

2021 IRP Stakeholder Update

February 23, 2021



Welcome

Jeff Burke



AGENDA



Welcome
Jeff Burke



2021 DSM Implementation Plan
Tom Hines



2020 Review/
2021 Short-term Outlook
Jeff Burke



APS Transportation Strategy
Kathy Knoop



Energy Rules/RPAC
Development and Timing
Jeff Burke/Charlie Banke



Community Coal Transition
Eric Massey



Energy Storage/RFP Update
Derek Seaman



Closing/Discussion
Jeff Burke

CLEAN ENERGY COMMITMENT



100% clean, carbon-free electricity to customers by 2050



2030 target; 65% clean energy using 45% renewables



2031 remove coal-fired generation

NOW-2030 CLEAN ENERGY COMMITMENT

How we get there: clean, reliable, affordable and customer centric



Increase renewable energy



Support transition with natural gas



Decrease coal



Continued economic growth of Arizona



Increase energy storage



Energy Efficiency and Demand Response



2020 Review and 2021 Short-term Outlook

Jeff Burke



2020 IRP

Action Plan Update

- APS continues to work under the existing Action Plan and plans to meet long-term needs with renewables, DSM, customer resources, and energy storage
- Working to finalize our plans for short-term reliability requirements
- Formation of resource planning stakeholder group
- RFP update
- DSM Implementation Plan
- Transportation Electrification



2020 Review

Western US Grid Overview

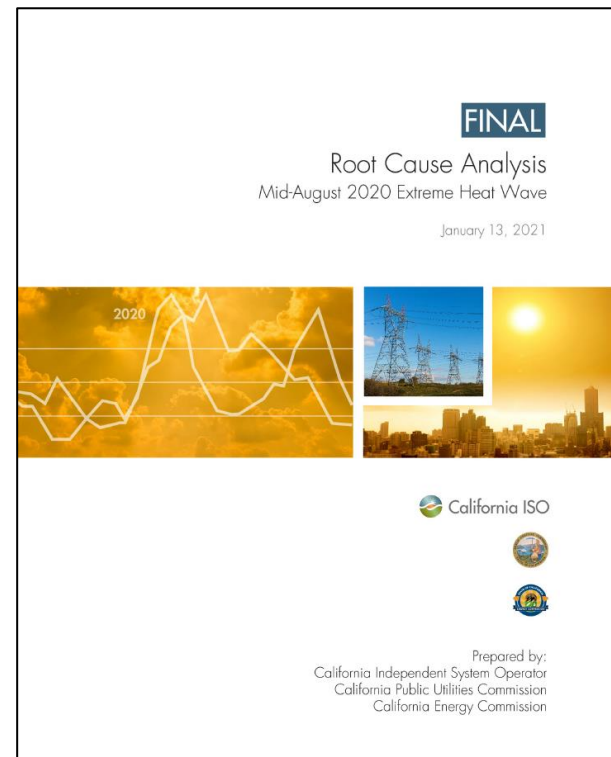
- Southwest generation landscape has changed dramatically with the reduction of many baseload generation units and reduction of excess merchant capacity
- Western grid was under stress from a heatwave during August and September which saw 12 states issue excessive heat warnings
- Summer 2020 CA rolling blackouts and multiple BA energy emergency declarations have brought a renewed focus on reliability and resource adequacy
- **Resource planning and sufficient reserve margins are essential to a reliable Western Grid**



2020 Review

California Rolling outages

- CAISO developed a preliminary and final root cause analysis to evaluate outages that occurred in August 2020
- Three major items were identified that contributed to outages:
 - Extreme weather conditions
 - Resource adequacy and planning processes
 - Market practices
- 2021 Recommendations
 - Immediately seek resources for 2021
 - Increase RA procurement targets (gross/net peaks, June-October)
 - Consider changes to scheduling, exports, performance incentives and penalties
 - Track battery development to explore expedited in service dates
 - Increase coordination with non-CPUC entities regarding procurement
 - Conduct probabilistic studies to evaluate loss of load expectation (LOLE) and reliability targets
 - Enhance customer participation during flex alerts
 - Advanced coordination for contingencies (CAISO, CPUC, CEC)



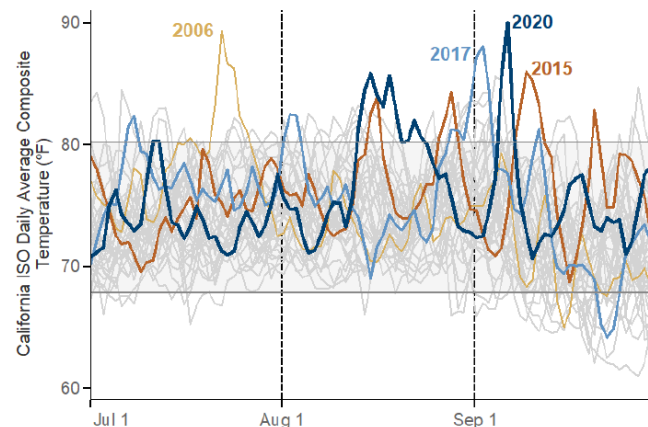
<http://www.caiso.com/Documents/Final-Root-Cause-Analysis-Mid-August-2020-Extreme-Heat-Wave.pdf>

2020 Review

California Rolling outages

- 2022-2025 approach
 - Planning and operational improvements for different types of resources
 - Accelerate DSM
 - Consider generation and transmission buildouts under SB 100 scenarios accounting for natural gas and nuclear retirements
- 2025 and beyond approach
 - Collaboration with regional stakeholders to modernize integrated approach to forecasting, resource planning and RA targets on approach and transition to clean energy

Figure ES.1: July, August, and September Temperatures 1985 - 2020



Source: CEC Weather Data/CEC Analysis

2020 Review

WECC Report

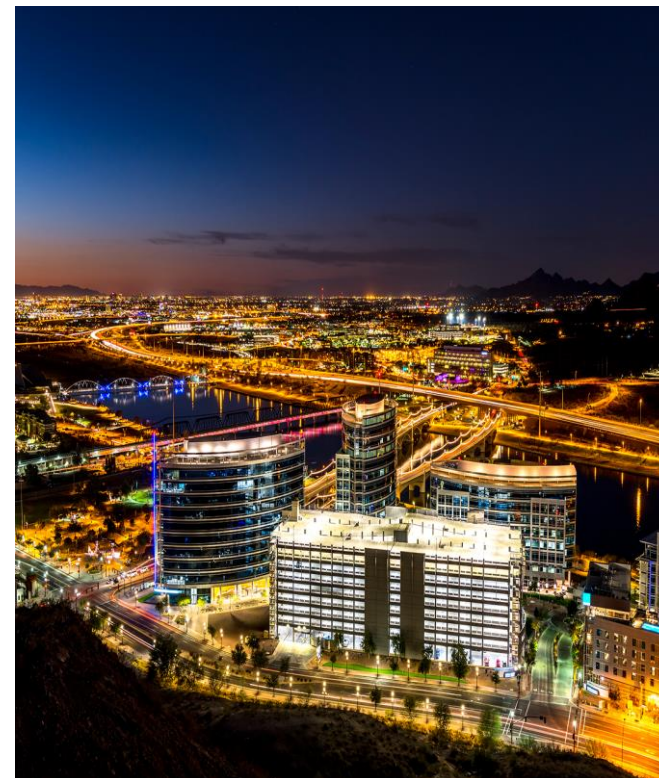
- In December 2020, WECC released “**The Western Assessment of Resource Adequacy Report**” focused on Western Grid reliability and identified 3 major recommendations:
 - Probabilistically determined reserve margins that are dynamic will better ensure resource adequacy in all hours
 - Resource Adequacy studies should consider expected availability of the resource
 - Planning entities should coordinate each year on an interconnection wide basis to avoid double counting imports



2020 Short-term Updates

APS Results

- Arizona experienced the hottest summer on record, with 53 days above 110 degrees, and 14 days above 115 degrees
- APS set an all-time peak in the summer 2020 at nearly 7700 MW
 - Peak occurred on July 30, not during August extreme regional weather (August 14-15)
- APS units and personnel performed well to maintain system reliability
- Customers were responsive to voluntary request to conserve energy effectively boosting reserves for emergency use and reinforcing approach to customer partnerships
- Focus on resource planning and sufficient reserve margins were key to maintaining reliability in the summer 2020 and going forward



2021 Short-term Updates

APS Approach Going Forward

- Arizona economy continues to show momentum related to new residential customer growth and positive business environment
 - Large customers continue to show interest in developing and expanding business in Arizona
- Although APS avoided any energy disruptions, APS is reviewing the peak load forecast process, evaluating generation unit capabilities under extreme weather conditions and preparing for the summer 2021 resource need
 - Peak load forecast was reviewed and determined reasonable by Itron in 2019 audit, and APS has contracted with Itron to further explore peak modeling alternatives
 - APS saw some unit derates during extreme temperatures and is evaluating options going forward



2021 Short-term Updates

APS Approach Going Forward



- Working with regional utilities to further resource adequacy discussions

Proposed Energy Rules Framework

Jeff Burke/Charlie Banke



Proposed Energy Rules Milestones

- **2030** resource portfolios achieve 35% DSM capacity reduction based on 2020 peak demand (1.3% average annual energy reduction)
- **2032** requires a 50% reduction in Carbon emissions based on 2016-2018 baseline
- **2035** resource portfolios will include energy storage capacity that is equivalent to at least 5% of 2020 peak load (40% customer based)
- **2040** resource portfolios achieve 75% carbon emissions reductions
- **2050** resource portfolios achieve 100% carbon emissions reductions



Energy Rules Filings

– Upcoming

- Energy Storage System Tariffs (120 days)
- Baseline Carbon Emissions Level (210 days)

– Annual

- Compliance with Clean Energy Implementation Plan Goals (2022)
- DSM Resource Data Report (2022)
- Supply-Side Resource Data Report (2022)
- Procurement Activity Report (2024)

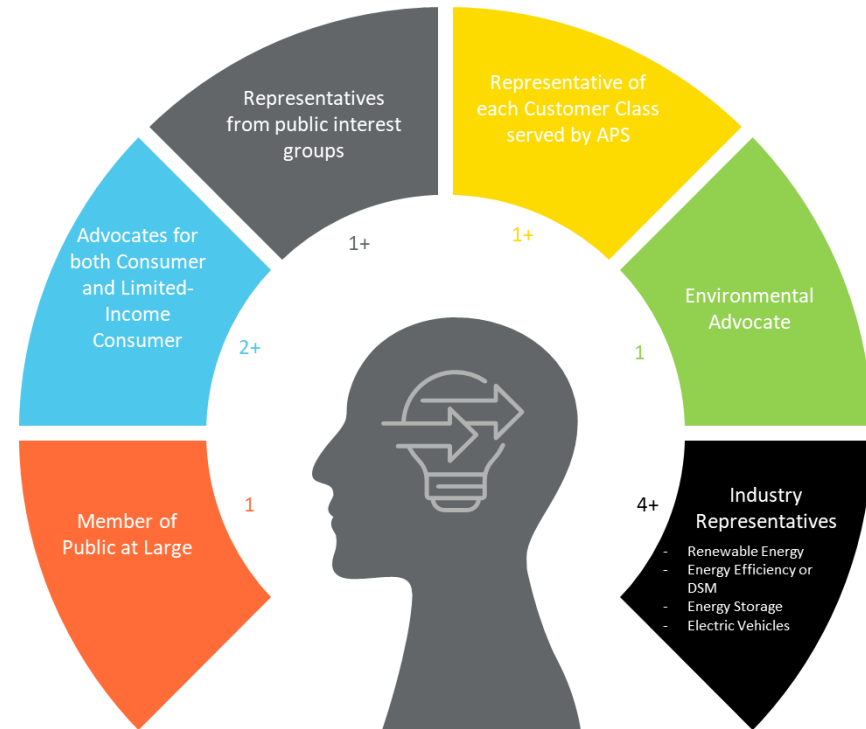
– Triennial

- Load Forecast and Needs Assessment (2021)
- Integrated Resource Plan (2023)
- Energy Efficiency Report (2023)
- Clean Energy Implementation Plan (2023)



RPAC Identification and Tasks

- Energy Rules defines a Resource Planning Advisory Council (RPAC)
 - A group of diverse stakeholders to be included in the broad planning process of Arizona utilities
- APS requests input into the load forecast and needs assessment from RPAC including load forecast sensitivity (filed August 2021)
- APS provides a draft All-Source Request for Information (ASRFI) to the RPAC for feedback (TBD ~ end 2021/early 2022)
- APS will provide a draft IRP to the RPAC for feedback (due August 2023)



RPAC Development Proposal

- APS would propose developing a stakeholder list from participants in prior stakeholder meetings along with new inquiries for this meeting
- Participants would nominate stakeholders for RPAC representative
- Stakeholders asked to vote for nominees of each RPAC representative
- Stakeholder organizations receive one vote per RPAC position identified in the proposed energy rules
- Majority to determine RPAC representative
- Request RPAC representatives to serve an entire planning cycle (approximately 3 years) or would encourage the development of an alternate representative from the same organization
- APS may have the need to fill RPAC representative positions to meet proposed energy rules framework



RPAC Proposal Timeline

- RPAC development needs to occur soon to meet Load Forecast and Needs Assessment for August 2021
- APS proposes to circulate stakeholder list March 3, 2021
- APS suggests nominations from participants for RPAC members by March 10, 2021
 - APS will share nominee list with stakeholders
- Voting for RPAC membership requested by APS on or before March 24, 2021
- Stakeholders could be identified/notified by April 1, 2021 to form RPAC
- APS would coordinate with RPAC and provide membership information to the ACC



Proposed RPAC and Stakeholder Communications

- Monthly RPAC meetings proposed to meet Energy Rule framework
- Quarterly updates with larger stakeholder group
- APS liaisons available to RPAC to provide information, coordinate schedules, and set meetings
 - Charlie Banke
<Charles.Banke@aps.com>
 - Jess Hankins
<Jessica.Hankins@aps.com>



Energy Storage/RFP Update

Derek Seaman



ENERGY STORAGE UPDATE

- Progress toward Clean Energy Commitment depends upon development of energy storage resources
- Success in this space requires close collaboration with industry experts
- APS engaged wide range of industry experts to develop safety requirements that will apply to all battery energy storage facilities (both APS-owned and third party-owned (PPA))
- Technology and corresponding requirements will evolve; **safety focus will remain constant**



WHAT DOES BATTERY SAFETY LOOK LIKE?



Testing: Industry leading testing that guides all safety-related design decisions



Design: Engineering physical components to safely handle risks



Keeping people safe: Physical distance from components; remote access to information from the facility



Training: Risk evaluation, hazard mitigation, safety procedures

BATTERY STORAGE WILL BENEFIT APS CUSTOMERS

- Storage helps meet peaking capacity needs – we can deliver stored energy to our customers when they need it most
- Storage allows for increased integration of renewable energy resources
- Storage enhances operations, increasing flexibility and reducing costs for customers



BATTERY STORAGE PROJECTS UNDER CONTRACT

100MW/400MWh

- 20-year PPA
- adjacent to West Wing (Peoria)
- in service by end of 2022
- ACC approved January 2021

50MW/200MWh

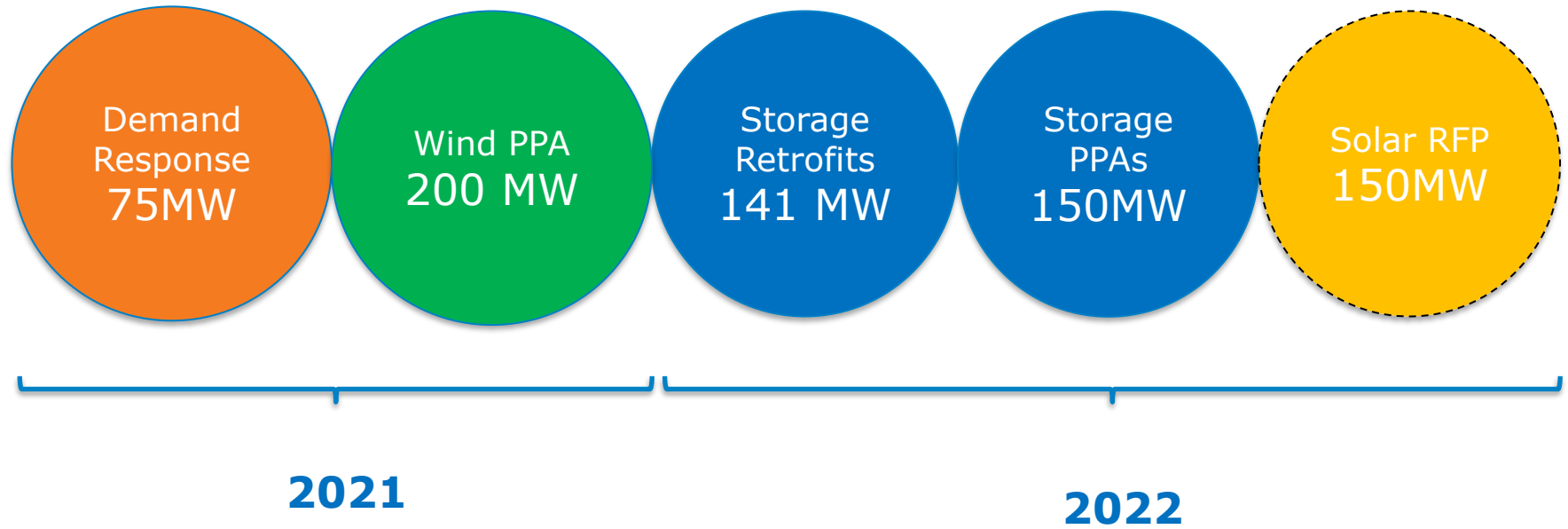
- 20-year PPA
- adjacent to El Sol (Youngtown)
- in service for summer 2022
- ACC approved January 2021

141MW/423MWh

- APS owned
- retrofits to AZ Sun facilities; optimization of existing facilities
- in service for summer 2022

All resources will incorporate APS safety requirements

CLEAN ENERGY COMMITMENT: PROGRESS MADE



CLEAN ENERGY COMMITMENT: CURRENT ACTIVITY

2020 All Source RFP

- 300-400MW renewable energy resources per year
- 200-300MW peaking capacity resources per year
- PPAs, APS-owned resources, and PPAs with future APS ownership option
- Natural gas remains a short-term bridge resource; no APS ownership
- In service 2023-2024



2020 Battery Energy Storage RFP

- 60MW battery energy storage retrofits to APS-owned Chino Valley and Red Rock facilities
- In service no later than June 1, 2023
- Solar after sunset
- Converts existing renewables into flexible peakers

PARTNERING WITH STAKEHOLDERS

- APS has resource needs that must be timely pursued even as we work through Energy Rules and establishing formal stakeholder engagement
- During transition, expect summary sharing of data and results that will help inform participation with load forecast, IRP and RFI processes
- RFP focus: discussion, transparency, feedback



2021 DSM Implementation Plan

Tom Hines



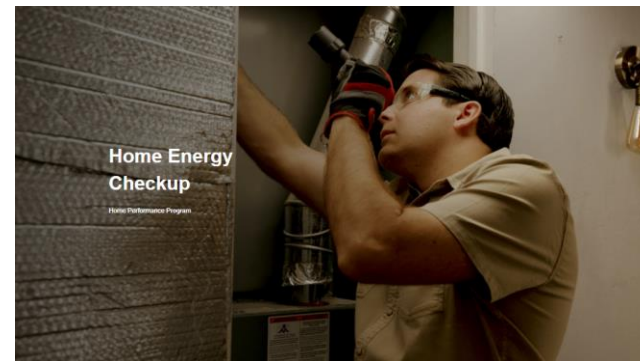
2021 DSM Plan Overview

- Filed on 12/31/20
- Used recently approved 2020 DSM Plan as the starting point and...
 - Continues all current programs
 - Includes new measures/modifications
 - Adds EE energy savings - close to 1.3% level
 - Adds DR peak demand capacity
 - C&I Peak Solutions and Residential/SMB Cool Rewards



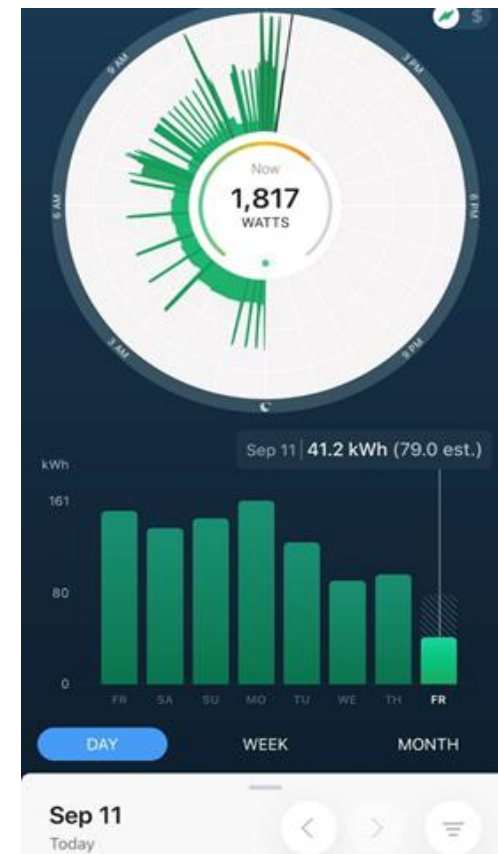
2021 DSM Plan Highlights

- Increased EE Savings
 - Expanded Non-Residential measures/increased goals
 - New ductless mini-split heat pump measure
 - Smart thermostats
 - HVAC replacement
 - Special segments – limited income, MF, schools, tribal communities
- Peak Solutions (C&I DR) – Expand to 60 MWs
- Cool Rewards (Residential DR) – Expand to ~150 MWs
- Residential Energy Storage Pilot



2021 DSM Plan Overview

- **Proposed Budget**
 - \$63.7 million
- **Funding**
 - Requests \$9.9 million increase to DSMAC
- **Programs**
 - Continues all current programs and incorporates new programs/measures approved in 2020 DSM Plan
 - Continues temporary emergency COVID support through summer 2021
- **2021 Energy and Demand Savings Portfolio Goals**
 - 335,000 MWhs (on target to meet average 1.3% EE savings goal)
 - 436 MWs (400% increase in peak demand savings since 2016)



DER Aggregation Tariff

- **DER Aggregation** – Per Decision 77855, APS is developing a tariff to provide compensation for aggregated DER with respect to:
 - Capacity
 - Demand Reduction
 - Load Shifting
 - Locational Value
 - Voltage Support
 - Ancillary & Grid Services
- **Evaluation** – analyze data for an array of DER technologies to determine impacts
- **Valuation** – determine mutual benefits for APS and customers using data from evaluation to monetize the benefits that DER can provide at scale

We are holding our next stakeholder meeting in March to discuss and gather feedback.

We want to hear from you! Please let us know if you want to participate.

APS Transportation Strategy

Kathy Knoop



APS Electric Vehicle Strategy -

IRP Stakeholder Meeting
February 23, 2021
Kathy Knoop, Energy Innovation
Advisor C2GS



Transportation Electrification – long term goals



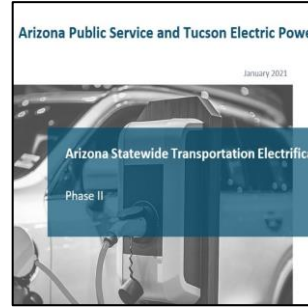
The APS fleet from Bolts to Bucket trucks – **enhancing fleet stewardship**



EVs and the customer experience – **deeper connections and economic growth**



Transportation electrification for emissions reductions – support **ozone attainment status** and **decarbonization**



Strengthening our relationships with vendors, stakeholders, utility partners and regulators to find win/win solutions and collaboration opportunities



Manage EV growth increased load at the right time can lead to downward pressure on rates – **accelerate EV adoption now and educate buyers on charging**

Transportation Electrification (TE) Strategy guiding principles



**Design around
customer needs**



**Provide value for
customers**



Manage EV charging



**Establish stakeholder
support**

Bolts to Bucket trucks – leading by example

Sustainable Fleet

In July 2020, we set a goal of transitioning 30% of our light-duty vehicles and equipment (comprised of forklifts, all-terrain vehicles, golf carts and light-duty passenger vehicles) to electric by 2025 with an aspirational goal of achieving a 100% clean, carbon-free fleet by 2050.



Working with stakeholders and regulators to advance TE across all agencies – a comprehensive approach

Arizona Statewide Transportation Electrification Plan

Electric vehicle (EV) technology has progressed dramatically in recent years and is beginning to create changes to our conventional transportation system. Transportation electrification (TE) can provide significant benefits to EV purchasers and utility customers generally, improves air quality, and aids in the growth of the Arizona economy. To unlock this value, Arizona's electric utilities along with regulatory agencies, policymakers, automakers, third-party charging service providers, and other stakeholders must work together to support EV adoption while also integrating this new load into the existing electricity system.

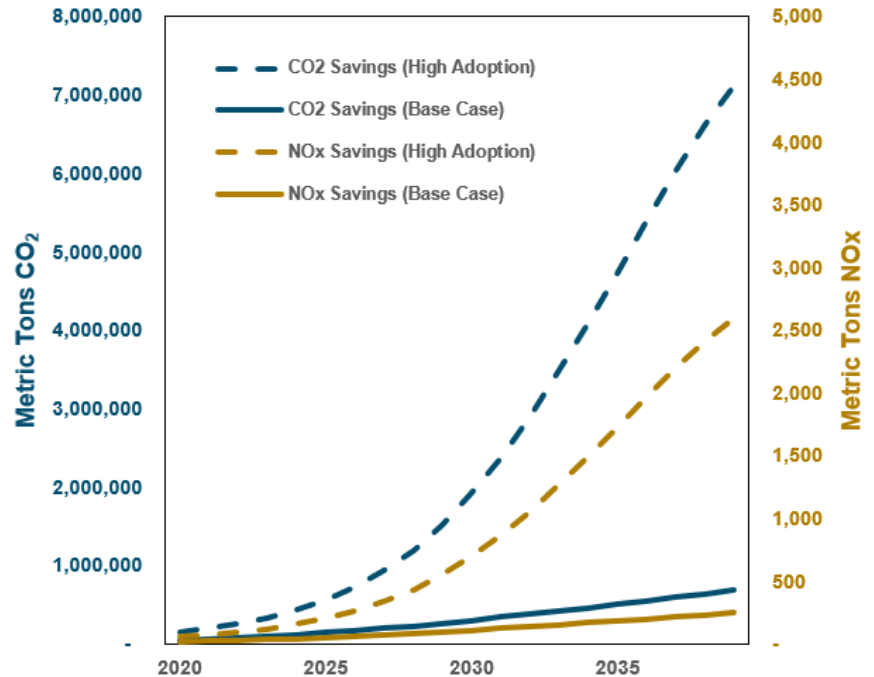
Arizona's Statewide Transportation Electrification Plan is intended to provide a roadmap for TE in our state, focused on realizing the associated air quality and economic development benefits for all residents along with understanding the impact of EV charging on the grid. In 2020, Arizona utilities – Arizona Public Service (APS), Tucson Electric Power (TEP), Salt River Project (SRP) – and other stakeholders will discuss proposed TE programs and initiatives with the ultimate goal of drafting a plan to implement TE in Arizona.



More TE = More emission reduction from transportation



Annual savings



2020 EV market highlights

EV sales increase against a flat or declined overall automotive market

- 1 **Tesla made 500,000 EVs (globally)**

- 2 **Big push for fleet charging business**

- 3 **DC charging power nearing 250 kW**

- 4 **Plug and Charge is here**

- 5 **Autonomous vehicles are hard /Rise of SPACs (and what is one?)**

Plug-in crossovers and SUVs finally started arriving in 2020

Tesla Model Y BEV



BMW X3 PHEV



Audi Q5 PHEV



Toyota RAV4 Prime PHEV



BMW X5 PHEV



Lincoln Aviator PHEV

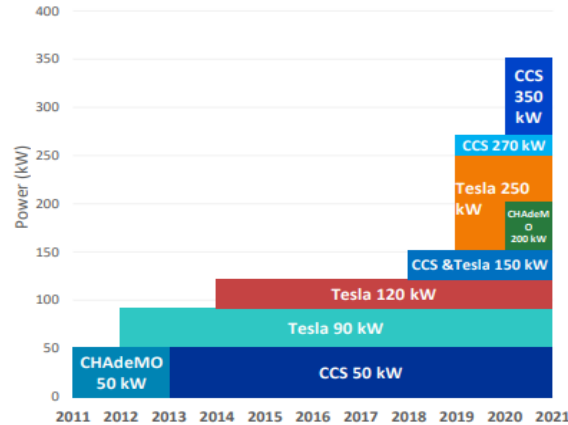


EV trends: Increasing DC charging power

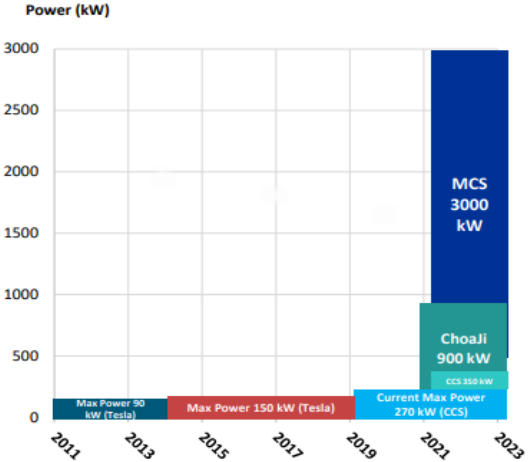
Key market drivers:
 DC charging power levels increase
 Battery prices decrease

This enables larger EVs as well as lower volume market segments

DC Charging Power Level

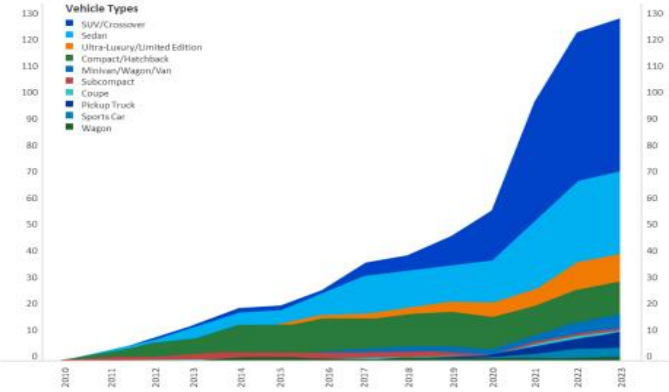
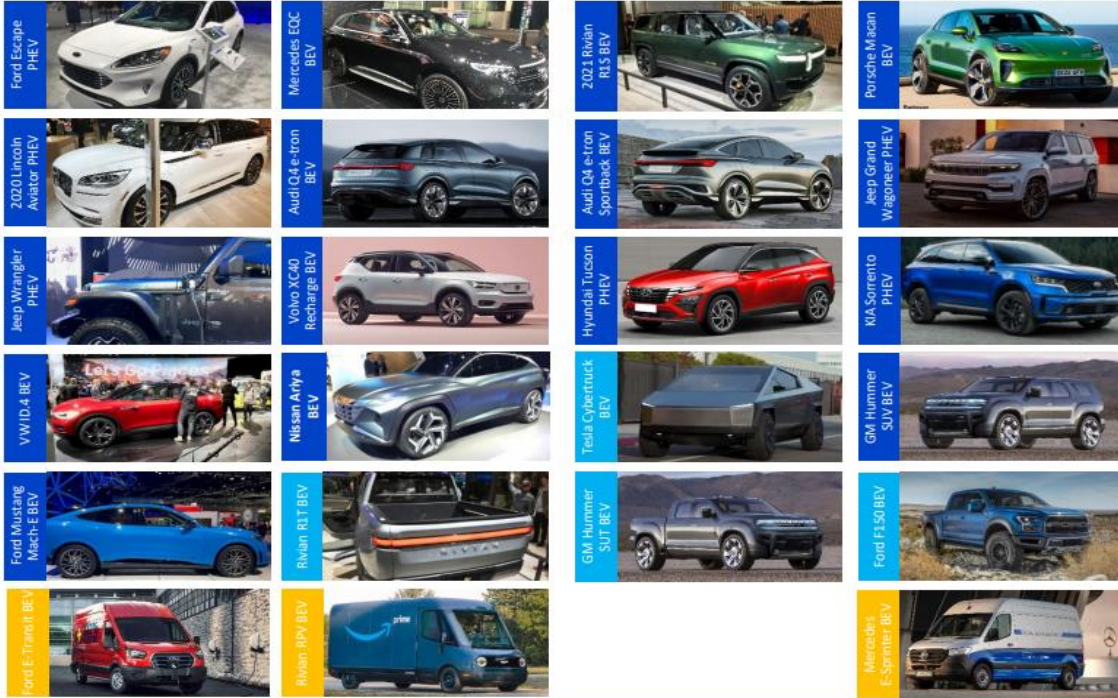


Future DC charging power level



Electric trucks, crossovers, and SUVs arriving in 2021-2022

Key questions focus on announcements versus reality and local availability



2021

2022

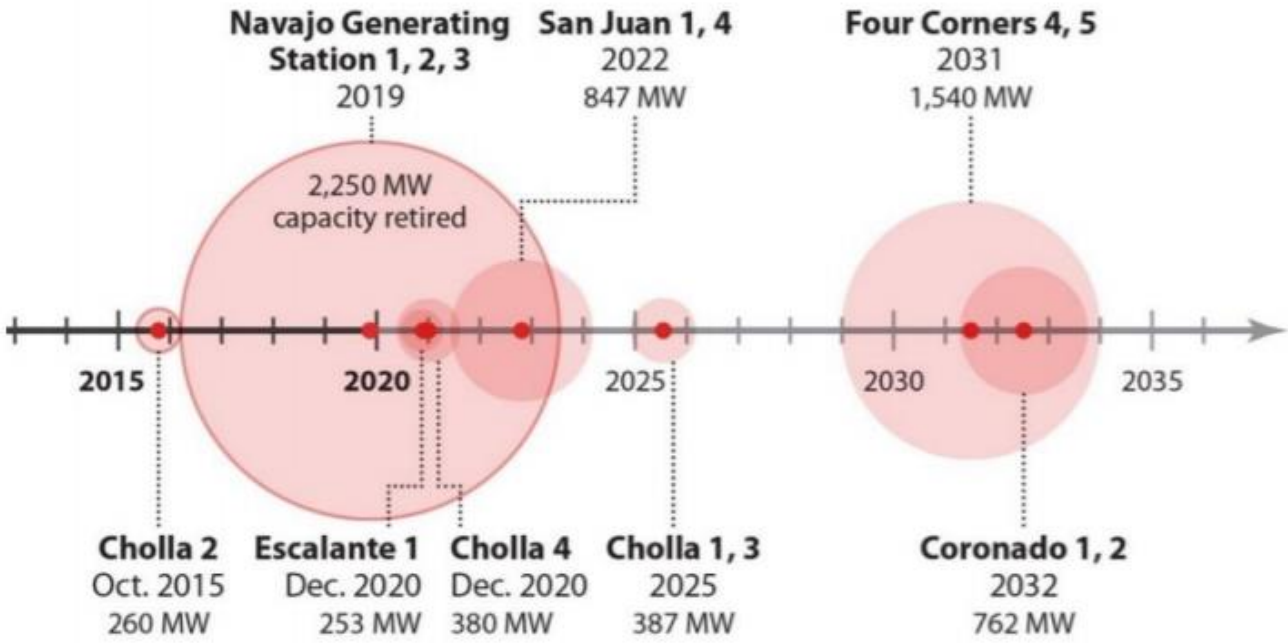
Photo credit: Dan Bowermaster, EPRI; Mark Kosowski EPRI; bmwusa.com (media); ford.com (media); www.motortrend.com; www.caranddriver.com (accessed 9/13/2020)

Community Coal Transition

Eric Massey



Regional Trends in Coal-Fired Power



Source: [Institute for Energy Economics and Analysis](https://www.iewa.org/energy-economics-and-analysis)

Community Impacts



Schools

- Students depart the area
- Less revenue to support students
- Impacts surrounding communities



Families

- Long distance commute or move
- Separation of generations
- Rural way of life threatened



Jobs

- High paying jobs lost
- Fewer local opportunities
- Relocation required for work
- Upskilling and education may be necessary to compete



Coal Fired Plant

- Higher investment & credit risk
- Economics favor other technology
- Regulations

Tax Base

- Often the largest revenue source
- Fewer community services
- Fewer social programs
- Local and County level

Economy

- Impact to supporting businesses
- Reduced flow of dollars
- Overall reduced demand for local goods and services

Stakeholder Priorities

NAVAJO NATION

- Coal Community Transition
- Economic Development
- Tribal Electrification & Infrastructure
- Renewables development on Navajo Nation

STAKEHOLDER ADVOCATES

- Just and equitable transition for Navajo Nation
- Clean energy technology developments
- Renewable energy and energy efficiency projects on the Navajo Nation



APS



- Clean Energy Commitment
- Renewable Energy Development
- Balance clean, affordable and reliable
- Honor long term partnerships with communities in which we've operated
- Balance shareholder impacts and benefits

ACC



- Reasonable rates for customers
- Clean energy rules and development
- Renewable energy development

Navajo Nation CCT Framework

APS Rate Case Proposal (Nov. 6, 2020)

Item	Customers	Shareholders
CCT Fund	\$100M over 10-years	-
Tribal Electrification Work and Fund	\$10M over 10-years	
Economic Development	-	\$1.25M over 5-years
Transmission Revenue	-	\$17.5M (minimum) over 7-years

Additional Elements

- 600 MW of renewable energy RFPs on/nearby the Navajo Nation
- Tribal water rights support
- Support Tribe's other CCT Efforts
- Job Re-deployment for employees at APS-owned coal plants



Coal Community Transition Proposal

NAVAJO NATION	SHAREHOLDER	INCLUDED IN RATES	TOTAL PAYMENTS
Coal Community Transition (Includes Electrification)	\$5,000,000	\$105,000,000	\$110,000,000
Economic Development	\$1,250,000	-	\$1,250,000
Transmission Revenue	\$17,500,000	-	\$17,500,000
Total	\$23,750,000	\$105,000,000	\$128,750,000

CHOLLA COMMUNITIES	SHAREHOLDER	INCLUDED IN RATES	TOTAL PAYMENTS
Coal Community Transition	\$500,000	\$10,900,000	\$11,400,000
Economic Development	\$600,000	-	\$600,000
Total	\$1,100,000	\$10,900,000	\$12,000,000

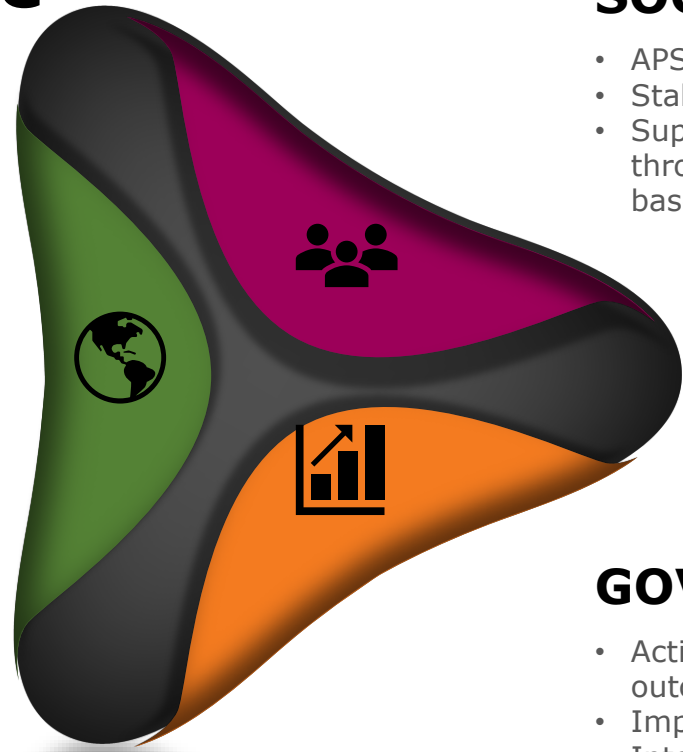
HOPI TRIBE	SHAREHOLDER	INCLUDED IN RATES	TOTAL PAYMENTS
Coal Community Transition	\$150,000	\$3,350,000	\$3,500,000
Economic Development	\$200,000	-	\$200,000
Total	\$350,000	\$3,350,000	\$3,700,000

Triple Bottom Line



ENVIRONMENT

- Action on Clean Energy Commitment
- Increased renewable energy
 - Improved air and water
 - Lower carbon emissions



SOCIAL



- APS workforce employment promise
- Stakeholder involvement and support
- Support impacted communities through transition away from coal-based economy

GOVERNANCE



- Active management of financial outcomes
- Implementation of business plans
- Integration of sustainability into actions
- Reduced risk of pressure from stakeholders

Closing/Discussion

All



Thank You

