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April 27, 2021

## MEMORANDUM

**TO:** Council Members

**FROM:** Ben Kujala

**SUBJECT:** Findings from the Analysis of the Bonneville Portfolio

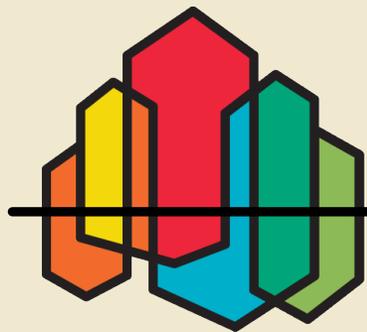
### **BACKGROUND:**

Presenter: Ben Kujala

Summary: We will continue to look at results from the analysis of the Bonneville Portfolio. Work on this scenario is ongoing and discussion at the advisory committee will occur after the date of this packet. A presentation will be provided to the Power Committee directly in advance of the committee meeting.

Background: The April 21<sup>st</sup> Power Committee Webinar covered some initial concerns and questions related to the analysis of the Bonneville Portfolio.  
<https://nwcouncil.app.box.com/file/800440165844?s=miwmhswbyluxdnjqv125yzafc0odgh2a>

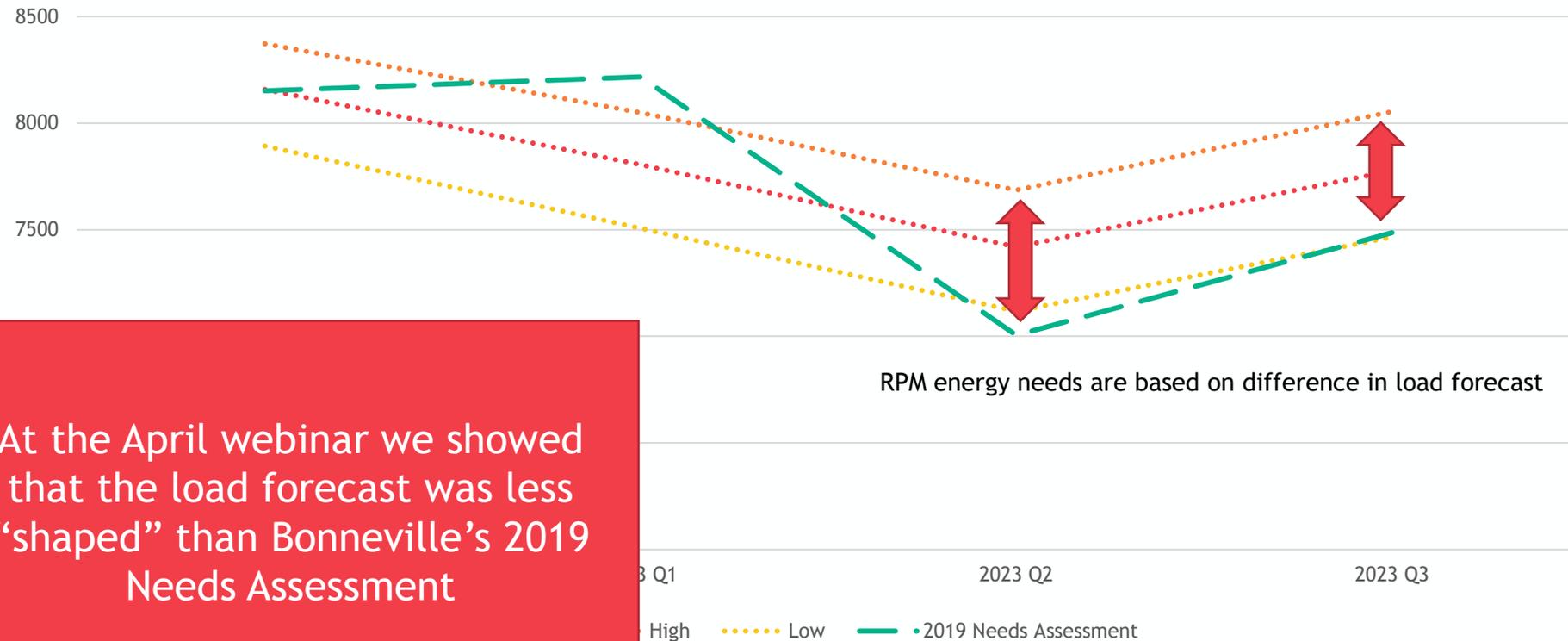
# Findings from the Analysis of the Bonneville Portfolio



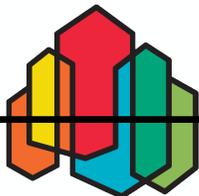
THE 2021  
NORTHWEST  
POWER PLAN

FOR A SECURE & AFFORDABLE  
ENERGY FUTURE

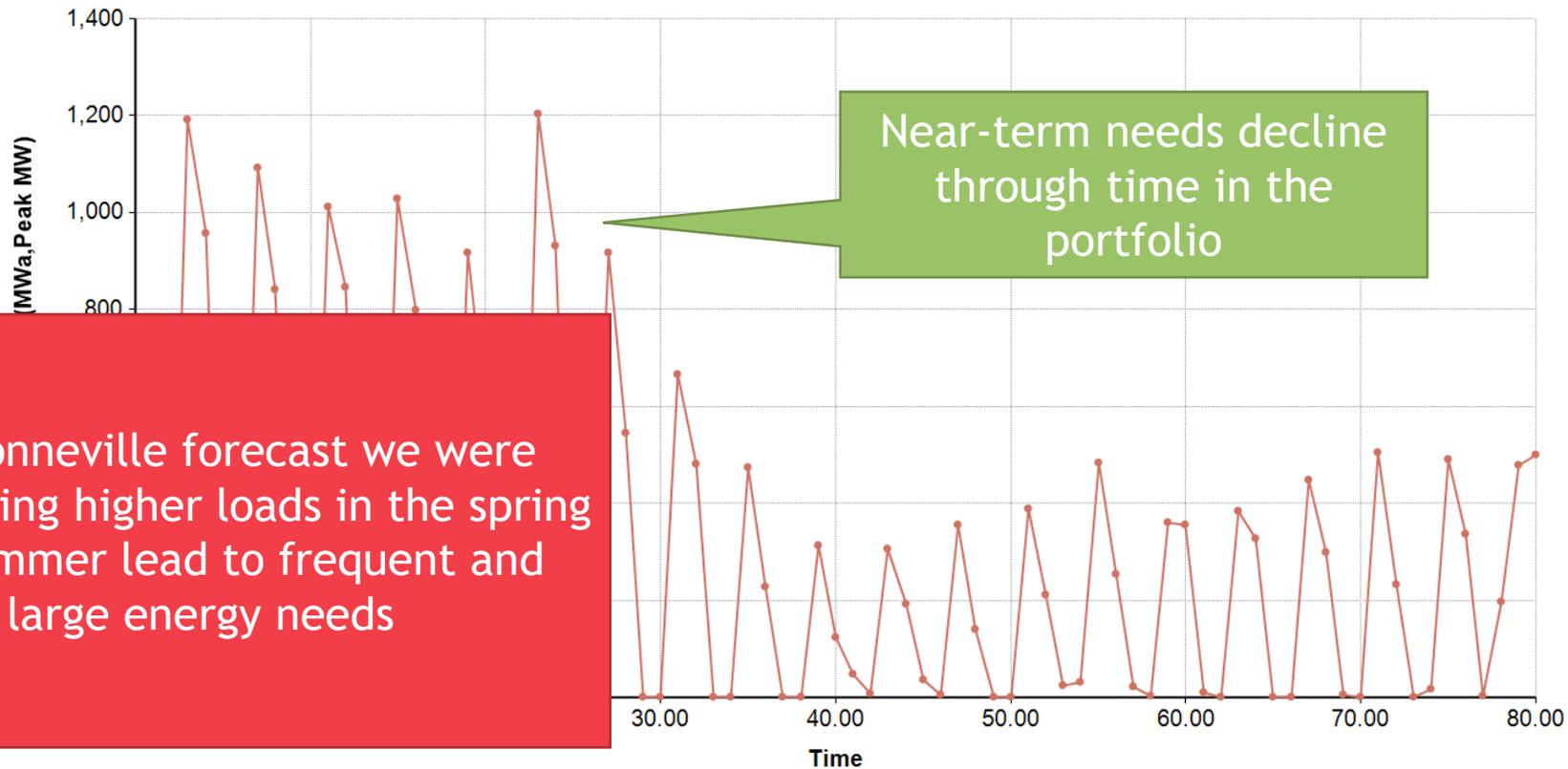
# 2021 Plan BPA Forecast vs 2019 Needs Assessment



At the April webinar we showed that the load forecast was less “shaped” than Bonneville’s 2019 Needs Assessment

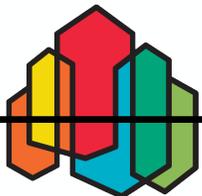


# Example Energy Need



The Bonneville forecast we were using having higher loads in the spring and summer lead to frequent and large energy needs

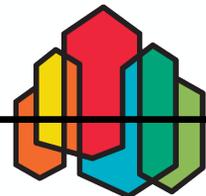
Near-term needs decline through time in the portfolio



# Downscaling the Regions Load to Bonneville

When discussing Bonneville rates there are always exceptions, but generally:

- A subset of Bonneville's customer utilities (generally load following customers) have temperature impacts on their load that translates through to the Bonneville load obligation
- Another portion of Bonneville's customers load served by Bonneville varies by the amount of generation being produced (generally slice & block customers)
- Bonneville has further contracts that do not increase or decrease with temperature or generation



# Change in Downscaling Approach

Previous downscaling approach:

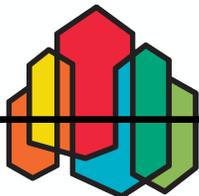
- Treated all Bonneville load as subject to temperature variation increasing average load and the range of loads we were forecasting for Bonneville
- Generally worked with Bonneville to understand what proportion of regional loads matched their forecast and came up with a percentage by month

Change in downscaling approach:

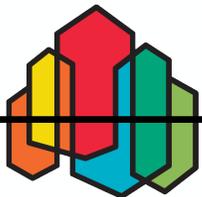
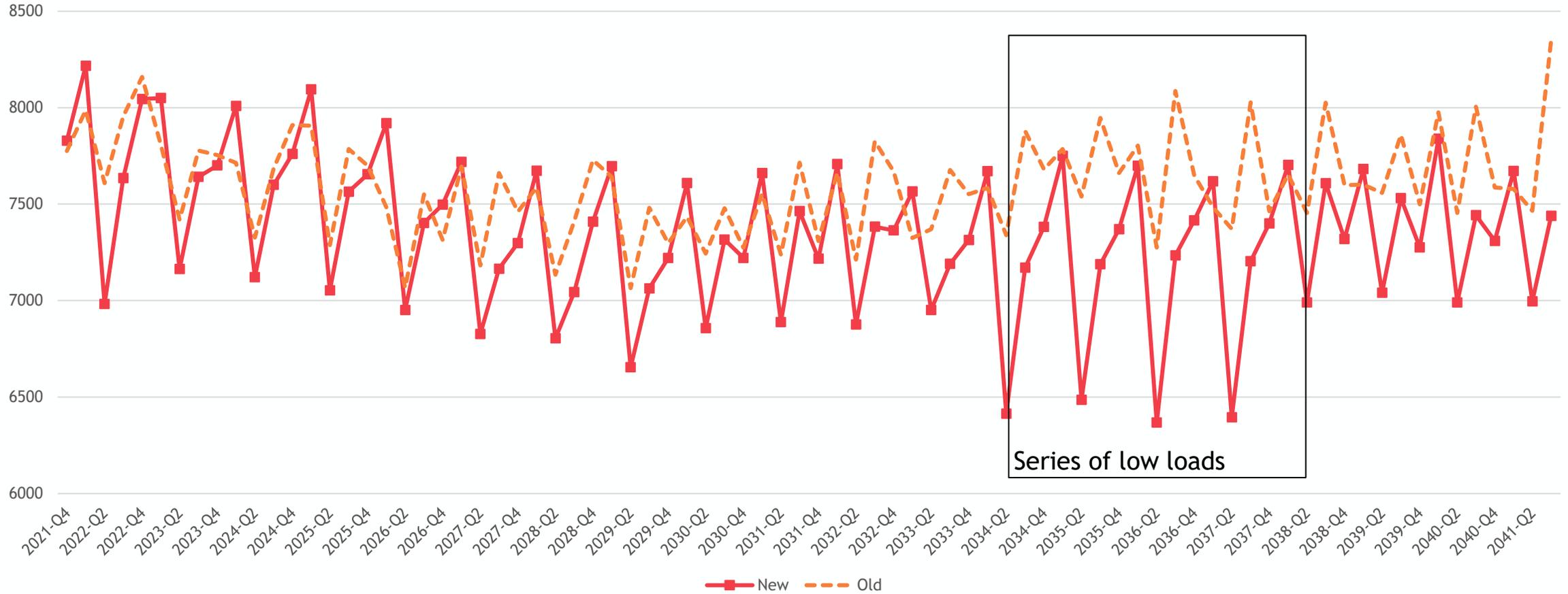
- Only downscale regional loads for a proportion of the Bonneville's load subject to temperature impacts
- Add in contract load on a quarterly basis
- Add in maximum slice load and match adequacy to use maximum slice load as well

Future work, past the 2021 Plan:

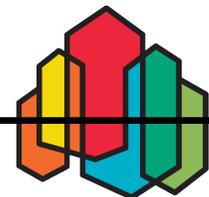
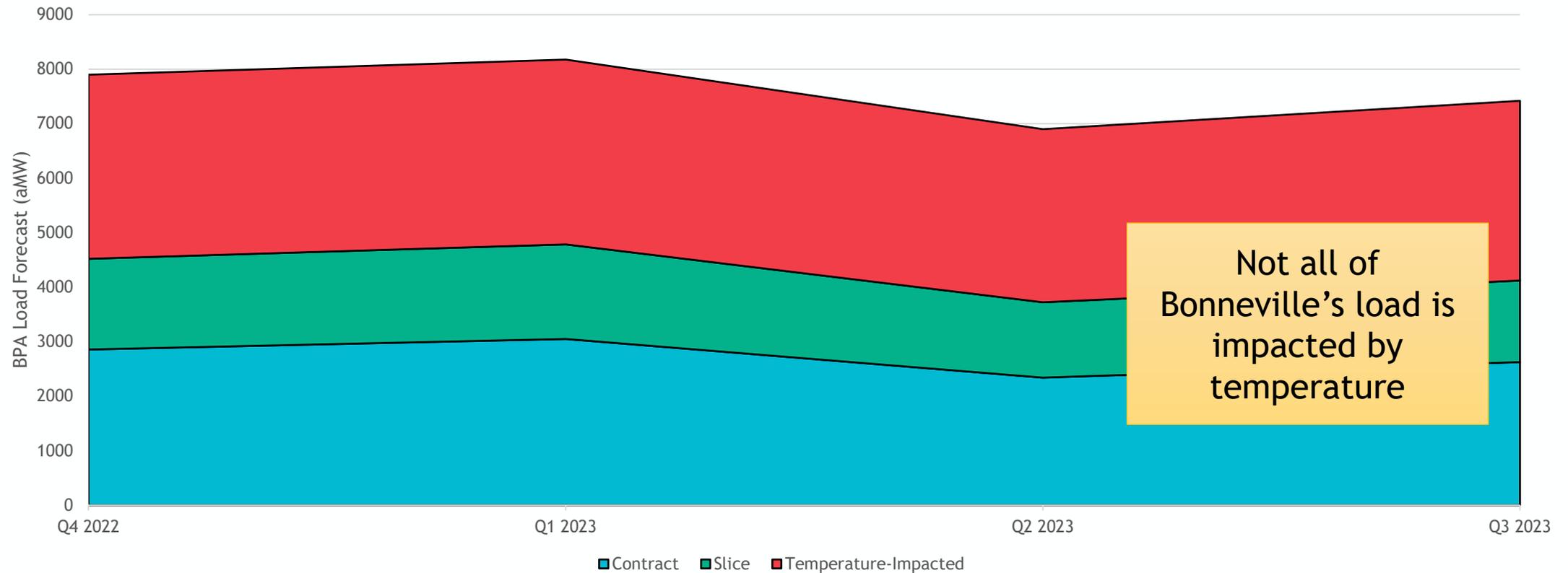
- Creating a method to accommodate a portion of Bonneville's load being based on Federal system generation



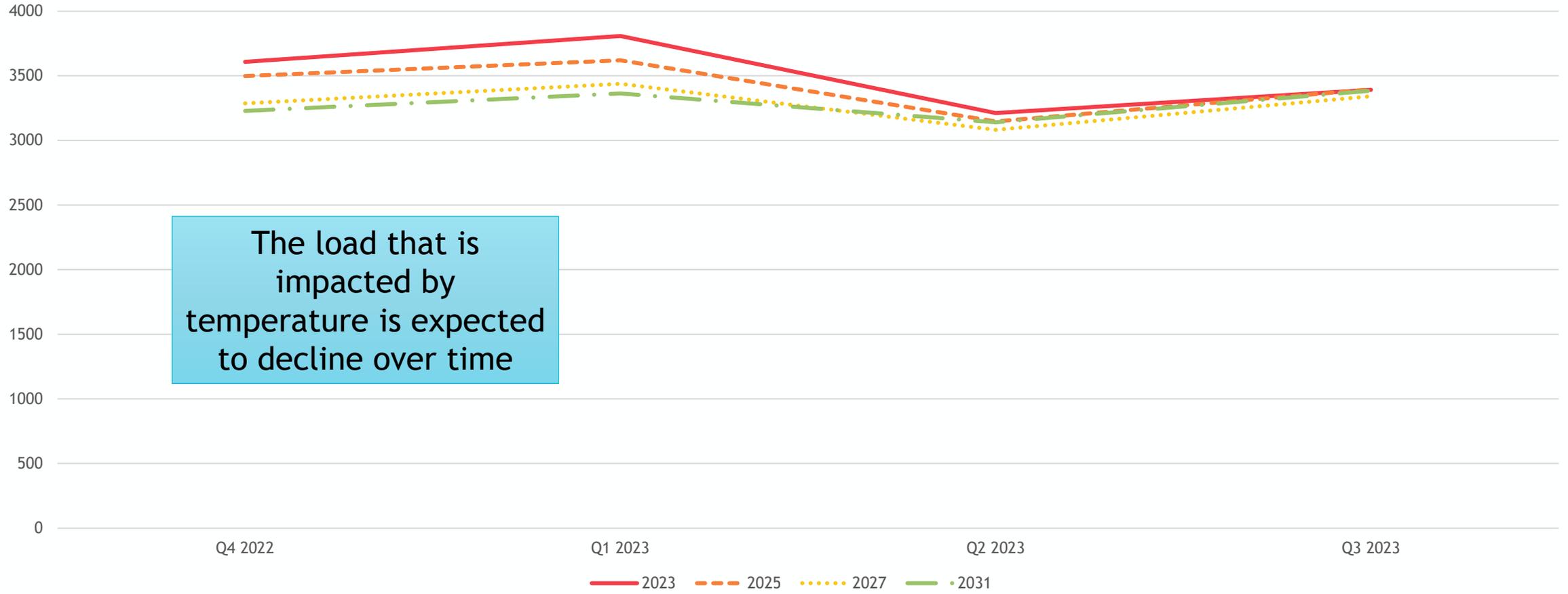
### Change in Average BPA Load Based on Downscaling Approach



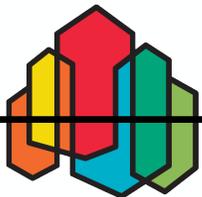
# Components of Bonneville Adequacy Reserve Margin Load Calculation



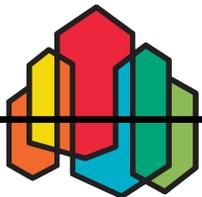
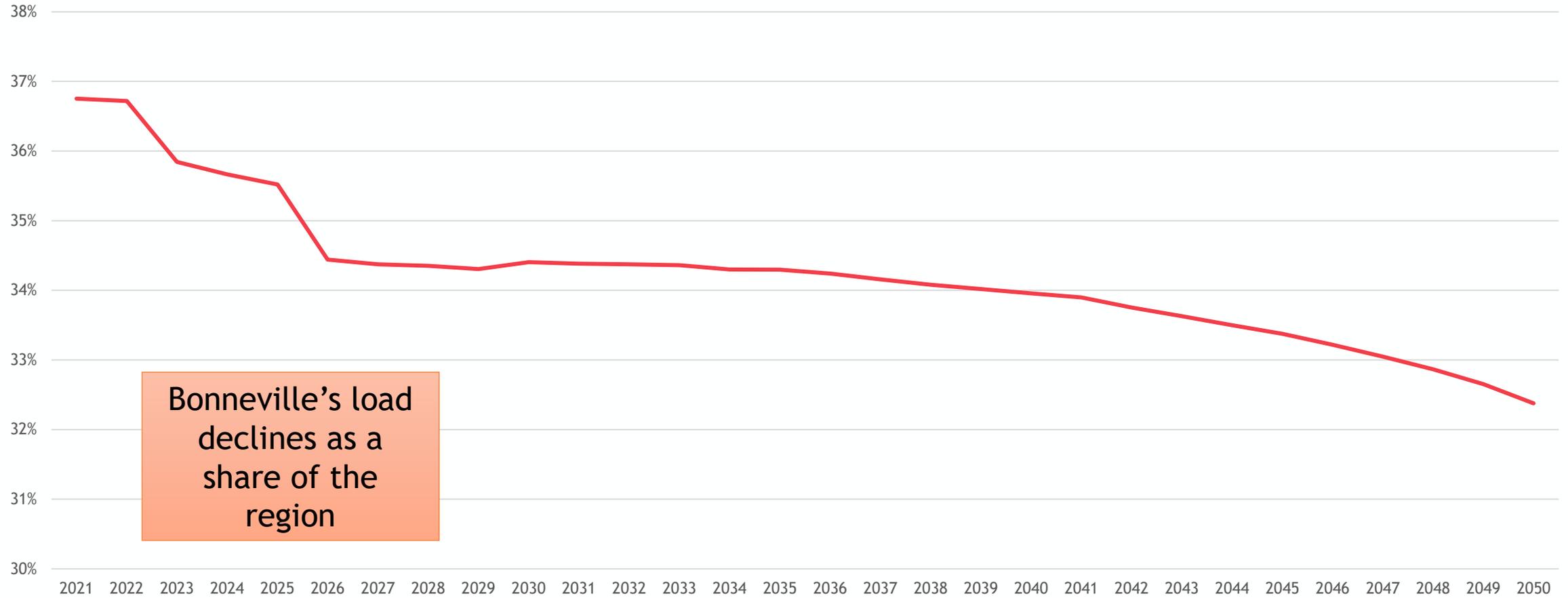
### Temperature-Impacted Load



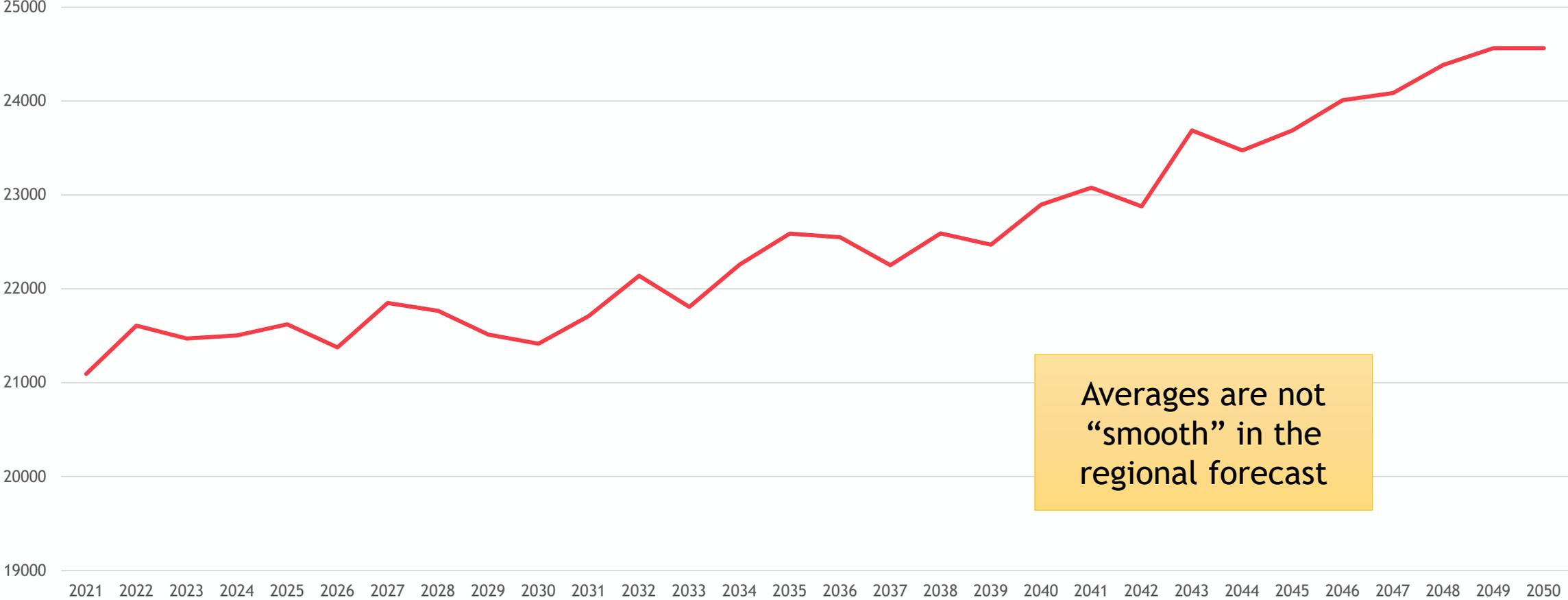
The load that is impacted by temperature is expected to decline over time



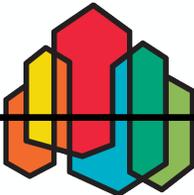
## BPA as Proportion of Regional Load



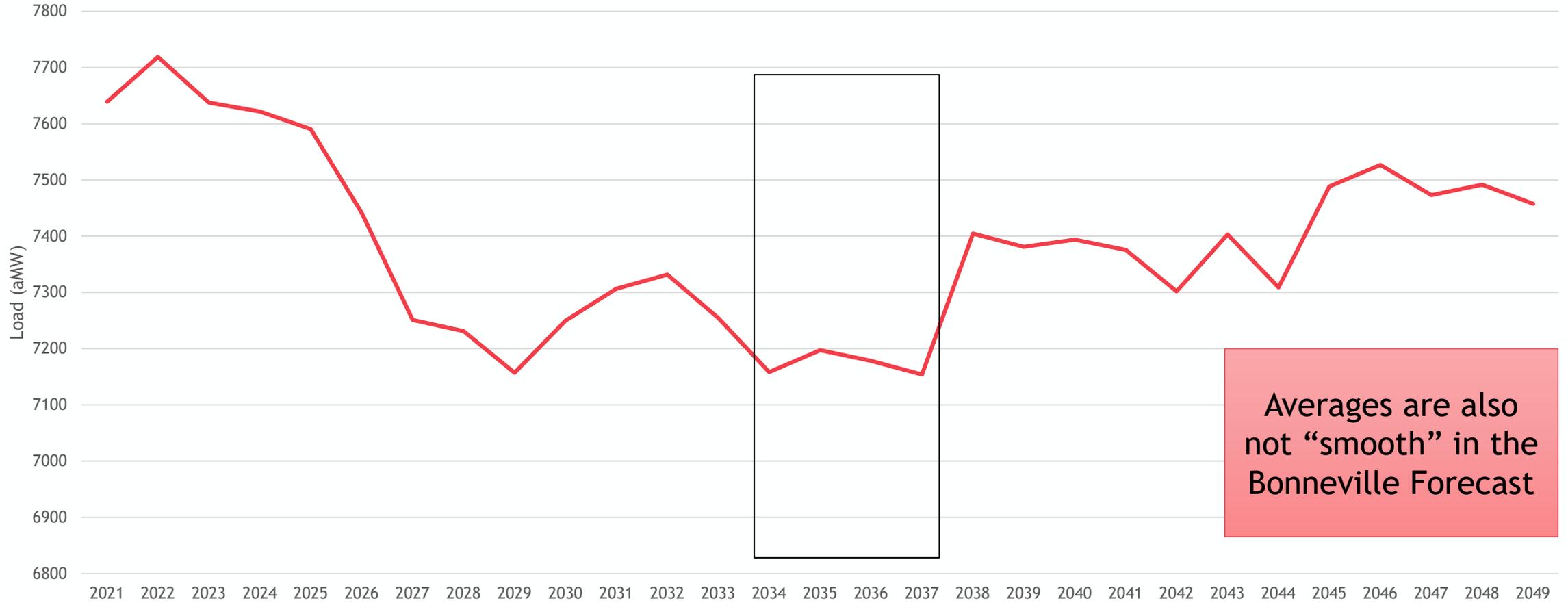
### Regional Average Load CANESM2



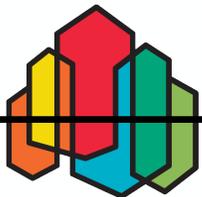
Averages are not “smooth” in the regional forecast



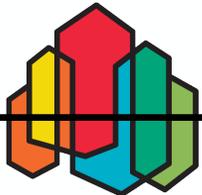
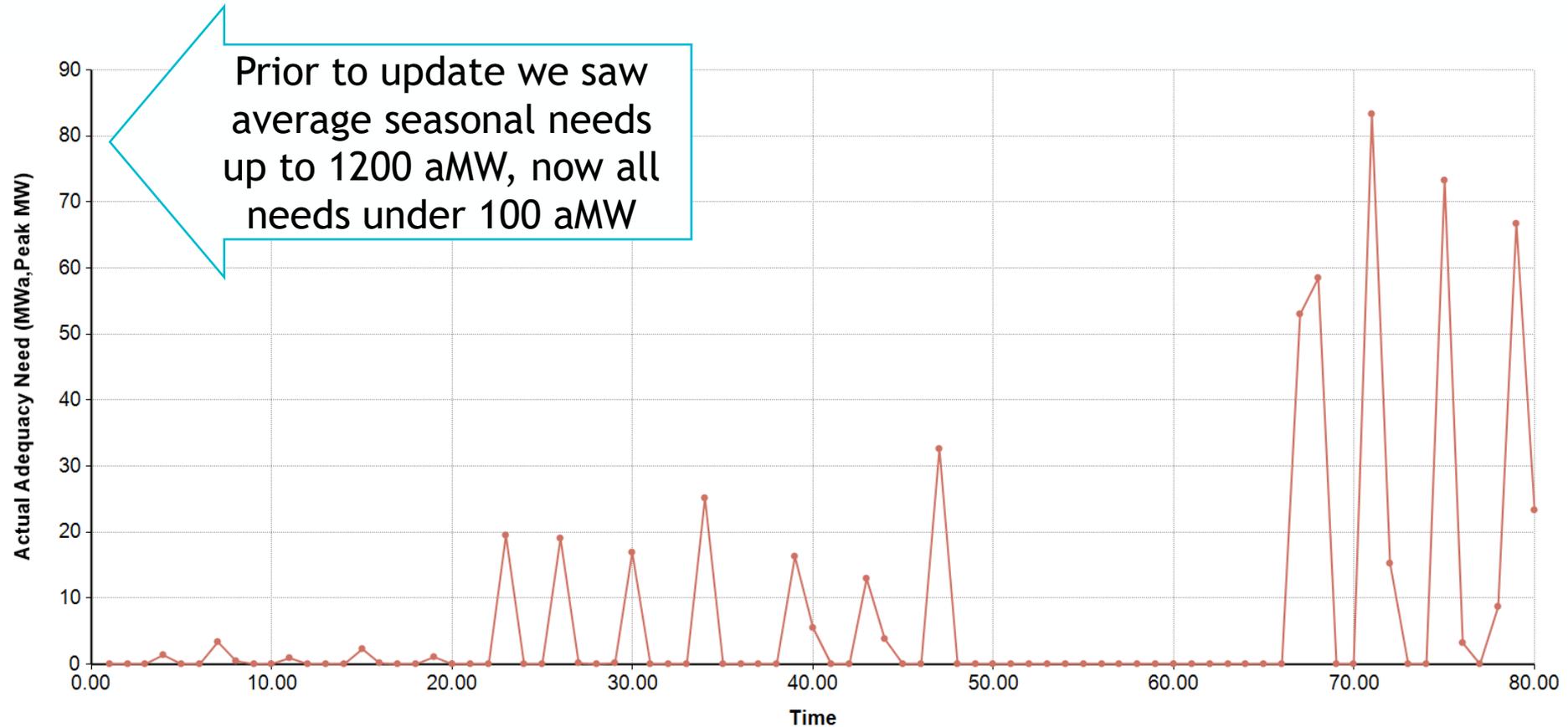
### Bonneville Average Annual Load CANESM2



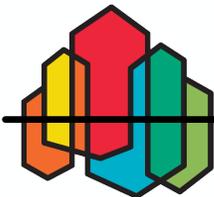
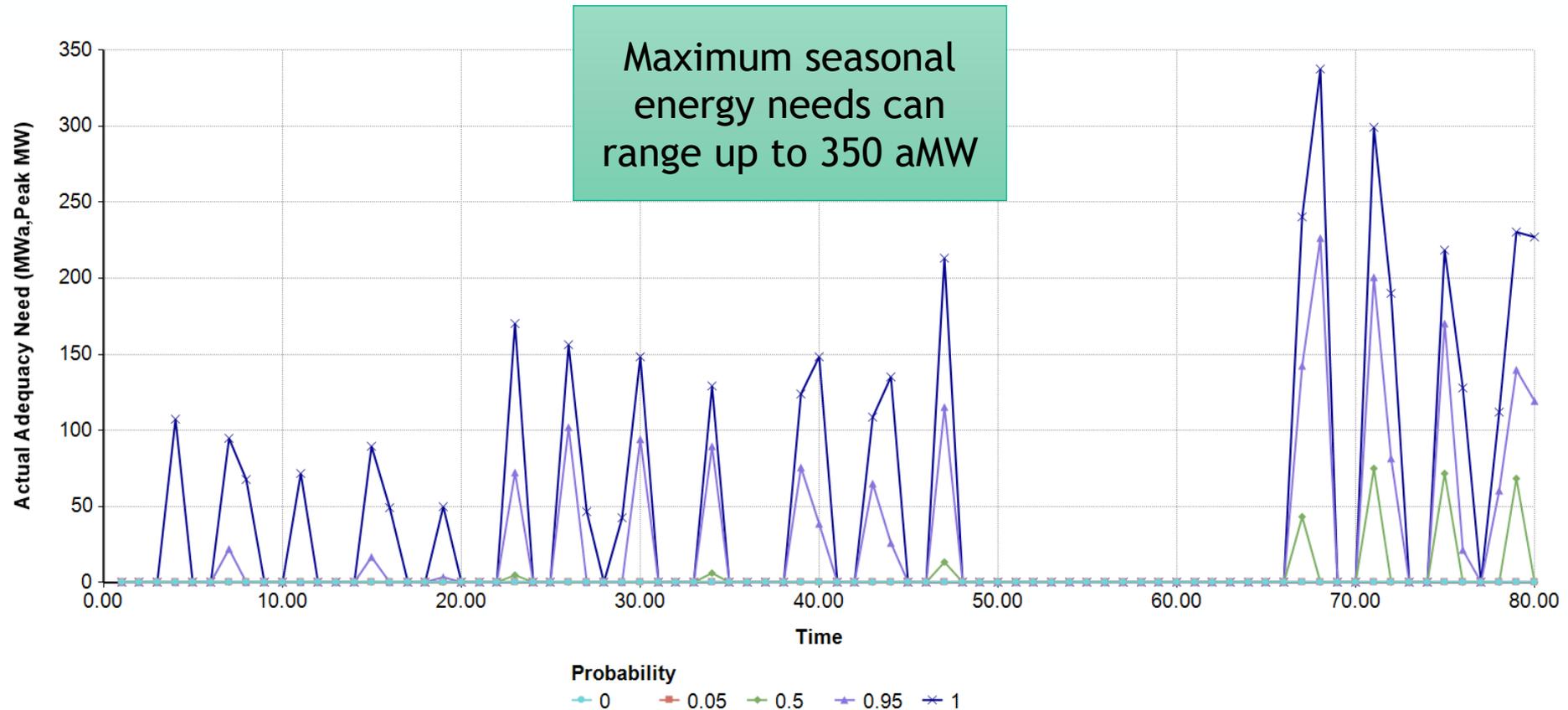
Averages are also not “smooth” in the Bonneville Forecast



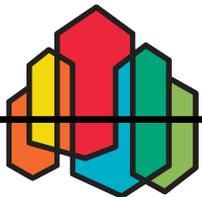
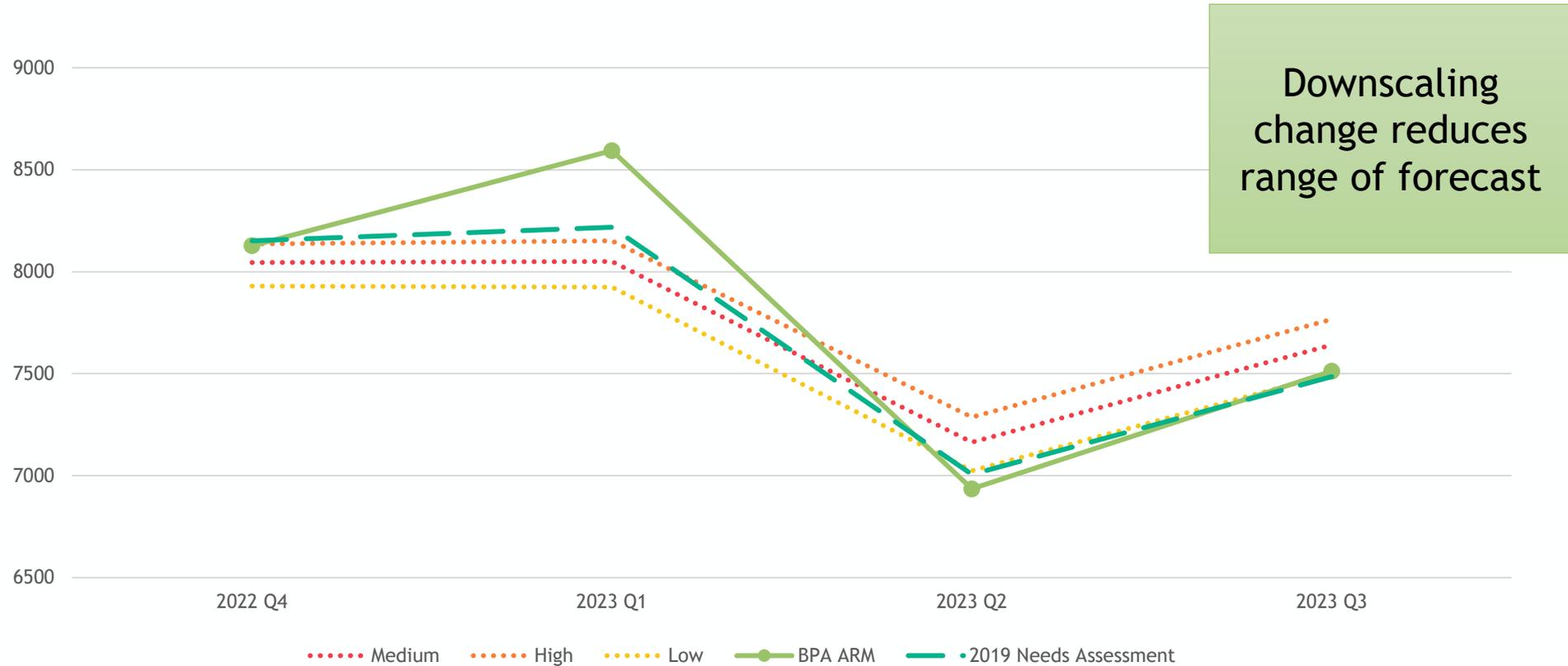
# Energy Need with Updated Loads



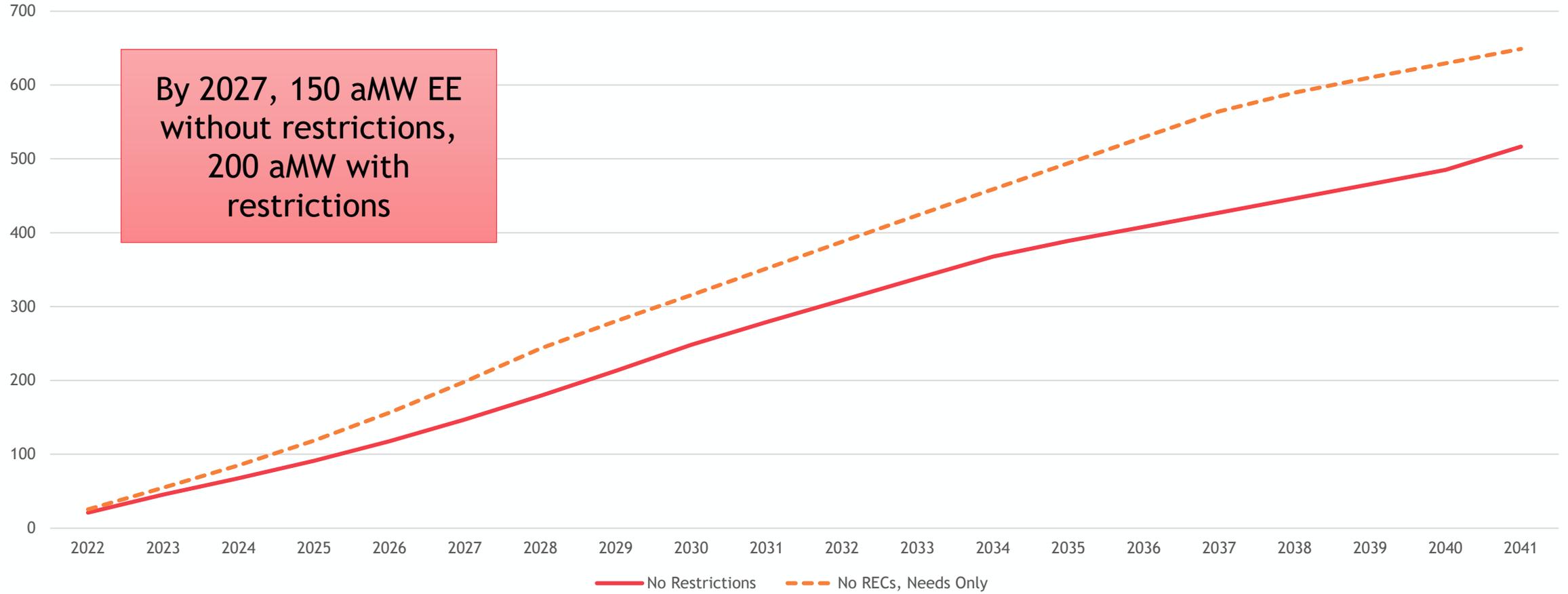
# Energy Need with Updated Loads



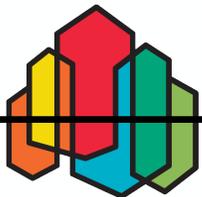
# 2021 Plan Updated BPA Forecast



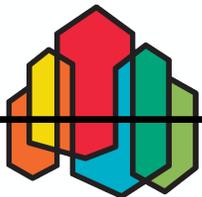
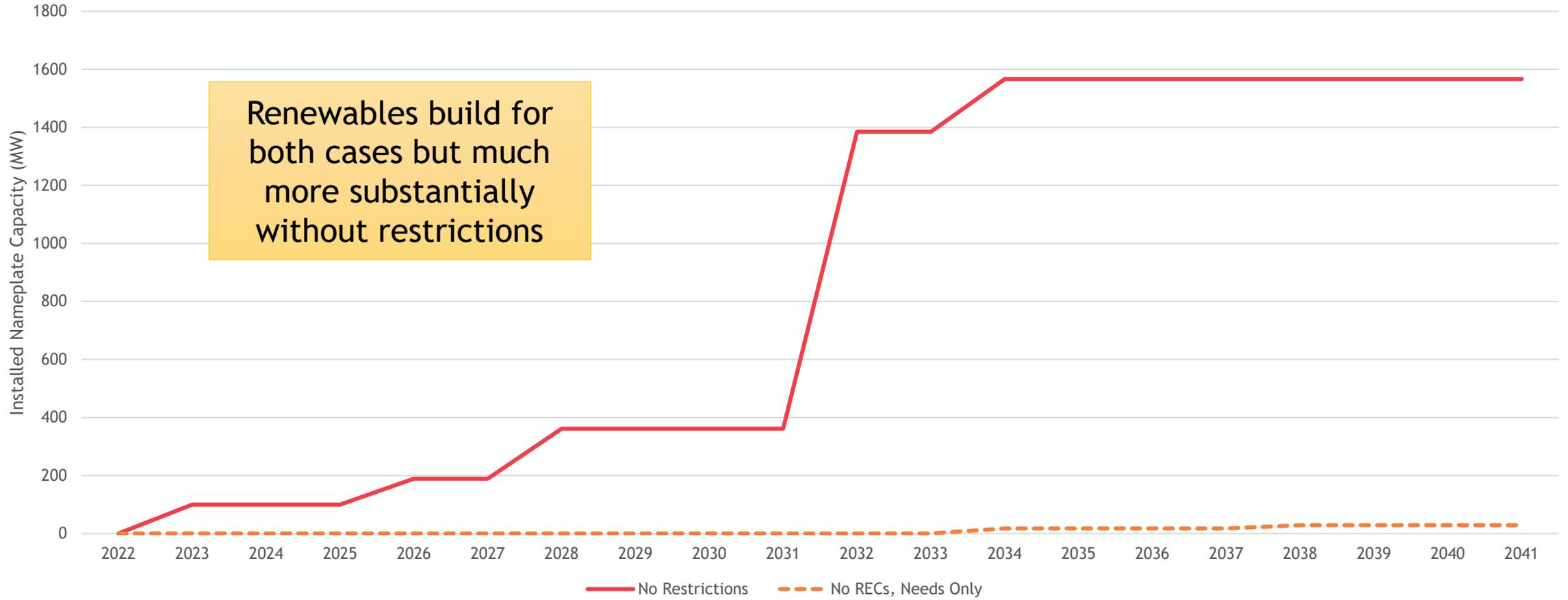
# Energy Efficiency Acquired



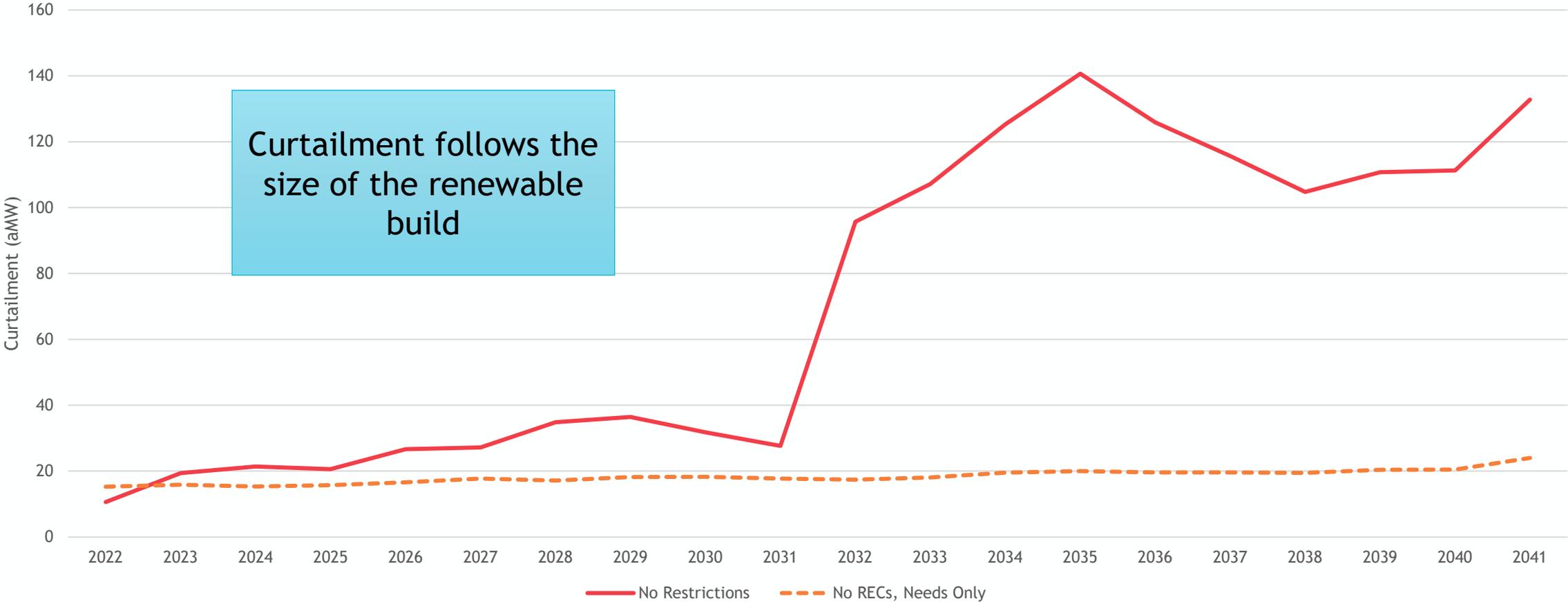
By 2027, 150 aMW EE without restrictions, 200 aMW with restrictions



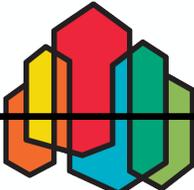
# Renewables Build



### Renewables Curtailment



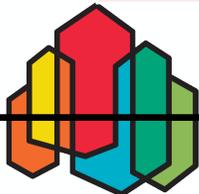
Curtailment follows the size of the renewable build



# Why is it cheaper without restrictions?

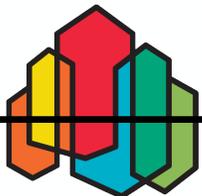
	Change
Market Cost of Load	0
Hydro Generation Value	(0)
Must Run Generation Value	(0)
Dispatchable Generation Value	(5,108)
Conservation Value	926
Conservation Cost	(341)
REC Value Stream	(648)
Backstop/Curtailment Cost	-
New Resource Costs (Construction, FOM)	2,639
Fixed O&M of Existing Resources	0
Resource Adequacy Penalties	-
RPS, Clean Energy Penalties	-
Net Cost to Serve Load	(2,531)

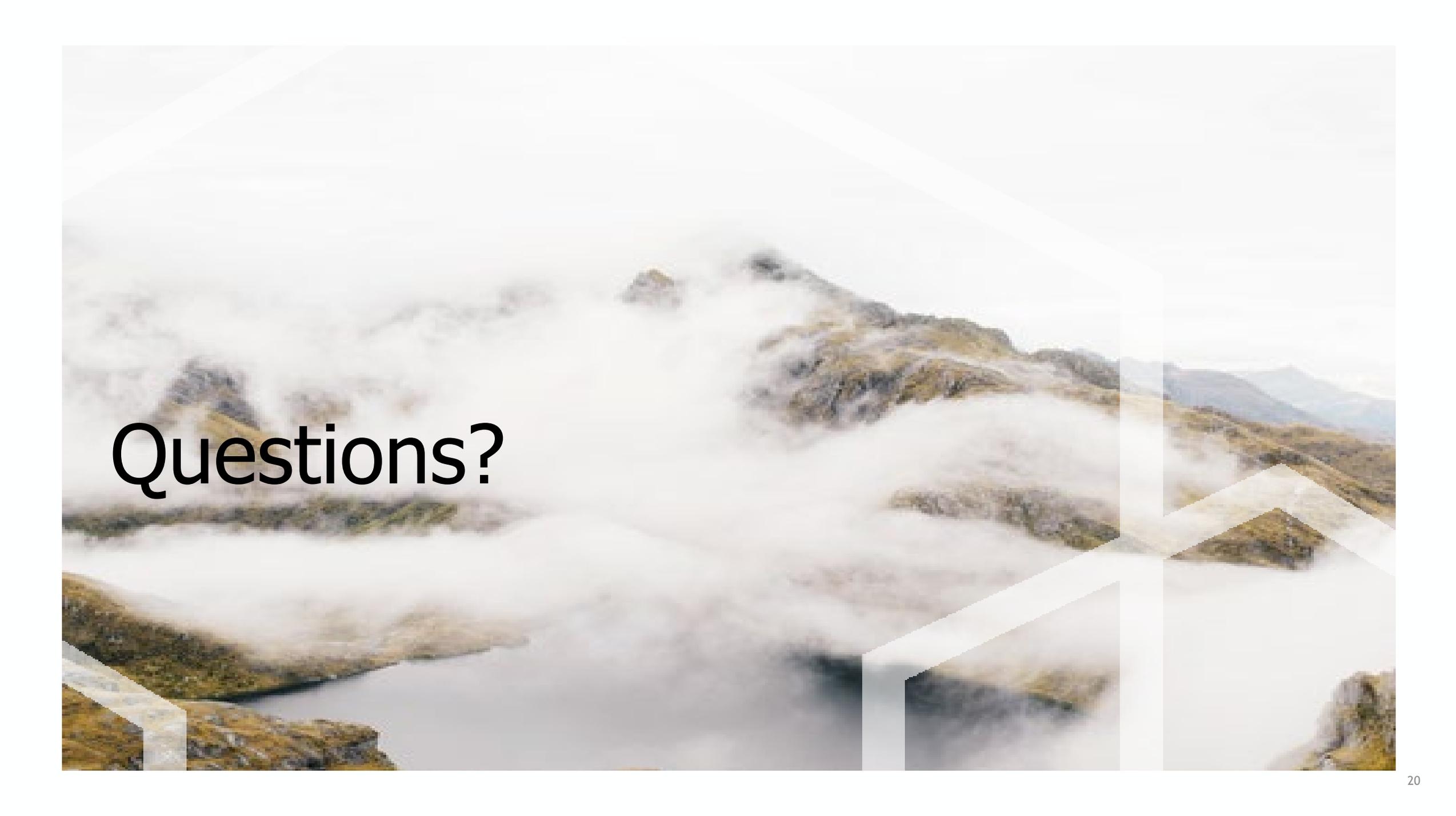
- \$2.6 Billion 2016 \$ in added new resource cost
- Loss of \$585 Million in EE value relative to restricted case
- Nets \$5.75 Billion in generation value plus REC value
- I.e. costs of resources is substantially less than the value



# RECALL: Where does this point?

- Models are likely to show a need for Bonneville to acquire some level of renewable resource – *though moderate to low and later if you restrict builds to only match needs*
- The energy efficiency acquisition is likely to remain moderate to low – *between 30% to 40% of regional baseline results*
- What are the models missing?
  - Federal GENESYS does not capture the same level of detail on the hydro and external market interact as the regional analysis
  - RPM does not include hydro spill / curtailment
  - RPM likely overstates renewable curtailment for Bonneville Scenario – Bonneville has access to substantial hydro flexibility



A scenic landscape of a mountain valley. In the foreground, a road with a concrete guardrail curves along a rocky, mossy slope. A calm lake is nestled in the valley below. The middle ground is dominated by a thick layer of white mist or low clouds that fills the valley and partially obscures the mountains. In the background, more mountain peaks are visible under a pale, overcast sky. A large, white, semi-transparent geometric overlay, consisting of several overlapping trapezoidal shapes, is positioned on the right side of the image, partially covering the landscape.

Questions?