

SRP Summer Stakeholder Series: Since We Last Met

June 16, 2021

Welcome

Kelly Barr

Associate General Manager

Chief Strategy and Corporate Services & Sustainability Executive

Welcome SRP Board and Council Observers



John Hoopes
SRP Board Vice President



Randy Miller
SRP Board Member



Anda McAfee
SRP Board Member



Jack White
SRP Board Member



Larry Rovey
SRP Board Member



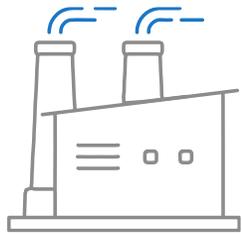
Suzanne Naylor
SRP Council Member



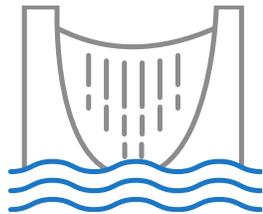
Rocky Shelton
SRP Council Member



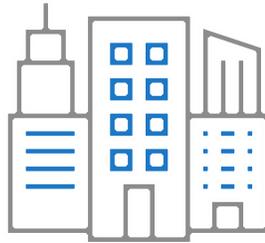
SRP 2035 Sustainability Goals



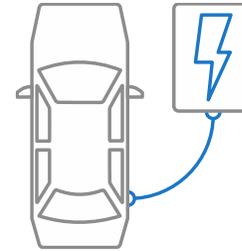
**Carbon
Footprint**



**Water
Resiliency**



**Supply Chain &
Waste Reduction**

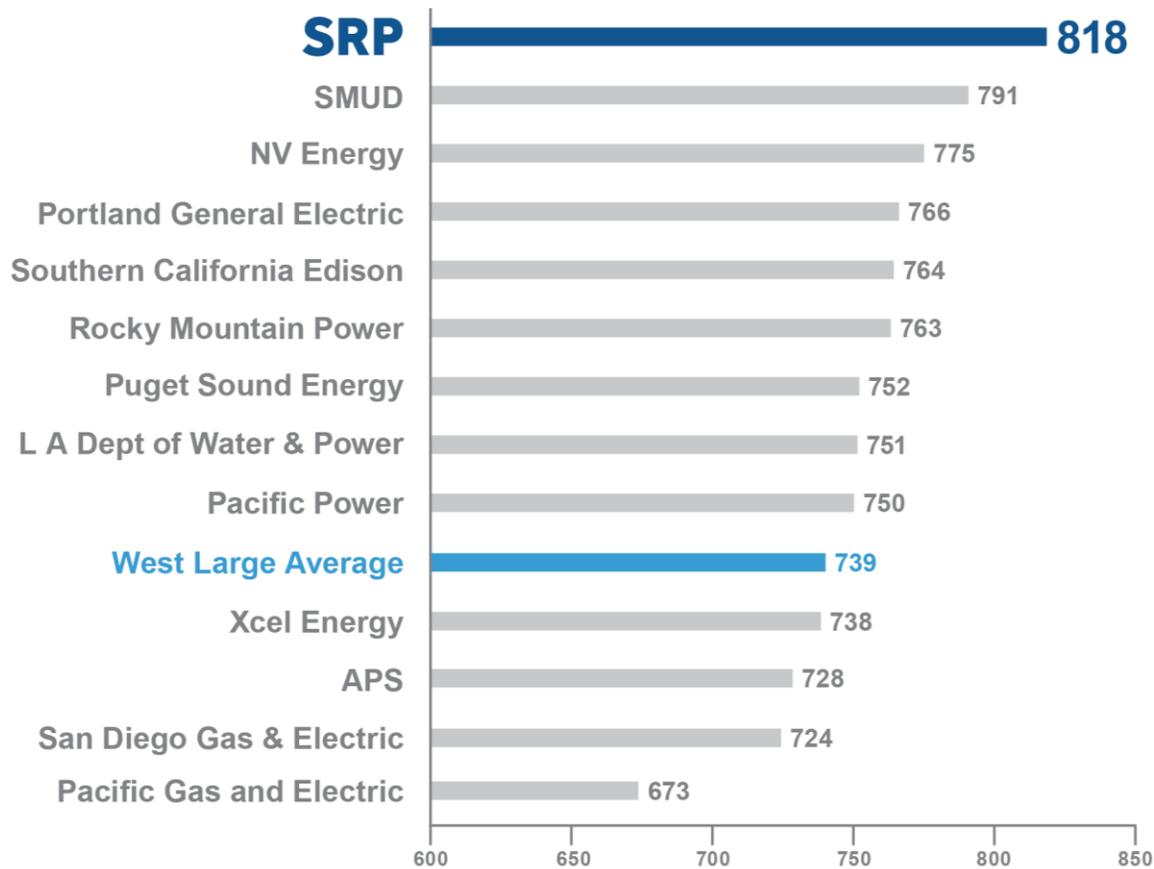


**Customer &
Grid Enablement**



**Customer,
Community &
Employee
Engagement**

Customer Satisfaction



J.D. Power

No. 1

Electric Utility
Residential Customer
Satisfaction in the West

safety minute

Heat Stress

Symptoms of Heat Exhaustion/Stroke

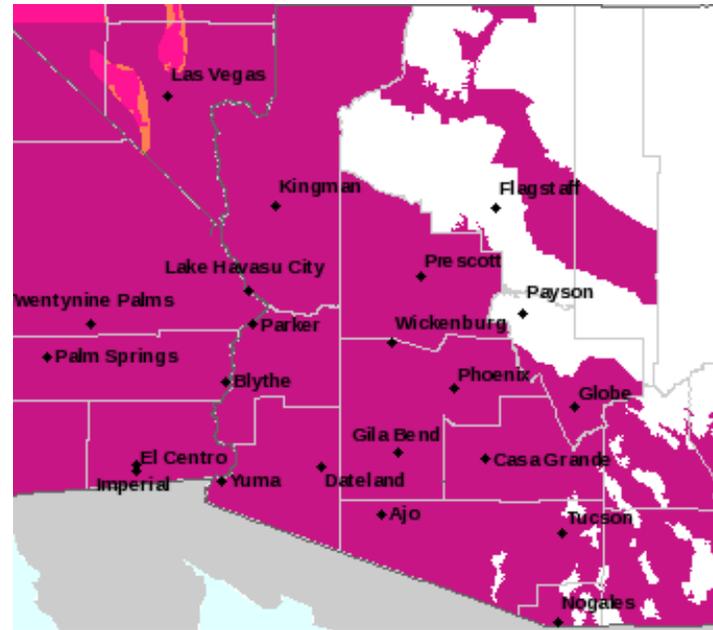
- Headache, dizziness, cramps
- Irritability, confusion, nausea, vomiting

Prevention

- Limit activity to nights and mornings
- Take frequent breaks in shady areas
- Hydrate, hydrate, hydrate!

azcentral.

Weeklong excessive heat warning issued for central Arizona; temps to reach up to 117



sustainability minute

Plastic Waste

800 million tons of plastic end up in our oceans each year

Enjoy water without waste

- Reusable water bottles - saves on average 156 plastic bottles annually
- Home filter - for a family of 4, a filter can save on average \$400 per year



Series and Meeting Overview

Kim Hartmann
Facilitator (KCH Solutions LLC)

Summer Stakeholder Series Program

June "Since We Last Met"

Objective: Update on actions taken in accordance with the Strategic Resource Directions from the 2017-2018 Integrated Resource Plan

Overview of Topics:

2017-2018 Integrated Resource Plan Refresh

2017-2018 Integrated Resource Plan Strategic Direction Progress

System Planning Foundations (Distribution, Transmission & Load Growth)

July "Near Term Planning"

Objective: Educate on forces of change affecting the industry and SRP's near-term planning focus

Overview of Topics:

Integrated Resource Plan to Integrated System Plan Transition

Current Planning Environment

Near Term Reliability Challenges & Solutions

August "Where We Want To Go"

Objective: Engage stakeholders in early development of the ISP

Overview of Topics:

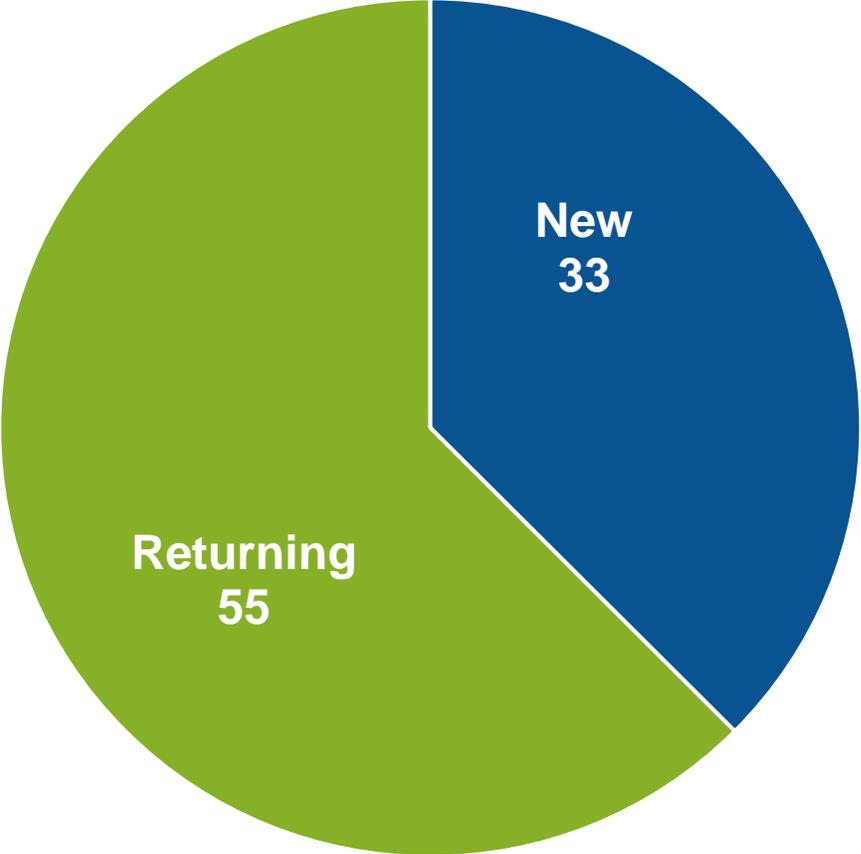
Integrated System Plan Objectives

Stakeholder Involvement Opportunities

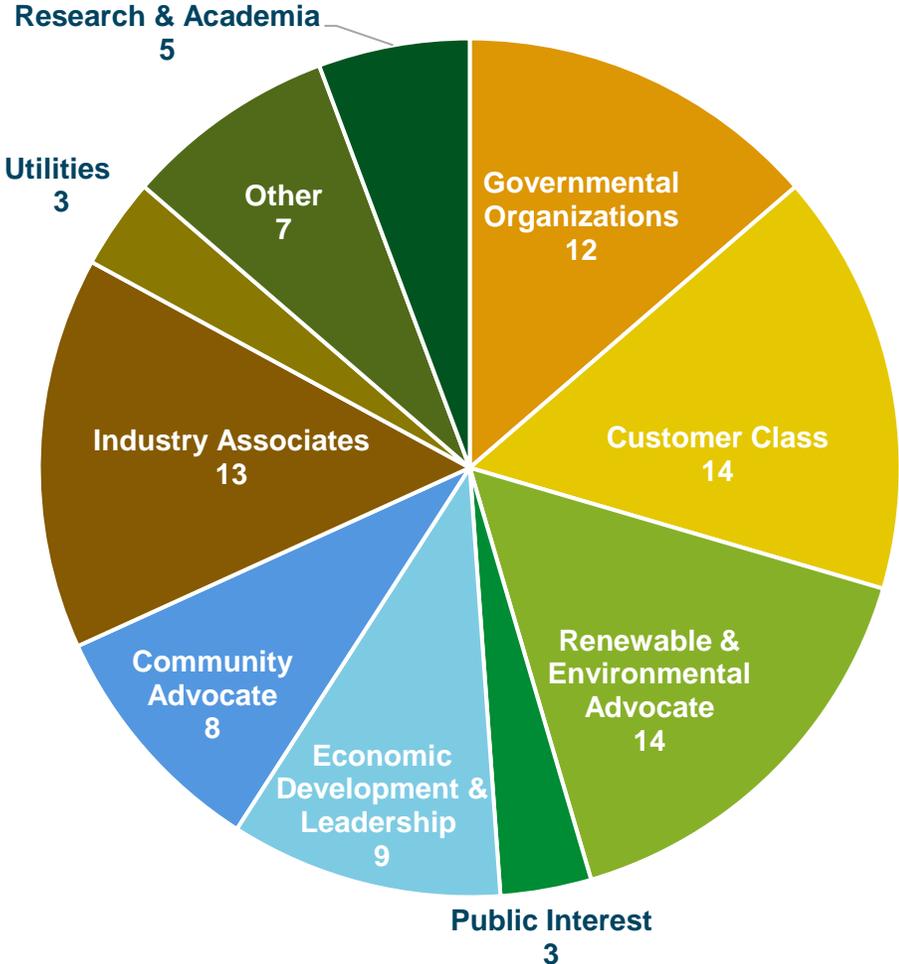
Preliminary Integrated System Plan Metric Considerations

Community Stakeholder Participation

Returning & New Stakeholder



Industry/Sectors Represented by Stakeholder



Meeting Protocols

- Engagement and active participation
- Respectful and inclusive dialogue
- Chatham House rules

- Breaks when necessary (please return!)
- Notetaking matrix
- Q&A feature for questions
- Zoom poll (pulse survey) & chat box for feedback
- Microphone mostly turned off



Agenda Overview

Time	Topics	Presenter
9:30 – 9:40	Welcome	Kelly Barr
9:40 – 9:50	Series and Meeting Overview	Kim Hartmann
9:50 – 10:00	Integrated Resource Plan (IRP) Refresh	Angie Bond-Simpson
10:00 – 11:00	IRP Strategic Directions Progress	Strategic Directions Leaders
11:00 – 11:25	System Planning Foundations	Planning Department Leaders
11:25 – 11:30	Next Steps Systems Planning	Angie Bond-Simpson

Integrated System Planning (ISP) Timeline

We are here



2021

Jan

Mar

May

Jul

Sep

Nov

2022

Mar

May

Jul

Sep

Nov

2022

Align

Prepare

Analyze

Synthesize

Board Engagement and Stakeholder Outreach

Publish ISP

ISP

Integrated Resource Plan (IRP) Refresh

Angie Bond-Simpson

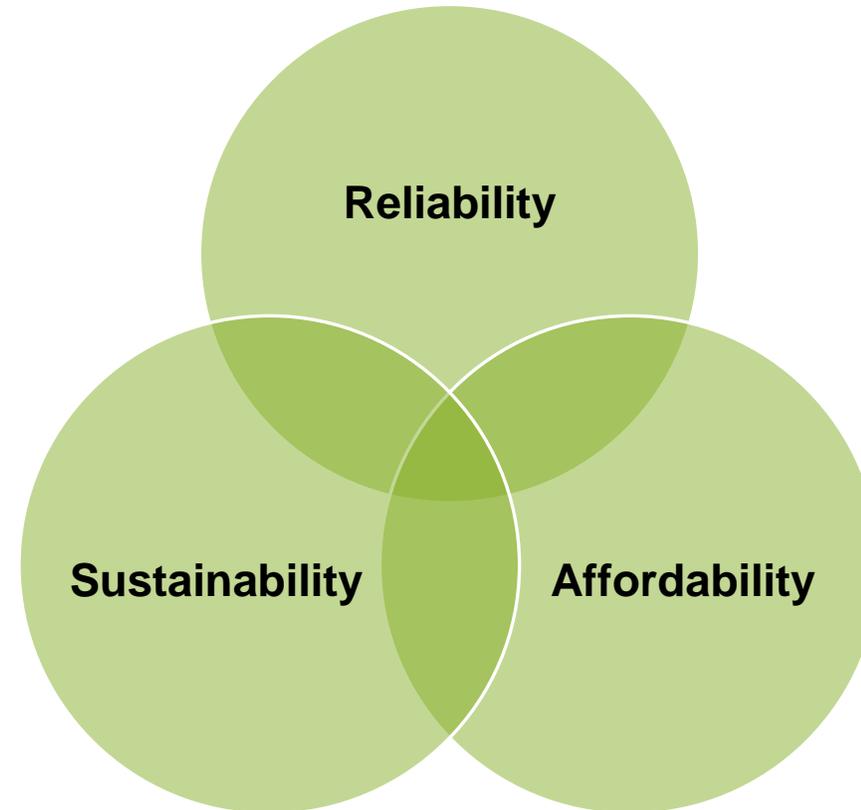
Manager

Integrated System Planning & Support (SRP)

What do we mean by Resources?

Resources are both the power plants generating electricity and the customer partnerships to reduce energy. Planning for new resources requires careful consideration of:

- Customer needs
- Safety
- Siting & permitting
- Financing
- Workforce
- Community
- Uncertainty

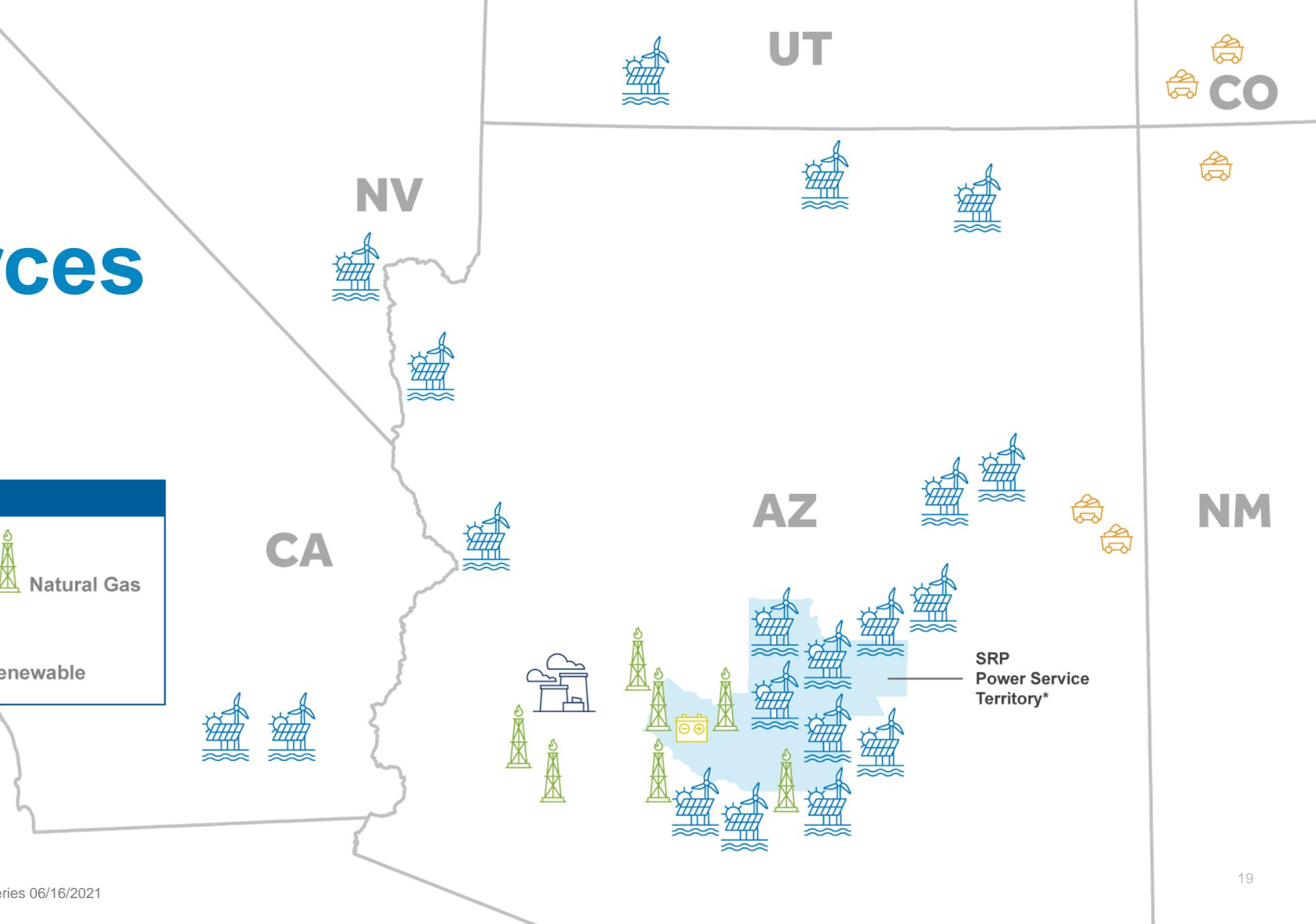


SRP Resources Today

LEGEND

 Battery	 Coal	 Natural Gas
 Nuclear	 Renewable	

*Please note map is not to scale.

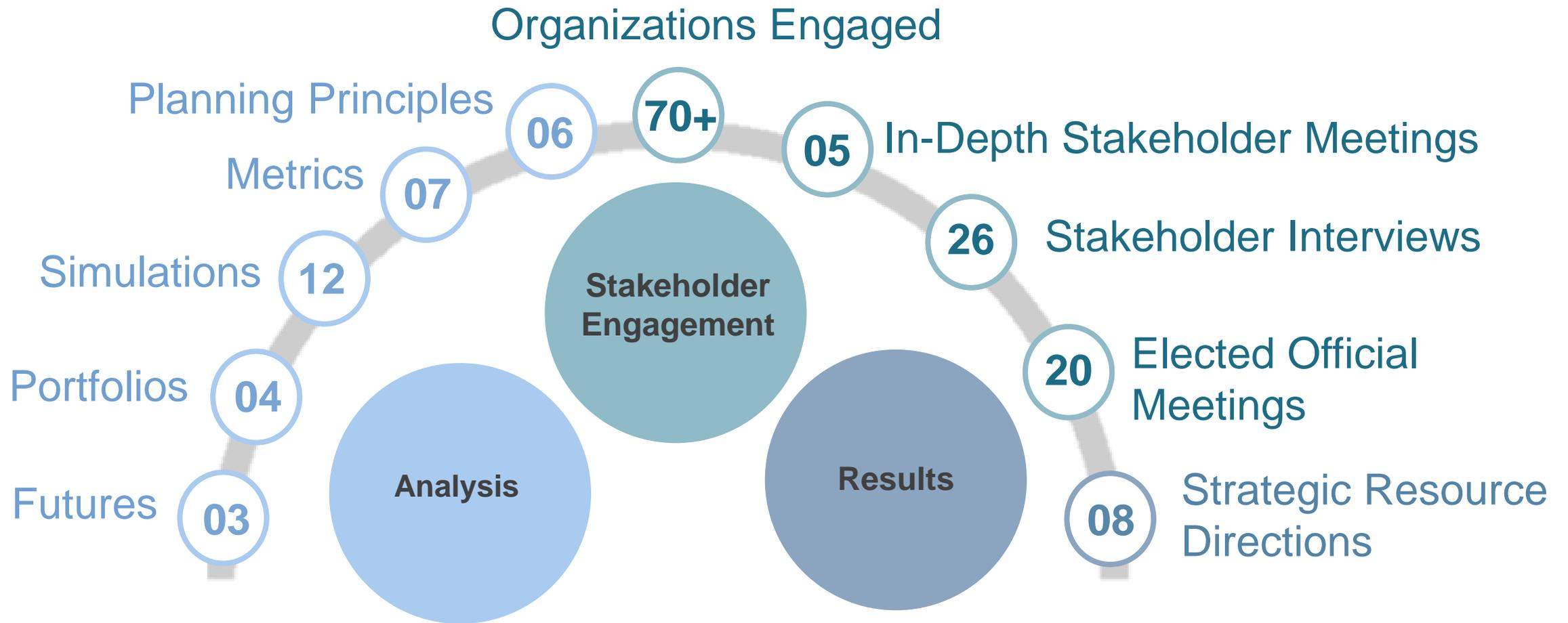


A Look in the Rearview Mirror

2017 Integrated Resource Plan (IRP) Purpose

- Conduct a **robust analysis** of the business environment and resource options
- Educate and inform **balanced stakeholder** groups, **seek input**, and respond to questions
- Ensure that the resource strategic conclusion **aligns with SRP Board** policies and direction

2017 IRP By the Numbers



Strategic Resource Directions



Grow renewables



Reduce coal



Preserve option for new nuclear



Develop and promote customer programs



Seek battery alternatives



Develop flexible natural gas



Expand participation in regional transmission markets



Focus research on new technologies for generation, load management, storage and electrification

IRP Strategic Direction Progress

Pulse Survey

- ❑ Given the Strategic Directions, on a scale of 1 to 5, how satisfied are you with SRP's overall progress? select one (zoom poll):
 - ❑ 1 = not satisfied, 2 = partially satisfied, 3 = moderately satisfied, 4 = mostly satisfied,
 - ❑ 5 = strongly satisfied, N/A = No Opinion

- ❑ What do you appreciate about the overall progress of the IRP strategic directions? (chat box)

- ❑ What would you like to see more of, better, or differently regarding the overall progress of the IRP strategic directions? (chat box)

Renewables & Energy Storage

Barry Petrey

Manager

Resource Acquisition (SRP)



2019 IRP Feedback: Renewables

What do you appreciate?

- Focus on helping **Navajo Nation** transition from coal and add more solar
- Commitment to **solar**
- Large procurements benefiting from **economies of scale**

What would you like SRP to do more of, better or differently?

- More **wind** now that turbine technology has improved
- Increasing commitment to renewables
- Criteria for **socially responsible** procurement

Expanded Solar Commitment

- 1000 MW by 2025 Commitment in 2018
 - Reduce CO₂ intensity and manage costs
 - Expand opportunities for customer dedicated projects
 - Sustainable Energy Offering benefits 33 commercial customers
- Increasing to 2,025 MW by 2025
 - 450 MW enabled by SRP commercial customer to meet its renewable commitments
 - 648 MW online or under contract
 - 1377 MW in progress for procurement



2025 MW of Solar by 2025

2020



2020

East Line 100MW



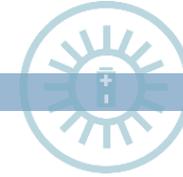
2020

Saint 100MW



2021

Central Line 100MW



2023

Sonoran 260MW & Storey
88MW Solar + Storage



2022-2024

Additional Projects 1,377MW

2024

Project: East Line

Developer: sPower/AES

Size: 100 MW

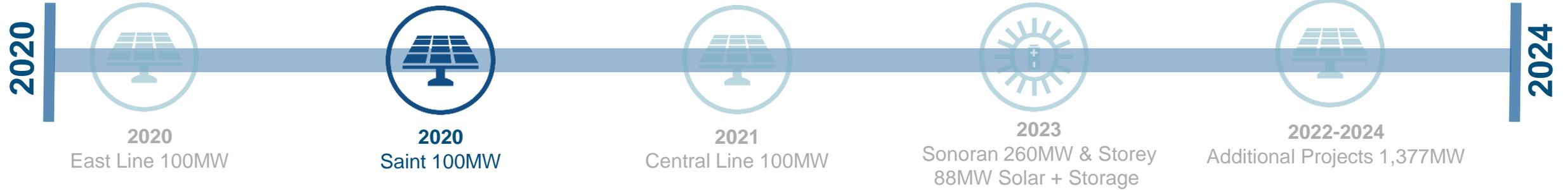
Status: Online

Commercial Operation Date (COD): 2020

Location: Coolidge, AZ



2025 MW of Solar by 2025



Project: Saint
Developer: NextEra
Size: 100 MW
Status: Online
Commercial Operation Date (COD): 2020
Location: Coolidge, AZ



2025 MW of Solar by 2025



Project: Central Line
Developer: sPower/AES
Size: 100 MW
Status: Under Development
Commercial Operation Date (COD): 2021
Location: Coolidge/Eloy, AZ



2025 MW of Solar by 2025

2020



2020

East Line 100MW



2020

Saint 100MW



2021

Central Line 100MW



2023

Sonoran 260MW & Storey
88MW Solar + Storage



2022-2024

Additional Projects 1,377MW

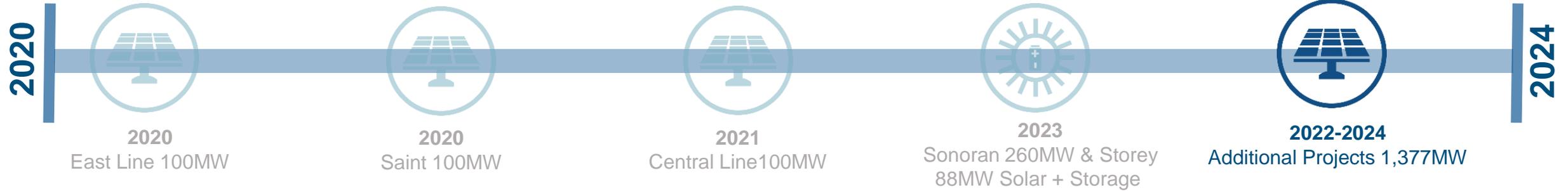
2024

Project: Sonoran
Developer: NextEra
Size: 260 MW/ 1,040 MWh
Status: Under Development
Commercial Operation Date (COD): 2023
Location: Little Rainbow Valley, near Gila Bend, AZ

Project: Storey
Developer: NextEra
Size: 88 MW/ 264 MWh
Status: Under Development
Commercial Operation Date (COD): 2023
Location: Coolidge, AZ



2025 MW of Solar by 2025



Project: Additional Projects

Developer: Various

Size: 1,377 MW

Status: Various stages of procurement and negotiation

Commercial Operation Date (COD): 2022-2024



Other Renewables



Geothermal - Additional 69 MW



Wind RFI

Questions?



2019 IRP Feedback: Energy Storage

What do you appreciate?

- Combining battery storage with solar
- Piloting projects, and waiting for cost to stabilize

What would you like SRP to do more of, better or differently?

- Exploration of other storage technologies
- Move faster with storage

Energy Storage Update: Developed Projects

2018



2018

Pinal Central Energy Center
Solar + Battery PPA 20MW
Solar & 10MW 4-hr



2019

Dorman Energy Center
PPA 10 MW 4-hr



2021

Bolster Battery
25 MW 4-Hr



2023

Sonoran 260MW & Storey
88MW Solar + Storage

2024

Project: Pinal Central Energy Center
Size: 10 MW 4-hour duration, 40 MWh
Configuration: Paired and charged from 20 MW solar array
Commercial Operation Date (COD): 2018
Location: Coolidge, AZ



Energy Storage Update: Developed Projects

2018



2018

Pinal Central Energy Center
Solar + Battery PPA 20MW
Solar & 10MW 4-hr



2019

Dorman Energy Center
PPA 10 MW 4-hr



2021

Bolster Battery
25 MW 4-Hr



2023

Sonoran 260MW & Storey
88MW Solar + Storage

2024

Project: Dorman Energy Center
Size: 10 MW 4-hour duration, 40 MWh
Configuration: Stand alone and grid charged
Commercial Operation Date (COD): 2019
Location: Chandler, AZ



Energy Storage Update: Developed Projects

2018



2018

Pinal Central Energy Center
Solar + Battery PPA 20MW
Solar & 10MW 4-hr



2019

Dorman Energy Center
PPA 10 MW 4-hr



2021

Bolster Battery
25 MW 4-Hr



2023

Sonoran 260MW & Storey
88MW Solar + Storage

2024

Project: Bolster Battery

Size: 25 MW 4-hour duration, 100 MWh

Configuration: Stand alone and grid charged

Commercial Operation Date (COD): 2021

Location: Glendale, AZ



Energy Storage Update: Projects Under Development

2018



2018

Pinal Central Energy Center
Solar + Battery PPA 20MW
Solar & 10MW 4-hr



2019

Dorman Energy Center
PPA 10 MW 4-hr



2021

Bolster Battery
25 MW 4-Hr



2023

Sonoran 260MW & Storey
88MW Solar + Storage

2024

Project: Sonoran

Size: 260 MW, 4-hour duration battery, 1040 MWh

Configuration: Paired and charged from 260 MW solar array

Commercial Operation Date (COD): 2023

Location: Little Rainbow Valley, near Gila Bend, AZ

Project: Storey

Size: 88 MW, 3-hour duration battery, 264 MWh

Configuration: Paired and charged from 88 MW solar array

Commercial Operation Date (COD): 2023

Location: Coolidge, AZ



Questions?

Coal & Flexible Natural Gas

Chico Hunter

Manager

Resource Planning & Development (SRP)



2019 IRP Feedback: Reduce Coal

What do you appreciate?

- Thoughtfulness in **HOW** to transition from coal
- Working with impacted community and employees
- **Glide path approach**
- Moving in the **right direction**.

What would you like SRP to do more of, better or differently?

- **Eliminate** coal entirely
- **Biomass transition**

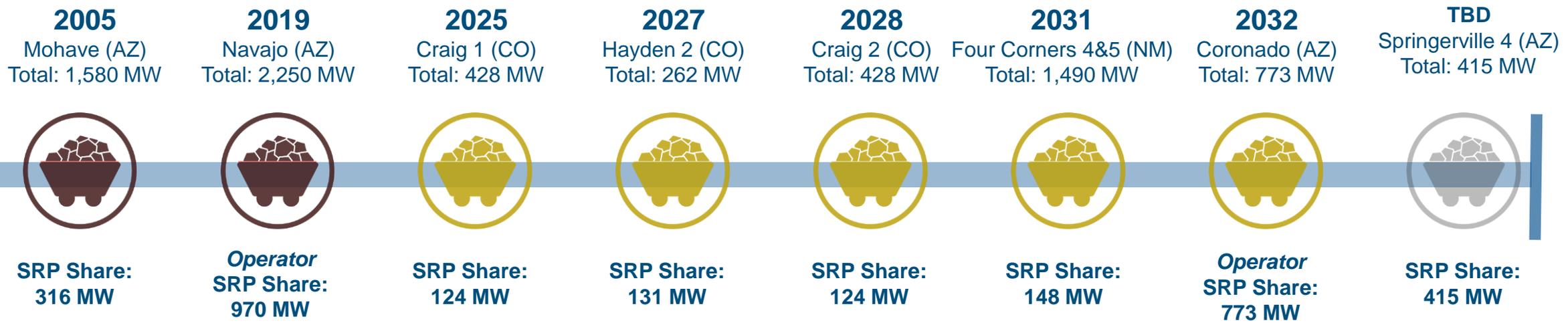
Reduce Coal: Retirements



~ 1,300 MW Retired

~ 1,300 MW Announced

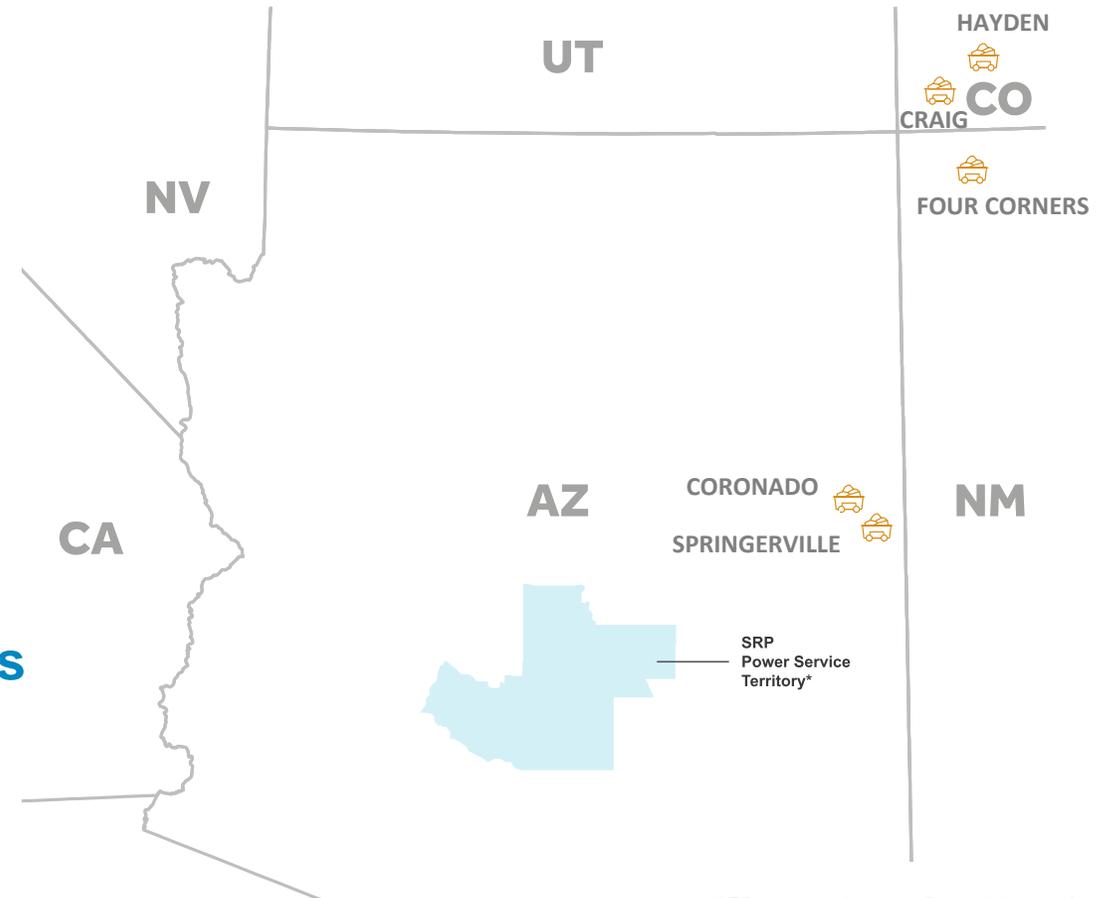
2005



Reduce Coal: Seasonal and Reduced Usage



- **Variety of drivers**
 - Regional Haze regulations
 - Low natural gas prices
 - Low day-time market prices in spring/fall
 - Integration of renewables
- **Cost and emission benefits for SRP customers and the region**



*Please note map is not to scale.

Questions?



2019 IRP Feedback: Flexible Natural Gas

What do you appreciate?

- Uncompromising commitment to **reliability**
- No plans for additional combined cycle gas
- **Integration** of gas with renewables

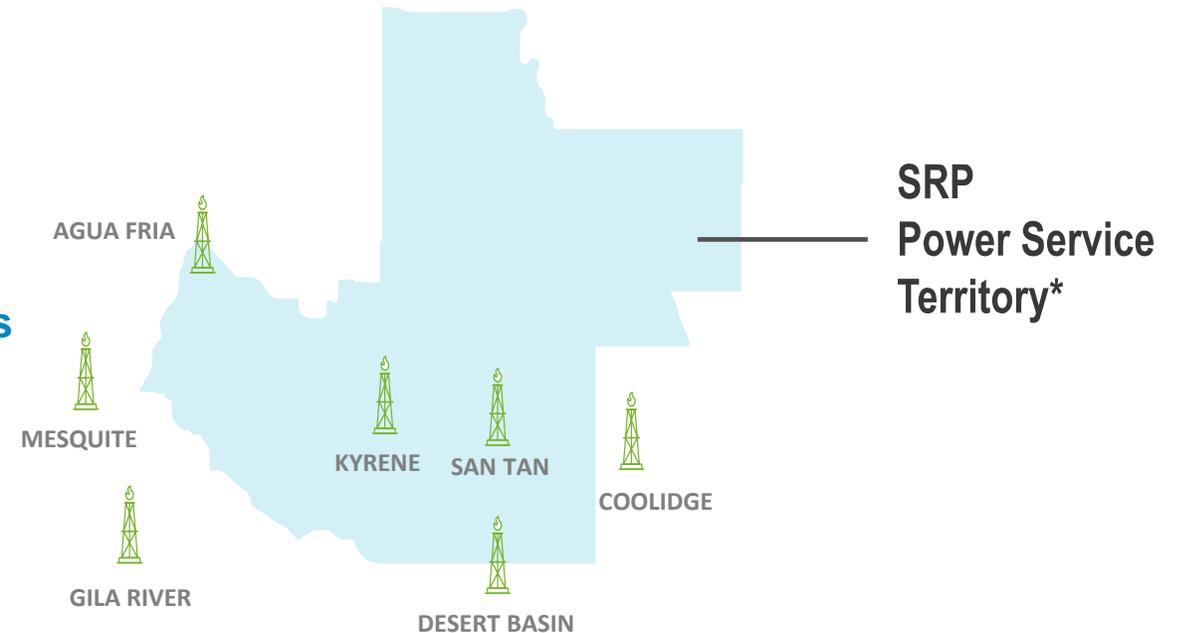
What would you like SRP to do more of, better or differently?

- Emphasis on **flexibility**
- **No new** natural gas resources - pursue more renewables
- Partner with other utilities on gas facilities and operations

Flexible Natural Gas: Leverage Existing Plants



- **Bought Coolidge Generating Station (575 MW) in 2019**
 - Flexible units that can start up in 10 minutes
 - Valuable for system reliability, solar integration, peak loads
 - 30% hydrogen blend capable
- **Pursuing gas upgrades across 12 combined cycle units**
 - Work started in 2020, scheduled through 2024
 - Increase operational flexibility with lower turn-down capabilities
 - Improve efficiency, reducing carbon intensity by 1.5%
 - 312 MW total increased output capacity
 - Enable 40% hydrogen (H₂) blending capability



*Please note map is not to scale.

Flexible Natural Gas: New Small Turbines



Four new peaking units added to Agua Fria and Desert Basin (two units at each)



176 MW to meet unexpected customer demand growth in summer 2022



Expected commercial operation date (COD) of June 1, 2022



Ensures grid reliability as SRP accelerates renewable integration



Proven technology, identical to Coolidge Generating Station units



30% hydrogen capable

Questions?

Nuclear

Tom Cooper

Director

Strategic Planning and Economic Development (SRP)



2019 IRP Feedback: Nuclear

What do you appreciate?

- Stepping back from new nuclear is prudent
- Keeping carbon-free baseload as option

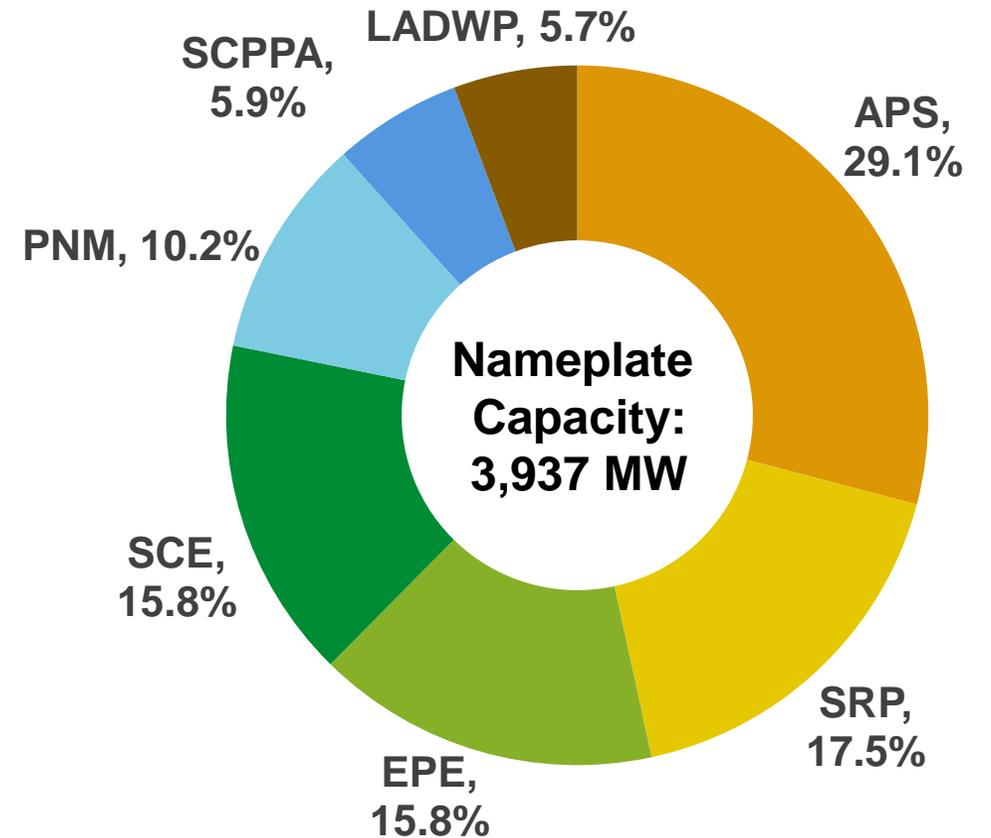
What would you like SRP to do more of, better or differently?

- Nuclear power for desalination and hydrogen production

Palo Verde Nuclear Generating Station (PVNGS)



- ❑ Largest nuclear power plant in the U.S.
- ❑ The three units began operations between 1986 and 1988
- ❑ SRP will acquire an additional 114 MW from PNM's share in 2023-2024



Questions?

Market Resources

Bobby Olsen

Director

Supply and Trading & Fuels (SRP)



2019 IRP Feedback: Market Resources

What do you appreciate?

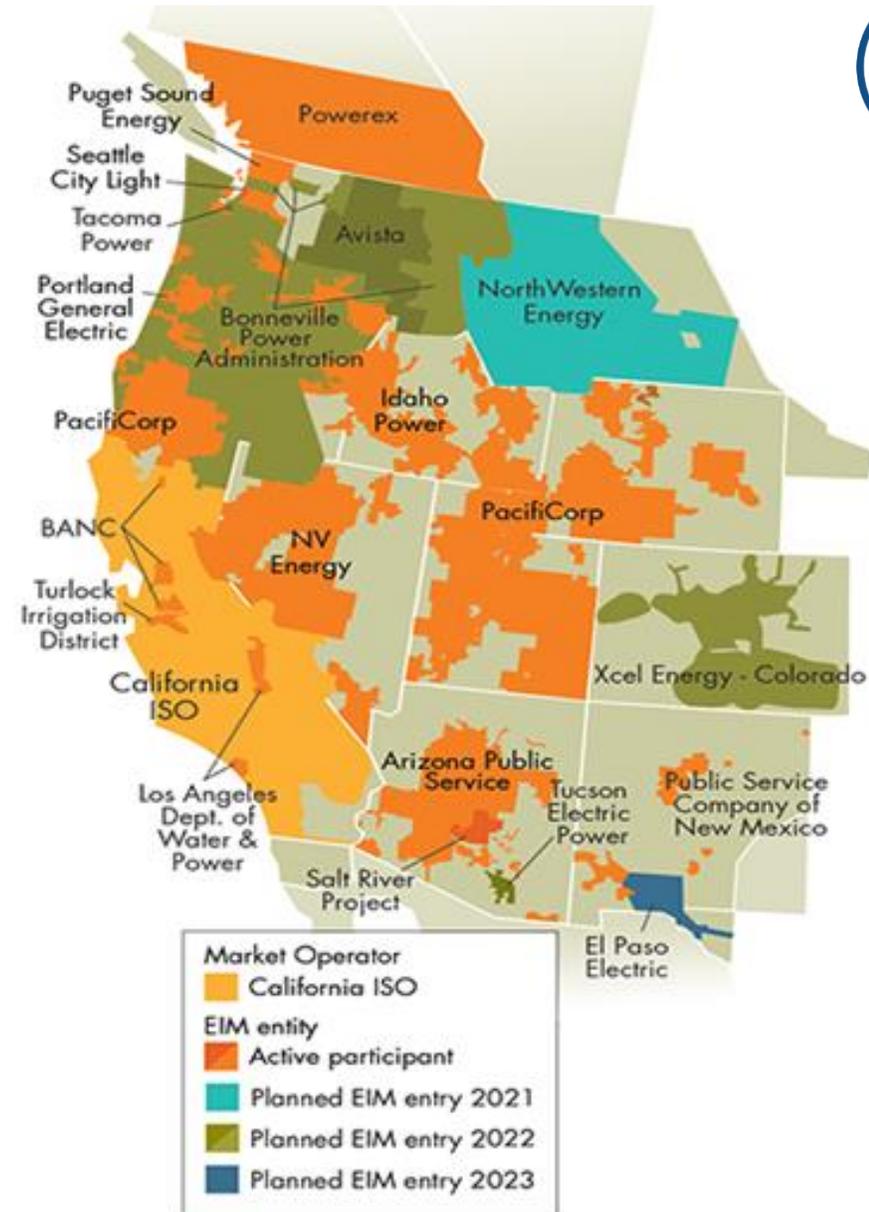
- Using the market as generation asset
- Joining EIM
- Engagement in the design of the EIM day ahead market.

What would you like SRP to do more of, better or differently?

Organized Energy Markets



- Joined the California Independent System Operator (CAISO) Western Energy Imbalance Market (EIM), a real time energy market, in April 2020
- Currently exploring options in day ahead markets, focusing on CAISO's proposal
- Developing principles and critical requirements for long-term regional planning and the concept of Regional Transmission Operators (RTOs)



Questions?

Customer Programs

Nathan Morey

Manager

Product Development (SRP)



2019 IRP Feedback: Customer Programs

What do you appreciate?

- Multi-prong approach focused on improving customer service
- Thoroughness of the research and evaluation
- Leadership role

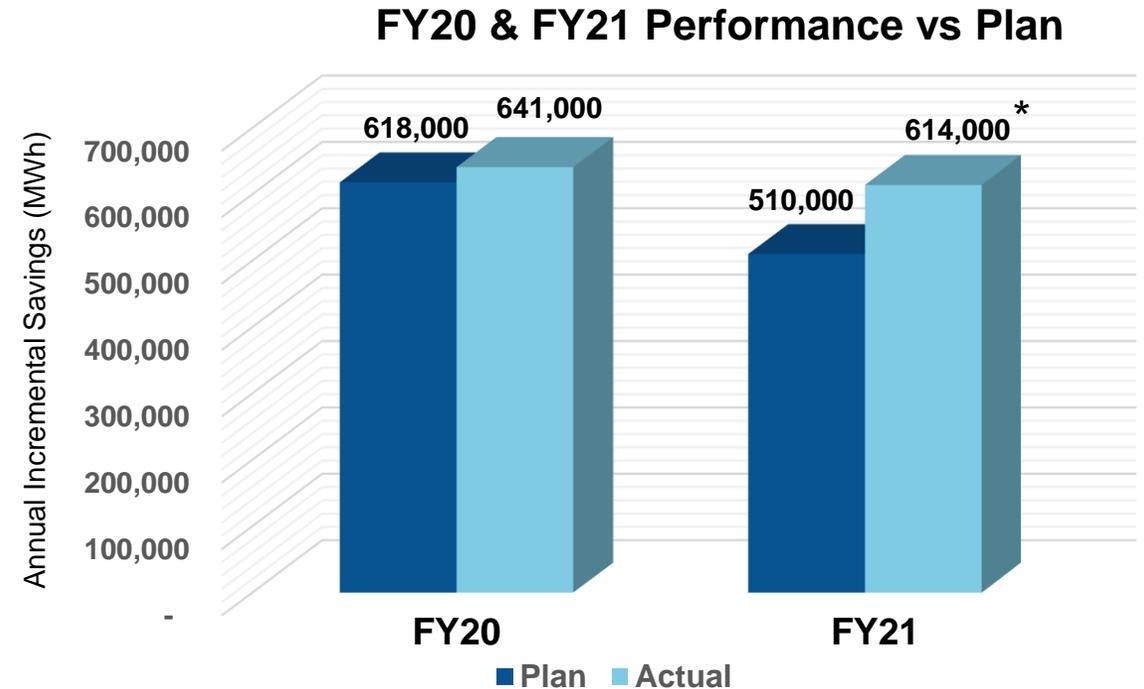
What would you like SRP to do more of, better or differently?

- More opportunity for aggregated residential demand response
- Creation of a beneficial electrification road map

Energy Efficiency Update



- Exceeded annual energy-saving targets in each of the past two years
- Completed and retired the Sustainable Portfolio Principles Objective
- Transitioned to the new 2035 Sustainability Goals & action plans
- Greater focus on AC-related measures, business programs, underserved market segments and smart thermostats



* Represents preliminary, unaudited year-end energy savings value

Accelerated Demand Response Plan



- Grow DR portfolio capacity to deliver 150 MW by summer of CY22
- Accelerate enrollments through aggressive marketing and recruitment efforts
- Begin to develop weekend DR capacity in CY22

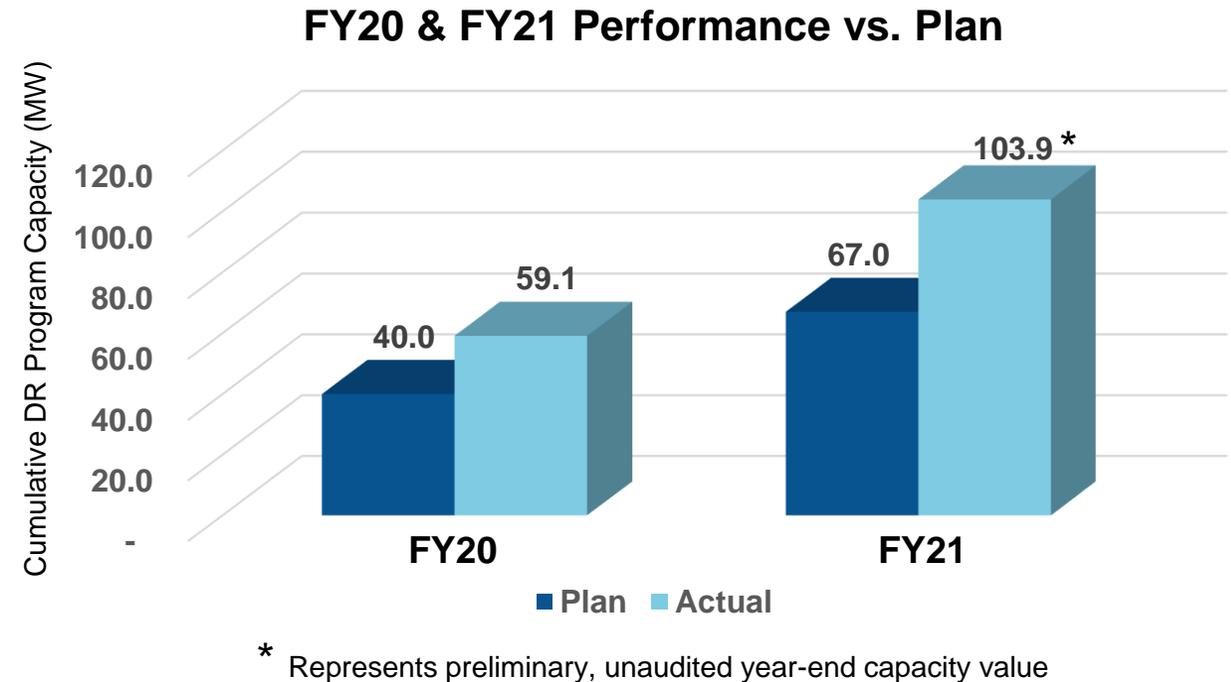
Demand Response Capacity Plan

	CY20	CY21	CY22	CY23	CY24
FP21 Plan (MW)	67	95	120	138	150
Incremental Bring Your Own Thermostat		+5	+15		
Incremental Business Demand Response		+10	+15		
FP22 Plan (MW)	67	110	150	150	150

Demand Response Update



- Surpassed annual cumulative DR portfolio capacity goals in the past two years
- Launched new Business Demand Response program – well received
- Expanded Residential Bring Your Own Thermostat program
- Dispatched DR events performing as expected



Electric Vehicle & Electric Technologies Update



- Exceeded annual Electric Vehicle and Electric Technologies program targets
- Launched numerous new EV programs and initiatives
 - Business EV Charging Rebate Program
 - ENERGY STAR Homes EV Make-ready Builder Rebate
 - Residential Smart Charger Program
 - Plug-In and Save Rebate Program
 - SRP EV Infrastructure Program
 - Transportation Electrification Activator
- Continued E-Tech program growth through electric forklifts and custom projects

Electric Vehicle
Exceeded 17,000 VIO
goal with 20,629 * EVs in
SRP Service Territory
in FY21

Electric Technologies
Surpassed 8,400 MWh of
energy impact goal by
delivering 11,428* MWh
in FY21

Questions?

New Technologies

Kara Montalvo

Director

Environmental Services (SRP)



2019 IRP Feedback: New Technologies

What do you appreciate?

- Engaging the innovative community and ecosystem
- Diversity and interest in forward looking technologies
- Practical solutions that customers can benefit from

What would you like SRP to do more of, better or differently?

- Seasonal storage
- Technologies that connect customers to power markets
- Quantify benefits of technology and research

New Technologies



SRP Innovation & Technology Pipeline

Near-term Operational Readiness

- Solar dispatch
- Battery use
- Electric vehicle enablement
- Customer-sided technology



Longer-term Technology Development

- Long-duration storage
- H2 work group
- Low Carbon Resources Initiative



Questions?

Pulse Survey

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- ❑ What do you appreciate about the overall progress of the IRP strategic directions? (chat box)

- ❑ What would you like to see more of, better, or differently regarding the overall progress of the IRP strategic directions? (chat box)

System Planning Foundations

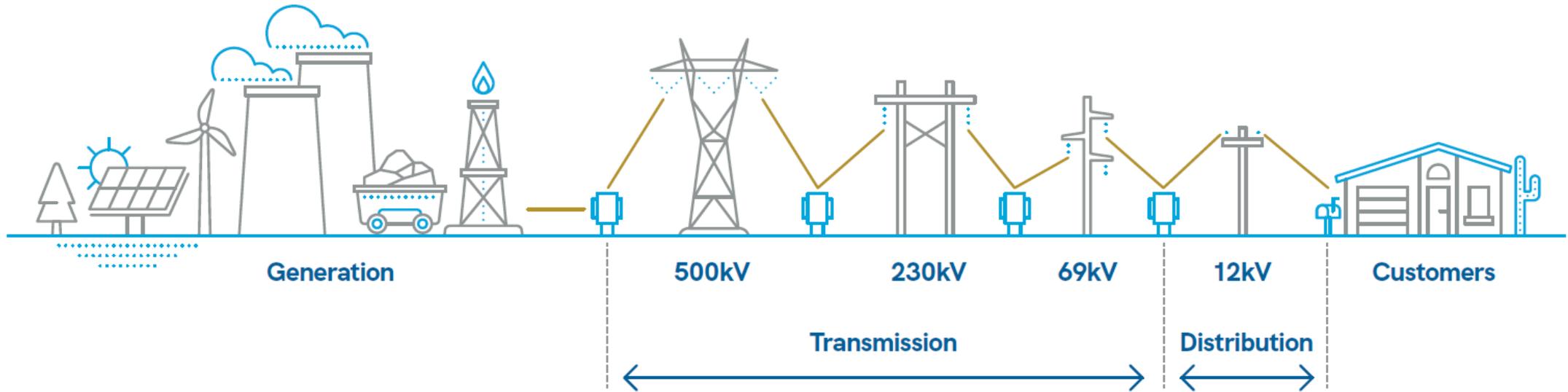
Transmission Planning

Bryce Nielsen

Director

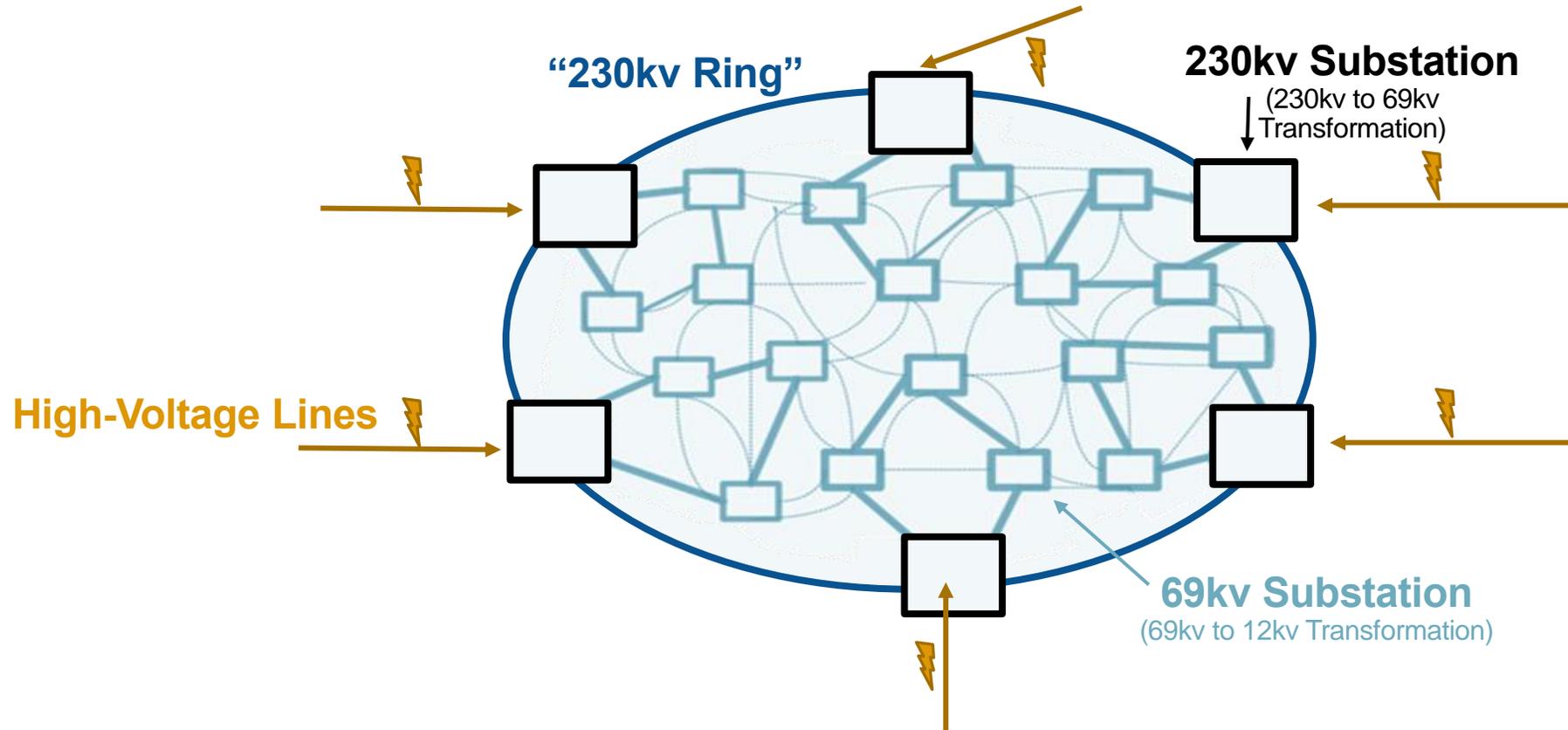
Transmission Planning, Strategy & Development (SRP)

Generation to Load

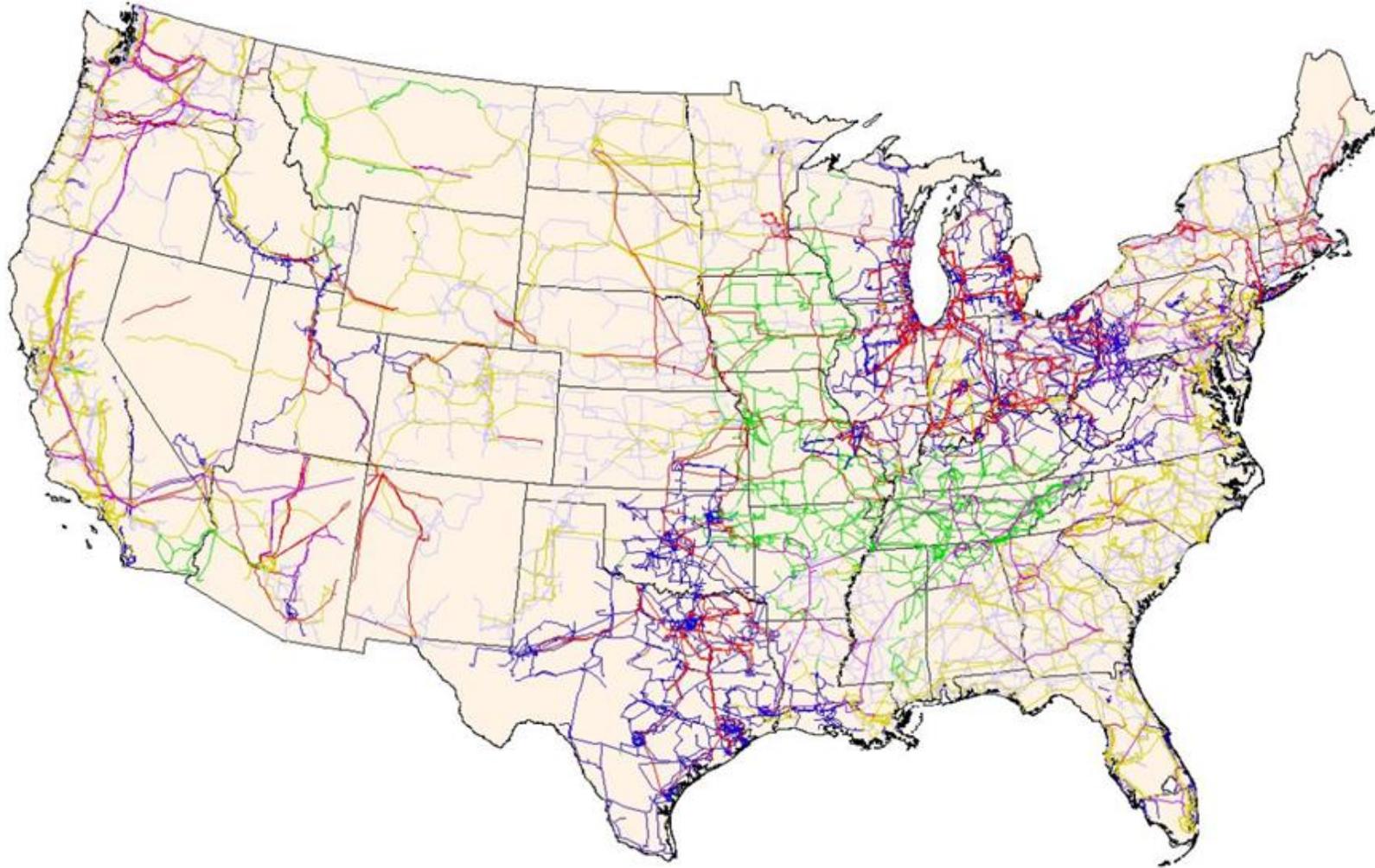


SRP's Transmission Network

SRP Service Territory



US Transmission System



Transmission Key Considerations

- Regional connections
- Regulatory compliance
- Siting/Permitting
- Cost
- Original configuration based on traditional resources

Questions?

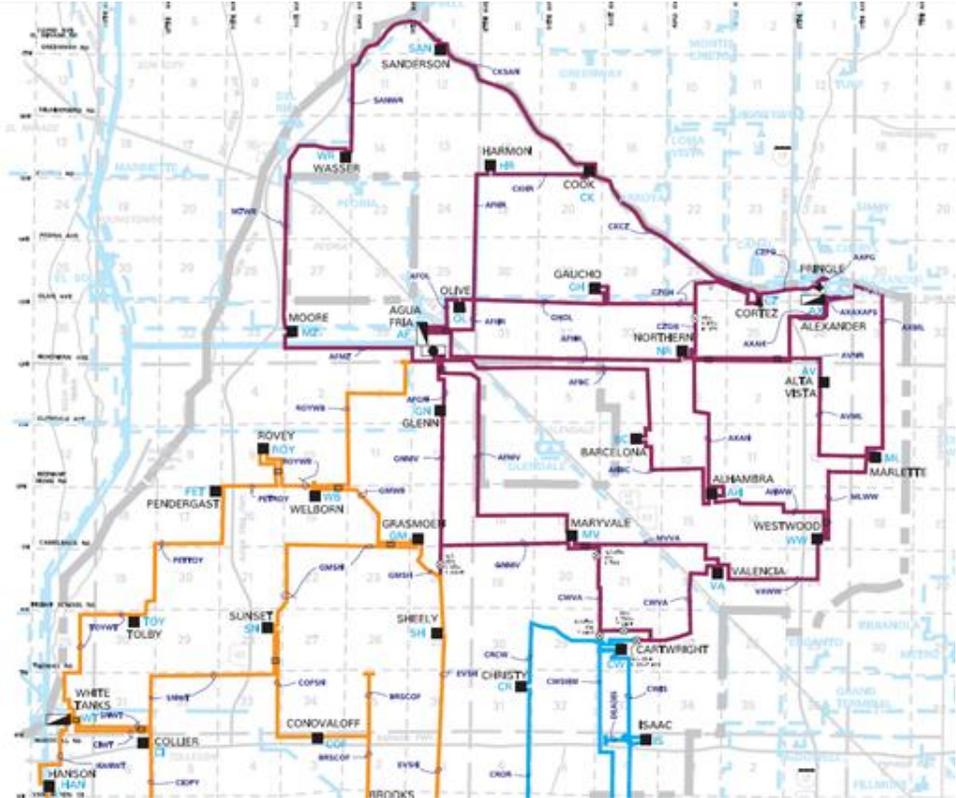
Distribution Planning

Vanessa Kisicki

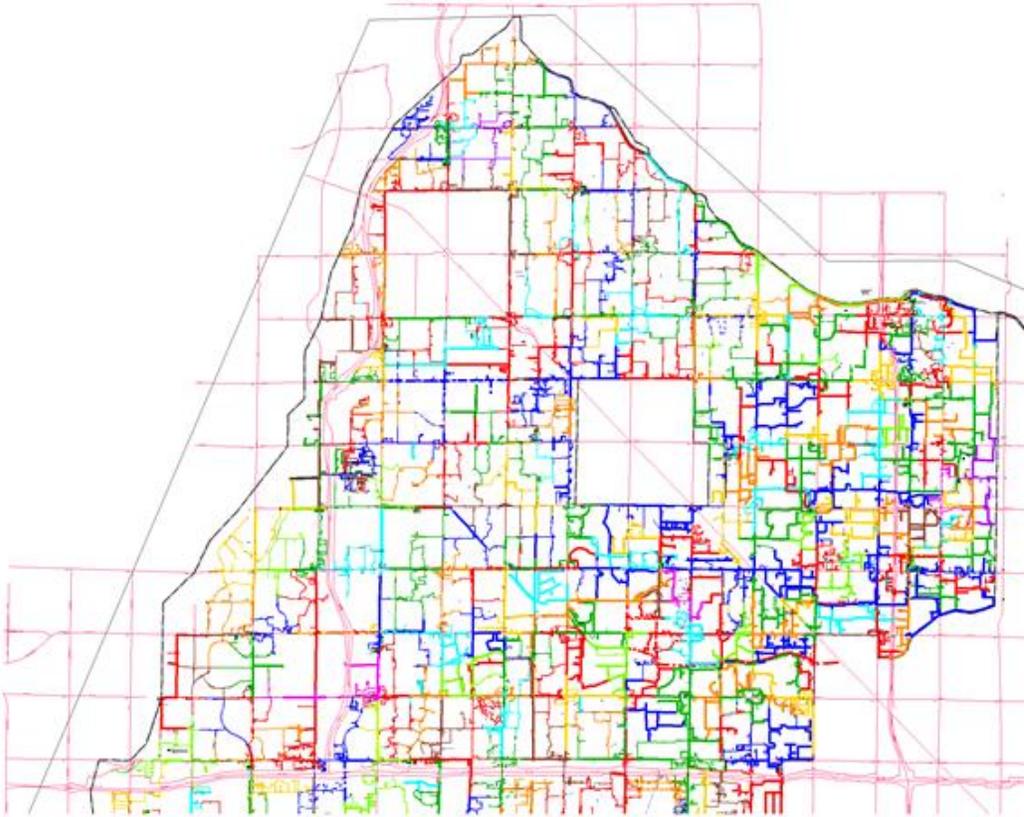
Director

Distribution Strategy (SRP)

Planning for Distribution



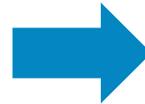
69 kV Transmission Lines



12 kV Distribution Circuits

Traditional Distribution Planning Focus

- Provide service to meet customer needs
- Provide infrastructure for reliability
- Proactive system development
- Manage costs



Distribution Key Considerations

- Increasing amounts of solar, storage and electric vehicles
- Increasingly dynamic nature of the distribution system
- New options to mitigate constraints
- Customer engagement

Questions?

Load Growth

Harry Sauthoff
Manager
Forecasting (SRP)

Load Growth: Forecast Process

Key Drivers

Economy
Population
SRP Programs
DER
Econ Development



Forecast Outlook

Peak Demand
Energy Sales
Accounts



Impacts

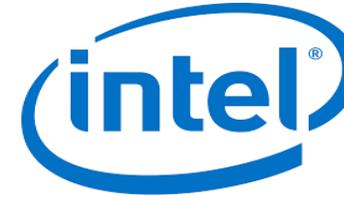
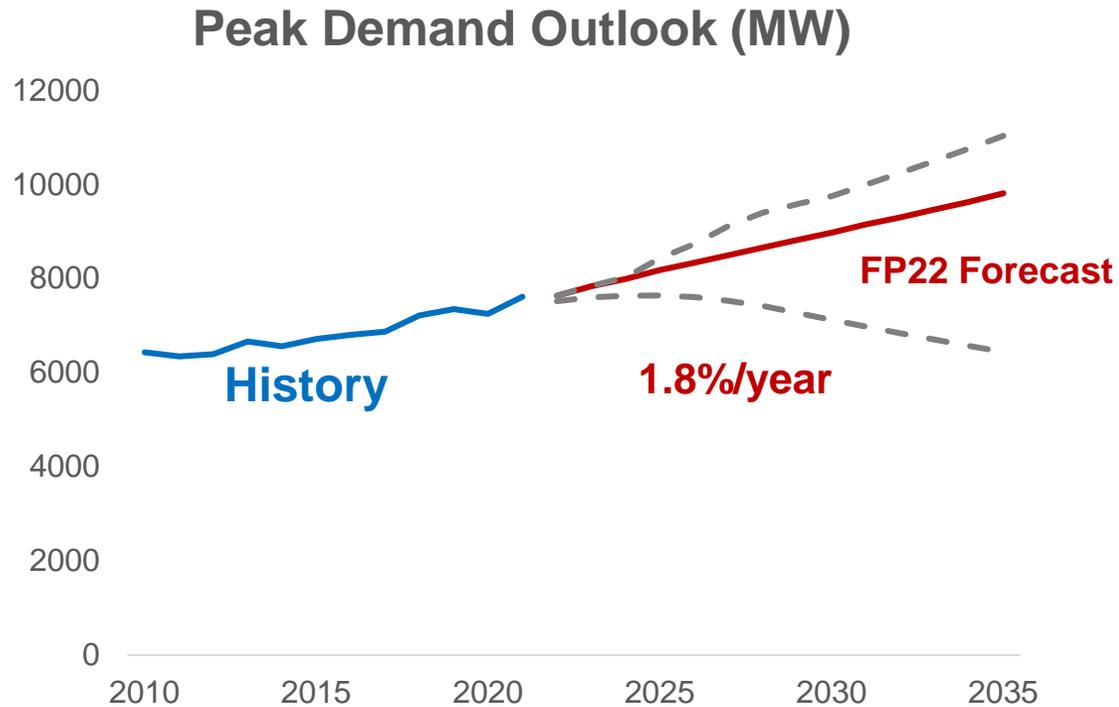
Financial Plan
Resource Plan
Transmission Plan
Distribution Plan

Load Growth: Forecast – Key Drivers

- Economy/Population Outlook
- Economic Development
- SRP Customer Programs
- Electric Vehicles
- Rooftop Solar
- Customer-Owned Batteries
- Weather



Load Growth: Forecast Outlook



20B Arizona expansion will bring 3,000 new high-wage jobs – AZ Republic



Demand for new homes in metro Phoenix soars - AZ Republic

Economists: Arizona to regain all jobs lost in the pandemic in 2021 – Phoenix Business Journal



ElectraMeccanica picks Mesa as electric vehicles manufacturing site - AZBIGMEDIA



Questions?

Next Steps: System Planning

Angie Bond-Simpson

Manager

Integrated System Planning & Support (SRP)

SRP's System Planning Vision



The ISP identifies:

- Viable pathways for achieving SRP's 2035 Corporate Goals
- Costs, risks and tradeoffs of the different pathways
- System solutions valuable across different pathways
- Needed new capabilities or tools

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2017-2018 Integrated Resource Plan Strategic Directions Progress

System Planning Foundations (Distribution, Transmission and Load Growth)

July "Near-Term Planning"

Objective: Educate on forces of change affecting the industry and SRP's near-term planning focus

Overview of Topics:

Integrated Resource Plan to Integrated System Plan Transition

Forces of Change

Near-Term Reliability Challenges & Solutions

August "Where We Want To Go"

Objective: Engage stakeholders in early development of the ISP

Overview of Topics:

Integrated System Plan Objectives

Stakeholder Involvement Opportunities

Preliminary Integrated System Plan Metric Considerations

Welcome Kearns & West

Joan Isaacson

Principal

Public Involvement and Facilitation (Kearns & West)

thank you!