



#### **ABOUT THIS DOCUMENT**

SRP's plan for modernizing the distribution system comprises three strategies, including the Distribution System Plan that addresses capacity expansion, the Asset Management Plan that defines how we operate and maintain our existing assets, and the Distribution Enablement Strategy that drives the digital transformation.

This document, defining the Distribution Enablement Strategy, showcases SRP's vision for the future distribution grid capability and lays out our plan to realize it.

In the following pages, you will learn about:

- How SRP plans to transition to a sustainable energy future while maintaining power reliability and affordability.
- How Distribution Enablement's six roadmap initiatives are unlocking advanced capabilities to drive the digital transformation of the grid.

In addition to the strategy document, we've created one-pagers for each of our key initiatives to offer a more in-depth view of Distribution Enablement projects, their impact and their timeline.

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#### A MESSAGE FROM LEADERSHIP

The Distribution Enablement Strategy is a holistic plan and program that will ensure SRP's distribution system meets future customer needs by delivering advanced capabilities for the electric grid and the workforce that supports it. The distribution grid plays a crucial role by enabling access to a variety of energy resources and innovative customer programs. It is a cornerstone of SRP's ability to provide reliable, affordable and sustainable energy to the communities we serve.

SRP is making significant investments to ensure the grid remains resilient in the face of climate change and changing customer expectations that are driving adoption of distributed energy resources (DERs) and electrification. At the same time, technological innovation is rapidly advancing and offering new solutions to manage a more dynamic grid and optimize these investments in decarbonization. The Distribution Enablement Strategy must factor in these variables and offer an integrated, action-oriented plan to achieve SRP's corporate goals.

The origin of the Distribution Enablement Strategy can be traced back to the first Grid Modernization Strategy document published in 2014, which provided a vision for how the grid will evolve but lacked an actionable plan. In 2019, the strategy was updated and re-branded to Distribution Enablement and a program was launched to manage its execution. The roadmap is reviewed and updated annually, which allows us to consider trends, progress and lessons learned to ensure we adapt the plans and continue to focus on the most important priorities. In May of 2024, we will enter the sixth iteration with the deployment of the FY25 Distribution Enablement Roadmap that continues to advance our capabilities and implement our vision of the future. This iterative yet sustained effort has resulted in the establishment of many essential foundations and advancements that will enable SRP's distribution grid for decades to come.

The Distribution Enablement Strategy does not stand alone; it is aligned to strategic efforts across the enterprise such as the Integrated System Plan (ISP), Customer Programs, Operational Readiness, Corporate Pricing and Information/Operational Technology (IT/OT) to form a well-oiled and forward-looking machine. It also leverages a long legacy of SRP's success including a resilient distribution grid, outstanding customer focus, early technology adoption and an engaged and passionate workforce.

While there have been many significant technical advancements associated with Distribution Enablement, the thing that I am most proud of is the outstanding response from the SRP team and the partnerships with various internal and external stakeholders. Working together, we are well positioned to provide our customers with reliable, affordable and sustainable energy now and in the future.

Thank you for your engagement, support and ongoing contributions.

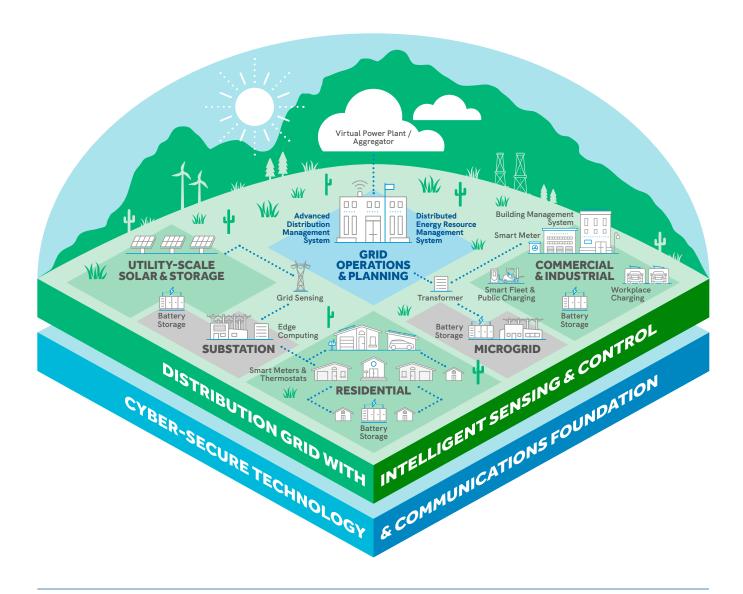


Chris Campbell Senior Director

Distribution and Technology Operations

#### **EVOLVING THE ENERGY GRID FOR A WIN-WIN FUTURE**

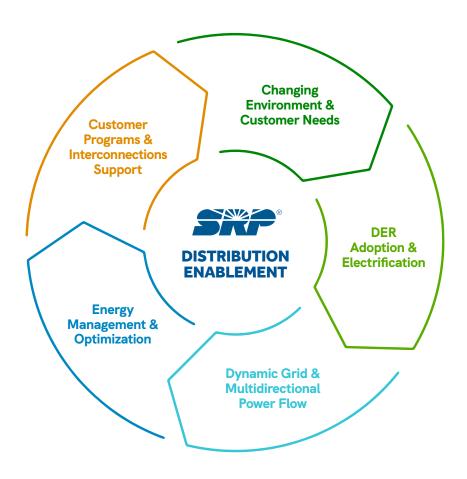
For over 100 years, SRP has served metro Phoenix residents and businesses with the reliable and affordable energy needed for community development, economic expansion and enhanced quality of life. Our predecessors achieved this by building dams and establishing a robust network to deliver power to end users from centralized generation stations. Today, however, we must adapt and evolve to continue meeting our customers' needs — especially as the energy landscape diversifies in response to climate change. To do this, we are working to make our grid more flexible and resilient by integrating customer-sided solar and battery storage systems, electric vehicles (EVs), smart home appliances, and other distributed energy resources (DERs) like microgrids and virtual power plants (VPPs).



As our customers become active participants in the ownership and management of these distributed energy resources, the Distribution Enablement (DE) Strategy seeks to empower individual households and businesses with more affordable and sustainable choices to meet their unique energy needs while managing an increasingly complex and dynamic grid.

#### **Distribution Enablement Mission:**

To seamlessly interconnect utility- and customer-owned resources as we build an intelligent, flexible and sustainable energy distribution system that adapts to evolving needs while maintaining affordability and reliability.



# HOW WE BENEFIT FROM AN INTELLIGENT, INTERCONNECTED GRID

Where the power grid was historically built in a generation-to-load model — with energy generated at centralized plants and then distributed to end users with consistent usage patterns — widespread DER integration means our system must now be ready to handle distributed energy generation, two-way power flow and more dynamic power quality impacts.

Through the deployment of intelligent grid devices such as smart meters and fault locators — feeding into advanced computing capabilities via secure, high-speed telecommunication networks — we will optimize power flow of distributed energy resources. In turn, this will help SRP continue to provide reliable and affordable power to its customers while supporting the energy transition.









## System Resilience Fosters Economic and Social Strength

The electric grid is the largest machine in the world, and the power it provides is the fuel on which global economies and societies run. Outages cost billions of dollars annually and can wreak havoc on businesses and households nationwide. As climate change continues to increase the severity and unpredictability of extreme weather, grid resilience and the ability to mitigate and recover from destructive events becomes ever more pressing. And reliable power depends on it.

By interconnecting distribution grid assets with robust communications and powerful operational technologies, utilities today can enjoy a level of visibility and understanding — and proactive management — of the grid not previously possible. Predictive analytics can leverage smart sensors throughout the network to anticipate imminent equipment failure, allowing for repair before an outage. Power can also be rerouted automatically around failed devices, minimizing the length and impact of outages that do occur. Ultimately, this creates a virtually self-healing grid.

## Our Community Demands Sustainable, Climate-Friendly Energy

Renewable energy resources such as solar and wind, augmented by battery storage, and vehicle electrification are all important ways we can tackle climate change. As costs fall, our residential and commercial customers alike are adopting these technologies at an accelerating pace. Maximizing the capacity to integrate customer-sided energy resources and electric vehicle infrastructure will reduce greenhouse gas emissions, improve regional air quality and lower energy waste overall.

## An Intelligent, Interconnected Grid is More Efficient and Affordable

Effective DER integration, combined with connectivity and advanced management systems, will provide an unprecedented level of flexibility and control over our energy network. The future grid will collect data from utility and distributed energy resources and, in return, offer actionable, real-time insights for operators, planners and customers. Demand response programs can be automated and total net load optimized by reducing or shifting generation and consumption as needed. The outcome is a more affordable energy ecosystem that benefits everyone.

## Ultimately, It's About Grid Performance

With visibility and control at the grid edge, SRP will be able to accommodate multidirectional energy distribution and maintain adequate power levels. Grid operators will be able to manage the increased variability of power generation that comes with renewable resources and the shifting loads that will likely be created by widespread electrification. Furthermore, grid security — both cyber and physical — can be enhanced through new technological solutions like AI-powered monitoring of critical grid assets.

In short, an intelligent, interconnected grid will reduce operations and maintenance costs, improve system reliability and sustainability and create an inclusive and affordable energy economy in which both SRP and our customers are engaged for maximum mutual benefit.

# PREPARING FOR THE FUTURE THROUGH ACTION TODAY

SRP's DE plan puts our customers first and aligns with one of the 2035 Corporate Goals, which informed the design of four strategic goals and six key roadmap initiatives.



Enable the interconnection of all customer-sided resources, without technical constraints, while ensuring current levels of grid integrity and customer satisfaction.



# OUR GOALS FOR THE DE PROGRAM ARE BUILT AROUND FOUR BROAD FOCUS AREAS:

# DEVELOP AGILE GRID ASSET PLANNING

- Create more precise grid expansion and optimization plans that adjust to real-time needs.
- Introduce more granular data and conduct detailed studies and analyses.

# 2 BUILD ADVANCED GRID MANAGEMENT

- Strategically deploy sensing and control devices to enhance visibility and situational awareness across the grid.
- Upgrade operational systems to effectively orchestrate the integration of distributed energy assets while enhancing power quality, reliability and safety.

# 3 STRENGTHEN ROLE AS ENERGY OFFERINGS PARTNER

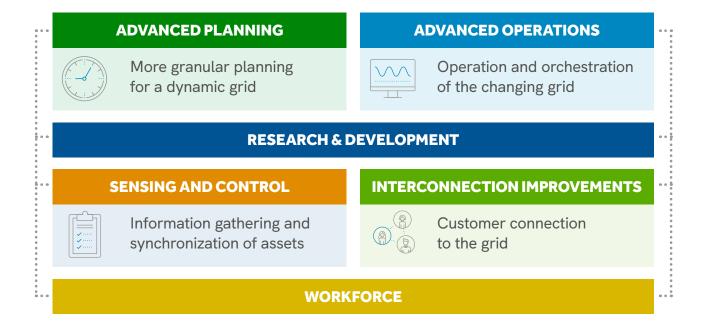
- Optimize the customer experience when connecting behind-the-meter resources to the grid.
- Standardize and automate the interconnection process.
- Enable more tailored, valueadded offerings to our customers, including microgrids and virtual power plants.

# 4 EMPOWER OUR WORKFORCE

- Train and equip employees with future-oriented skills to support the development, maintenance and everyday operations of the modernized grid.
- Invest in the resiliency and flexibility
  of the local workforce as part of
  our commitment to the Valley's
  continued prosperity.

# SRP'S DISTRIBUTION ENABLEMENT ROADMAP INITIATIVES

SRP's DE roadmap is organized into six key initiatives that follow structured six-year plans. Each initiative has defined objectives, success criteria and a collection of associated projects aimed at achieving larger strategic goals. The Distribution Enablement roadmap is reviewed and refreshed annually. Further details on the DE initiatives and projects are provided as one-page overviews appended to this document.



### **Advanced Planning**

Advanced Planning evolves SRP's approach to develop and deploy efficient, cost-effective solutions for optimizing system growth, with the ability to incorporate new resources and demands by analyzing localized load and demographic information. Through this initiative, we will:

- Create improved DER and electrification forecasting capabilities via more sophisticated data models.
- Support operations with short-term planning information and trending data.
- Conduct new studies on the opportunity and impact of customer-adopted technologies such as solar, battery and electric vehicles on the distribution system.

## **Advanced Operations**

Advanced Operations addresses the "brains of the grid" and replaces existing operational applications with a unified Advanced Distribution Management System (ADMS), which includes a Distributed Energy Resource Management System (DERMS) that enables greater situational awareness and more precise control of the distribution system in support of increased DER and EV adoption. Through this initiative, we will:

- Ensure the necessary tools and procedures are in place for safe and reliable operations.
- Provide schematic models of the electric system that are informed by real-time data from grid sensors.
- Establish the ability for more granular power quality management by synchronizing grid and DER performance data.

## Sensing and Control

The Sensing and Control initiative enhances the capability to holistically gather and leverage data on grid assets for analysis and control of field devices based on different operating scenarios, effective outage management and proactive system maintenance. Through this initiative, we will:

- Augment situational awareness by integrating data from existing sensing infrastructure and new, targeted sensor deployments into the ADMS.
- Reduce the risk and impact of outages by quickly locating faults and using predictive analytics to identify weak spots prior to failure.
- Ensure crews are deployed efficiently and outfitted with the necessary information to repair or upgrade equipment.

## Interconnection Improvements

Interconnection Improvements advance the safety and speed of integrating customer-side DER and EV infrastructure while preserving the integrity of the grid. Through this initiative, we will:

- Create standardized work processes that are customer-responsive, clearly communicated and managed through key performance indicators (KPIs).
- Use automation tools to process customer interconnection requests more efficiently and ensure grid integrity.
- Ensure proper data management for effective monitoring and control of DER interconnections.
- Establish the ability to help customers optimize the location of DERs for maximum energy value.



### Research and Development

Research and Development establishes a pipeline to capture, evaluate and pilot new technological and operational innovations that enhance the interconnection of distributed energy resources and the orchestration of a dynamic grid. Through this initiative, we will:

- Identify and study emerging innovations that impact the power distribution system by relying on expertise from across the organization and industry.
- Develop a safe and repeatable methodology to test and prepare new technologies for potential implementation on the grid by leveraging the Distribution Enablement Lab.

### Workforce Strategy

Workforce Strategy centers on building and transitioning the skills, knowledge and job roles needed to support the electric distribution system of the future, promoting advanced, data-driven analytical thinking and richer, technology-supported collaboration. Through this initiative, we will:

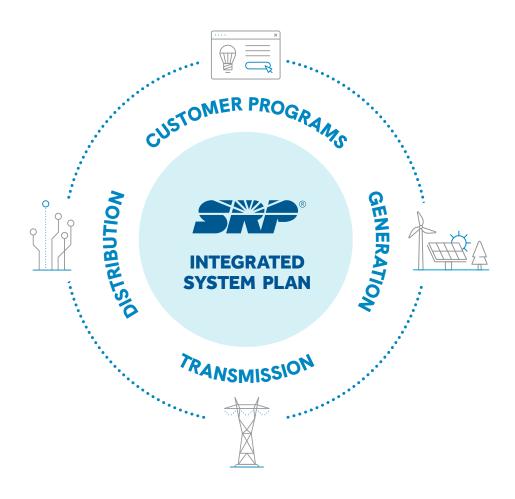
- Establish a standardized process for identifying technical and adaptive skill gaps within the job roles pertaining to the Distribution Enablement program.
- Deliver an HR-aligned talent development solution consisting of targeted learning academies and a career progression framework.
- Incorporate a talent management strategy to monitor staff recruitment, development and retention based on quantifiable metrics.

#### **SMARTER AND STRONGER TOGETHER**

By interconnecting with a range of distributed energy resources and deploying advanced management solutions, the grid of the future will be a vastly more intelligent and sustainable ecosystem offering greater flexibility and system resiliency for all customers without compromising reliability and affordability.

Our success depends on the support from both internal and external partners. We will continue to leverage strong partnerships across SRP's operations, innovation and technology groups, and with research institutions like the Electric Power Research Institute and local universities, including Arizona State University, the University of Arizona and Northern Arizona University.

We look forward to our collaborative contribution to SRP's Integrated System Plan (ISP) as we implement this strategy-driven Distribution Enablement program to prepare for the next century of growth and prosperity in the Valley of the Sun.



# DISTRIBUTION ENABLEMENT INITIATIVE ONE-PAGERS

FISCAL YEAR 2025 UPDATE



Delivering water and power®



# ADVANCED PLANNING



The Advanced Planning initiative evolves SRP's approach to develop and deploy efficient, cost-effective solutions for optimizing system growth, with the ability to incorporate new resources and demands by analyzing localized load and demographic information.

#### Major capabilities enabled by this initiative:

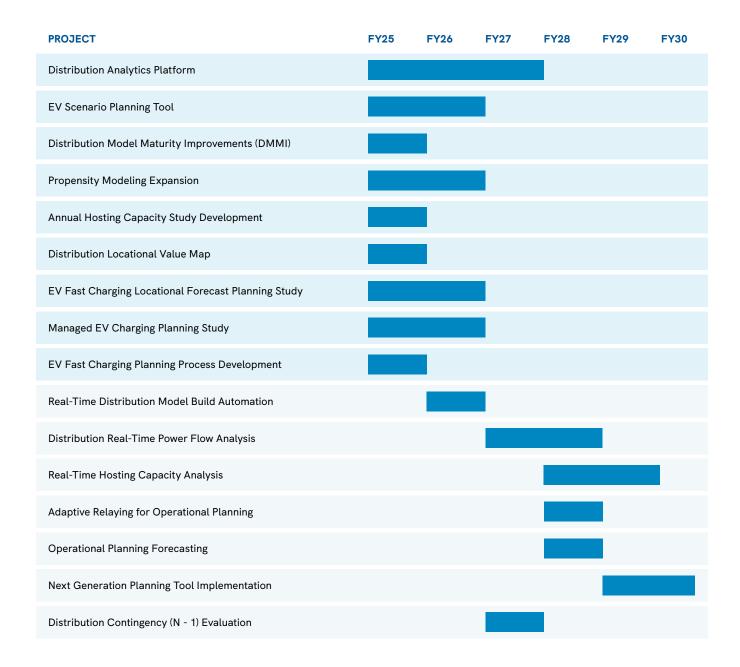
- Enhanced distribution system planning with automated model builds for power flow.
- Advanced load forecasting, including distributed energy resource (DER) output.
- Electric vehicle (EV) scenario simulation for dynamic planning.
- Real-time power flow analysis.



#### Notable past successes, work completed or major accomplishments:

- Developed Distribution Locational Value Map (DLVM) that illustrates feeder-level hosting capacity availability, load serving capability and EV locations to support planning and engineering of SRP's distribution system.
- Implemented automated switching optimization of the electrical distribution system to enhance multiple scenario analysis, improve efficiency and increase business capabilities.
- Completed model maturity improvements that automate and streamline data processes enhancing the electrical distribution system models.
- Evaluated EV charging impacts based on price plan signals on grid assets.
- Conducted a comprehensive study of the economic value of customer solar and storage systems.

Initiative Sponsor: Melissa Martinez, Distribution Strategy Director









# ADVANCED OPERATIONS



The Advanced Operations initiative addresses the "brains of the grid" and replaces existing operational applications with a unified Advanced Distribution Management System (ADMS), which includes a Distributed Energy Resource Management System (DERMS) that enables better operational efficiency and heightened situational awareness while maximizing the value of the distribution system in support of increased distributed energy resources (DERs) and electric vehicle (EV) adoption.

#### Major capabilities enabled by this initiative:

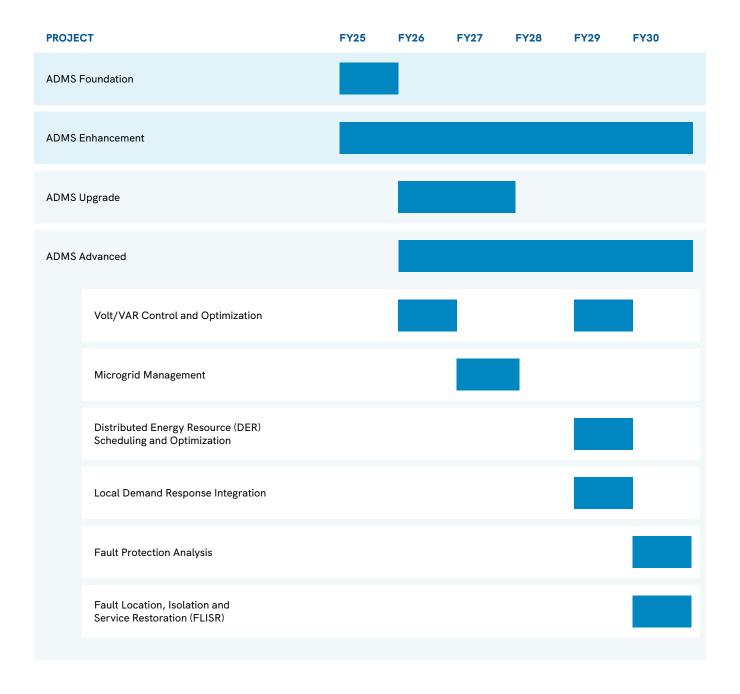
- Smarter analysis and control of an evolving grid.
- More accurate outage information for customers.
- Targeted emergency load shed program.
- Awareness, forecasting and modeling of DERs.
- Manual control of DERs to support advanced customer programs.
- Advanced sensing and fault location.
- Centralized automatic power restoration.
- Power quality and Volt/VAR control.



#### Notable past successes, work completed or major accomplishments:

- Laid the groundwork for transitioning from a static, rules-based operational platform to a dynamic, model-based ADMS system.
- Created an ADMS sandbox for the Distribution Enablement lab to conduct R&D.
- Bolstered the Geographic Information System (GIS).

Initiative Sponsor: Eric Call, Distribution Operations Director









# SENSING AND CONTROL



The Sensing and Control initiative enhances the capability to holistically gather and leverage data on grid assets for analysis and control of field devices based on different operating scenarios, effective outage management and proactive system maintenance.

#### Major capabilities enabled by this initiative:

- Enhanced accuracy and standardization of the distribution grid model to support operations and planning.
- Expanded real-time power quality monitoring with a consolidated dashboard based on key performance indicators.
- Advanced detection of incorrectly mapped, underperforming or inactive distributed energy resource (DER) systems.
- Improved voltage control using distribution line and substation capacitor banks.

#### Notable past successes, work completed or major accomplishments:

- Upgraded over 3,000 distribution 12 kV line capacitor bank controllers to communicate through the Field Area Network (FAN); enabled ADMS integration for enhanced Volt/VAR control of the distribution system.
- Established the Grid Performance Center to consolidate data management and model validation for strategic planning and operations.
- Readied several data integrity and asset health monitoring solutions for production.
- Initiated an interdepartmental effort to implement a revised and more accurate DER model.
- Updated multiple network topology curation processes to work off the new standard Geographic Information System (GIS) Distribution model to coincide with Advanced Distribution Management System (ADMS) deployment and the planned obsolescence of GIS circuits.
- Implemented new processes to monitor the integrity of SCADA data used by distribution operations.
- Developed and tested a new Remote Fault Indicator (RFI) solution that addresses concerns and risks associated with the sunsetting of 3G cellular technology.
- Consolidated power quality (PQ) data from over 200 channels across over 400 power quality meters into Foundation PI; began development of a PQ dashboard highlighting key metrics.

Initiative Sponsors: Melissa Martinez, Distribution Strategy Director | Brant Heap, Protection, Automation & Control Director

CATEGORY	PROJECT	FY25	FY26	FY27	FY28	FY29	FY30
Grid Performance Center (GPC)	Inverter-Based Resource (IBR) Ride-Through Monitoring Process						
	ADMS Distribution Power Flow (DPF) Estimate Validation Process						
	Create Distribution Loss Metrics						
	Distribution Model Curation + Asset Performance Monitoring						
	Distribution Voltage Performance Reporting						
New Device Deployment	Substation Capacitor Bank Controllers						
	Targeted Sensing and Control						
	Remote Fault Indicators (RFI) ADMS Integration						
	Remote Fault Indicators (RFI) Phase 2 Rollout						













# INTERCONNECTION IMPROVEMENTS



The Interconnection Improvements initiative advances the safety and speed of integrating customer-side distributed energy resource (DER) and electric vehicle (EV) infrastructure while preserving the integrity of the grid. This initiative supports the 2035 Sustainability Goal for Grid Enablement to "enable the interconnection of all customer-sided resources, including solar photovoltaic (PV) and battery storage, without technical constraints while ensuring current levels of grid integrity and customer satisfaction."

#### Major capabilities enabled by this initiative:

- Automated interconnection screening process to introduce efficiency, accuracy and speed to the safe adoption of renewable technologies while maintaining grid performance.
- Enablement of customer DER systems to participate in various distribution grid services through mutually beneficial partnerships with SRP.



As our customers adopt ever-evolving technologies, they challenge SRP to adapt our understandings of grid capabilities and internal processes and to be nimble in responding.

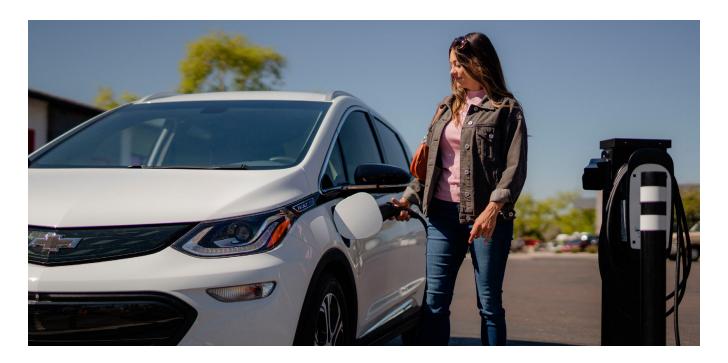
— Darrell Bearden | Senior Manager, Distributed Energy Programs

#### Notable past successes, work completed or major accomplishments:

- Updated the Distributed Generation Interconnection Handbook to be utilized as the single go-to source of standards and information for contractors and customers.
- Created SRP's first external facing scheduling tool using Microsoft Booking, allowing customers to schedule their own meter pulls in support of DER installations.
- Tested and approved meter socket adaptor installations, enabling residential customers to interconnect at a lower cost and improved functionality.
- Established telemetry requirements for real-time monitoring of large-capacity DERs.

Initiative Sponsors: Joel Dickinson, Distribution Integration Senior Manager | Darrell Bearden, Distributed Energy Programs Senior Manager Dustin Stapp, Policy, Procedures & Standards Senior Manager | Kyle Girardi, Distribution Strategy Development Senior Manager

PROJECT	FY25	FY26	FY27	FY28	FY29	FY30
Vehicle-to-X Process Development						
Microgrid Standards and Interconnections						
Inverter Commissioning and Settings Optimization						
Siting Advisory Service Offering						
Virtual Power Plant Communications Evaluation						









# RESEARCH AND DEVELOPMENT



Research and Development establishes a pipeline to capture, evaluate and pilot new technological and operational innovations that enhance the interconnection of distributed energy resources and the orchestration of a dynamic grid.

#### Major capabilities enabled by this initiative:

- Accelerated testing and implementation of advanced operations, planning, and sensing and control capabilities.
- Scalable and repeatable innovation management process for effective cross-functional collaboration and knowledge sharing.





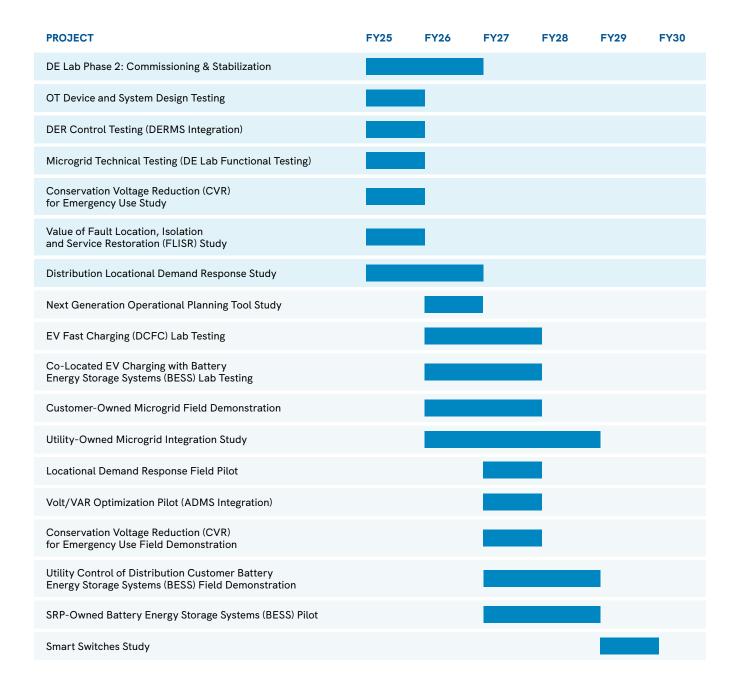
Commissioning a lab will enable for the first time the ability to test things in a 'real' environment.

— Joel Dickinson | Distribution Integration Manager

#### Notable past successes, work completed or major accomplishments:

- Completed Phase 1 of constructing a Distribution Enablement lab with DER and electric vehicle (EV) interconnection capabilities.
- Piloted a process for DER scheduling and optimization.
- Consolidated technical requirements for microgrid deployment.
- Studied phase imbalance due to distribution substation storage implementation.

Initiative Sponsors: Melissa Martinez, Distribution Strategy Director | Eric Call, Distribution Operations Director









# WORKFORCE STRATEGY



The Workforce Strategy initiative centers on building and transitioning the skills, knowledge and job roles needed to support the electric distribution system of the future, promoting advanced, data-driven analytical thinking and richer technology-supported collaboration.

#### Major capabilities enabled by this initiative:

- Effective management and operation of the next generation grid through continuous development of technical expertise.
- Maximized potential of new operational technology to optimize distributed energy resources while maintaining grid performance.
- Resilient workforce that adapts to evolving industry and customer needs.



I envision a robust DE workforce that not only possesses the necessary skills to support future distribution technologies and capabilities, but also an organizational culture that fully embodies the dynamic and interconnected nature of the next generation grid.

— Joshua LeBlanc-Shulman | Senior Business Analyst

#### Notable past successes, work completed or major accomplishments:

- Designed future-state success profiles for seven current and six new emerging job roles required to support the Distribution Enablement (DE) program.
- Identified and mapped technical and adaptive (soft) skills gaps across 13 DE job families.
- Constructed five common learning academies (four technical, one adaptive) with course content from the Percipio learning platform and external resources like EPRI and SEPA.
- Developed a career progression framework for the DE roles in scope.

Initiative Sponsor: Melissa Martinez, Distribution Strategy Director

PROJECT	FY25	FY26	FY27	FY28	FY29	FY30
Rollout of Learning Academies for Top 5 Skill Areas						
Group Learning Academy Pilot						
Individual Development Toolkit						
Program Evaluation and Expansion to Additional Roles and Skill Areas						

