

Long-Term Planning *in an era of rapid change*

Jeff Yockey, P.E.
Manager
Resource Planning



Corporate Family



Business Structure: IOU	Vertically Integrated
Employees	1,508
Owned Generation	2,869 MW
Service Area	1,155 Sq Miles
Customers	419,800



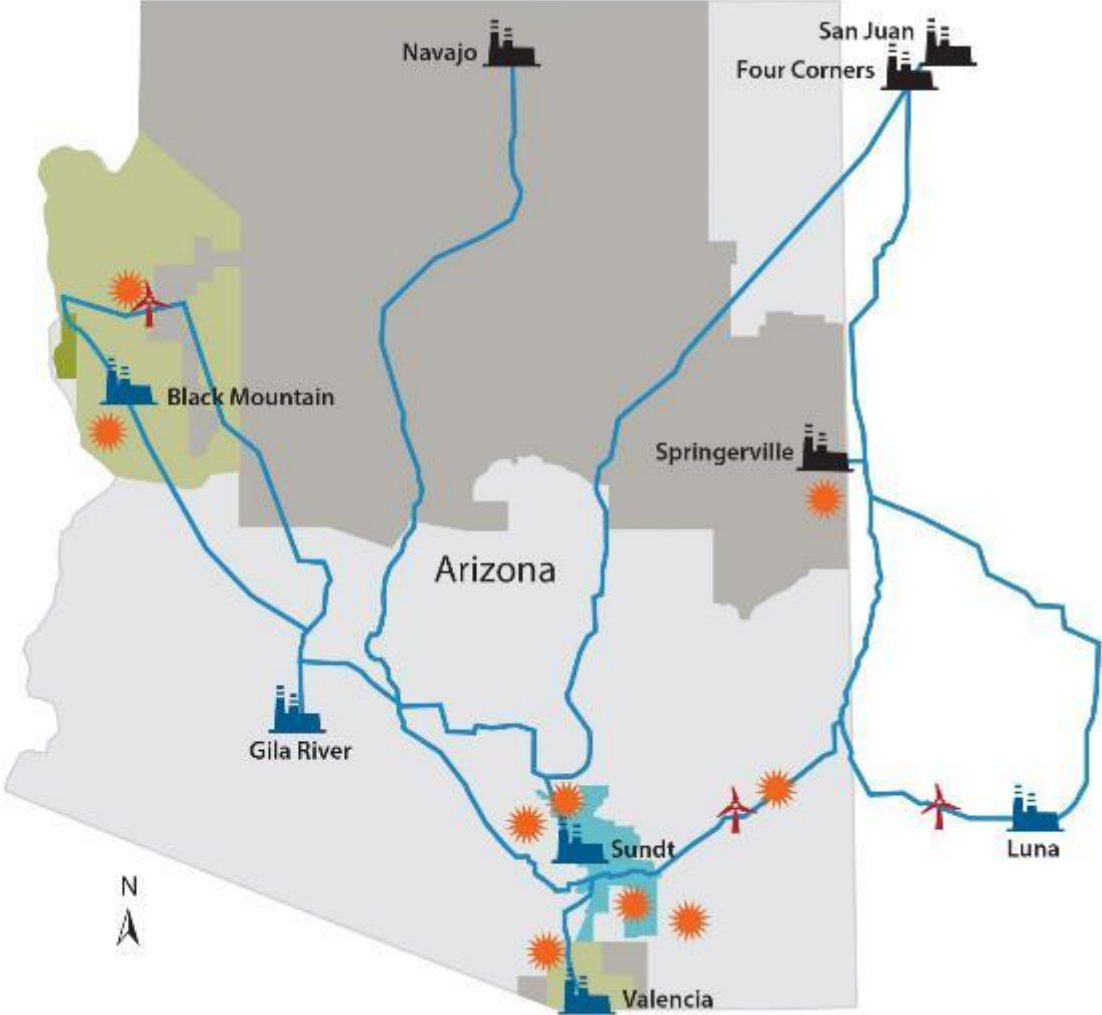
Business Structure: IOU	Vertically Integrated
Employees	325
Owned Generation	303 MW
Service Area	63,507 Sq Miles
Customers	251,769



Service Territories and Resources

Tucson Electric Power (TEP)
UniSource Energy Services (UES)

- SERVICE AREAS**
- TEP
 - UES
 - UES Electric
 - UES Gas & Electric
- Transmission Line
- Coal-Fired Power Plant
- Natural Gas-Fired Power Plant
- Community-Scale Solar Array
- Community-Scale Wind Turbines



Integrated Resource Plan (IRP) Overview

Oversight by Elected Officials

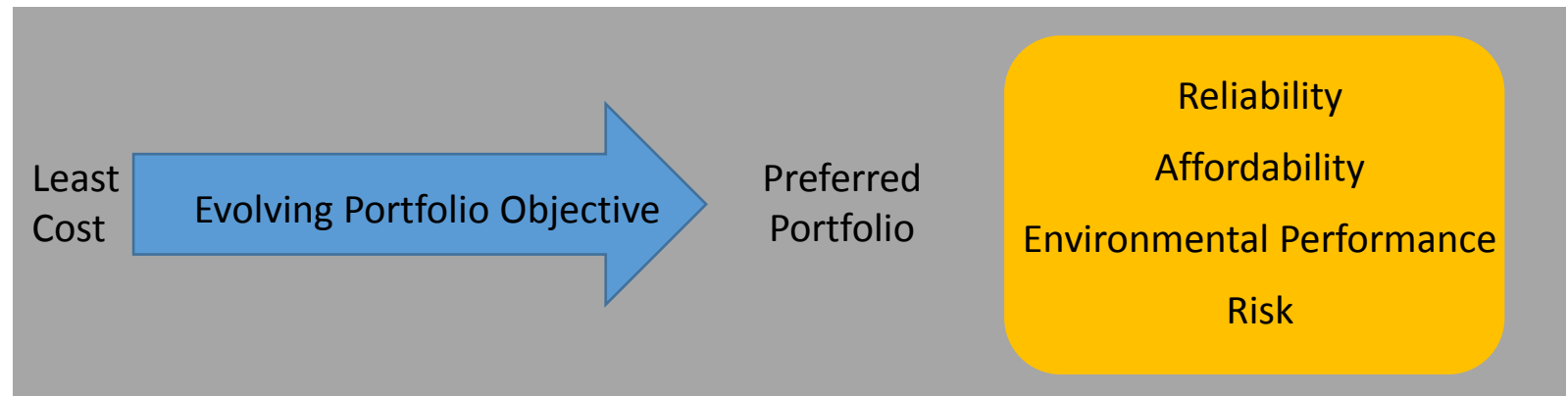
- ▶ Arizona Corporation Commission for IOUs and Co-ops
 - AAC R14-2-701 et seq
- ▶ Boards or Councils for Municipal or Federal

Timing

- ▶ 2-3 year planning cycle
- ▶ 15-20 year outlook

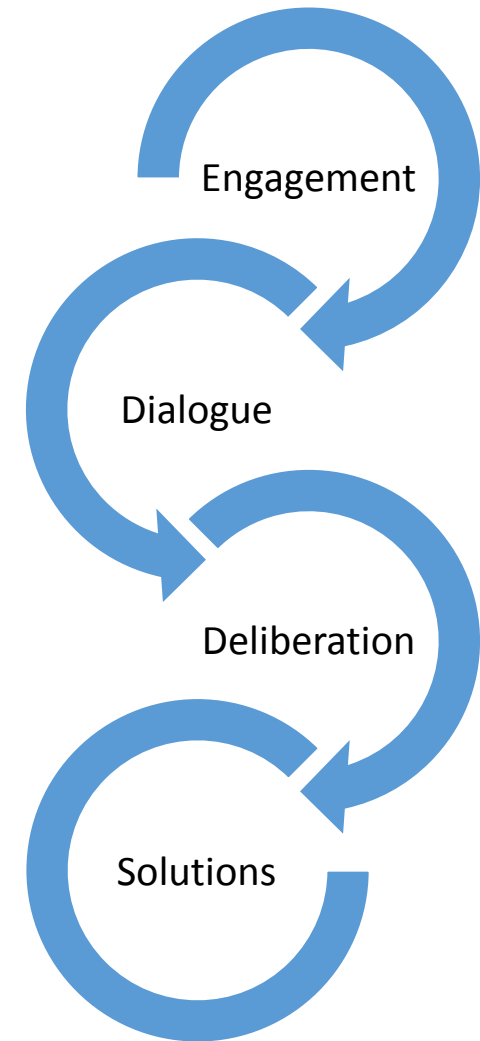
Stakeholder Involvement

- ▶ Preliminary IRP (PIRP)
- ▶ ACC Workshops
- ▶ Utility Workshops
 - Rulemaking
 - Portfolio selection
 - Energy efficiency
 - Pre-filing
- ▶ ACC Docket



Planning Around Meaningful Objectives

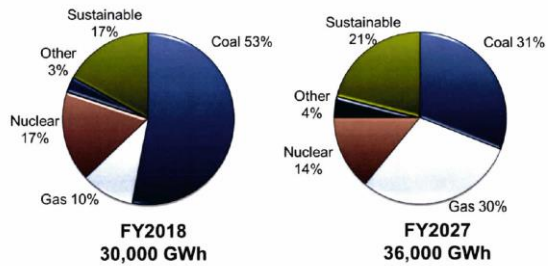
- Rate Impact
- Emissions
- Water Use
- Economic Impacts
 - Jobs
 - Business Development
- Equality



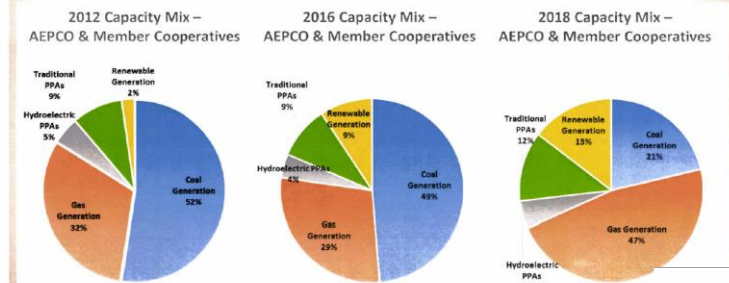
Resource Diversification



Current vs. Projected Energy Mix



The Cooperatives' Changing Capacity Mix



The Cooperatives' resources have become increasingly diverse over the past two decades as utility scale renewable and retail solar generation have become more economic and feasible.

TEP's 2017 Portfolio Diversification Strategy

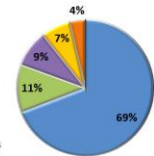
Transitioning to a Balanced Portfolio

Target a Balanced Mix of Coal, Natural Gas and Renewables

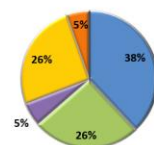
- Reduce coal capacity over the next five years
 - San Juan Unit 2
170 MW – December 2017
 - Navajo Generating Station
168 MW – December 2019
 - San Juan Unit 1
170 MW – June 2022
- Explore natural gas generation expansion
 - Combined Cycle Natural Gas
 - Fast ramping resources
- Integrate cost effective renewable energy
- Operational challenges / opportunities
 - Natural gas storage
 - Energy storage technologies



2017 Portfolio Energy Mix



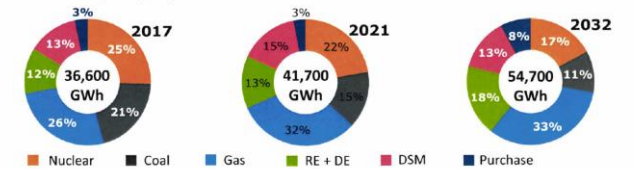
2032 Portfolio Energy Mix



APS Generation

Balanced and Stable

- Natural Gas
 - Stable contribution to the energy mix over the 2017-2032 planning period (26% to 33%)
 - Hedging program allows APS to keep rates stable
- Optimize Resource Position with Real-Time Decisions
 - Available transmission capacity
 - Interconnection to markets
 - Flexible resources in the load pocket provide high value and responsive services (Ocotillo, Sundance, Yucca, etc.)



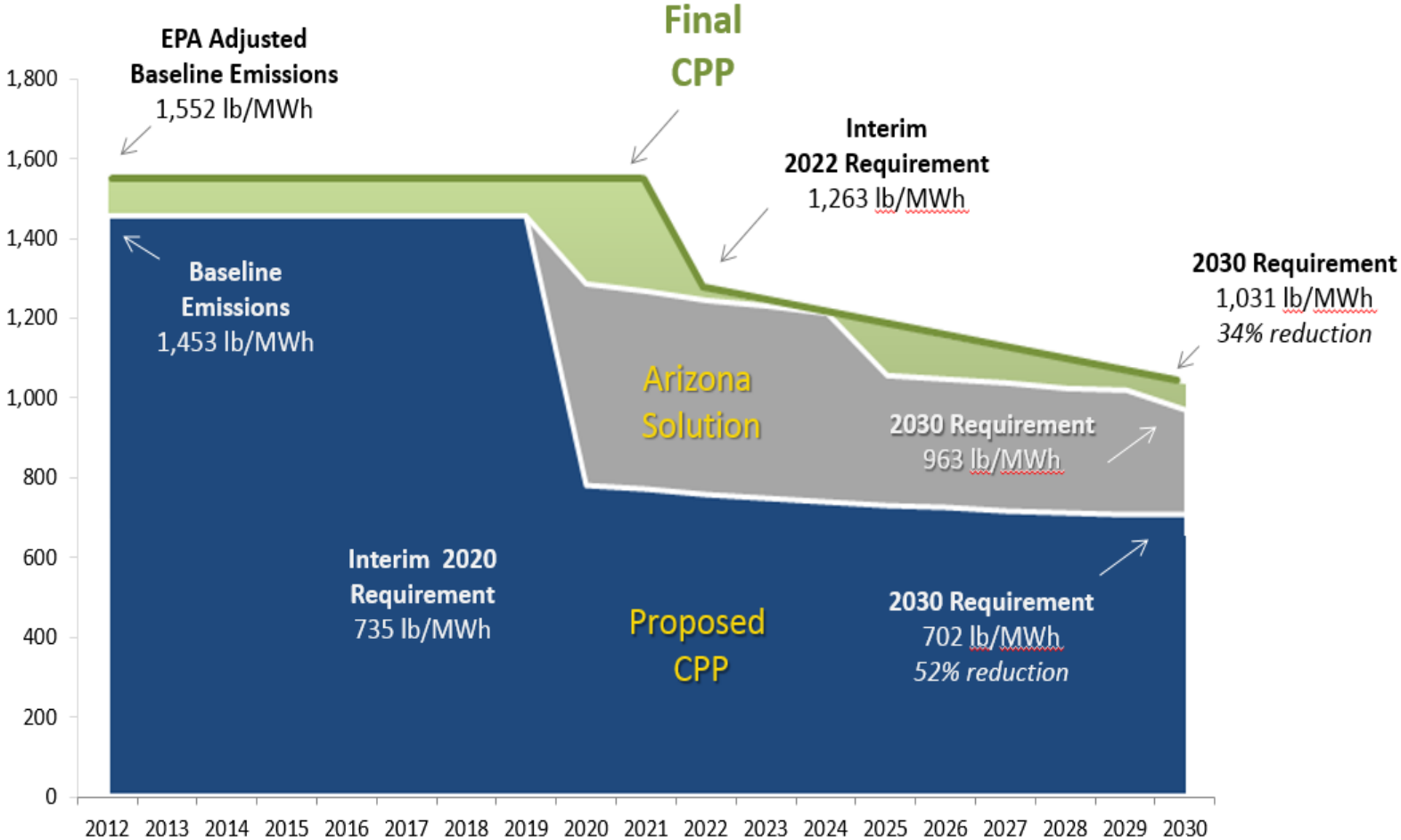
Diverse Energy Mix



Regulatory Impacts on Planning (Clean Power Plan)

Regulations can have
drastic affects

Cost-effective
transition takes time



Regulatory Impacts on Planning (Regional Haze)

Strict command and control investments reduce options

Avoided over \$2 billion in stranded assets

Navajo Generating Station



\$1.3 billion for
Selective Catalytic Reduction

San Juan Generating Station



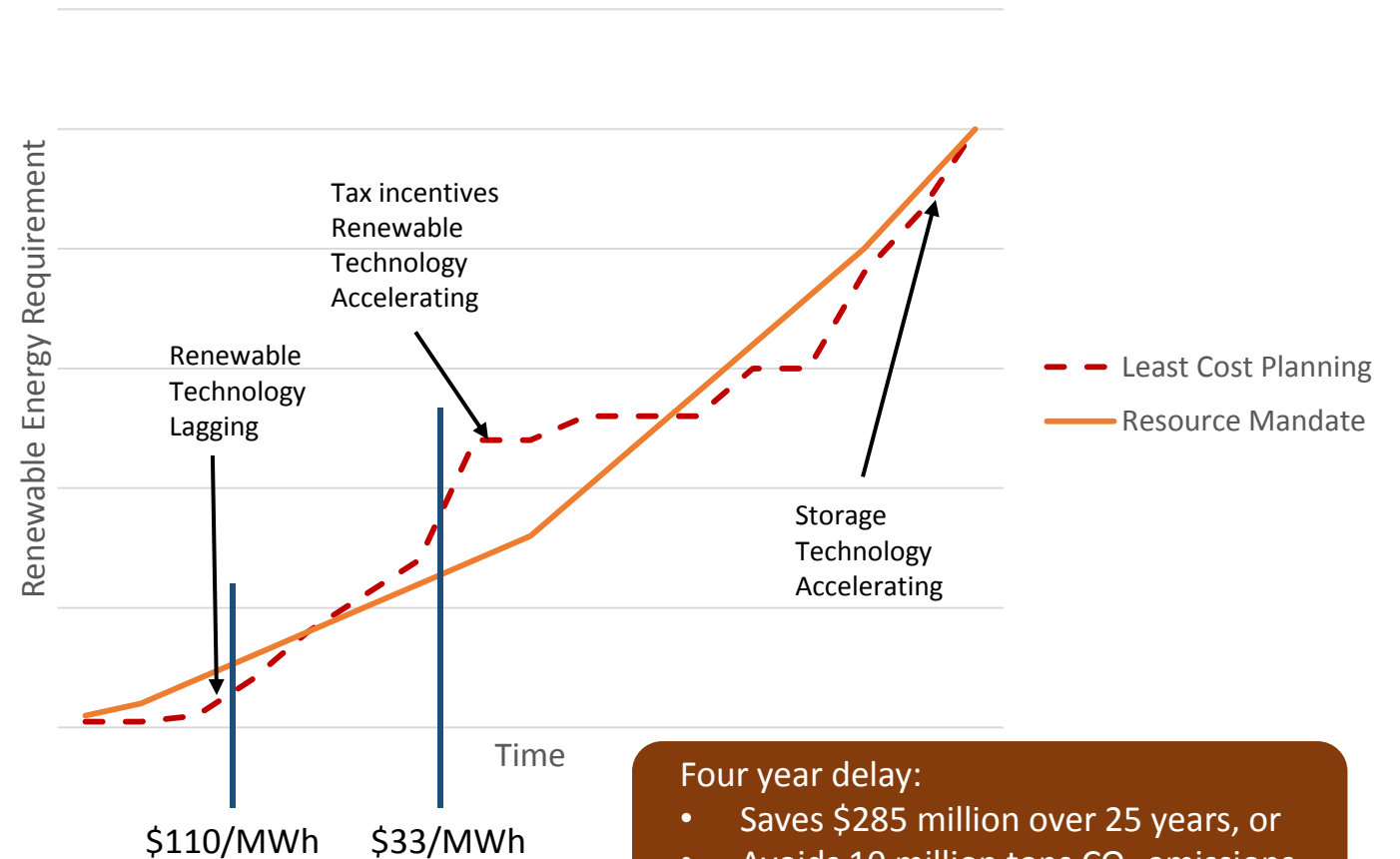
\$900 million for
Selective Catalytic Reduction

Regulatory Impacts on Planning (Resource Mandates)

Ignores timing of incentives

Not in sync with technology development

Renewable Energy Goal Trajectories



Four year delay:

- Saves \$285 million over 25 years, or
- Avoids 10 million tons CO₂ emissions

Thank You

