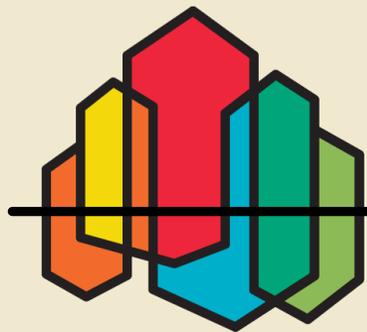


Highlights from the 2021 Power Plan

NWGA Annual Energy Conference

June 9, 2022

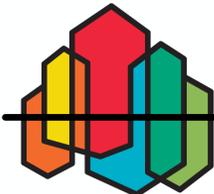
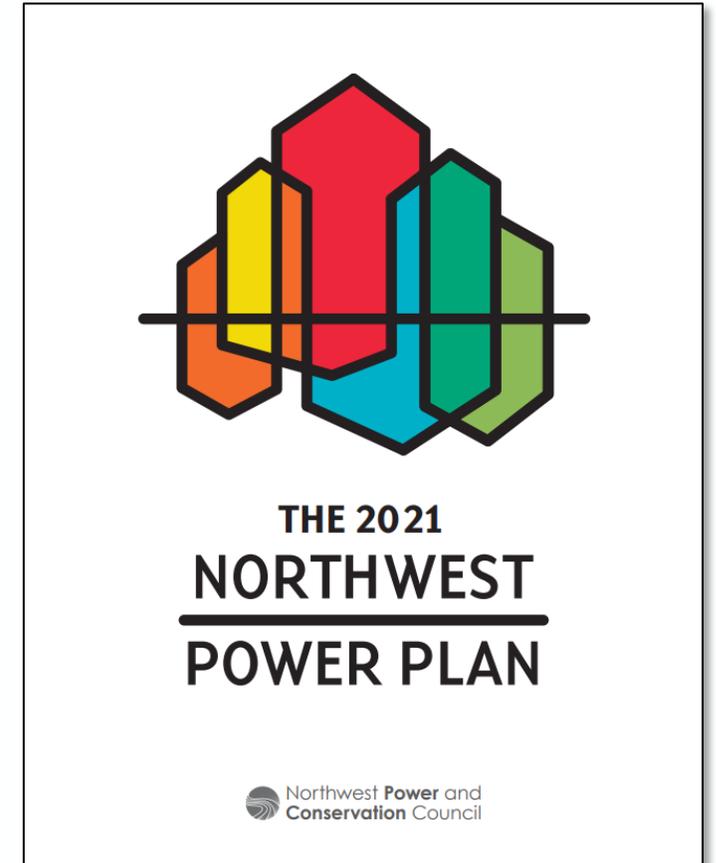


**THE 2021
NORTHWEST
POWER PLAN**

FOR A SECURE & AFFORDABLE
ENERGY FUTURE

The Council's Power Plan

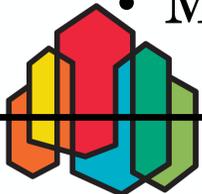
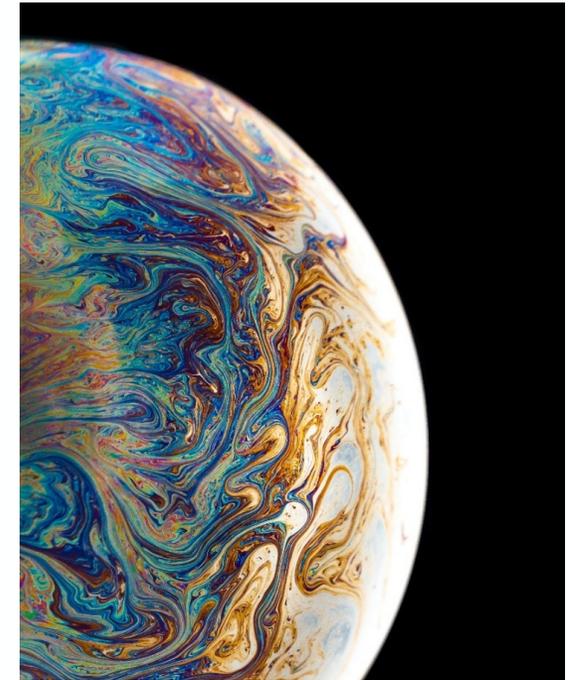
- “[T]he Council shall prepare, adopt, and promptly transmit to the [Bonneville] Administrator a regional conservation and electric power plan.”
- Goal: Ensure an adequate, efficient, economical, reliable regional power supply over the next 20 years
- Uses:
 - Under the NW Power Act, Bonneville’s decisions on resource acquisitions are to be consistent with the power plan
 - Independent reference for all of the region’s utilities, regulatory commissions, and policy-makers



2021 Power Plan: The Energy Landscape is Changing

A significant shift has occurred across many aspects of the energy industry

- **Clean policies and decarbonization goals** are driving significant coal retirements and renewable builds
- Dramatic **decrease in price** for alternative resources:
 - Market prices are rapidly decreasing and frequently negative by ~2030
 - Renewables cost have come down significantly
 - Decrease in price of efficient natural gas plants
 - Low natural gas fuel prices*
- Meanwhile, **less low-cost energy efficiency**



* At the time of the plan analysis

Key Assumptions in Baseline Conditions

Baseline conditions provide a basis for comparison when developing scenarios and use a set of common assumptions that are important dials for the analysis.



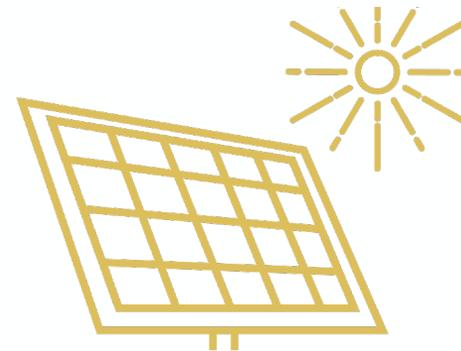
Climate change informed forecasts



Transportation forecast



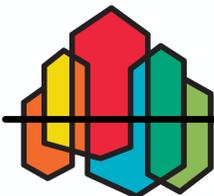
Clean Policies and SCC



Commercially available resources



Limits on new gas plants



Questions Explored in the Power Plan

Role of Markets

How does changing our reliance on markets outside the region change our resource needs in the region?

What are the potential impacts from changing the structure and reliability of markets outside the region?

Energy Efficiency

How would the resource strategy change with different estimates and assumptions regarding the supply of efficiency?

BPA

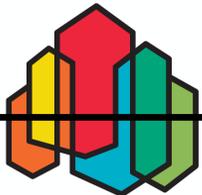
What might a resource strategy look like for Bonneville in meeting its obligation?

Greenhouse Gas Emissions and Decarbonization

What are the implications of accelerating the planned retirement dates for coal generation throughout the west?

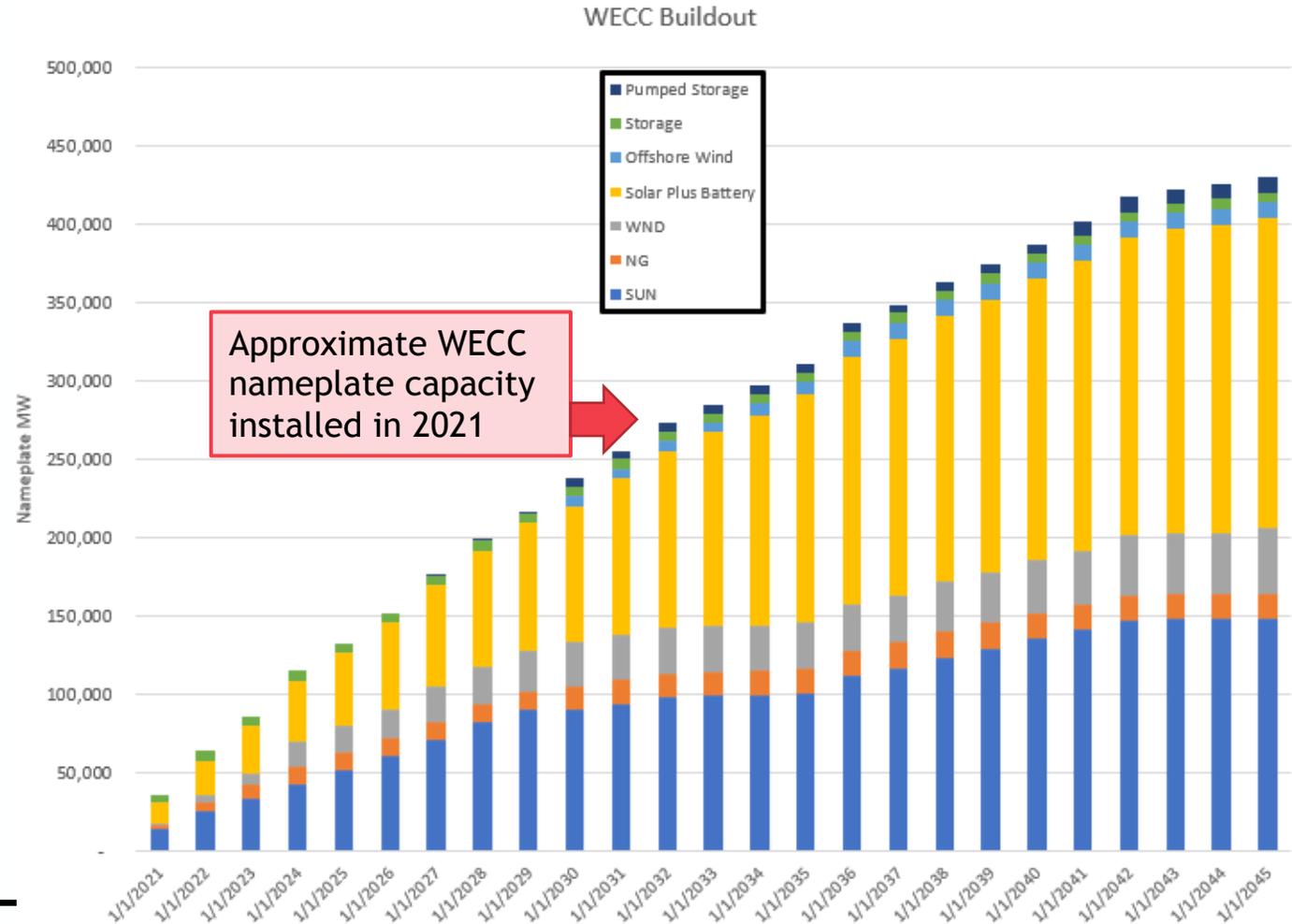
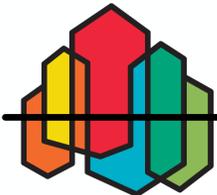
How do limitations on greenhouse gas emissions (financial or otherwise) impact the resource strategy?

How will efforts to substantially reduce economywide GHG emissions impact the electricity sector?

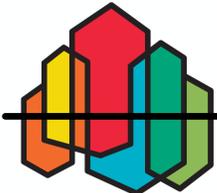
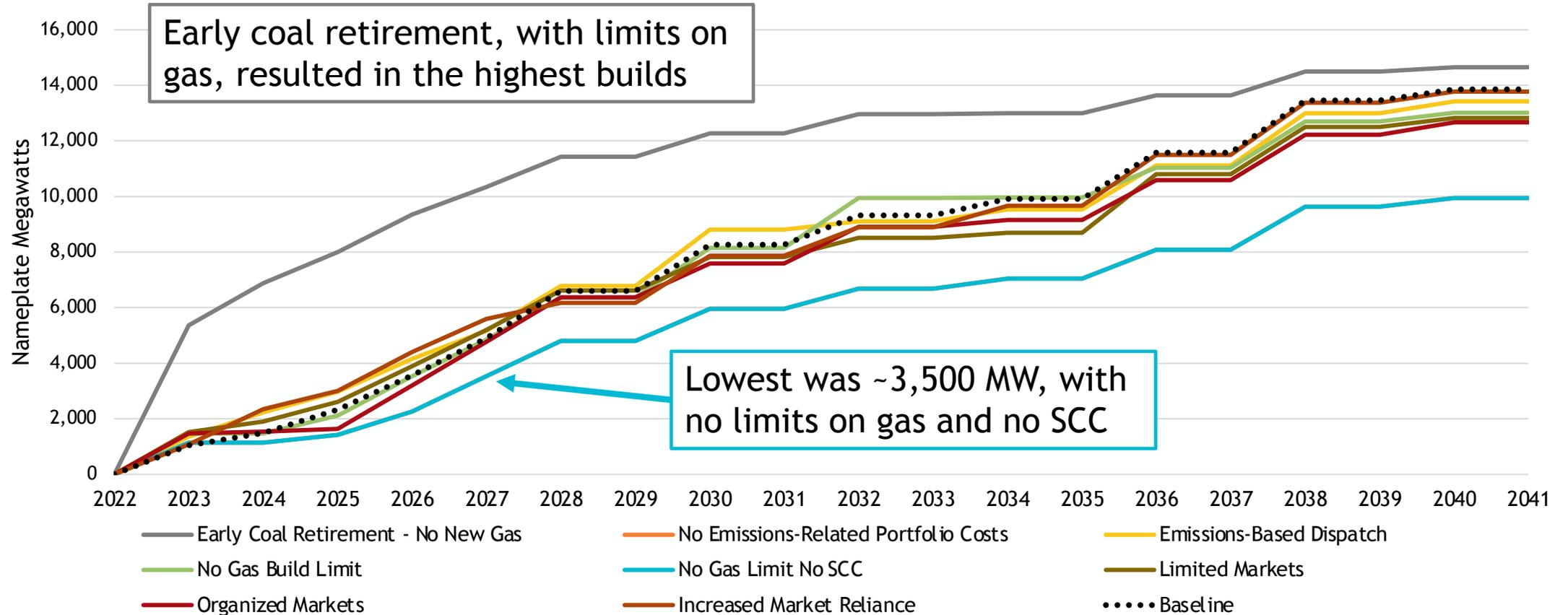


WECC-Wide Buildout of Projected New Resources and Market Prices

- Significant renewable builds throughout the WECC driven by clean policies
- System is adequate, but due to renewable curtailment, does not meet clean requirements in every year
- Buildout results in low and decreasing market prices that becoming increasingly variable and frequently negative

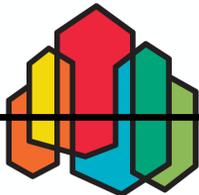
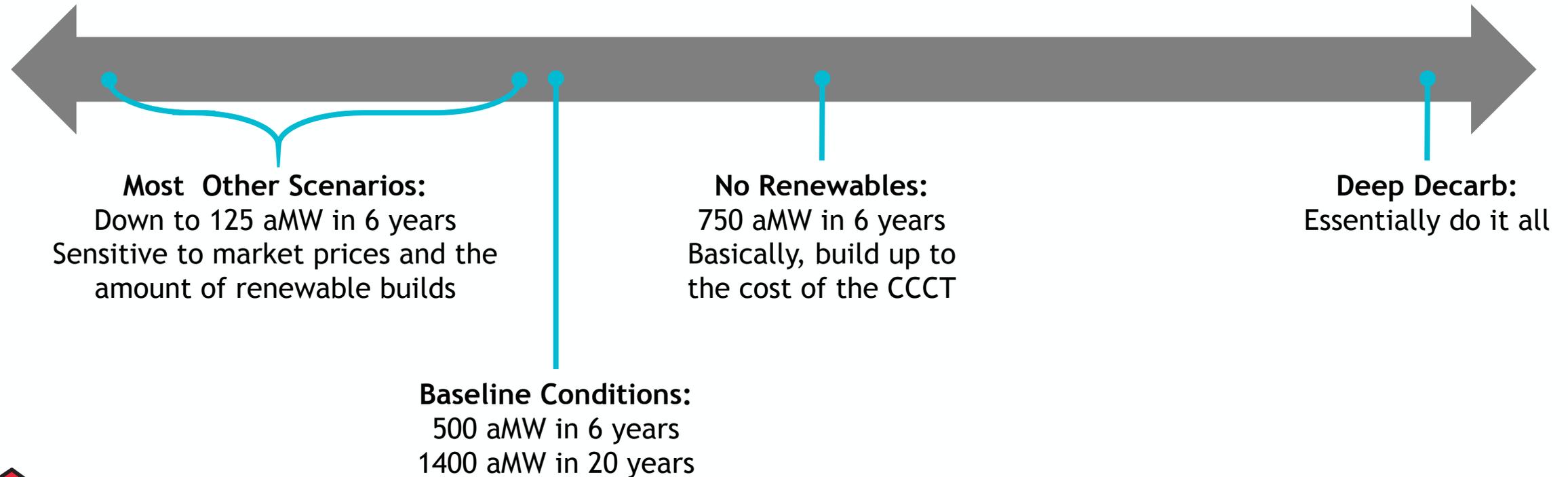


Average Regional Renewable Builds Across Various Sensitivities



Energy Efficiency Acquisition

Generally, EE acquisition is significantly lower than in the 7th Plan with the amount varying by (1) market prices and (2) renewable builds



Exploring Pathways Decarbonization

- Added significant load from transportation, building electrification, industrial fuel shifting to electric or hydrogen
- Increased renewable natural gas penetration

Key Takeaways

- Significantly more renewables and energy efficiency is required, along with demand response and storage
- Likely requires adjustments to reserves to account for all the renewables

Key Challenges

- Operability of the system is unclear
- Addressing the power sector alone through these approaches does not meet state goals



2021 Power Plan: Regional Resource Strategy



Existing System: More flexibility

- Greater potential flexibility in the hydro system and the ability to more effectively use our thermal fleet to provide reserves is needed, collectively reducing regional needs and supporting the integration of renewables



Renewables: >3.5 GW by 2027

- Significant renewable build recommended (>3.5 GW by 2027), due to their low costs, interruptibility, and carbon reduction benefits. This build out will impact the transmission system.



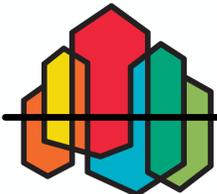
Energy Efficiency: 750 aMW by 2027

- Significantly less acquisition than prior plan due to greater cost-competitiveness with other resources, not being dispatchable, and being sensitive to market prices



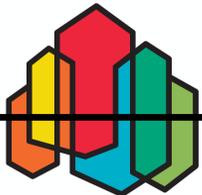
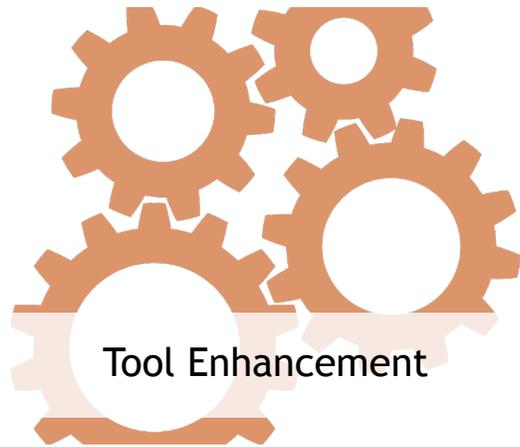
Demand Response: low-cost capacity

- Products that provide highest value to the system are those that can be regularly deployed at low cost and with minimal to no impact on customer (e.g. DVR, TOU)



Note: Resource strategy does not include new natural gas. New natural gas was built when we limited other resources, such as no renewables or early retirement of coal, but otherwise was absent from most of the results.

Action Items in Preparation for Future Plans



A scenic landscape photograph of a mountain range. The foreground shows a calm lake reflecting the surrounding environment. The middle ground is dominated by thick, white mist or low clouds that partially obscure the mountain peaks. The mountains in the background are rugged and appear to be covered in sparse, dry vegetation. The overall atmosphere is serene and somewhat ethereal. The text 'Questions?' is overlaid on the left side of the image in a large, black, sans-serif font.

Questions?