

A scenic view of the Tacoma waterfront. In the foreground, a wooden pier with several white boats is visible. The middle ground features a mix of modern and older buildings, including a prominent white, cone-shaped structure. The background shows a clear blue sky with some light clouds. The water in the foreground reflects the buildings and sky.

*Serving our customers*

# Tacoma Power 2022 IRP Workshop 1

2022 IRP Plans & Input Updates

**TACOMA POWER**  
TACOMA PUBLIC UTILITIES

IRP 2022 introduction



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graph TD; A[IRP 2022 introduction] --> B[Refresher on Tacoma Power's IRP modeling framework]; B --> C[Key changes & model updates: Prices]; C --> D[Resources to be considered in 2022];
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Refresher on Tacoma Power's IRP modeling framework

Key changes & model updates: Prices

Resources to be considered in 2022

# IRP 2022 Introduction



## **An integrated resource plan (IRP) is:**

- Plan to ensure we have enough resources to meet customer needs for many years into the future

## **Electric utility resource plans law (19.280 RCW)**

- Requires utilities to develop integrated resource plans
  - Full plan every 4 years, smaller update every 2 years in between
  - Full plan in 2020, next update due September 2022

## **Staying the same**

- Same modeling framework
- Same core scenarios
  - Cruise Control (Base Case)
  - Carbon Policy Accelerates
  - Technology Solves Everything
  - Reliability Reigns

## **Changing**

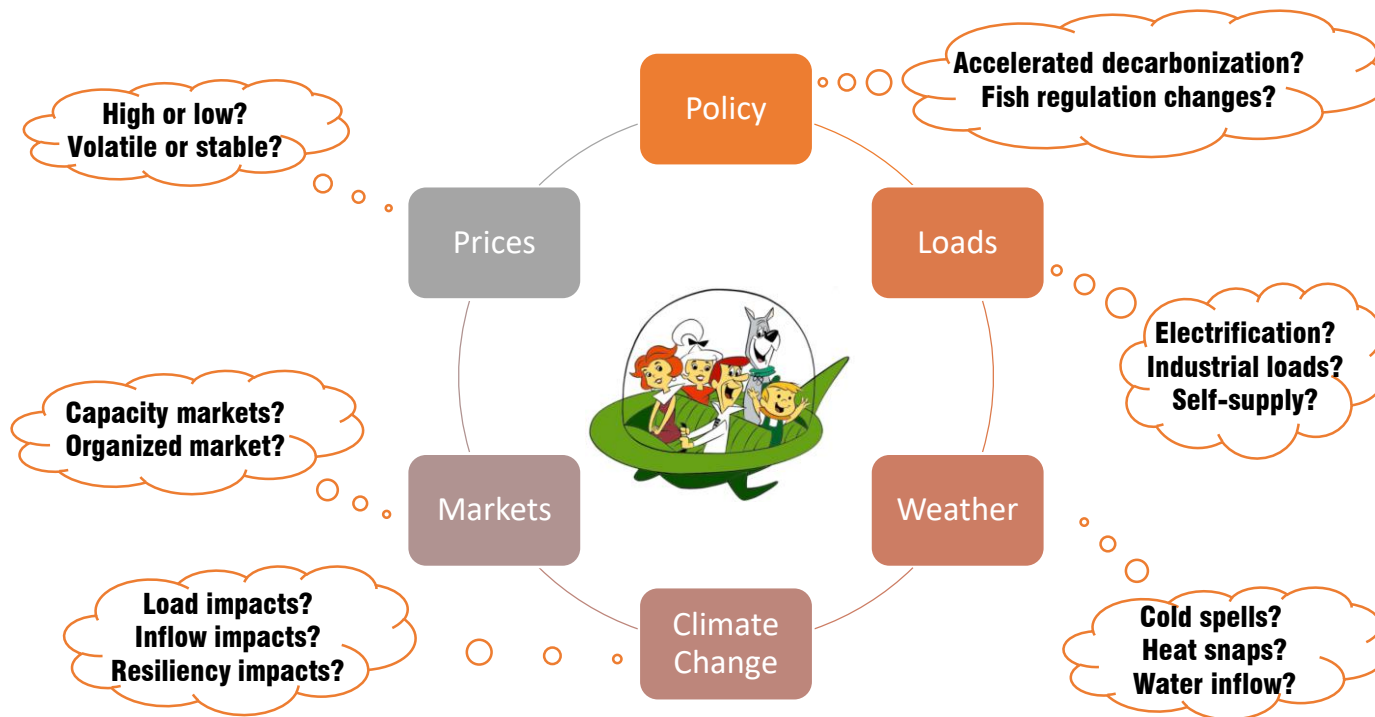
- Some new questions
- Updates to inputs for price
- Updates to load assumptions
- Some new resources modeled
- Updates to our resource adequacy calculations

- **Update:** BPA Contract Renewal
  - Should we renew?
  - Which product will best meet our needs if so?
  - What are the risks to renewal?
  - Should we diversify?
- **Update:** How will climate change impact our resource position?
- **New:** Should we renew our license for Wynoochee River Project in 2037?
- **New:** How will we ensure we have enough resources under accelerated vehicle & building electrification?
- **New:** How might we supply a large electrofuel load?

# Refresher on IRP Modeling Framework



# Who knows what will happen over 20 years?

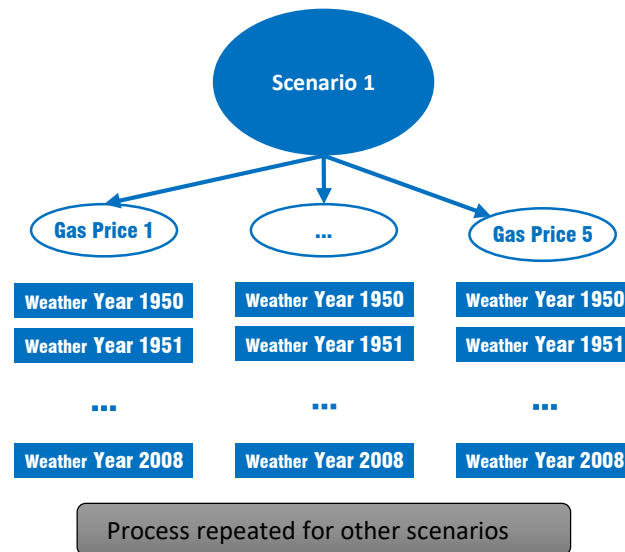




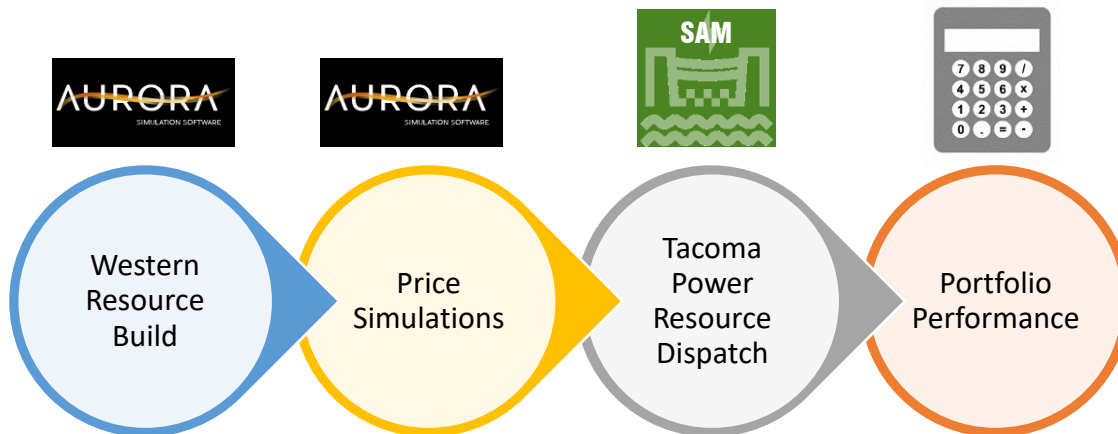
## Scenarios to address long-term uncertainties

- Carbon policies across the Western US
- Load trajectories across the Western US
- Natural gas price trajectory
- Resource costs
- Large change to industrial load
- Vehicle & building electrification
- Climate change

## Probabilistic modeling to address yearly variability



# Our IRP modeling framework



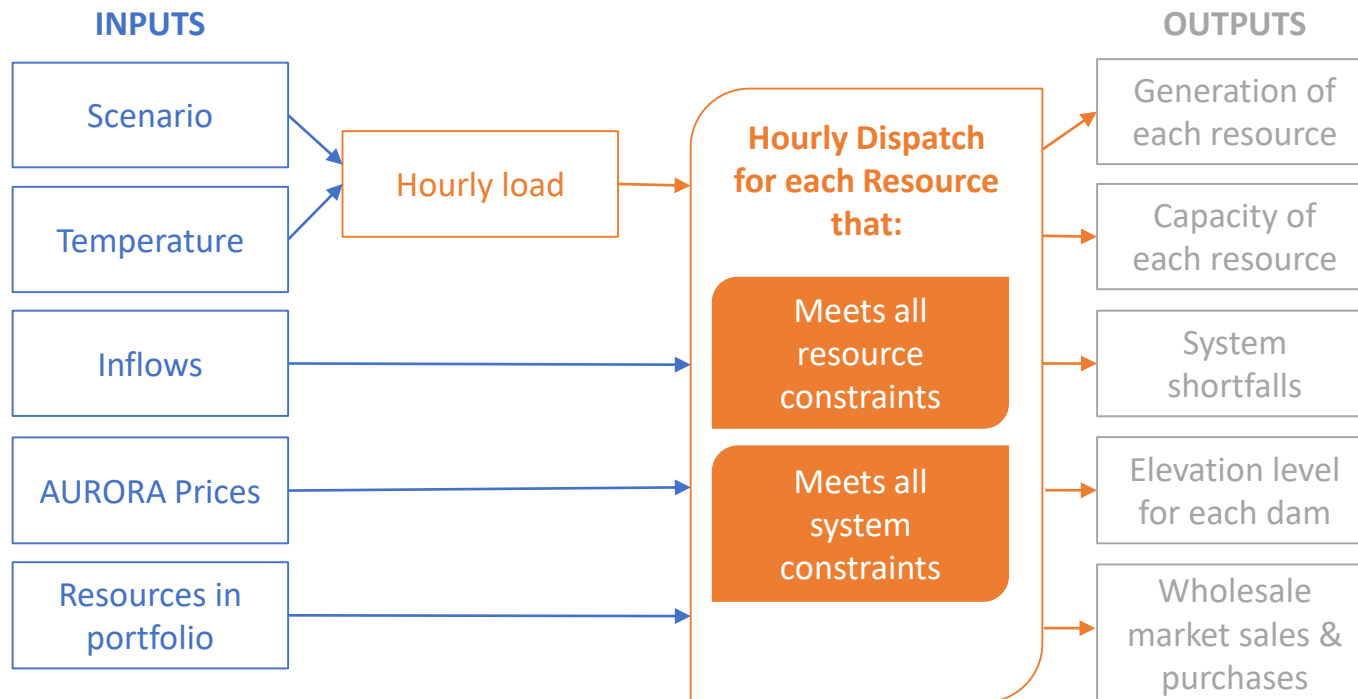
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How will Tacoma Power's system operate for a given weather simulation and market scenario?

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**IRP System Model (SAM)**

# Our IRP system model



# Resources Considered in 2022 IRP



# Resources we will consider in 2022

**Tacoma Power  
hydro**

**BPA contract**

**Solar**

**Wind (various  
locations)**

**Demand  
response**

**Storage**

**Small modular  
nuclear  
reactors**

**Conservation**

# Aurora WECC Model

Capacity Expansion and Price Forecast: Updated Inputs and Results

A little planning  
humor...

## Man announces he will quit drinking by 2050



A Sydney man has set an ambitious target to phase out his alcohol consumption within the next 29 years, as part of an impressive plan to improve his health.

The program will see Greg Taylor, 73, continue to drink as normal for the foreseeable future, before reducing consumption in 2049 when he turns 101. He has assured friends it will not affect his drinking plans in the short or medium term.



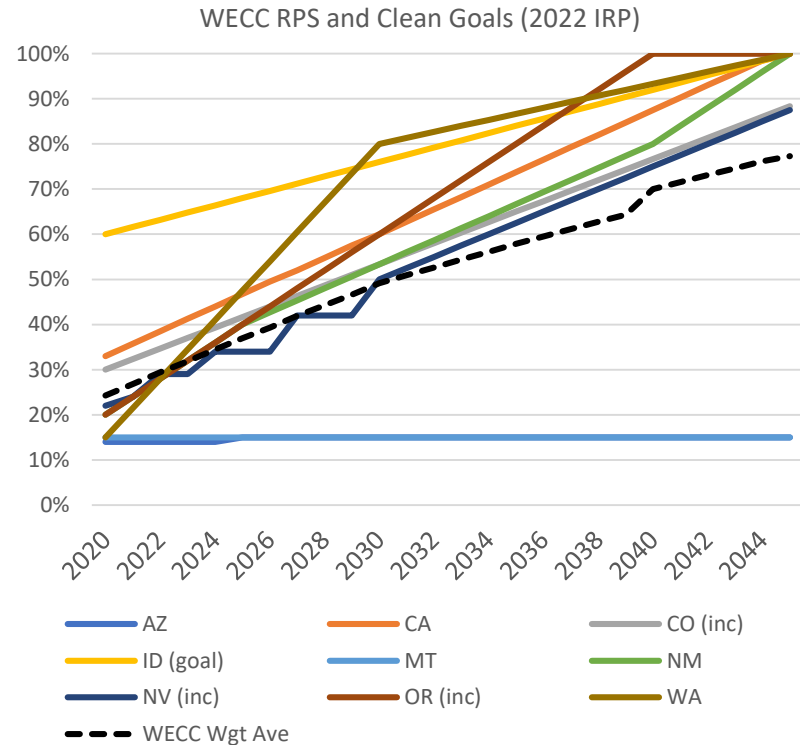
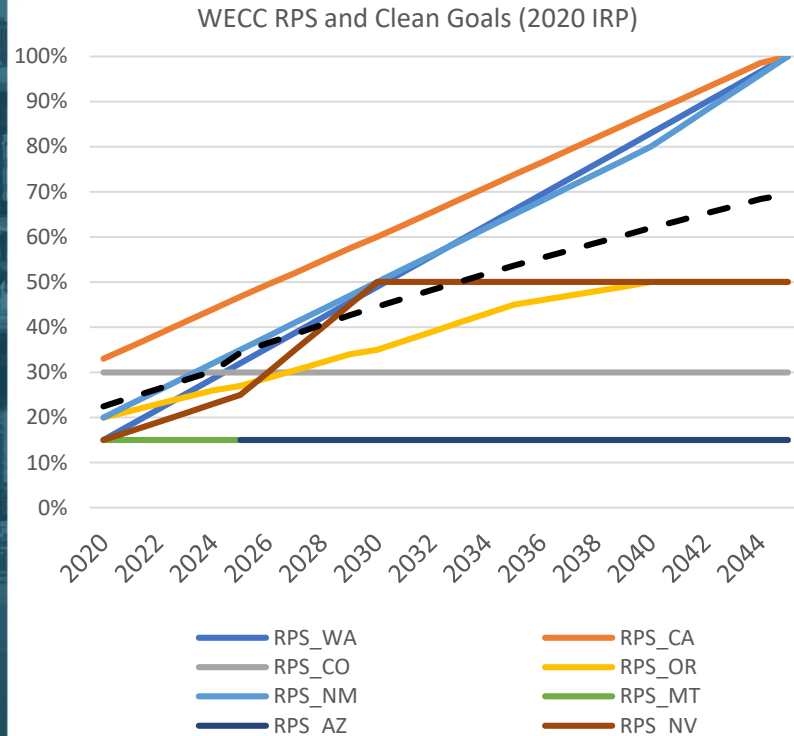
# Inputs



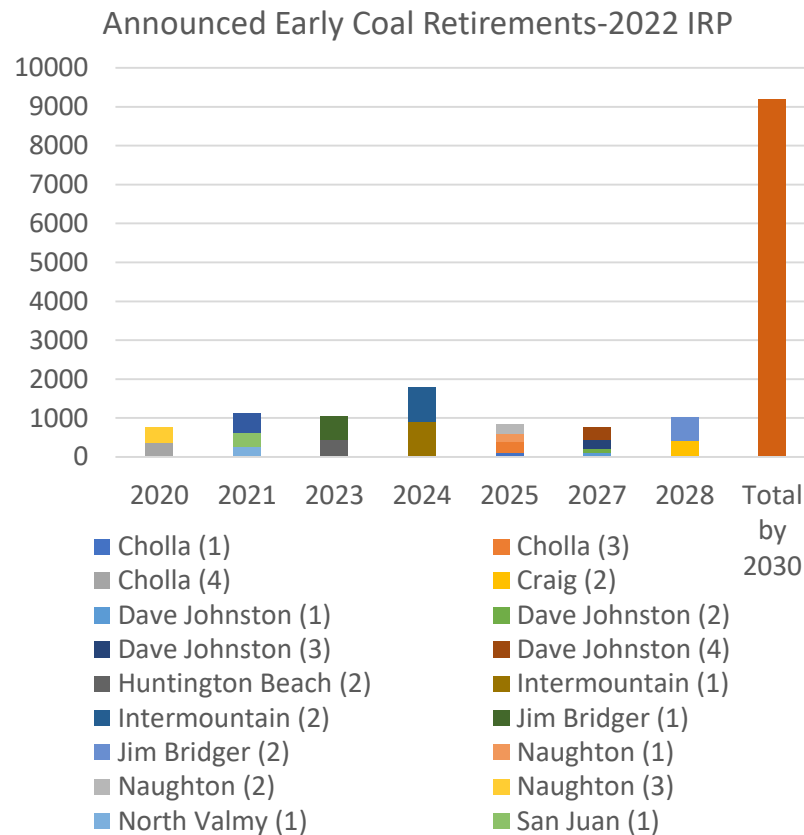
- Database updated in 2020, including:
  - Resource Costs
  - Loads and Resources
  - Fuel Costs
  - Carbon Policy Constraints
- WECC zonal network topology more granular (BA vs State)
- Battery storage option included in capacity expansion

# 11% Increase in WECC Weighted Avg Clean Energy Policies

(Base Case Scenario)



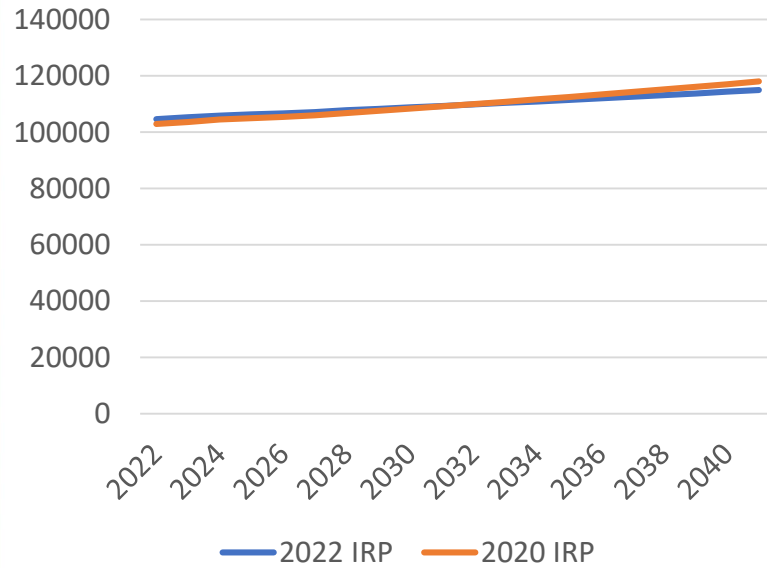
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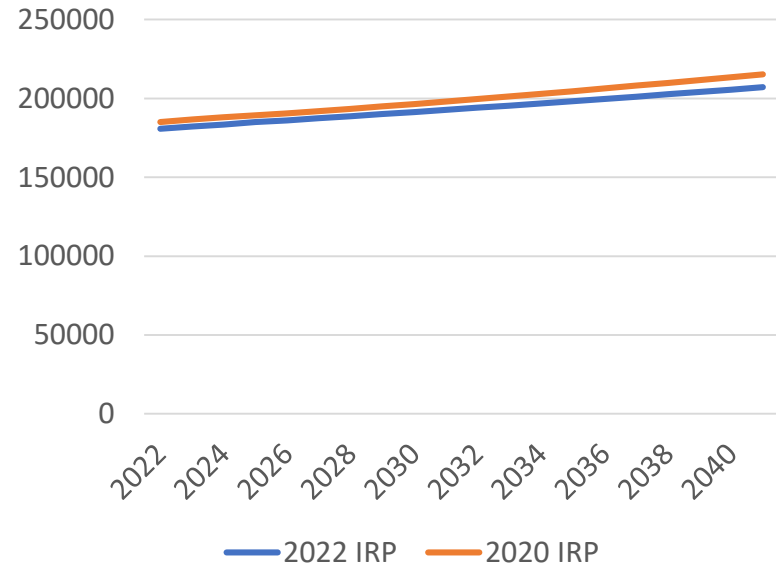
# Minimal Change in Overall WECC Load and Peak

(Base Case Scenario)

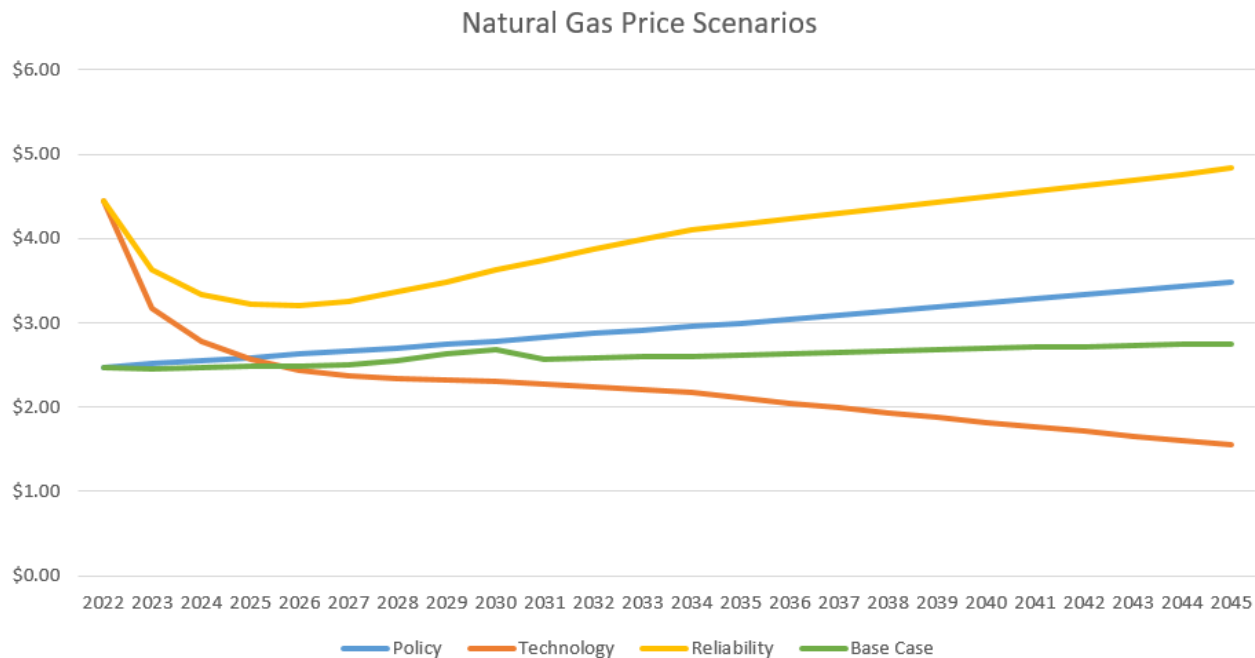
Energy (aGW)



Annual Peak (MW)



# Higher Forward Natural Gas Prices



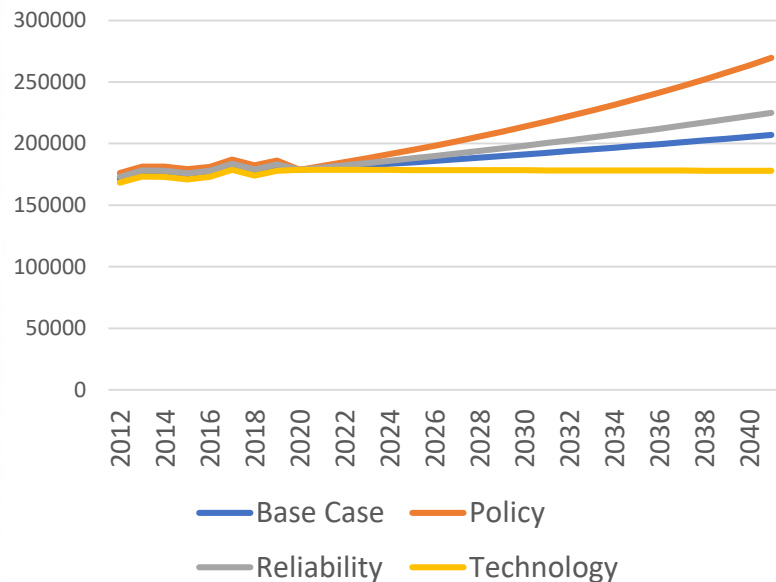
\*All scenario parameters (except forward NG prices) were unchanged between 2020 and 2022 IRP

# Scenarios

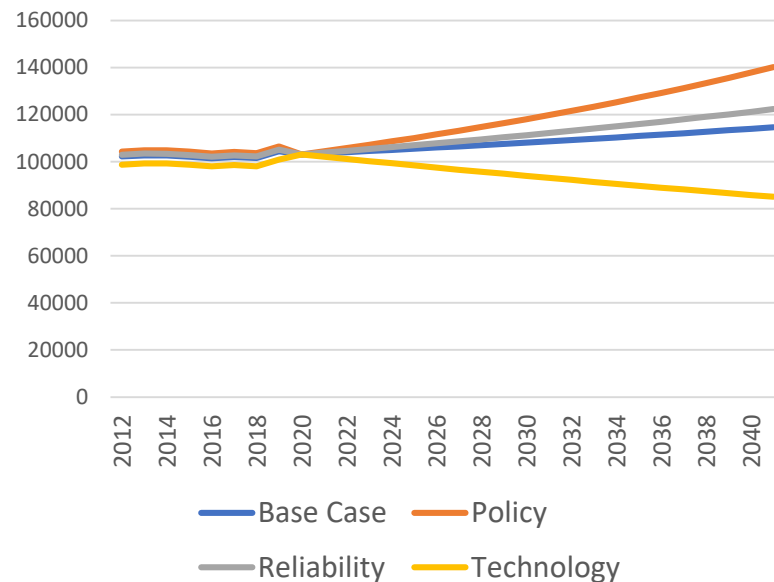
	Scenario 1: Carbon Policy- Driven WECC	Scenario 2: Technology Solves Everything	Scenario 3: Cruise Control (Base Case)	Scenario 4: Reliability Reigns
<b>Demand</b>				
Peak Growth Rate	25%	0%	base	base
Energy Growth Rate	20%	-25%	base	base
<b>Storage &amp; Other Resources</b>				
2hr	2%	25%	base (~1%)	base (~1%)
16hr	0	25%	base (0%)	base (0%)
<b>Carbon Policy</b>				
SCC (in price) pre 2030	yes	no (WA Only)	base (WA only)	yes
SCC (in price) post 2030	yes	no (WA Only)	base(WA only)	no
Min RPS by 2045	50%	base	base	no post 2030
<b>Natural Gas Prices</b>				
Initial Price	25%	base	base	base
Growth Rate	200%	-50%	base	200%
<b>Capital Costs</b>				
wind	base	-30%	base	base
solar	base	-30%	base	base
<b>RA Standard</b>				
PRM	15%	15%	15%	5% then 20%
NW Pool Sharing	yes	yes	yes	no
<b>Coal Retirements</b>				
NW Coal	2025	base	base	none post 2030
WECC Coal	2030	base	base	none post 2030

# Same WECC Load Scenario Assumptions

## WECC Peak (MW)



## WECC Load (GWh)



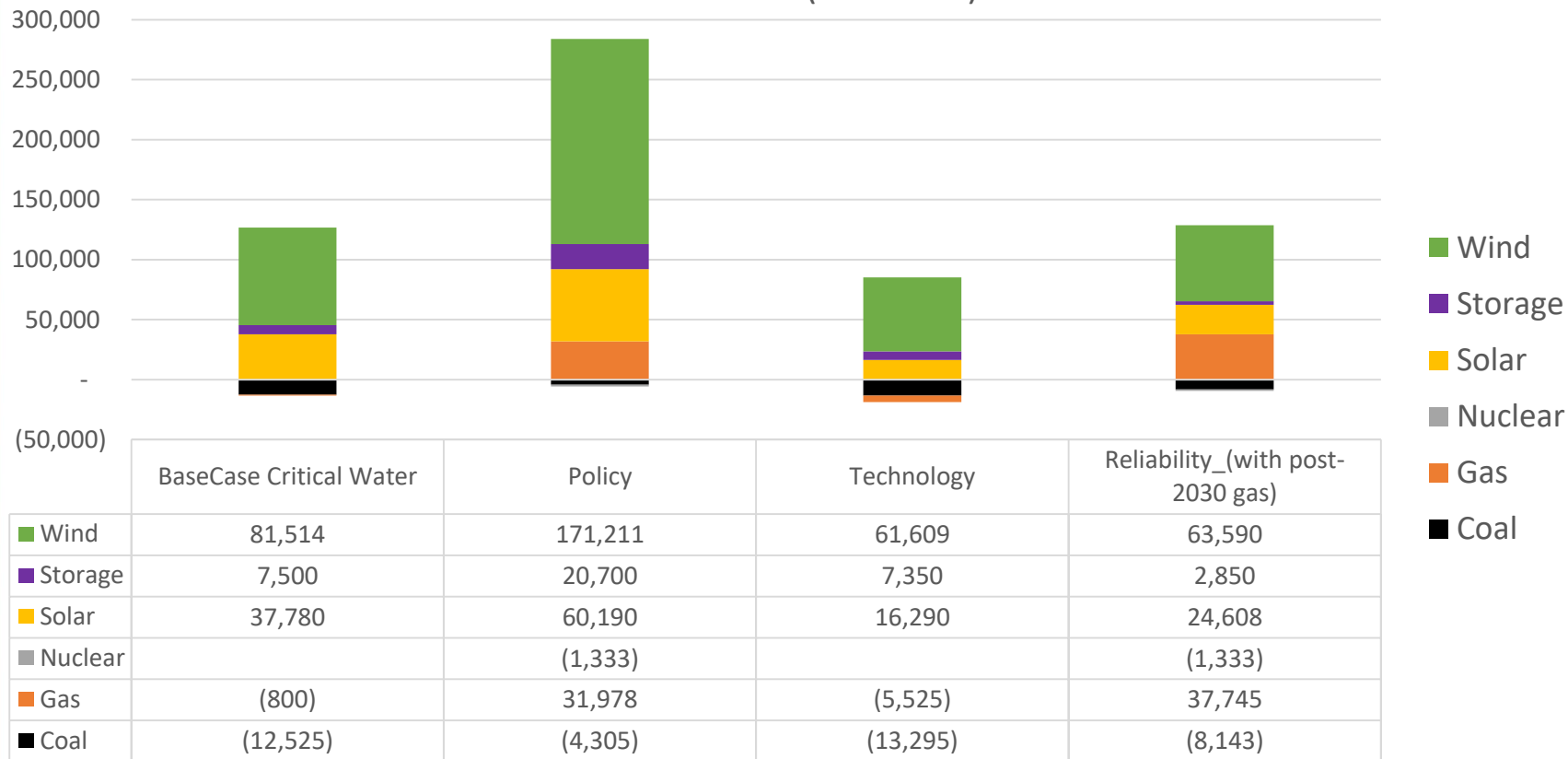


# Results

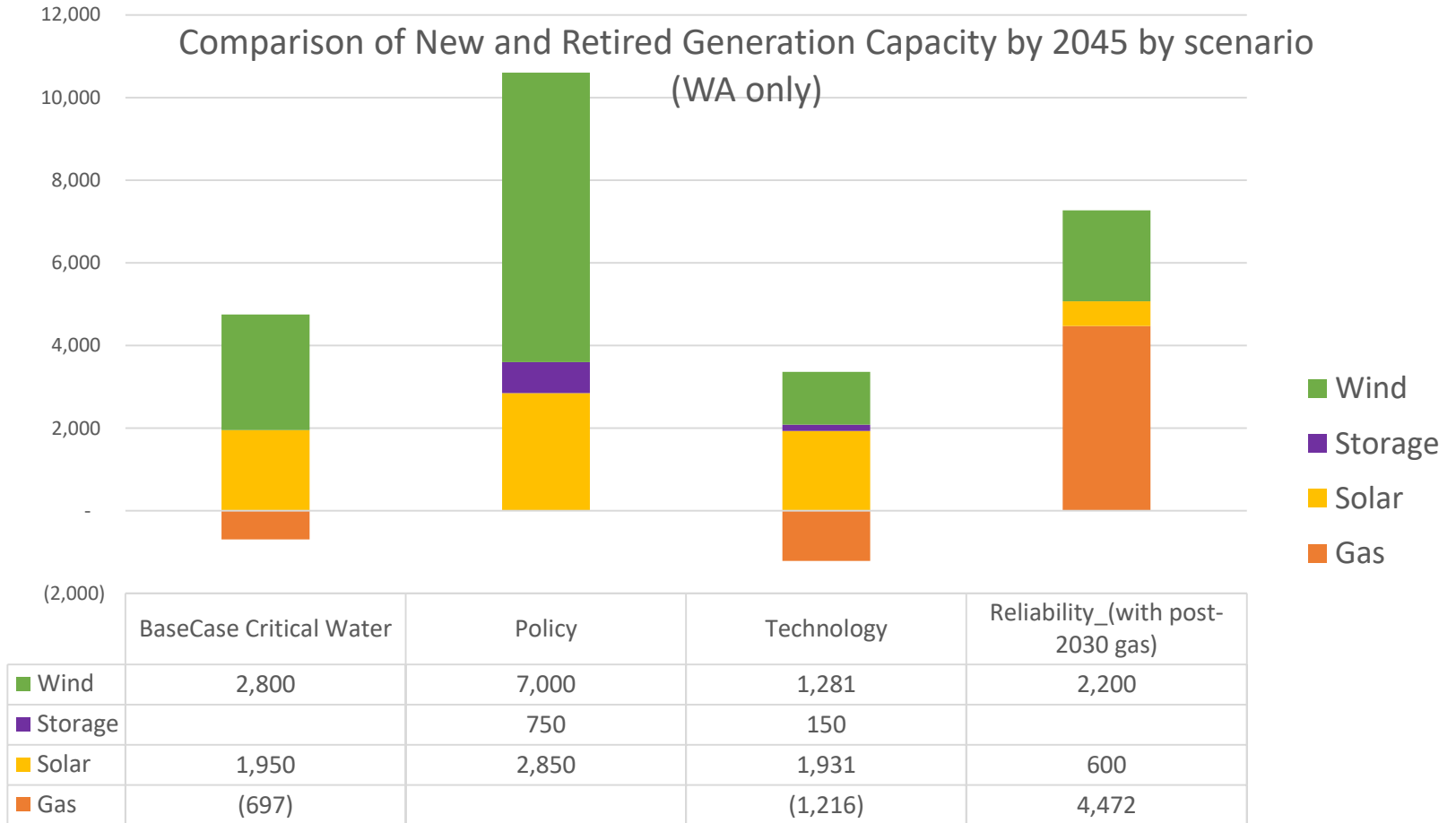


# WECC Net Capacity Expansion

Comparison of New and (Economic) Retired Generation Capacity by 2045 by scenario (WECC-US)

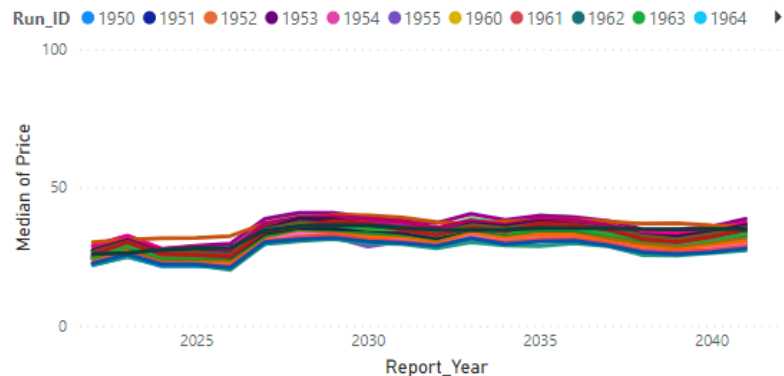


# \*WA Net Capacity Expansion

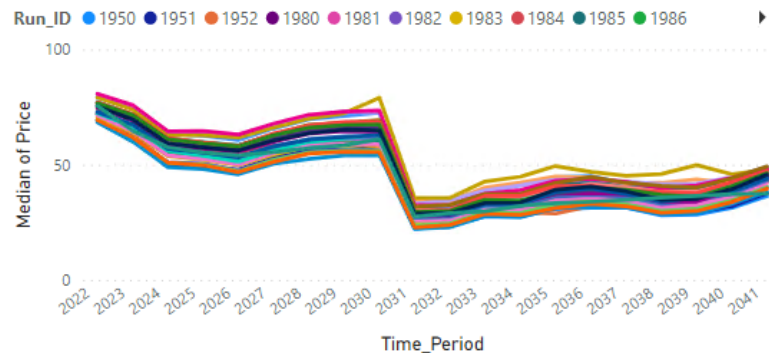


# Median Annual Price Forecast (by weather years)

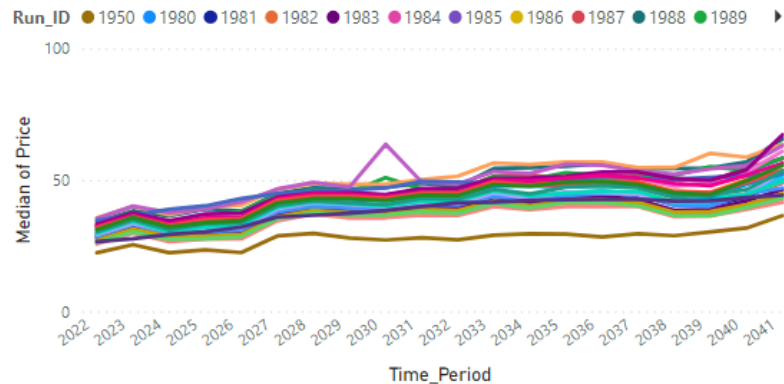
## Base Case



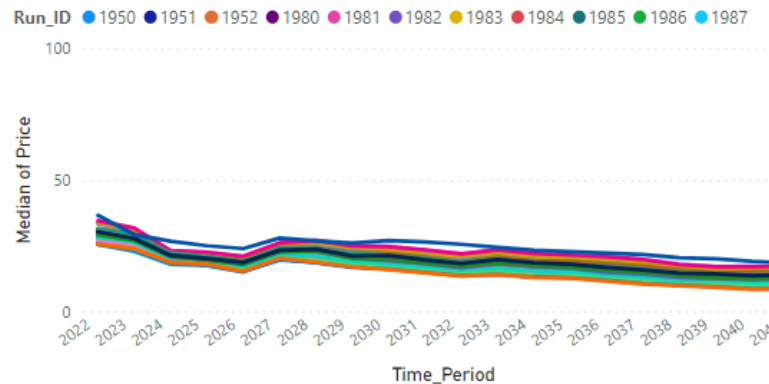
## Reliability



## Policy



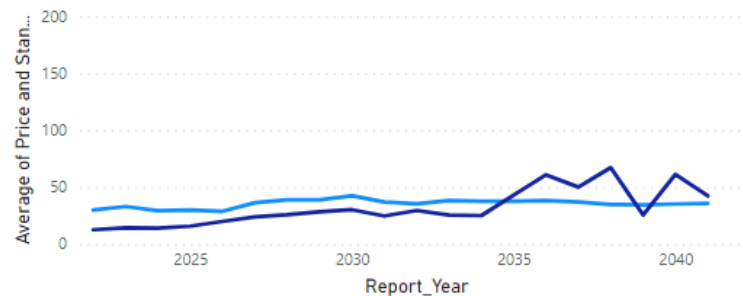
## Technology



# Average Annual Price Forecast (avg weather year)

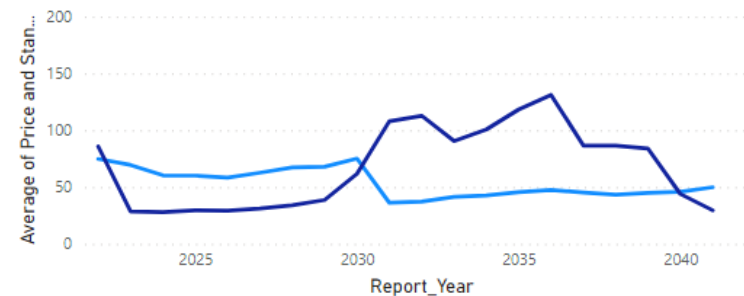
## Basecase Prices

● Average of Price ● Standard deviation of Price



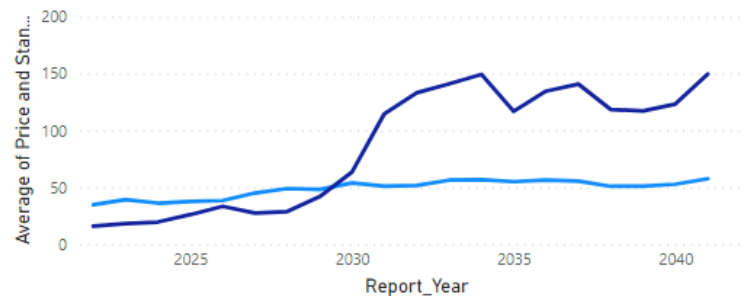
## Reliability

● Average of Price ● Standard deviation of Price



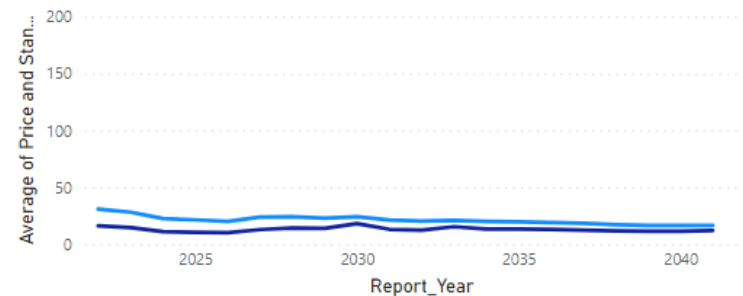
## Policy

● Average of Price ● Standard deviation of Price



## Technology

● Average of Price ● Standard deviation of Price



# Next Steps



# Tentative workshop schedule

