempe, AZ 85288

Committee Members: Mario Herrera, Chairman; Keith Woods, Vice Chairman; and Robert Arnett, Nick Brown, Kevin Johnson, Kathy Mohr-Almeida, and Stephen Williams
Association Board of Governors Observer: Larry Rovey

Call to Order
Roll Call

1. **CONSENT AGENDA:** The following agenda item(s) will be considered as a group by the Committee and will be enacted with one motion. There will be no separate discussion of these item(s) unless a Committee Member requests, in which event the agenda item(s) will be removed from the Consent Agenda and considered as a separate item CHAIRMAN MARIO HERRERA
 - Request for approval of the minutes for the meeting of April 20, 2023.
2. Summer Preparedness PAM SYRJALA and CHRIS JANICK

Informational presentation summarizing SRP's actions in preparing to meet forecasted loads and other requirements for Summer 2023.
3. Integrated System Plan (ISP) Update ANGIE BOND-SIMPSON; and JOE HOOKER and ARNE OLSON, E3 CONSULTING

Informational presentation regarding the results of the ISP analysis and key findings of the analytical process, as well as an update on the next steps for the ISP and the progress of community stakeholder engagement forums.
4. Advanced Customer-Grid Applications CHRIS CAMPBELL

Informational presentation regarding the current outlook for advanced customer applications that integrate with the electric grid.
5. Report on Current Events by the General Manager and Chief Executive Officer or Designees JIM PRATT
6. Future Agenda Topics..... CHAIRMAN MARIO HERRERA

The Committee may vote during the meeting to go into Executive Session, pursuant to A.R.S. §38-431.03 (A)(3), for the purpose of discussion or consultation for legal advice with legal counsel to the Committee on any of the matters listed on the agenda.

The Committee may go into Closed Session, pursuant to A.R.S. §30-805(B), for records and proceedings relating to competitive activity, including trade secrets or privileged or confidential commercial or financial information.

Visitors: The public has the option to attend in-person or observe via Zoom and may receive teleconference information by contacting the Corporate Secretary's Office at (602) 236-4398. If attending in-person, all property in your possession, including purses, briefcases, packages, or containers, will be subject to inspection.



**THE NEXT POWER COMMITTEE MEETING
IS SCHEDULED FOR TUESDAY, JUNE 27, 2023**

05/18/2023

MINUTES
POWER COMMITTEE MEETING

DRAFT

April 20, 2023

A meeting of the Power Committee of the Salt River Project Agricultural Improvement and Power District (the District) convened at 9:30 a.m. on Thursday, April 20, 2023, from the Board Conference Room at the SRP Administration Building, 1500 North Mill Avenue, Tempe, Arizona. This meeting was conducted in-person and via teleconference in compliance with open meeting law guidelines. The District and Salt River Valley Water Users' Association (the Association) are collectively known as SRP.

Committee Members present at roll call were M.J. Herrera, Chairman; K.B. Woods, Vice Chairman; and R.C. Arnett, N.R. Brown, K.J. Johnson, and S.H. Williams; and Association Board of Governors observer L.D. Rovey.

Committee Member absent at roll was K.L. Mohr-Almeida.

Also present were District Vice President C.J. Dobson; Association Vice President J.R. Hoopes; Board Members A.G. McAfee, R.J. Miller, M.V. Pace, P.E. Rovey, and L.C. Williams; Council Vice Chairman J.R. Shelton; Council Liaisons A.S. Hatley and T.S. Naylor; Mmes. K.J. Barr, A.P. Chabrier, C.M. Hallows, L.F. Hobaica, M.M. Klein, A.R. Laurence, L.A. Meyers, G.A. Mingura, N.J. Mullins, K.S. Ramaley, J.R. Schuricht, C.M. Sifuentes, and P.L. Syrjala; Messrs. T.L. Acker, J.D. Coggins, H.A. Courtright, A.C. Davis, J.M. Felty, M. Hummel, C.N. Hunter, K.J. Lee, B.J. McClellan, A.J. McSheffrey, M.J. O'Connor, B.A. Olsen, T.B. Perry, J.M. Pratt, G. Saint Paul, and R.R. Taylor; Ian Calkins of Copper State Consulting Group; and Steve Lowe of Next Era Energy.

In compliance with A.R.S. §38-431.02, Andrew Davis of the Corporate Secretary's Office had posted a notice and agenda of the Power Committee meeting at the SRP Administration Building, 1500 North Mill Avenue, Tempe, Arizona, at 9:00 a.m. on Tuesday, April 18, 2023.

Chairman M.J. Herrera called the meeting to order.

Consent Agenda

Chairman M.J. Herrera requested a motion for Committee approval of the Consent Agenda, in its entirety.

On a motion duly made by Board Member S.H. Williams and seconded by Vice Chairman K.B. Woods, the Committee unanimously approved and adopted the following item on the Consent Agenda:

- Minutes of the Power Committee meeting on March 21, 2023, as presented

Corporate Secretary J.M. Felty polled the Committee Members on Board Member S.H. Williams' motion to approve the Consent Agenda, in its entirety. The vote was recorded as follows:

YES:	Board Members M.J. Herrera, Chairman; K.B. Woods, Vice Chairman; R.C. Arnett, N.R. Brown, K.J. Johnson, and S.H. Williams	(6)
NO:	None	(0)
ABSTAINED:	None	(0)
ABSENT:	Board Member K.L. Mohr-Almeida	(1)

Appointment of Trapper Mining, Inc. SRP Representatives

Using a PowerPoint presentation, Bobby A. Olsen, SRP Senior Director of Corporate Planning, Environmental Services, and Innovation, stated that the purpose of the presentation was to request approval to appoint John Coggins, Pam Syrjala, and Craig Larson to serve as SRP representatives to the Board of Directors of Trapper Mining, Inc. and its subsidiaries.

Mr. B.A. Olsen provided background on Trapper Mining, Inc. He stated that Trapper Mining, Inc. supplies coal to Craig Generating Station Units 1 and 2. He explained that Trapper Mining, Inc. is owned by SRP, PacifiCorp, and Platte River Power Authority with SRP having a 43.72% ownership.

Mr. B.A. Olsen said that Trapper Mining, Inc. is governed by a seven-member board, and that each entity may nominate and appoint their own board members. He stated that board members also serve on Trapper Mining, Inc.'s subsidiaries – William Fork Land Company and Williams Fork Mining Company. Mr. B.A. Olsen said that board members cast a number of votes reflecting their pro-rata ownership share and allocated board seats.

Mr. B.A. Olsen concluded by recommending approval to appoint the following individuals to represent SRP on the board of Trapper Mining, Inc. and the board of any subsidiaries of Trapper Mining, Inc.:

John Coggins, SRP Associate General Manager and Chief Power System Executive
Pam Syrjala, SRP Director of Supply and Trading and Fuels
Craig Larson, SRP Director of Coronado Generating Station

Mr. B.A. Olsen responded to questions from the Committee.

On a motion duly made by Board Member S.H. Williams, seconded by Board Member K.J. Johnson and carried, the Committee agreed to recommend Board approval, as presented.

Corporate Secretary J.M. Felty polled the Committee Members on Board Member S.H. Williams' motion to recommend Board approval. The vote was recorded as follows:

YES:	Board Members M.J. Herrera, Chairman; K.B. Woods, Vice Chairman; R.C. Arnett, N.R. Brown, K.J. Johnson, and S.H. Williams	(6)
NO:	None	(0)
ABSTAINED:	None	(0)
ABSENT:	Board Member K.L. Mohr-Almeida	(1)

Copies of the PowerPoint slides used in this presentation are on file in the Corporate Secretary's Office and, by reference, made a part of these minutes.

Council Member M.R. Mulligan; and Mr. R.T. Judd entered the meeting during the presentation.

Hydrogen Technology Update

Using a PowerPoint presentation, Hank A. Courtright, SRP Executive Consultant, stated that the purpose of the presentation was to provide an update on hydrogen technologies and a regional hydrogen hub proposal for a Department of Energy grant opportunity. He introduced Tom L. Acker, SRP Senior Principal Research Engineer.

Continuing, Mr. T.L. Acker discussed how the hydrogen technologies involving natural gas replacement, petroleum replacement, and energy storage promote carbon reduction. He explained the colors method of hydrogen production and focused on the following colors: Blue – hydrogen derived from natural gas or coal with carbon capture sequestration/utilization; Green – hydrogen derived from water electrolysis with renewable electricity; and Pink – hydrogen derived from water electrolysis using nuclear electricity.

Mr. T.L. Acker highlighted hydrogen technologies with respect to powering heavy duty transportation. He discussed the implications of hydrogen power plants for SRP and stated that SRP is in the process of upgrading Combustion Turbine (CT) combustors at Desert Basin Generating Station, Gila River Power Station, Mesquite Generating Station, and Santan Generating Plant.

Mr. T.L. Acker discussed the options relating to hydrogen bulk underground storage in the form of salt dome caverns located in Arizona. He commented that SRP continues to monitor the progress of the Intermountain Power Project (IPP) and Advanced Clean Energy Storage (ACES) projects relating to renewable energy.

Mr. T.L. Acker explained that the Infrastructure Investment and Jobs Act includes \$9.5 billion for clean hydrogen development. He provided a breakdown as follows: \$1 billion supports electrolysis Research, Development, and Demonstration (RD&D); \$500 million

supports manufacturing and recycling Research and Development (R&D); and \$7 billion for six to ten regional clean hydrogen hubs across the US.

Mr. T.L. Acker said that Arizona energy providers and Arizona universities have formed the Center for Arizona Carbon-Neutral Economy at Arizona State University (ASU) with the goal of attaining a carbon-neutral economy in Arizona. He informed the Committee that SRP engages with the Southwest clean Hydrogen Innovation Network (SHINe) and explained that SHINe is a unique consortium of public, private, and tribal organizations working across Arizona and Nevada to produce, store, deliver, and use clean hydrogen, with connectivity to the Southwest and the broader US clean hydrogen ecosystem. Mr. T.L. Acker provided a map of counties participating in the SHINe projects and concluded with a discussion of key takeaways.

Messrs. T.L. Acker and H.A. Courtright responded to questions from the Committee.

Copies of the PowerPoint slides used in this presentation are on file in the Corporate Secretary's Office and, by reference, made a part of these minutes.

Ms. M.M. Klein left the meeting during the presentation; Messrs. T.L. Acker, H.A. Courtright, and C.N. Hunter left the meeting. President D. Rousseau; Council Members G.E. Geiger and R.W. Swier; and Eliasid Animas of Stratagen entered the meeting during the presentation.

Closed Session: Siting Process

Chairman M.J. Herrera called for a closed session for the Power Committee at 10:16 a.m., pursuant to A.R.S. §30-805(B), to consider matters relating to competitive activity, including trade secrets or privileged or confidential commercial or financial information, with respect to the SRP self-build resource option to be compared with responses to the All-Source Request for Proposals (RFP) and an update on the siting process for this self-build resource.

Eliasid Animas of Stratagen; Ian Calkins of Copper State Consulting Group; and Steve Lowe of Next Era Energy left the meeting.

The Committee reconvened into open session at 10:49 a.m. with the following Members and other present: President D. Rousseau; District Vice President C.J. Dobson; Association Vice President J.R. Hoopes; Board Members R.C. Arnett, N.R. Brown, M.J. Herrera, K.J. Johnson, A.G. McAfee, R.J. Miller, M.V. Pace, L.D. Rovey, P.E. Rovey, L.C. Williams, S.H. Williams, and K.B. Woods; Council Vice Chairman J.R. Shelton; Council Liaisons A.S. Hatley and T.S. Naylor; Council Members G.E. Geiger and R.W. Swier; Mmes. K.J. Barr, A.P. Chabrier, C.M. Hallows, L.F. Hobaica, M.M. Klein, A.R. Laurence, L.A. Meyers, G.A. Mingura, N.J. Mullins, K.S. Ramaley, J.R. Schuricht, C.M. Sifuentes, and P.L. Syrjala; and Messrs. J.D. Coggins, A.C. Davis, J.M. Felty, M. Hummel, R.T. Judd, K.J. Lee, B.J. McClellan,

A.J. McSheffrey, M.J. O'Connor, B.A. Olsen, T.B. Perry, J.M. Pratt, G. Saint Paul, and R.R. Taylor.

Closed Session: City of Mesa

Chairman M.J. Herrera called for a closed session for the Power Committee at 10:50 a.m., pursuant to A.R.S. §30-805(B), to consider matters relating to competitive activity, including trade secrets or privileged or confidential commercial or financial information, with respect to a request for approval of the sale of power to the City of Mesa.

The Committee reconvened into open session at 10:59 a.m. with the following Members and other present: President D. Rousseau; District Vice President C.J. Dobson; Association Vice President J.R. Hoopes; Board Members R.C. Arnett, N.R. Brown, M.J. Herrera, K.J. Johnson, A.G. McAfee, R.J. Miller, M.V. Pace, L.D. Rovey, P.E. Rovey, L.C. Williams, S.H. Williams, and K.B. Woods; Council Vice Chairman J.R. Shelton; Council Liaisons A.S. Hatley and T.S. Naylor; Council Members G.E. Geiger and R.W. Swier, Mmes. K.J. Barr, E.N. Barton, A.P. Chabrier, L.F. Hobaica, L.A. Meyers, G.A. Mingura, K.S. Ramaley, J.R. Schuricht, C.M. Sifuentes, and P.L. Syrjala; and Messrs. J.D. Coggins, A.C. Davis, J.M. Felty, M. Hummel, R.T. Judd, K.J. Lee, A.J. McSheffrey, M.J. O'Connor, B.A. Olsen, T.B. Perry, J.M. Pratt, G. Saint Paul, and R.R. Taylor.

Eliasid Animas of Stratagen; Ian Calkins of Copper State Consulting Group; and Steve Lowe of Next Era Energy entered the meeting.

Report on Current Events by the General Manager and Chief Executive Officer or Designees

Mike Hummel, SRP Associate General Manager and Chief Executive Officer, reported on a variety of federal, state, and local topics of interest to the Committee

Mmes. E.N. Barton and P.L. Syrjala left the meeting during the report.

Future Agenda Topics

Chairman M.J. Herrera asked the Committee if there were any future agenda topics. None were requested.

There being no further business to come before the Power Committee, the meeting adjourned at 11:00 a.m.

John M. Felty
Corporate Secretary

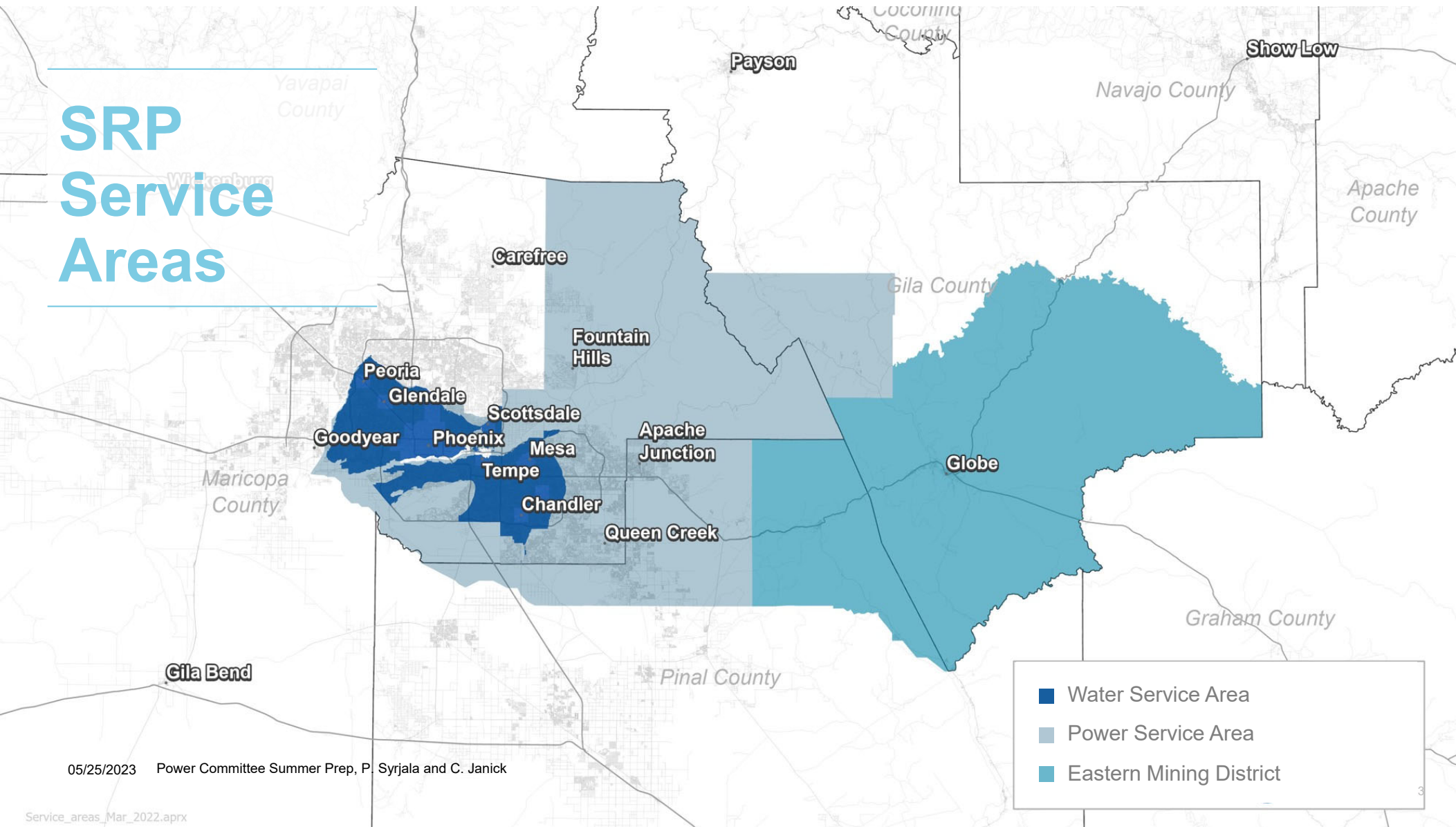
2023 Summer Preparedness

Power Committee | May 25, 2023

Pam Syrjala

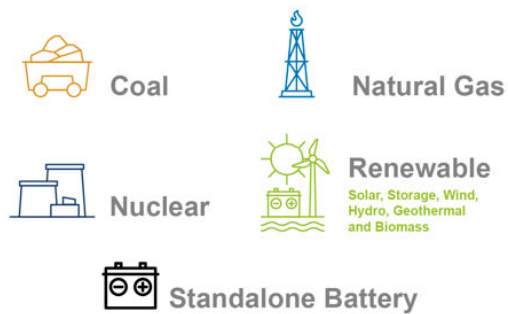
Director Supply, Trading & Fuels

SRP Service Areas



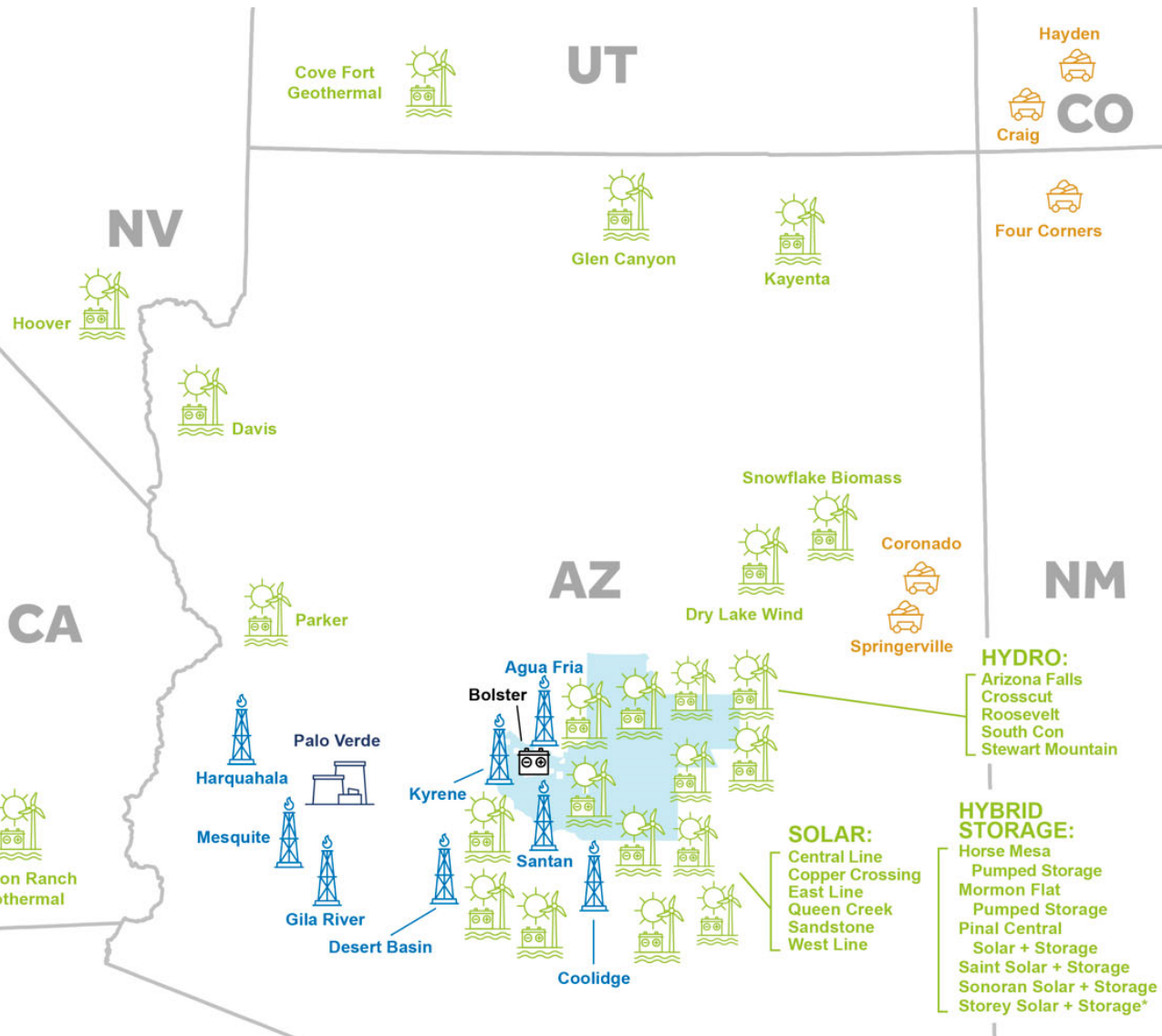
SUMMER CY 2023

LEGEND

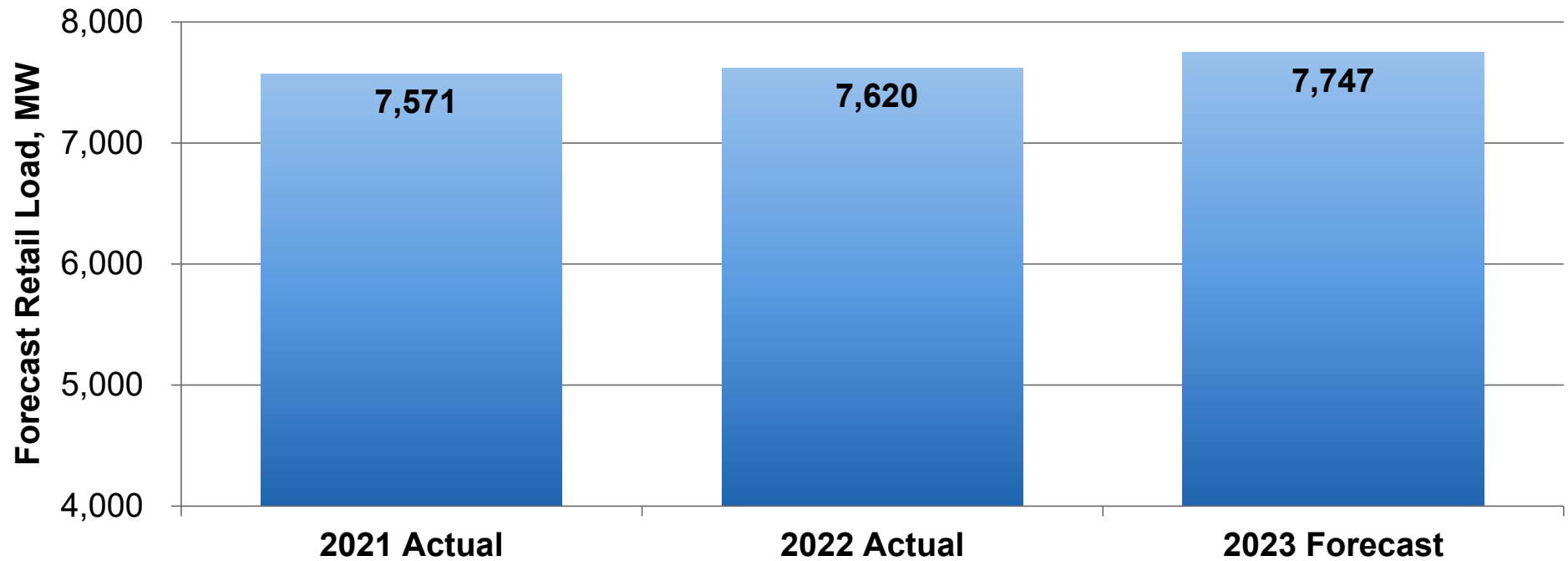


*Map locations and size are not precise, nor to scale

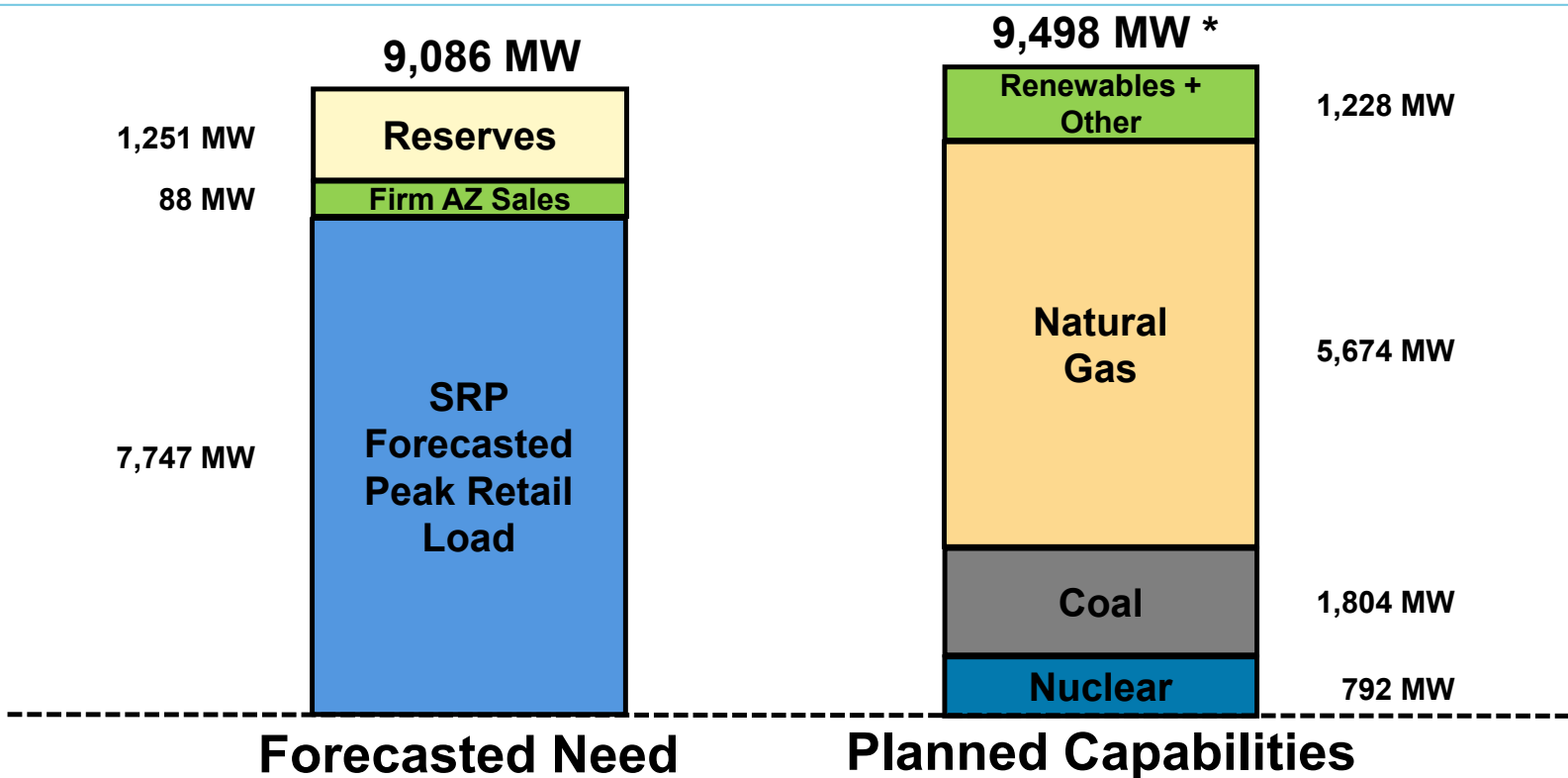
05/25/2023 Power Committee Summer Prep, P. Syrjala and C. Janick



Peak Hour Retail Load Forecast



Summer 2023 Outlook



* Up to 400 MW is at risk due to solar delays, supply chain constraints, interconnection challenges, and drought conditions

Resource Challenges

- Solar Delays
 - U.S. customs inspections
- Operational Risks
 - Battery technology integration
- Supply Chain Constraints
 - Longer equipment lead times
- Interconnection Challenges
 - Permits, outage coordination
- Drought Conditions
 - Reduced hydro output

05/25/2023 Power Committee Summer Prep, P. Syrjala and C. Janick



Supply-chain squeeze: Solar, storage industries grapple with delays, price spikes as demand continues to grow

Developers are facing price pressures and uncertainties that are making it difficult to complete the projects in their pipeline — or procure new ones, experts say.

Fuel Status

- **Nuclear** - Full requirements under contract.
- **Coal** - Full requirements under contract. Inventory at coal plants are at/above target levels prior to summer run.

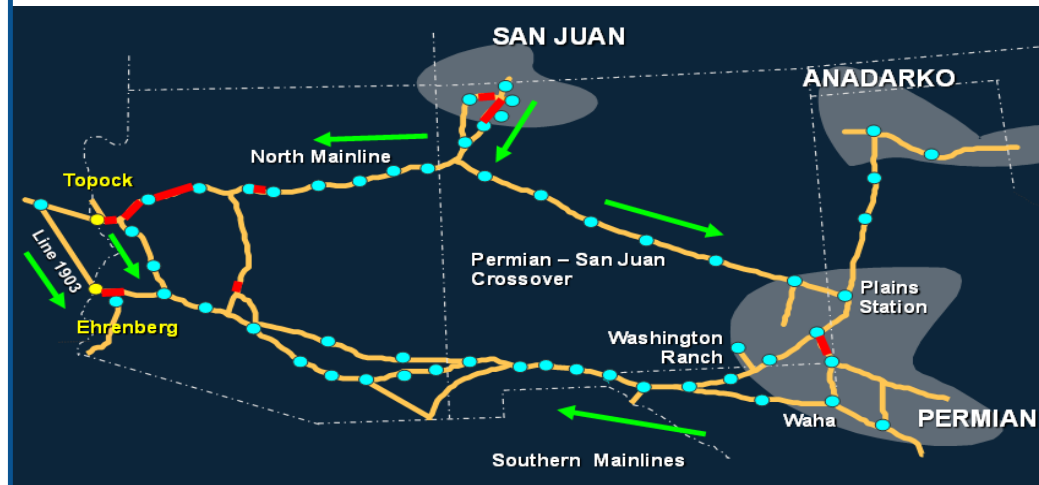


Natural Gas Supply

- Full transport requirements secured balanced between both natural gas pipelines, with access to Permian and San Juan gas basins.
- SRP employs a natural gas hedging program

05/25/2023 Power Committee Summer Prep, P. Syrjala and C. Janick

EPNG Pipelines



Available Capacity and Allocations

04/09/2013

04/10/2013

Transwestern Pipelines



New Resources

Currently Operational:

- Palo Verde Nuclear Generating Station: 104 MW additional ownership
- West Line: 100 MW Utility-Scale Solar

In Development for 2023:

- Sonoran: 260 MW Utility-Scale Solar and Storage
- Storey: 88 MW Utility-Scale Solar and Storage
- Saint: 100 MW Battery Storage addition to existing 100 MW Utility-Scale Solar



Chris Janick

Senior Director Power Delivery

Generation, Transmission & Distribution Readiness

- Asset Management
- Situational Awareness
- Emergency Preparations
- Wildfire Updates
- Operational Readiness



Asset Management

- Risk and data based approach to equipment replacements
- Condition & inspection based proactive and corrective maintenance
- Other preventive maintenance
- Maintenance of cooling systems



Situational Awareness

- Daily operational briefings; twice daily during extreme heat
- Inter-utility coordination & support
- Outage coordination



Emergency Preparations

- Storm, load shed & heat training drills
- Pre-storm equipment staging and staffing
- Outage moratoriums and notifications



Wildfire Updates

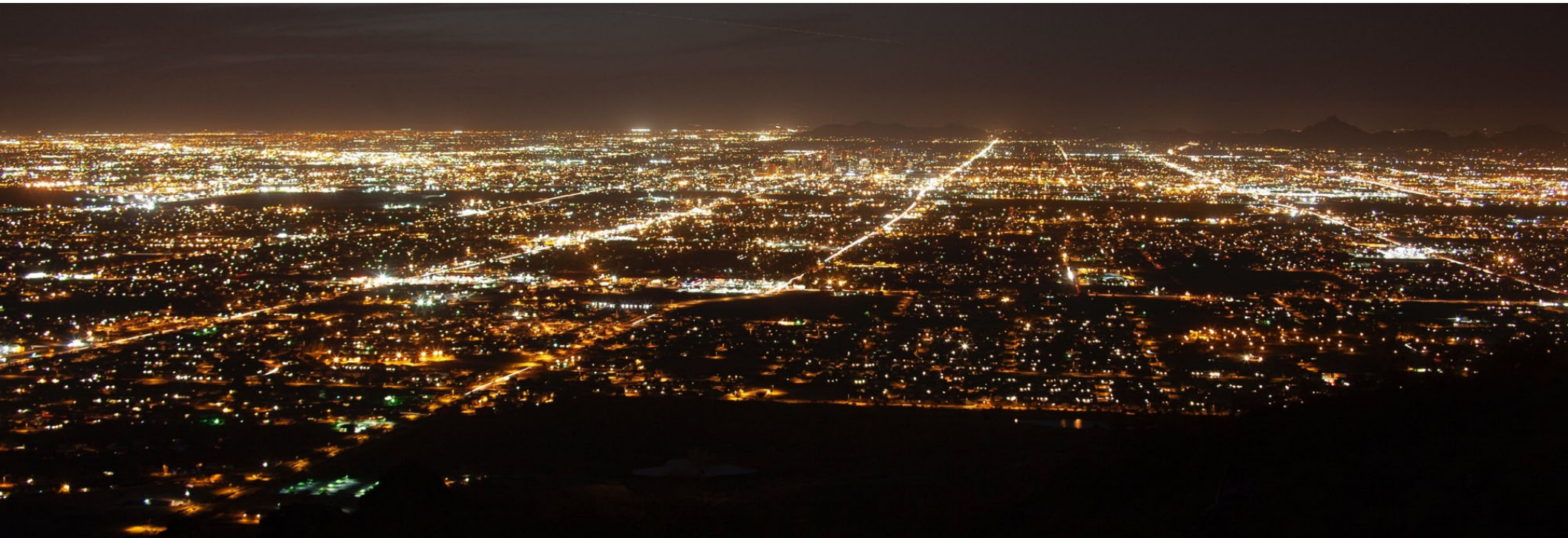
- Application of lessons learned
- Agency collaboration
- Grid incident command
- Fire season reclosing policy
- Vegetation management



Operational Readiness

- Bolster testing
- Reserves strategy
- Forecasting improvements
- PPA technical requirements





SRP is ready and prepared to meet 2023 forecast summer needs

- Fuel is secured
- Energy resources are available to meet peak
- Transmission and distribution assets are prepared
- SRP teams are ready to respond to emergencies

thank you!





Integrated System Plan (ISP) Update

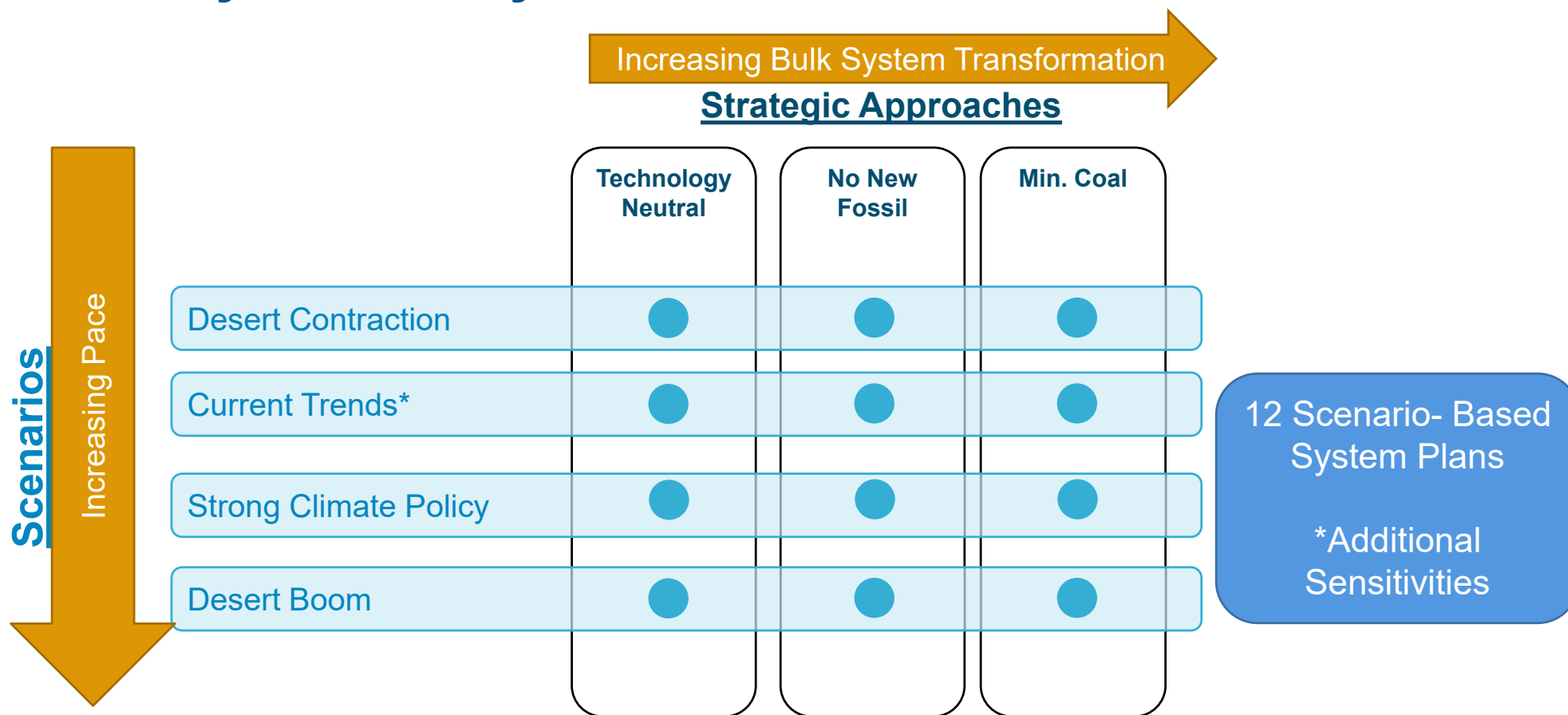
Power Committee

Angie Bond-Simpson, Arne Olson, and Joe Hooker | May 25, 2023

Since We Last Met

- Bulk System Analysis- **Completed**
- Residential Customer Research Phase 3- **Launched**
- Customer and Community Stakeholder Engagement- **Hosted**
 - 3/31 – Regional Market Developments Technical Working Session
 - 4/21 – Advisory Group Meeting
 - 5/12 – Large Stakeholder Group Meeting
 - 5/19 – Advisory Group Meeting

Bulk System Analysis



Long-Term Capacity Expansion Modeling

Arne Olson

Senior Partner, Energy and Environmental Economics (E3)

Joe Hooker

Director, Energy and Environmental Economics (E3)

About Energy and Environmental Economics (E3)



Technical and Strategic Consulting for the Clean Energy Transition

>100 consultants across 4 offices with expertise in economics, mathematics, policy, modeling



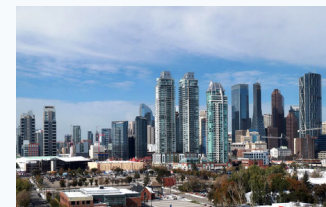
San Francisco



New York



Boston



Calgary

Founded in 1989, Energy + Environmental Economics (E3) is a fast-growing energy consulting firm that helps utilities, regulators, policy makers, developers, and investors make the best strategic decisions possible as they implement new public policies, respond to technological advances, and address customers' shifting expectations.

Long-Term Capacity Expansion Modeling

What generation resources does SRP need to add to its system to maintain reliability and achieve SRP's 2035 Sustainability Goals?

Overview of Long-Term Capacity Expansion Modeling

E3 supported SRP by performing long-term capacity expansion modeling in PLEXOS.

Long-term capacity expansion modeling does the following:

- **Identifies new resource additions in each year 2025-2050**
- Simulates system operations in each year 2025-2050
- Minimizes total cost (new resource additions + operations), subject to various constraints
- Satisfies planning reserve margin (PRM) to ensure resource adequacy in all years
- Satisfies SRP's goals for carbon emissions in 2035 and 2050

Long-term capacity expansion modeling does NOT do the following:

- Detailed 8760 hourly (or sub-hourly) operational analysis
- Detailed transmission system analysis

Bulk System Analysis

Scenarios	Strategic Approaches		
	Technology Neutral	No New Fossil	Minimum Coal
	Desert Contraction		
	Current Trends*		
	Strong Climate Policy		
	Desert Boom		

- On March 10th, we discussed **two bookend cases**
- Today, we will discuss long-term capacity expansion results for the **12 core cases**

* There are additional sensitivities not shown here.

Planning Reserve Margin in 2035

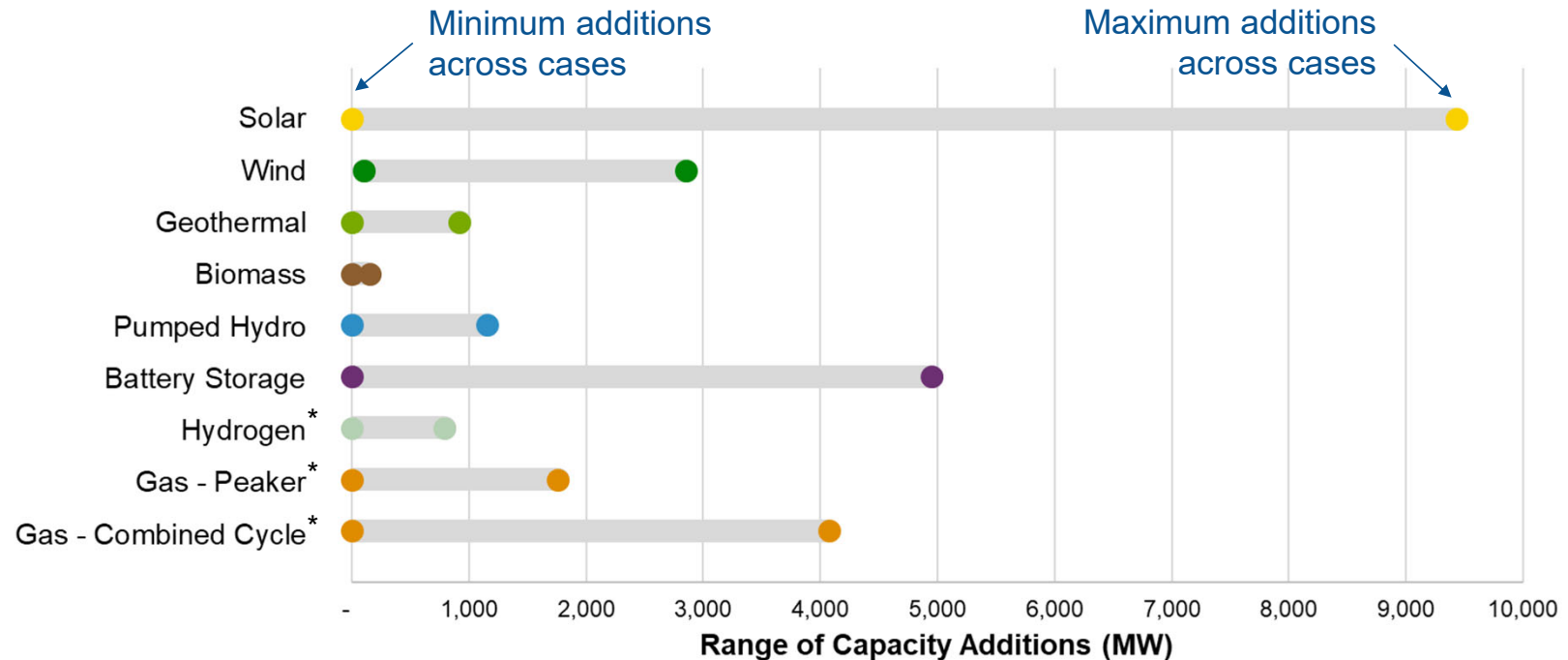
Key Finding: *Without new firm capacity, the system cannot satisfy reliability requirements under a high load growth scenario (Desert Boom). All other cases satisfy the planning reserve margin (PRM) requirement.*

Scenario	Strategic Approach		
	Technology Neutral	No New Fossil	Minimum Coal
Current Trends	✓	✓	✓
Desert Contraction	✓	✓	✓
Desert Boom	✓	~ 500 MW Short	~ 930 MW Short
Strong Climate Policy	✓	✓	✓

Achieve PRM

Fail to Achieve PRM

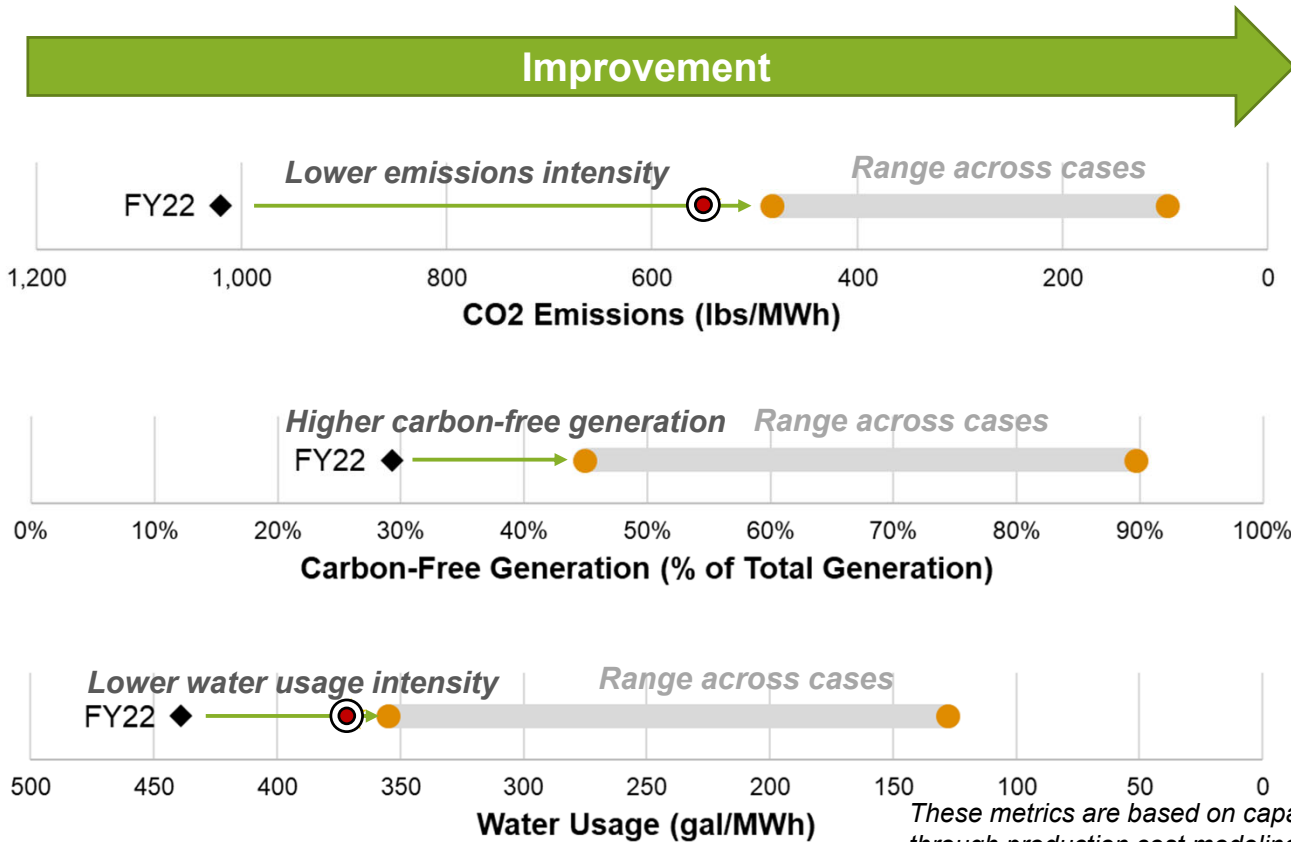
Range of Modeled Capacity Additions (2025-2035)



Notes

- * Hydrogen and natural gas are not included as resource options in all cases.
- Modeled capacity additions do not include additions already planned by SRP to come online.
- This chart excludes cases that are not reliable (Desert Boom, No New Fossil and Desert Boom, Minimum Coal).
- The model did not select Small Modular Reactors or Carbon Capture and Storage by 2035. These are not shown above.

Range of Sustainability Metrics in 2035



Key finding:

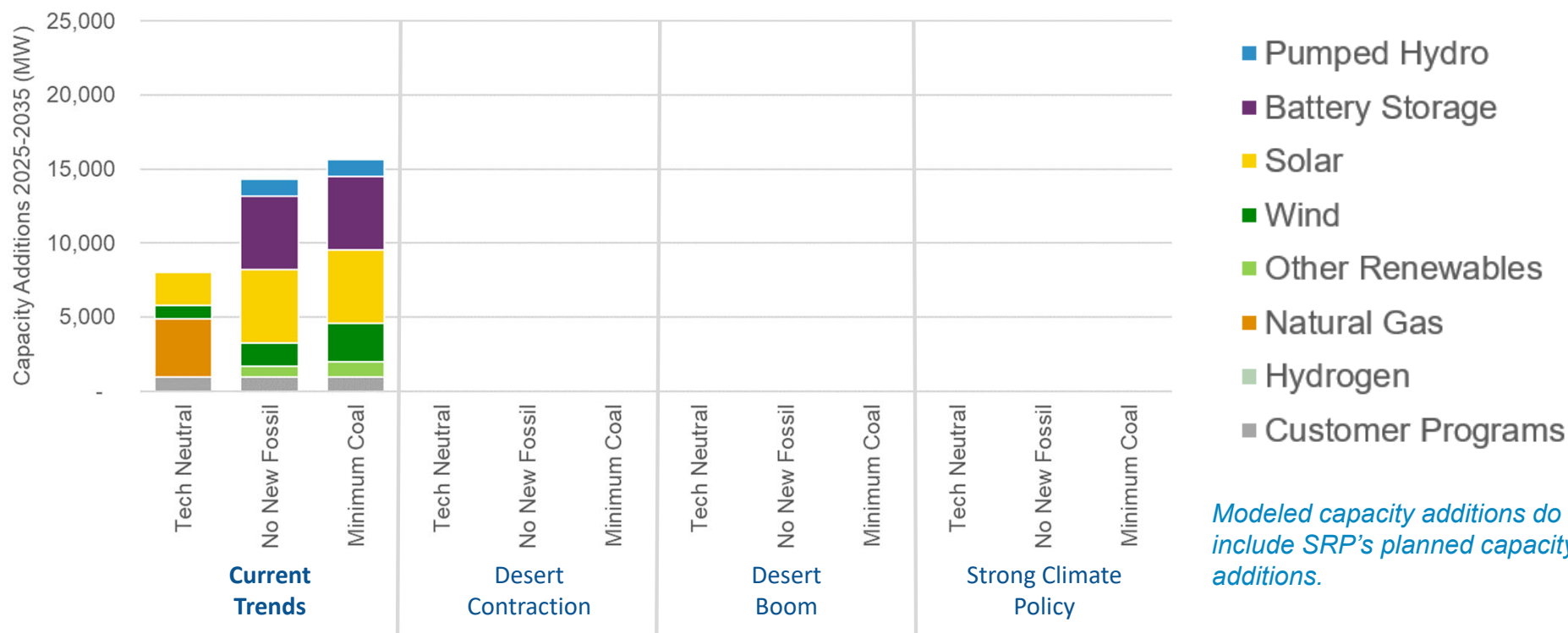
All system plans result in significant improvements in carbon emissions and water usage relative to today's system.

SRP's 2035 Sustainability Goal

These metrics are based on capacity expansion modeling. Detailed operational analysis through production cost modeling will follow and set the basis for the final metrics. This chart excludes cases that are not reliable.

Modeled Capacity Additions, 2025-2035 (MW)

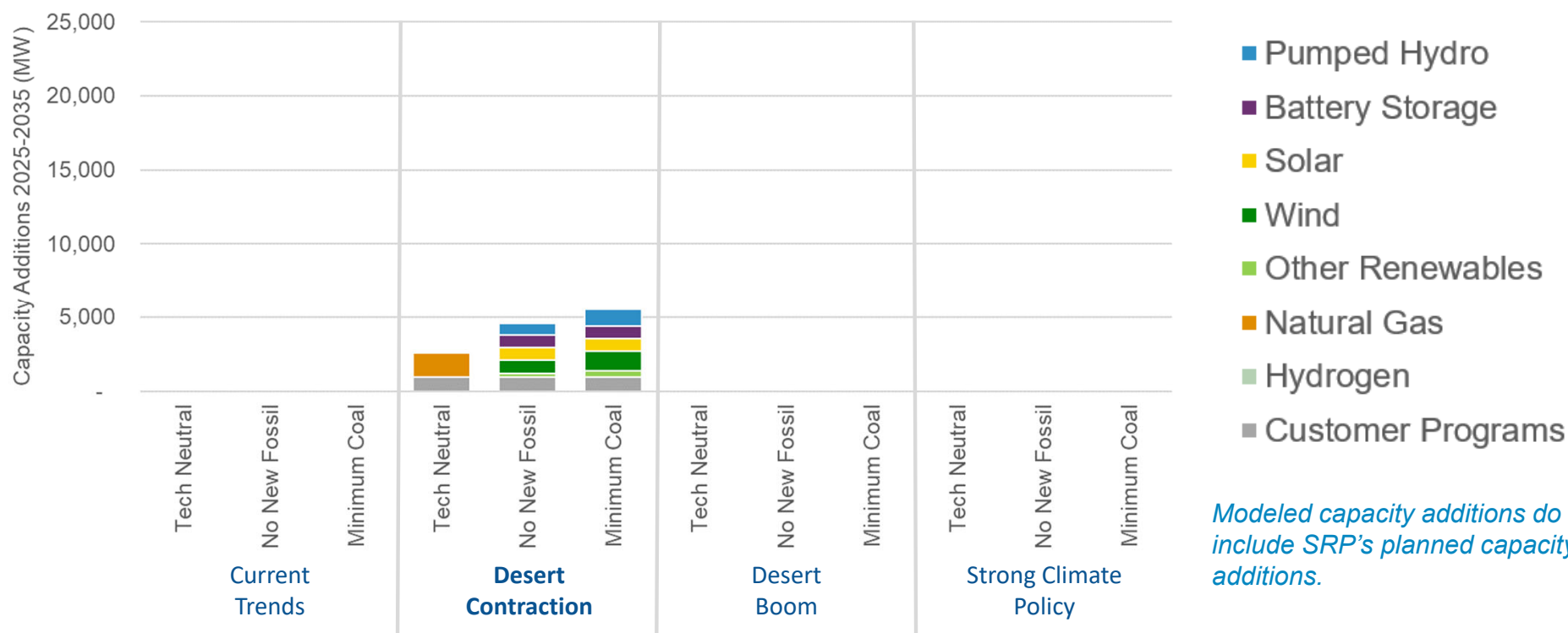
Current Trends: Natural gas (when available) and renewables are part of a least-cost portfolio. Without firm resource options, higher levels of renewables and battery storage are required.



Modeled capacity additions do not include SRP's planned capacity additions.

Modeled Capacity Additions, 2025-2035 (MW)

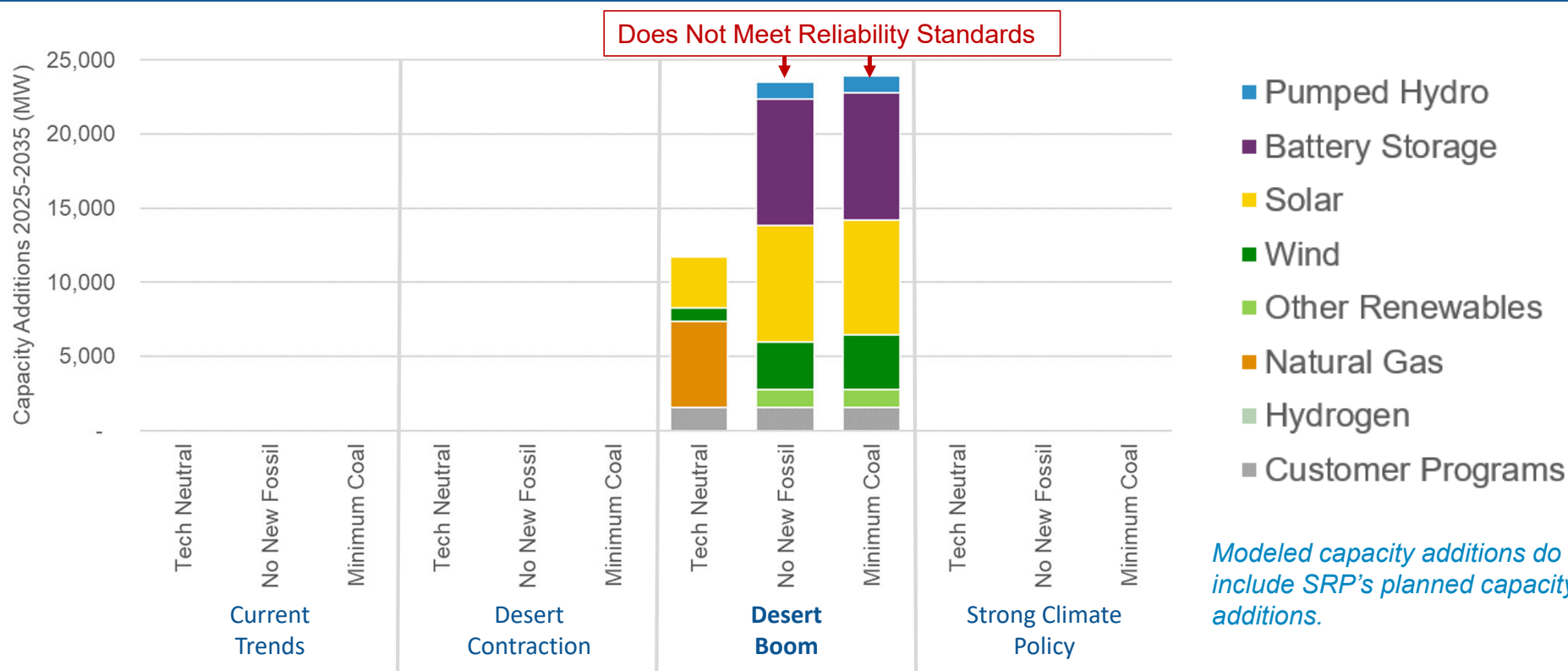
Desert Contraction: *Lower load growth greatly reduces additional capacity needs, particularly for renewables when natural gas is available.*



Modeled capacity additions do not include SRP's planned capacity additions.

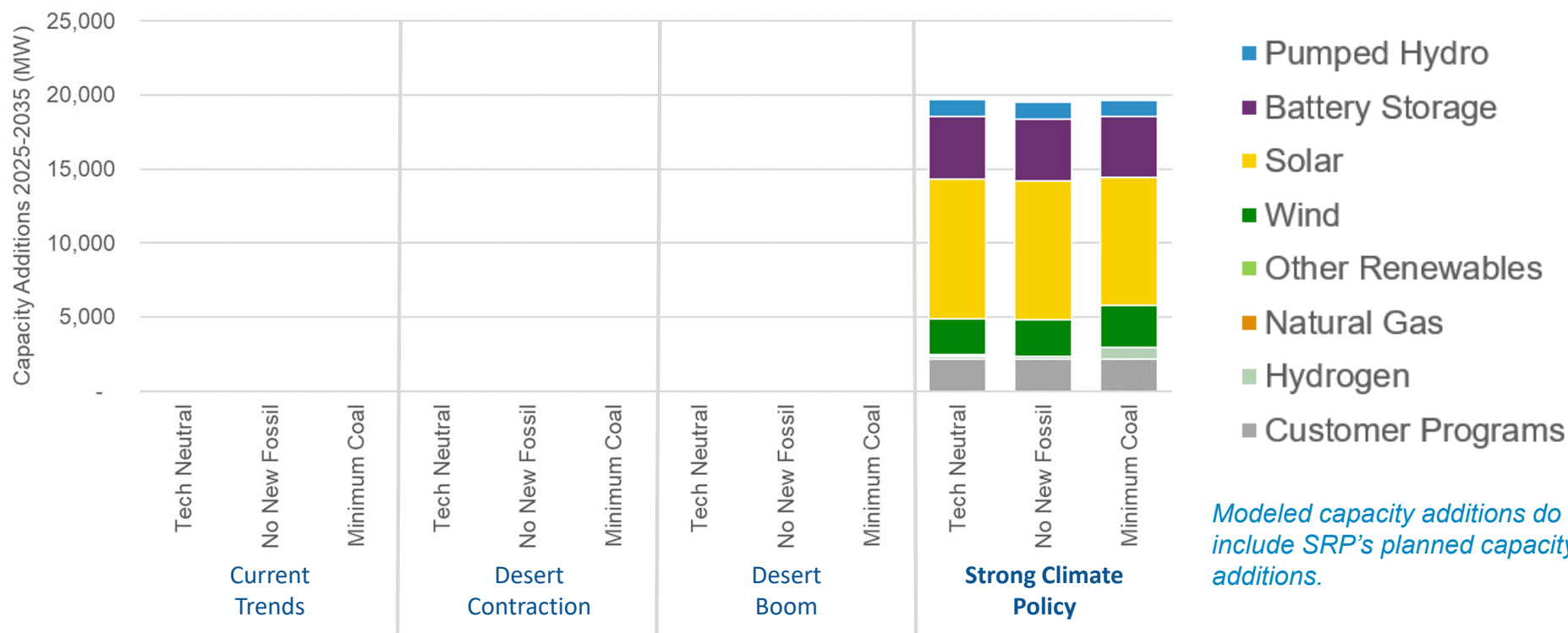
Modeled Capacity Additions, 2025-2035 (MW)

Desert Boom: High load growth requires significantly more capacity additions. Without firm resource options, the system is unable to meet reliability requirements.



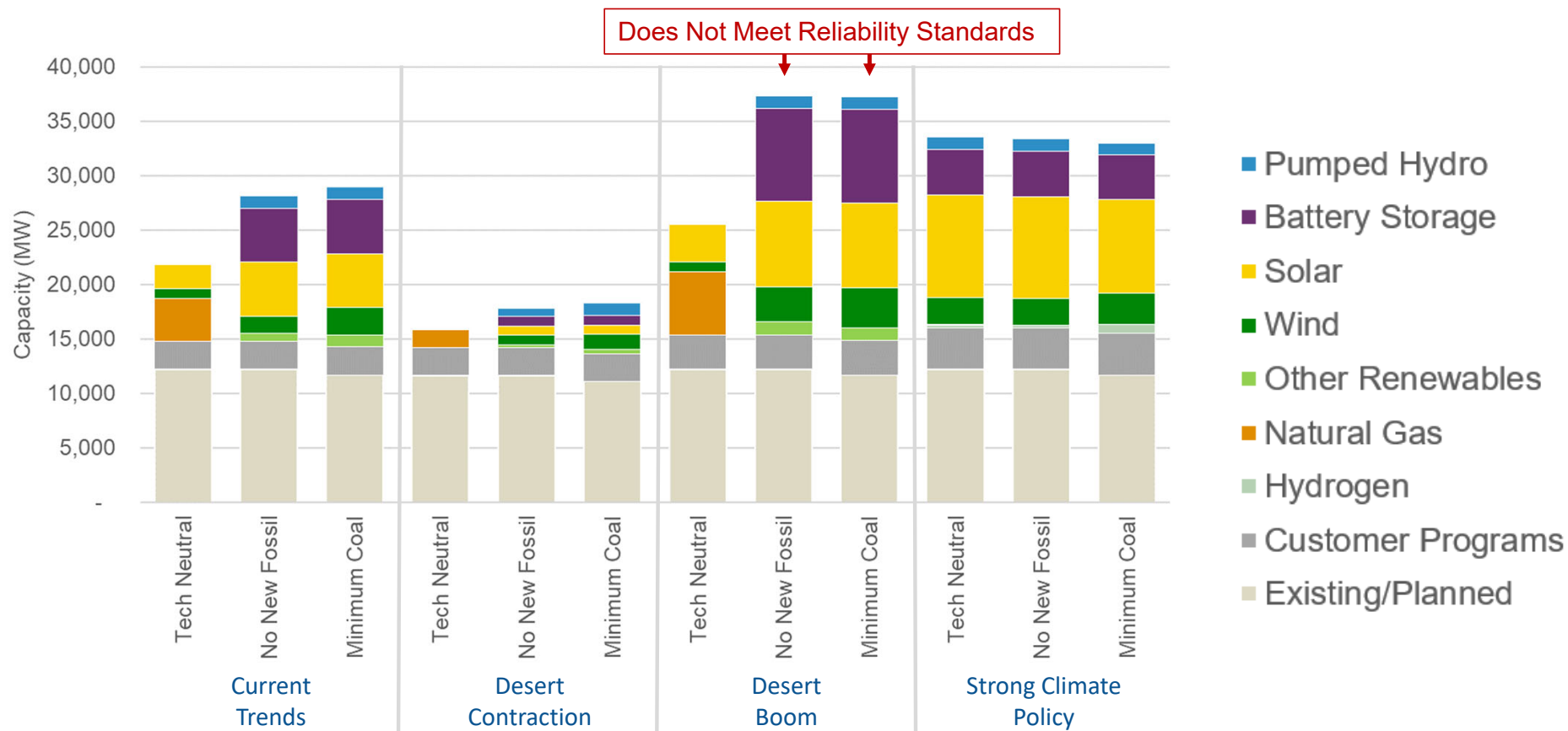
Modeled Capacity Additions, 2025-2035 (MW)

Strong Climate Policy: Meeting strong climate goals requires higher levels of renewables and energy storage. New firm capacity resources (hydrogen and, when available, natural gas) help ensure reliability.



Total Capacity, 2035 (MW)

With Existing and Planned Capacity



Key Findings

- SRP will need to build up to 7 times as many resources in the next decade than in the last decade to serve customers while achieving reliability and sustainability goals
 - Solar plus storage and wind provide low-cost energy, while firm resources (e.g., natural gas, hydrogen) provide low-cost capacity to serve reliability needs
- Without new firm capacity, the system cannot satisfy reliability requirements under a high load growth scenario (Desert Boom)
- SRP is well positioned to surpass its 2035 Sustainability Goals for carbon emissions reductions and water usage reductions at power plants across all system plans
- If the US government enacted a mandate for 85% CO2 reductions by 2035 (Strong Climate Policy), SRP would need to accelerate renewable & storage deployment significantly

Transmission Planning Key Findings

Angie Bond-Simpson

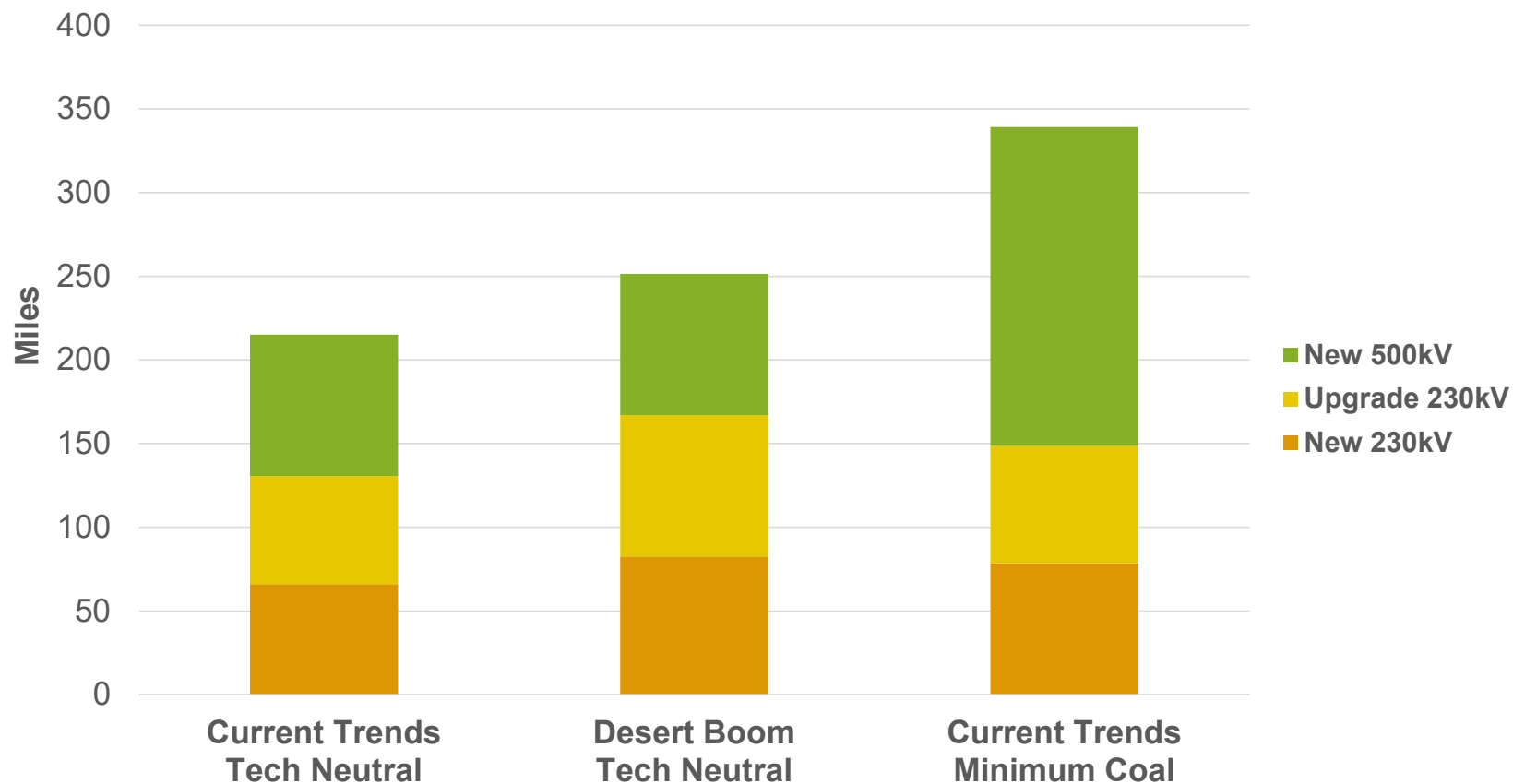
Director, SRP Integrated System Planning & Support

Transmission Planning

What new transmission infrastructure is needed to deliver energy reliably to SRP's Service Territory?

Transmission Planning

Average Transmission Line Upgrades and Additions



Transmission Key Findings

- Location of generation matters
- Most impact on 230kV transmission system
- Some 500kV transmission on west side is needed in all scenarios
- Ability to build gas plays a significant role in 500kV transmission needs
- Additional transmission evaluation will provide a more complete picture

ISP Next Steps

- Compile affordability, reliability, and sustainability metrics for the ISP analysis
- Residential customer research phase 3
- August Board and Council study session

thank you!



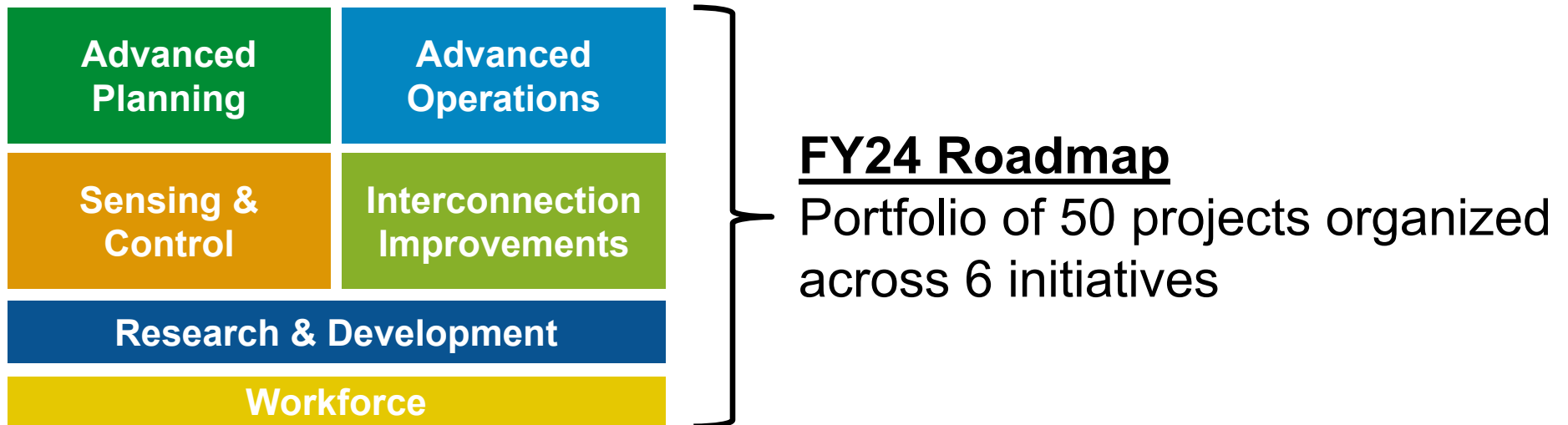
An aerial photograph of a city, likely Phoenix, Arizona, showing a dense urban area with many trees and buildings. In the background, there are prominent mountains under a clear sky. The lighting suggests it might be early morning or late afternoon.

Advanced Customer-Grid Applications Current Outlook

Power Committee Presentation
May 25th, 2023

Distribution Enablement Strategy

Corporate 2035 Goal: Enable the interconnection of all customer-sided resources, without technical constraint, while ensuring current levels of grid integrity and customer satisfaction.



Potential Advanced Customer-Grid Applications

Customer-Grid Applications refer to customer owned resources that integrate with the grid via active control

Application	Today	Potential
Managed EV Charging	Passive via pricing	Active via grid control
Customer Storage	Passive via pricing	Active via grid control for large customers
Microgrids	n/a	Active via grid control
Virtual Power Plants*	Active via grid control for smart thermostats	Active via grid control for supply & demand resources
Vehicle-to-Grid	n/a	Active via grid control
Wholesale Markets	n/a for distribution	Active via market control for DERs

* Includes Demand Response

Potential Advanced Customer-Grid Applications

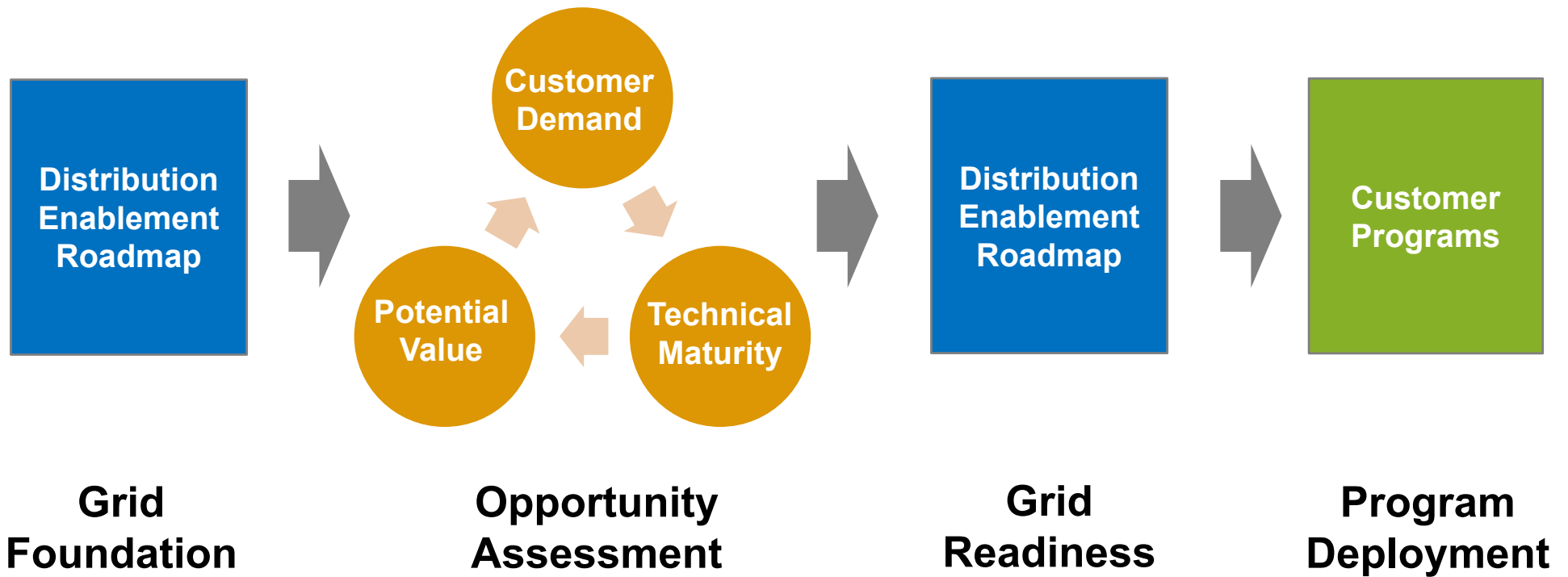
Customer-Grid Applications refer to customer owned resources that integrate with the grid via active control

Today's Discussion Scope

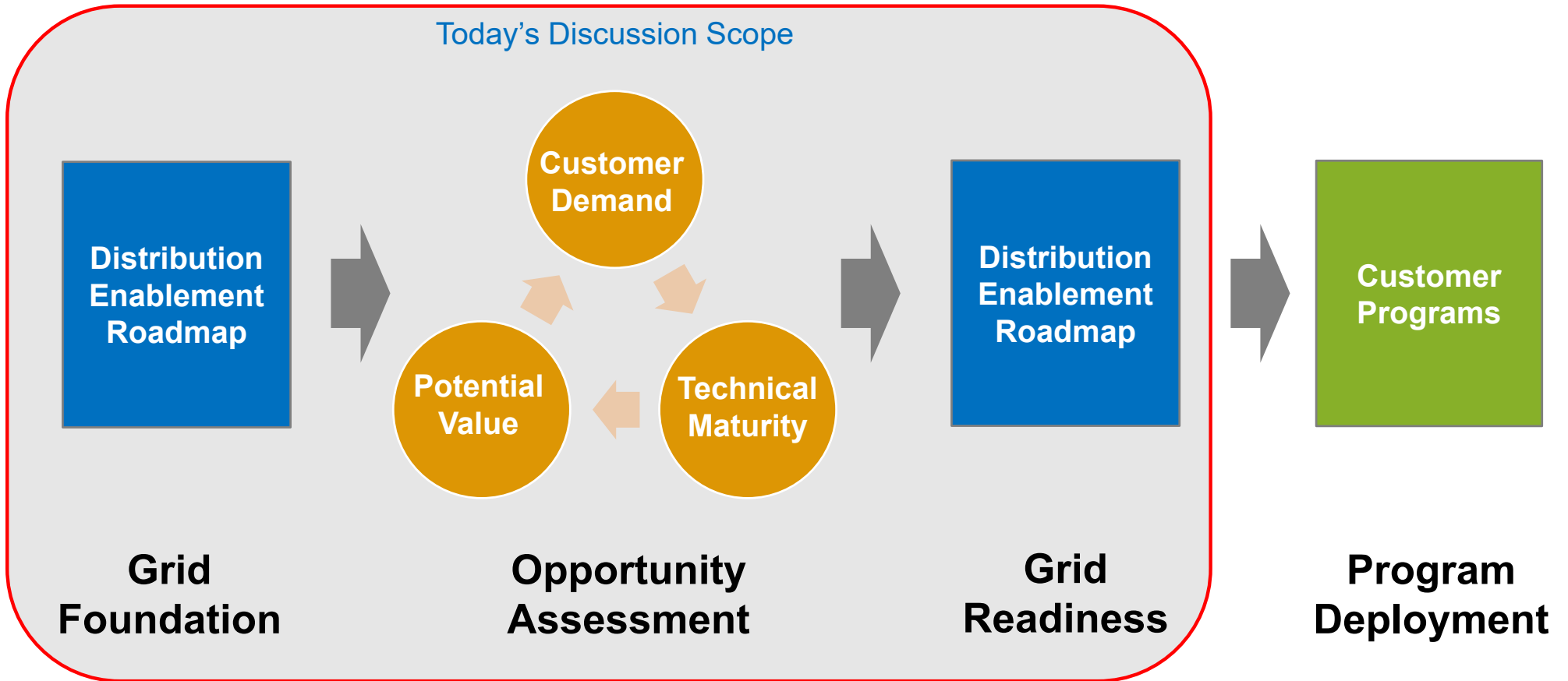
Application	Today	Potential
Managed EV Charging	Passive via pricing	Active via grid control
Customer Storage	Passive via pricing	Active via grid control for large customers
Microgrids	n/a	Active via grid control
Virtual Power Plants*	Active via grid control for smart thermostats	Active via grid control for supply & demand resources
Vehicle-to-Grid	n/a	Active via grid control
Wholesale Markets	n/a for distribution	Active via market control for DERs

* Includes Demand Response

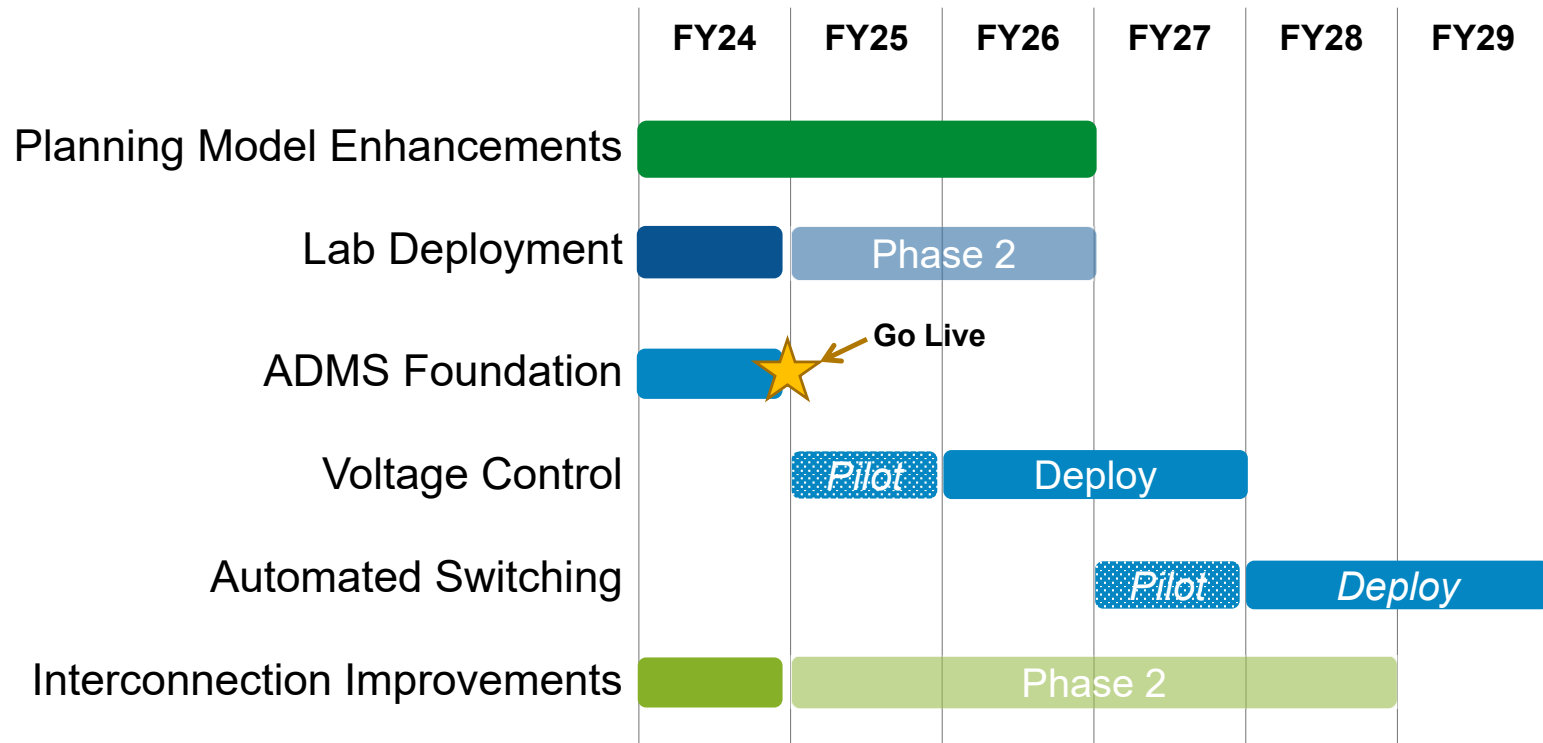
SRP Customer-Grid Application Approach





















SRP Customer-Grid Application Approach



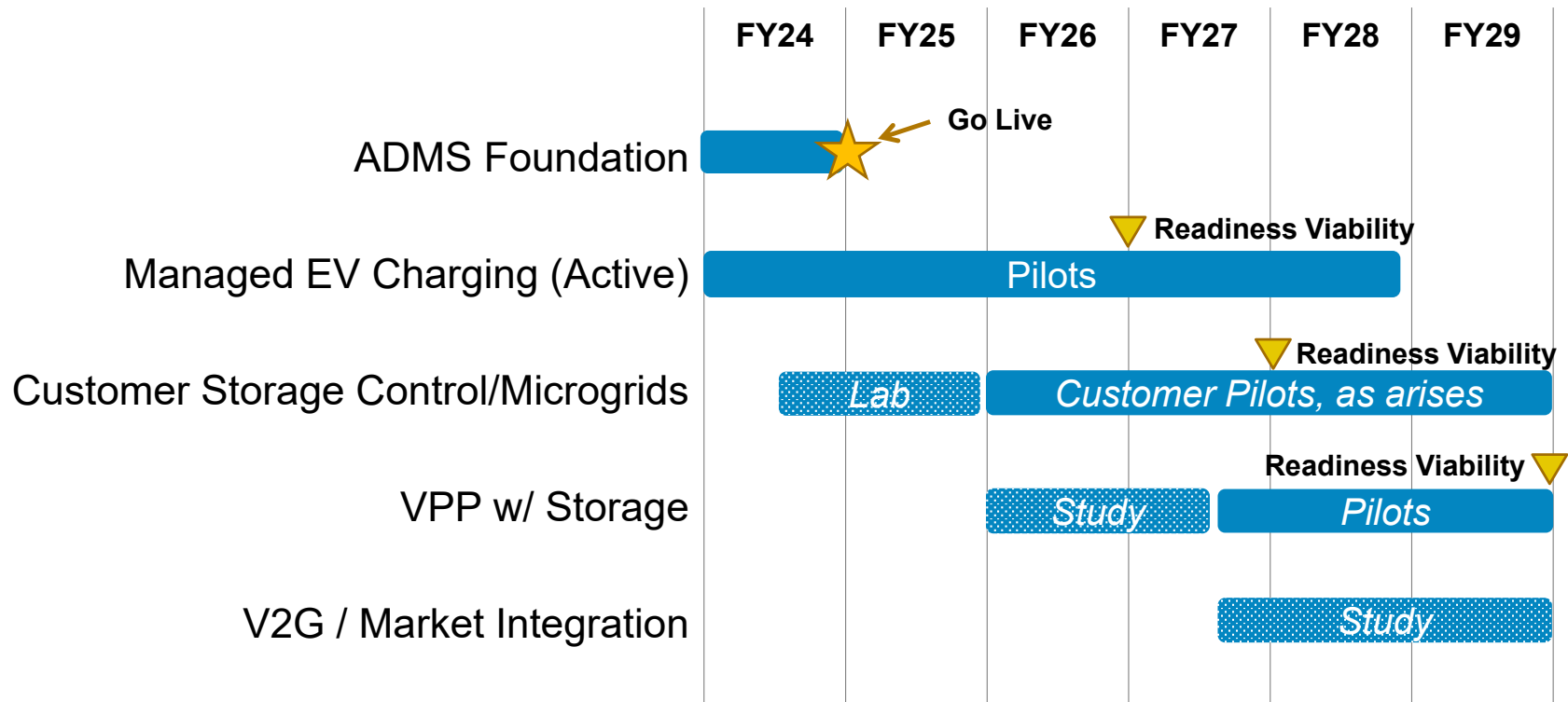
Grid Foundation – Key Projects



Opportunity Assessment - Customer-Grid

Advanced Application	Customer Demand	Technical Maturity	Potential Value	Comments
Managed EV Charging (Active)				<i>Pilots in progress, high potential value to shift charging off-peak</i>
Large Customer Storage Control				<i>Market evolving and growing, customer demand is low</i>
Microgrids				<i>Limited demand in SRP Territory, requires customized solutions</i>
Virtual Power Plants (VPP) w/ Storage				<i>Market needs to expand & mature, More density for local control</i>
Vehicle to Grid (V2G)				<i>Market & technology needs to scale, charger cost high</i>
Wholesale Market Integration				<i>Requires market structure evolution</i>

Grid Readiness - Application Schedule



Advanced Customer-Grid Application Summary

Outlook for Customer-Grid applications is evolving and requires an iterative approach to prioritize efforts and maximize value

- 1) Deployment of the Grid Foundation is in progress – required for all applications
- 2) Ongoing Opportunity Assessment of Advanced Customer-Grid Applications
- 3) Informed and prioritized development, testing and implementation of Grid Readiness investments
- 4) Enables deployment of Customer Programs

