



Seattle City Light

2018 INTEGRATED RESOURCE PLAN

Stakeholder Meeting # 5 – Risk Analysis, Action Items, Letter of Support

Seattle City Light | March 6, 2018

SEATTLE CITY LIGHT'S MISSION

- Seattle City Light is dedicated to delivering customers with **affordable**, **reliable** and **environmentally responsible** electricity services.
- The Integrated Resource Plan outlines how the utility expects to meet anticipated customer needs under changing market dynamics, evolving policies and **future uncertainties** over the next 20 years.

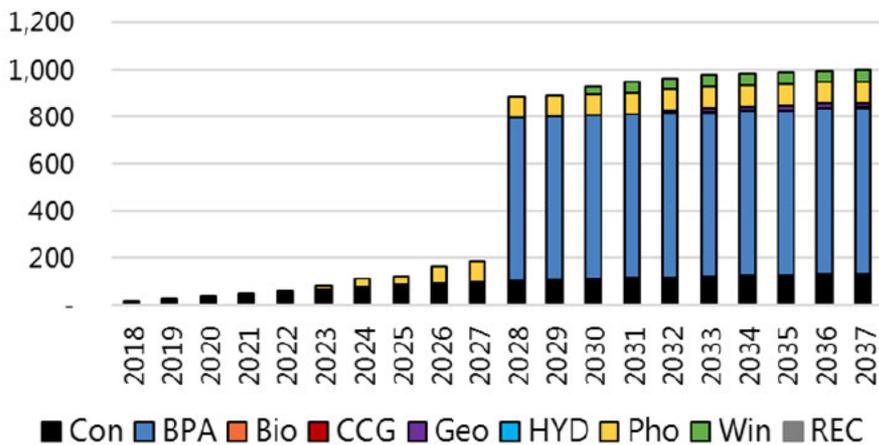
AGENDA

- 4:00 Welcome, safety, and goals for meeting
- 4:05 Review of top three portfolios
- 4:15 Analyze probabilistic results
- 4:45 Discuss themes and information to highlight from 2018 IRP analysis
- 5:10 Break
- 5:20 Develop recommendations and actions items to include in stakeholder letter (Groups of three)
- 6:00 Next steps
- 6:30 Adjourn

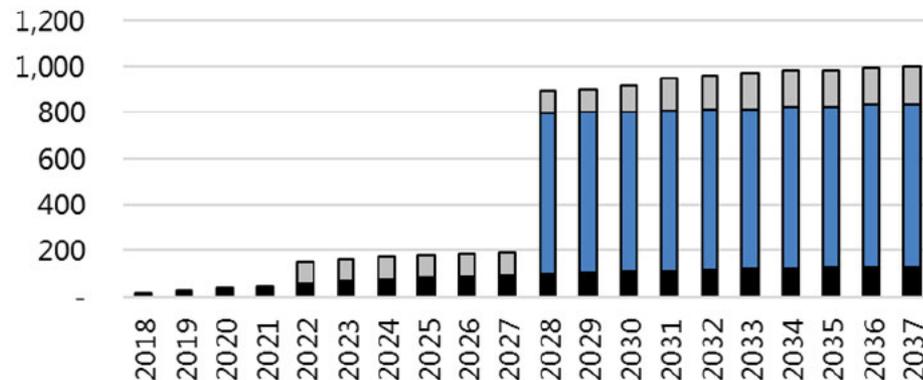
TOP THREE PORTFOLIOS FROM SCENARIO ANALYSIS

- RECs
- Renewables
- Early Renewables

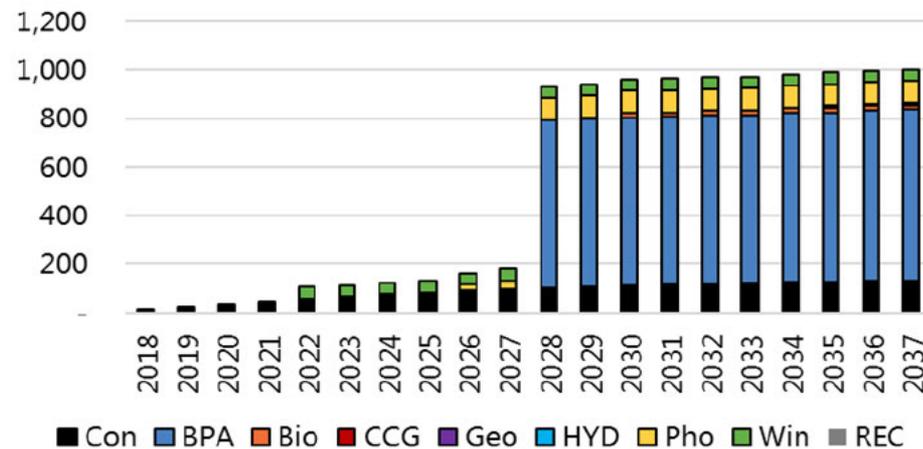
Renewables



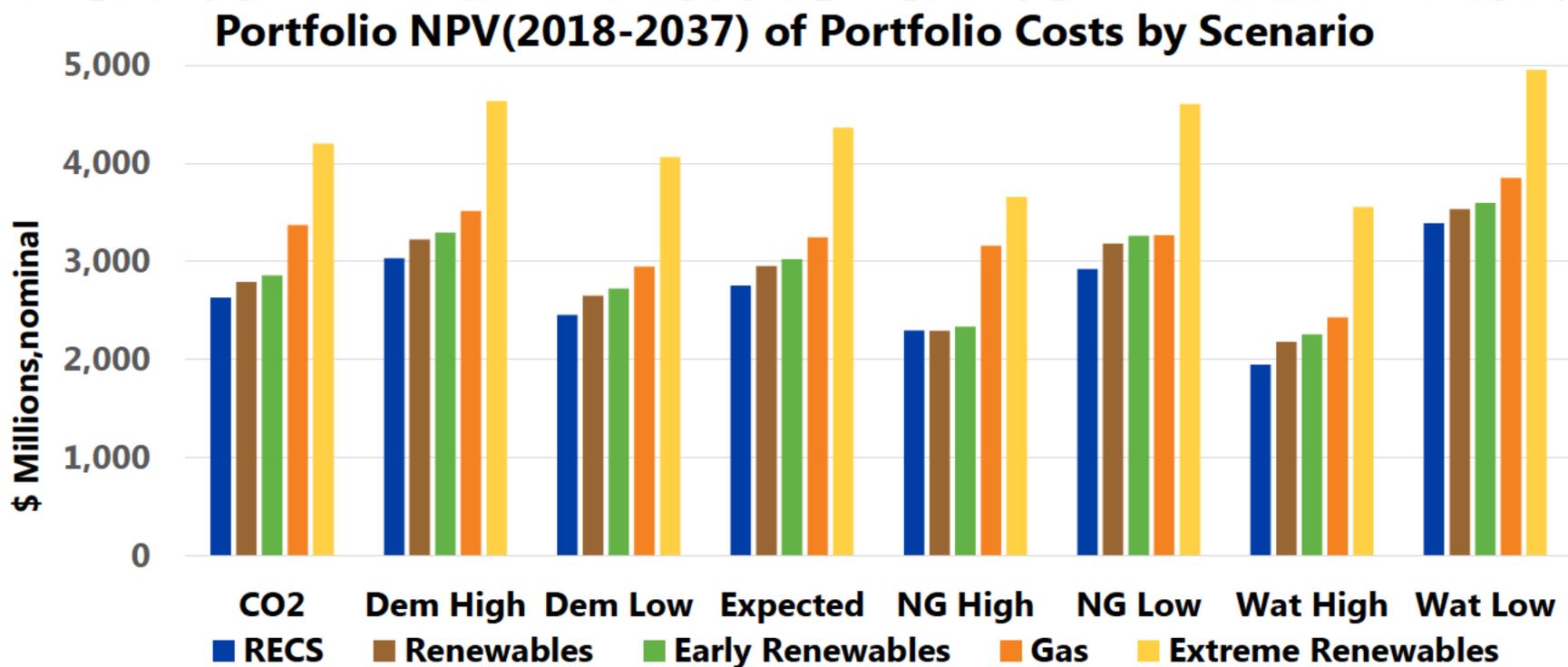
RECs



Early Renewables



SCENARIO RESULT: COMPARISON OF 20-YEAR NPV OF COSTS



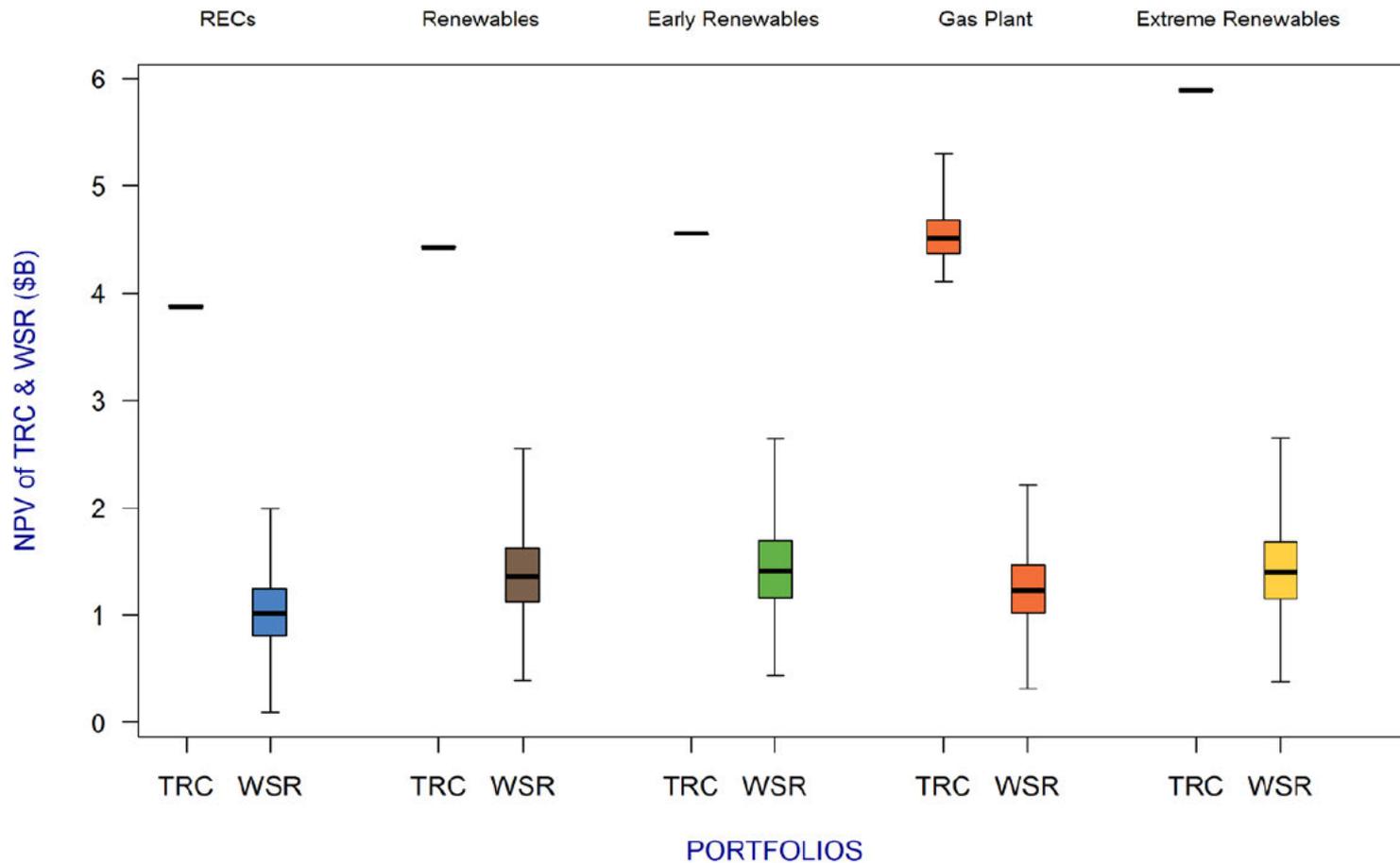
- Across all scenarios, RECs is the cheapest and Extreme Renewables is the costliest
- Portfolio costs are lower in high gas price, high water condition and low demand scenarios

TERMINOLOGY

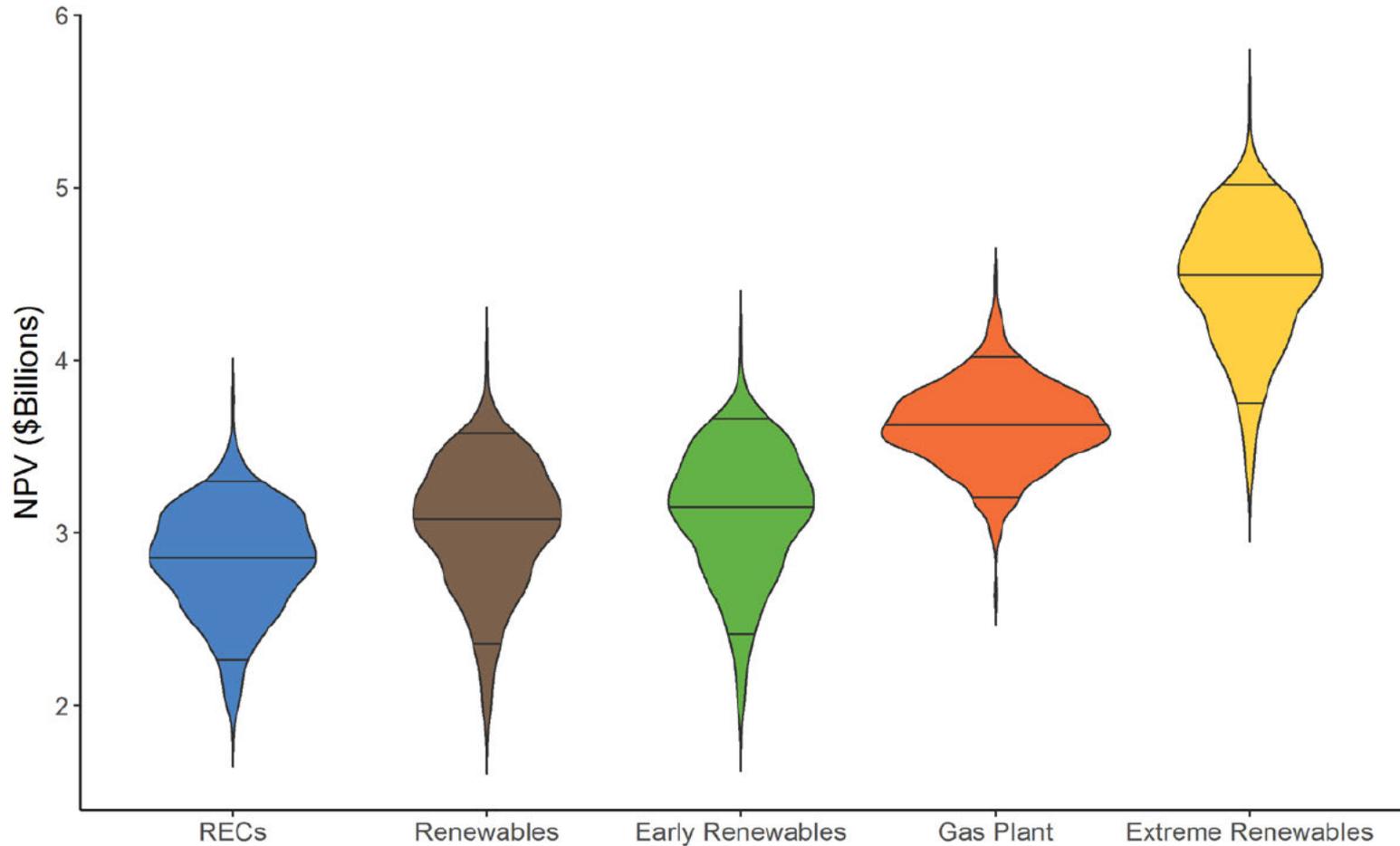
- Total Resource Costs (TRC) = Resource cost + contract cost + transmission cost + renewable shaping and firming cost + fuel cost
- Wholesale Revenue (WSR) = Market sales revenue – market purchase cost



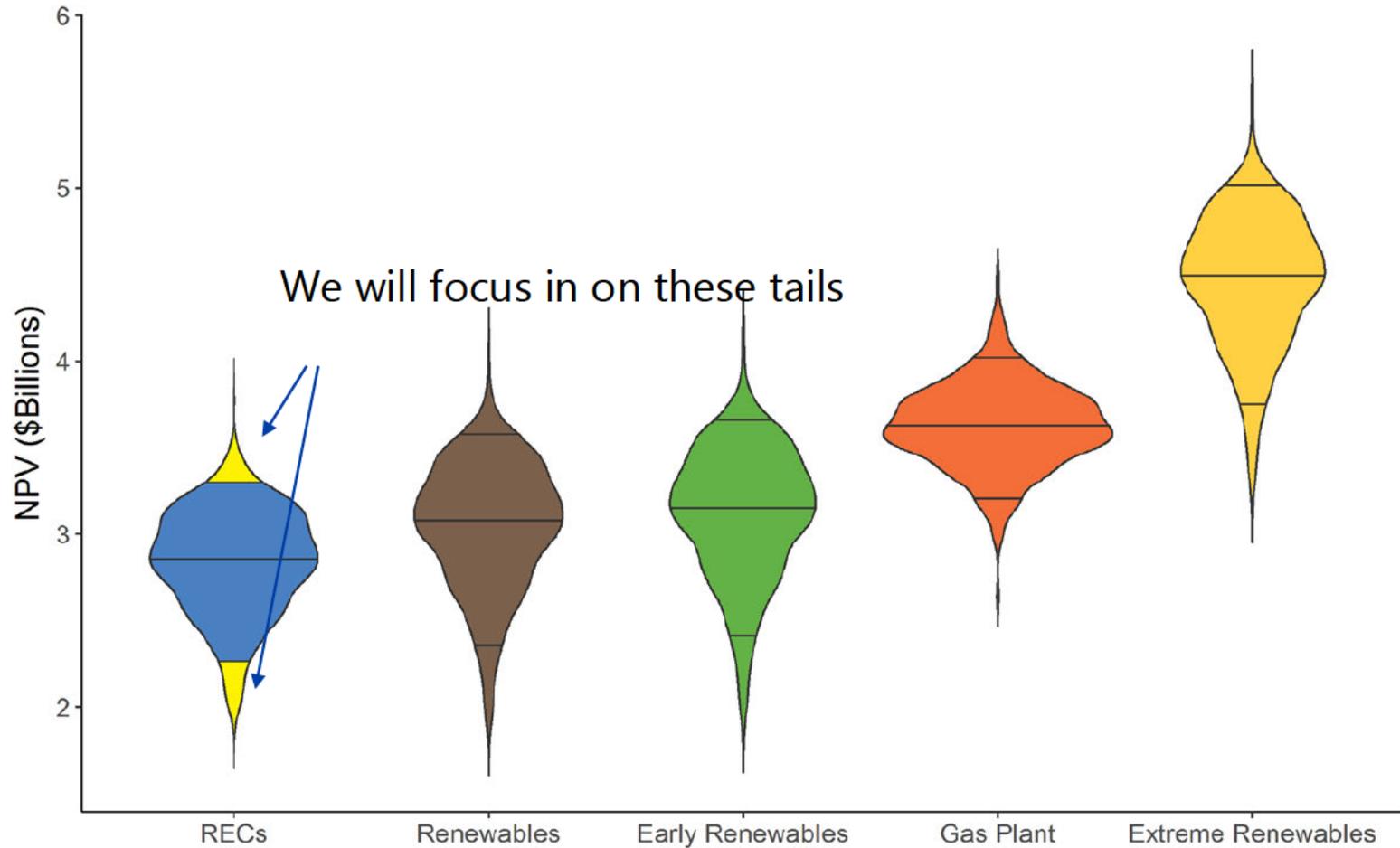
PORTFOLIO NPV (2017-2037) OF TOTAL RESOURCE COSTS AND WHOLESALE REVENUE



TOTAL PORTFOLIO COST (VIOLIN PLOT) NET PRESENT VALUE 2017-2037



TOTAL PORTFOLIO COST (VIOLIN PLOT) NET PRESENT VALUE 2017-2037

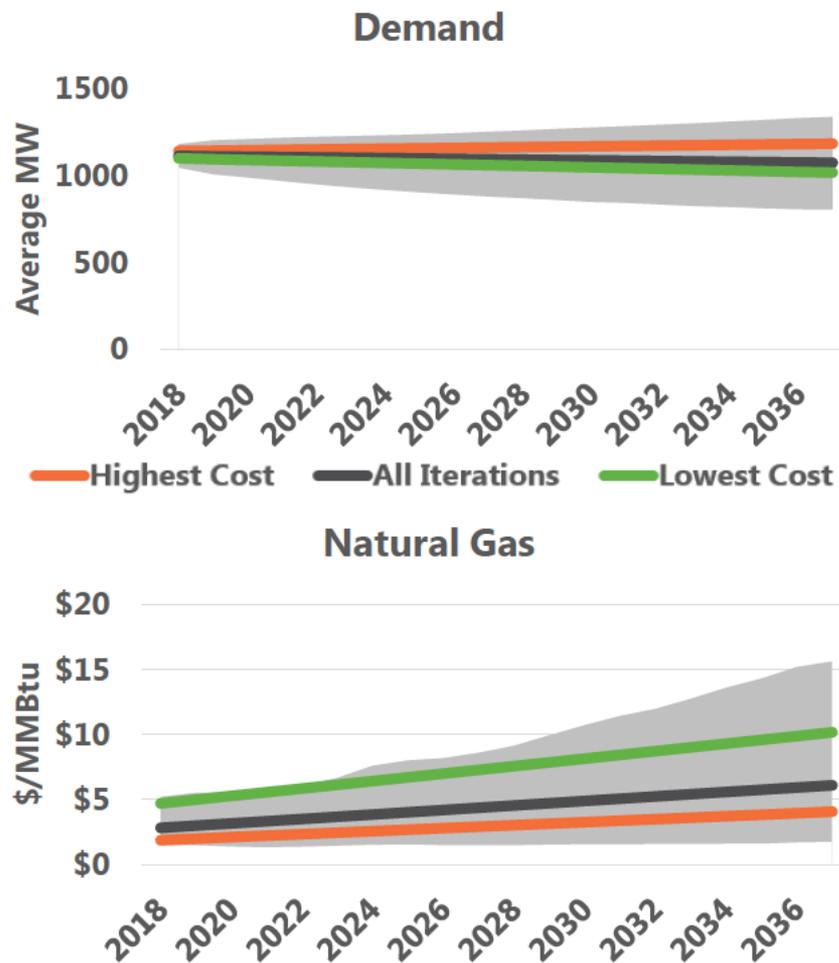


CHARACTERISTICS OF EXTREME SCENARIOS

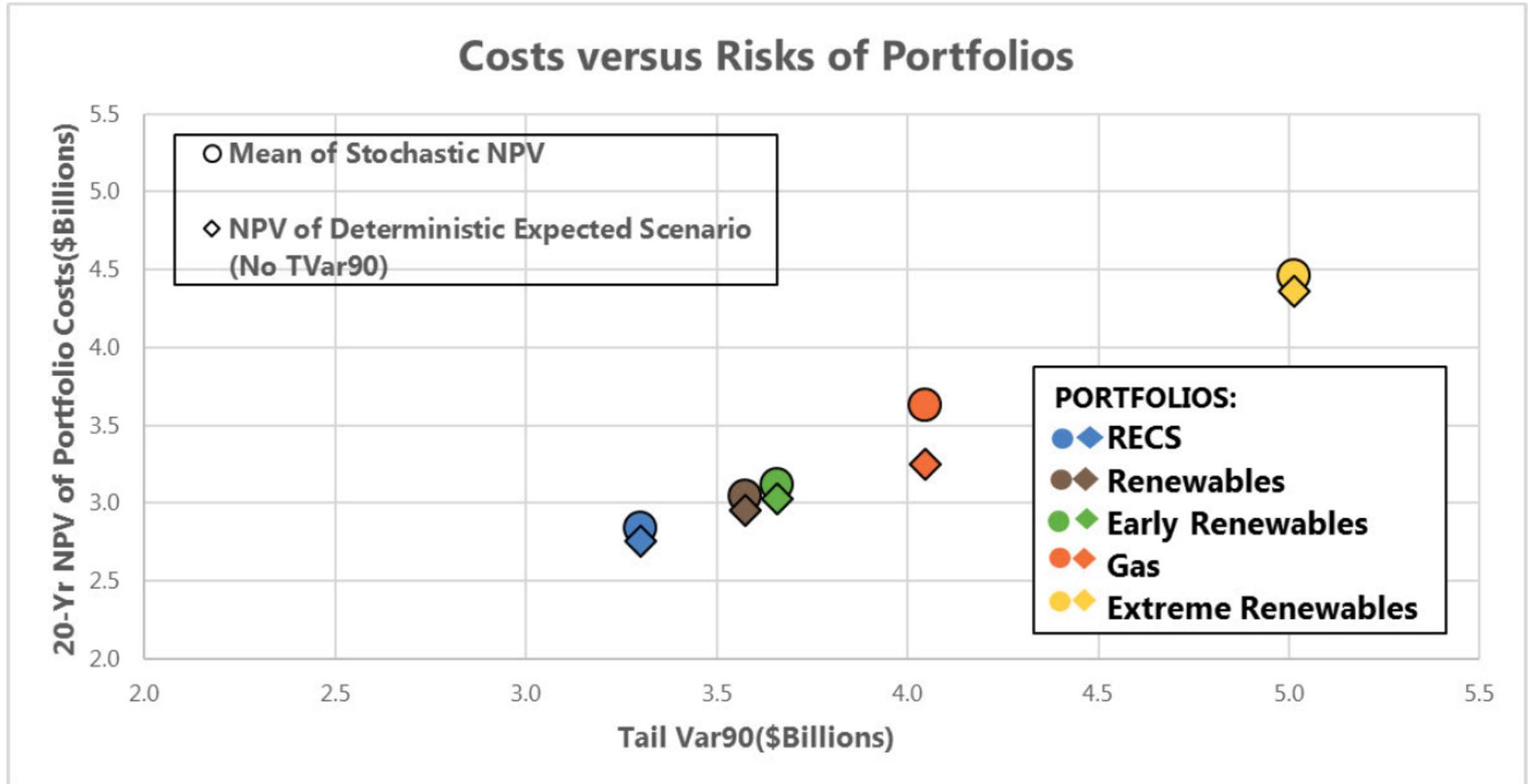
10% worst scenarios have lower natural gas prices and higher demand

10% best scenarios have higher natural gas prices and lower demand

Average hydro was not significantly different



EXPECTED PORTFOLIO COSTS VERSUS TAIL RISKS OF PORTFOLIOS



IRP GOALS



Affordability/Equity

- Supply or energy efficiency when customers need it
- Minimizes need for investment in new distribution and transmission
- Conservation and clean energy equitably available to historically underrepresented populations



Environmental Stewardship

- Offset greenhouse gas emissions
- Operations supports fish and wildlife habitat
- Reduces carbon emissions
- Lowest environmental impacts



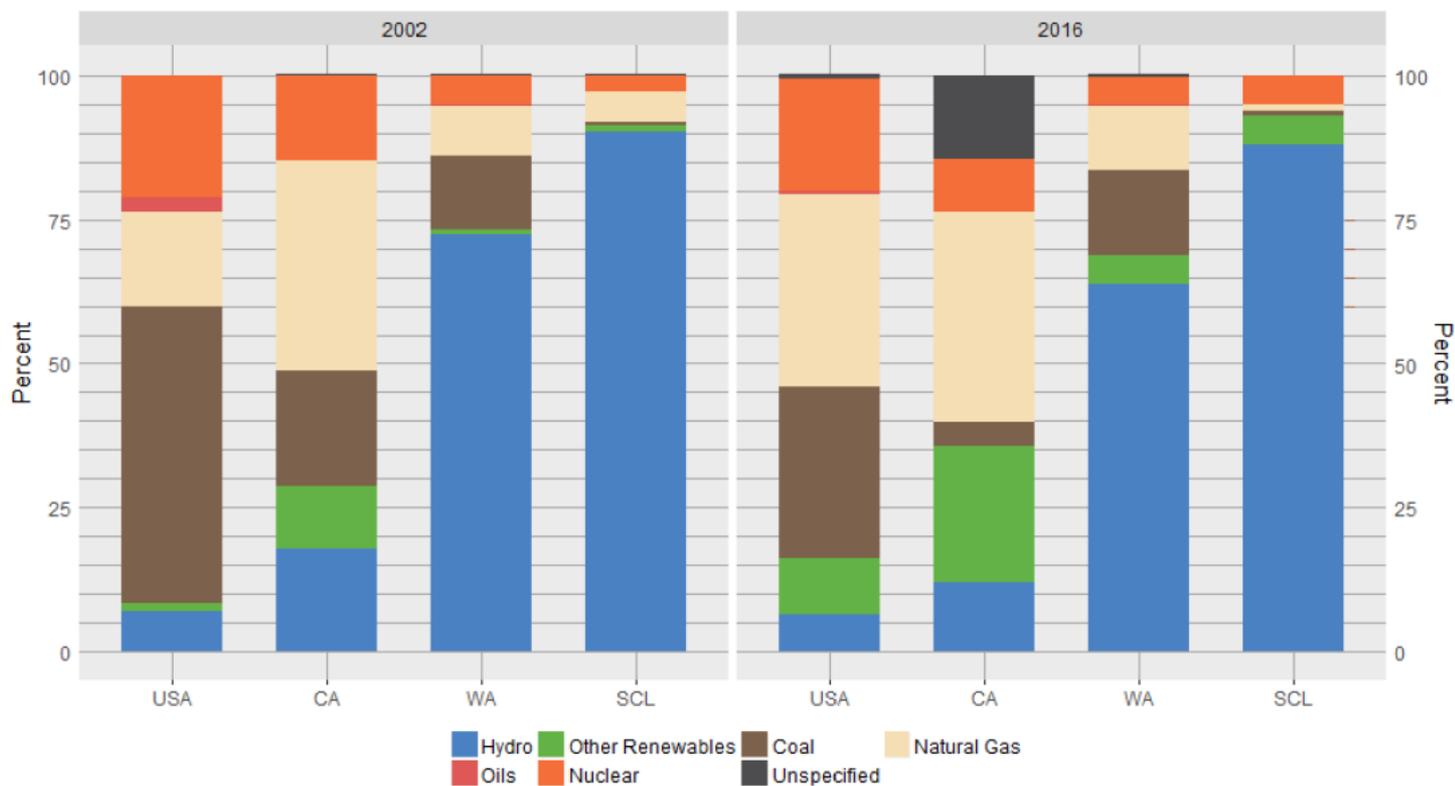
Reliability

- Secures power supply when Seattle experiences high demand and low supply
- New generation provides power when regional demand for electricity is high and supply is low

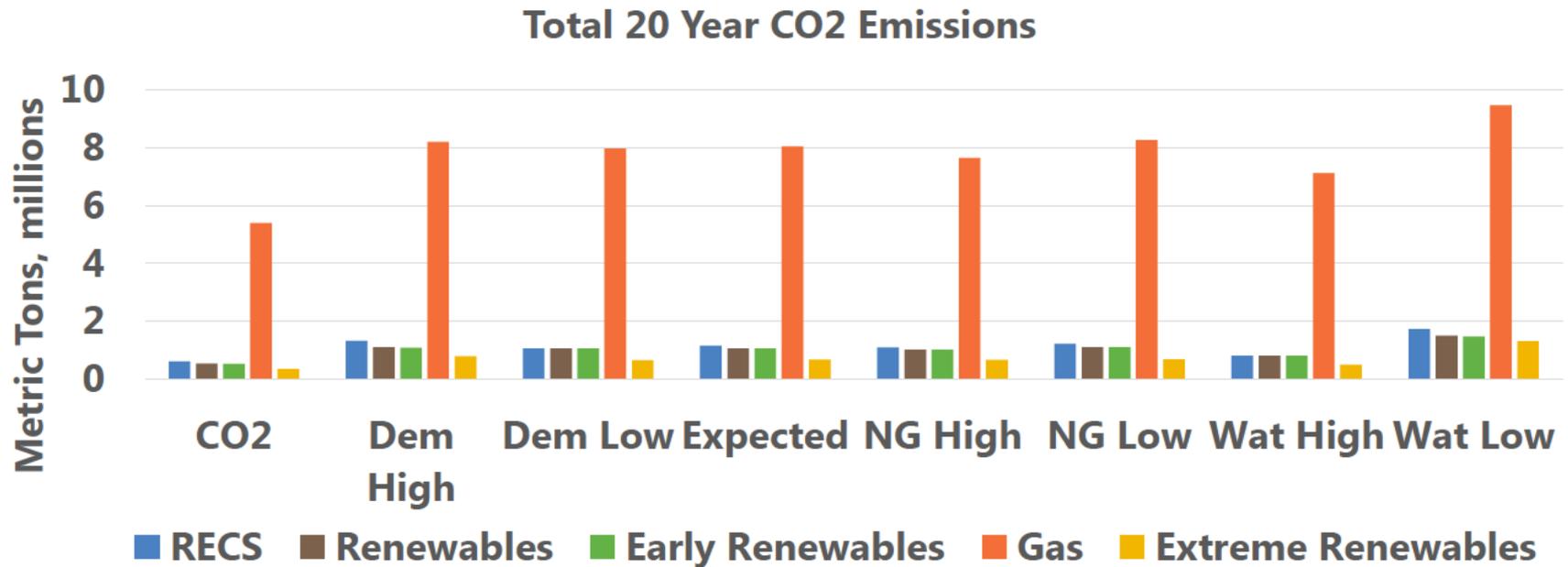


CITY LIGHT'S POWER SUPPLY FUEL MIX

- Since 2005, City Light offsets 100% of its greenhouse gas emissions



SCENARIO RESULT: 20 YEAR PORTFOLIO CARBON EMISSIONS TO BE OFFSET



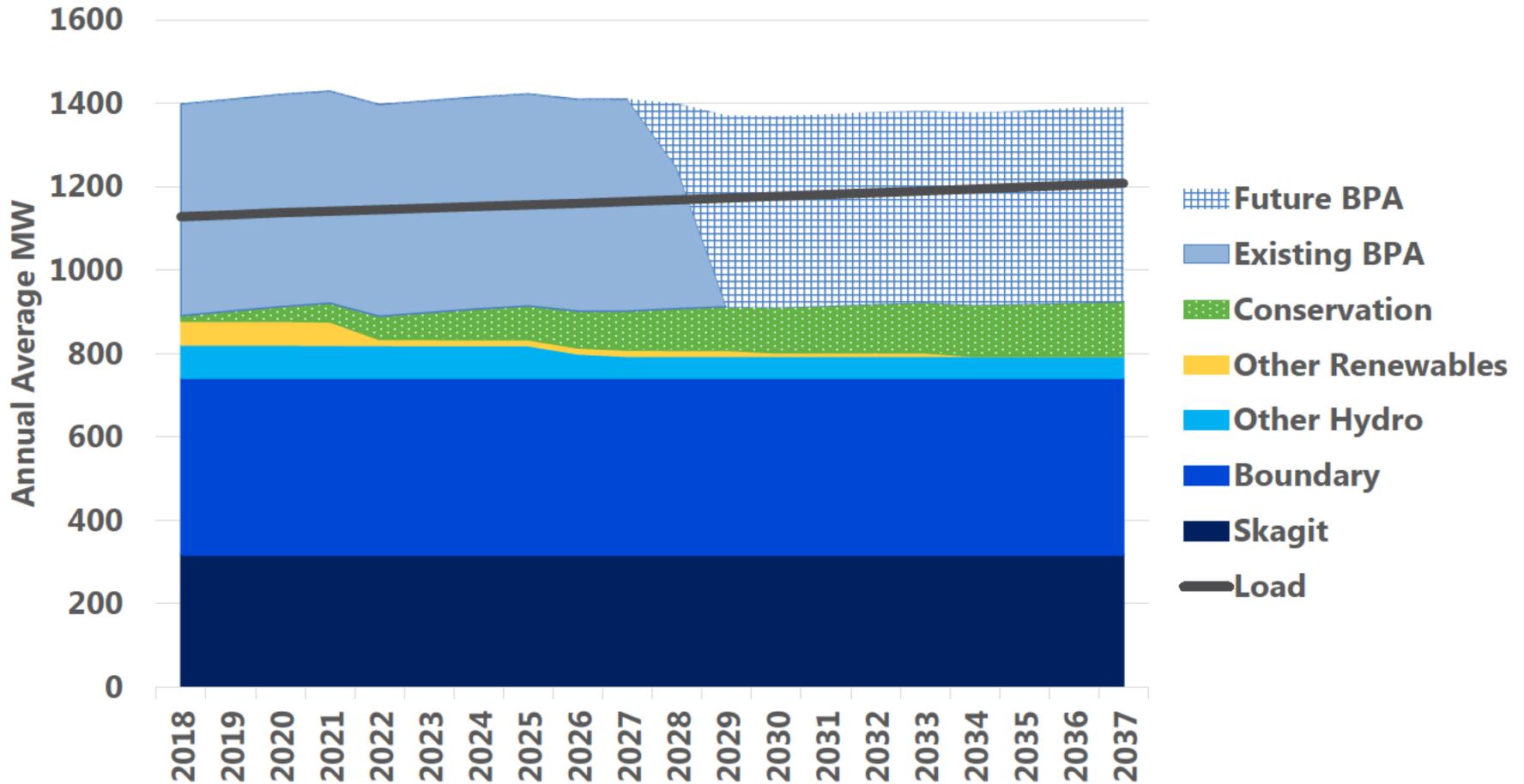
- Renewables portfolios have lower emissions across all scenarios, but most of the emission advantages occur after 2028
- Gas portfolio has the highest emissions level even with the carbon tax
- Average CO2 emissions is 50,000MT/year across scenarios/portfolios except for the Gas and Extreme Renewables portfolios

CITY LIGHT'S CURRENT PATH

- Continue to operate and maintain City Light's existing hydro power supply portfolio to meet City Light's mission
- Invest in all cost-effective energy efficiency (two year target ~ 24 aMW)
- Support efforts to maintain the value of the Federal Columbia River Power System power system for a future contract and the benefit of the region
- Use available reliable power supply of up to 200 MWs of day-ahead market purchases to meet peak demand periods
- In the near-term seek opportunities to replace canceled renewable energy contracts with delivery of RECs as early as 2021 and likely no later than 2024 to meet the Energy Independence Act
- Continue to support and promote clean energy policies, environmental stewardship and efforts to reduce the delivery cost of renewable energy
- Maintain affordability and focus on equitable outcomes

TOP PERFORMING PORTFOLIO

Load Resource Balance for RECs Portfolio



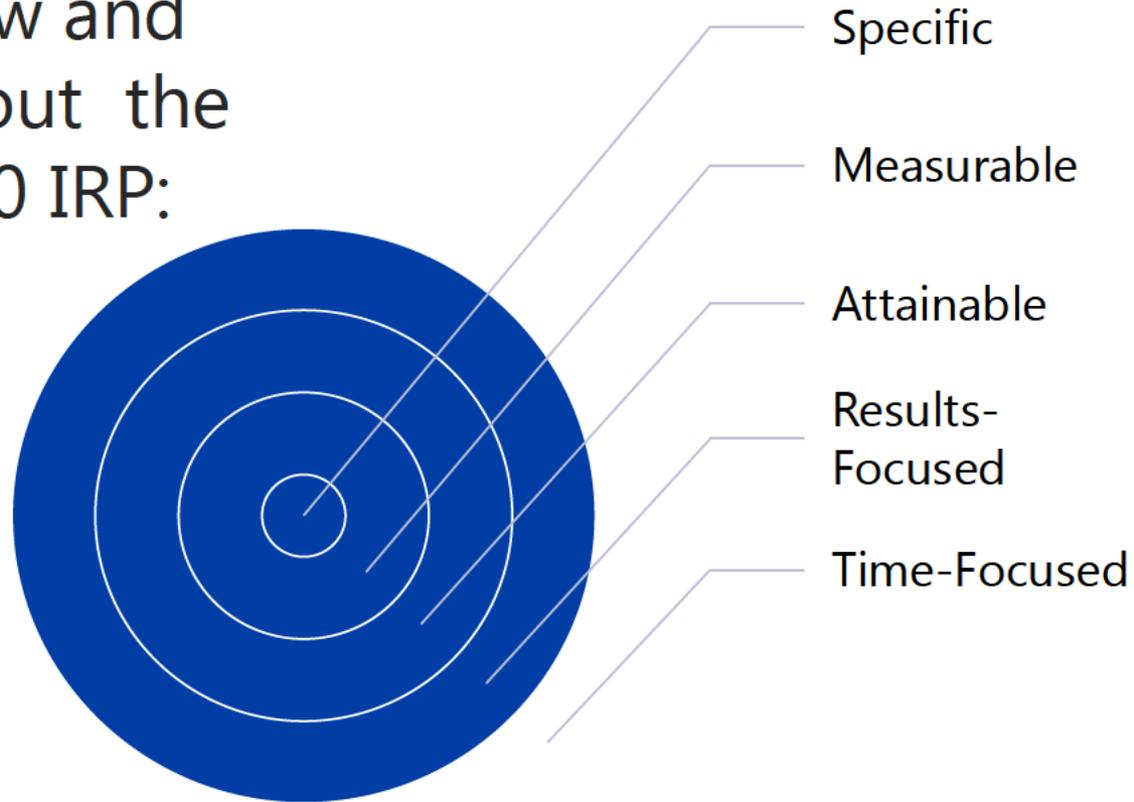
WHAT COULD CHANGE THE PATH

- Continued rapid cost reductions in solar, wind, batteries, storage and demand response
- BPA cost pressures from potential increases in environmental mitigation, potential treaty outcomes and load declines
- More efficient use of existing transmission
- Low cost customer generation and its impacts on distribution infrastructure
- Significant reductions in regional hydro generation
- Return of demand growth and electrification

INTEGRATED RESOURCE PLAN DISCUSSION

Take time individually and in small groups to review and provide feedback about the following for the 2020 IRP:

- Potential areas of study
- Action plans



POTENTIAL STUDY ITEMS TO PREPARE FOR THE 2020 IRP

- Investigate additional resource adequacy metrics and time horizons (such as summer)
- Evaluate RECs market supply/demand and uncertainties
- Update wholesale market reliance study
- Identify different levels of electrification/decarbonization to study
- Identify climate change impacts incorporating the Federal Columbia River Power System generation studies

POTENTIAL STUDY ITEMS TO PREPARE FOR THE 2020 IRP

- Identify fiscal or regulatory policies to study
- Evaluate integration, firming and shaping costs for intermittent renewable resources using options such as DR programs and storage (battery, pumped storage, and existing hydro generation)
- Regularly monitor and update IRP inputs, assumptions and analysis to ensure plans protect customer interests and needs
- Evaluate System Planning's distribution network improvement plans

STAKEHOLDER LETTER TO CITY COUNCIL

- Incorporates support for the 2018 IRP work and action plan items for the 2020 IRP
- City Light will draft based on feedback received from stakeholders
- The goal is to have the final letter signed and ready to submit with legislation in April



WRAP UP AND NEXT STEPS

- Select April IRP meeting date (April 11 or April 25)
- Topics
 - Follow up items
 - Review of Draft IRP resolution
 - Stakeholder support letter
 - Schedule meetings for the ongoing IRP process and suggest topics for each meeting

CITY LIGHT

OUR MISSION

Seattle City Light is dedicated to delivering customers affordable, reliable and environmentally responsible electricity services.

OUR VISION

We resolve to provide a positive, fulfilling and engaging experience for our employees. We will expect and reinforce leadership behaviors that contribute to that culture. Our workforce is the foundation upon which we achieve our public service goals and will reflect the diversity of the community we serve.

We strive to improve quality of life by understanding and answering the needs of our customers. We aim to provide more opportunities to those with fewer resources and will protect the well-being and safety of the public.

We aspire to be the nation's greenest utility by fulfilling our mission in an environmentally and socially responsible manner.

OUR VALUES

Safety, Environmental Stewardship, Innovation, Excellence, Customer Care



Seattle City Light