

# Portfolio Results and Action Plan for the 2022 IRP- Technical Working Group



Portfolio Results and Action Plan (IRP- TWG #7)  
September 8, 2022



# Forward Looking Statement



This and other presentations made by NW Natural from time to time, may contain forward-looking statements within the meaning of the U.S. Private Securities Litigation Reform Act of 1995. Forward-looking statements can be identified by words such as “anticipates,” “intends,” “plans,” “seeks,” “believes,” “estimates,” “expects” and similar references to future periods. Examples of forward-looking statements include, but are not limited to, statements regarding the following: including regional third-party projects, storage, pipeline and other infrastructure investments, commodity costs, competitive advantage, customer service, customer and business growth, conversion potential, multifamily development, business risk, efficiency of business operations, regulatory recovery, business development and new business initiatives, environmental remediation recoveries, gas storage markets and business opportunities, gas storage development, costs, timing or returns related thereto, financial positions and performance, economic and housing market trends and performance shareholder return and value, capital expenditures, liquidity, strategic goals, greenhouse gas emissions, carbon savings, renewable natural gas, hydrogen, gas reserves and investments and regulatory recoveries related thereto, hedge efficacy, cash flows and adequacy thereof, return on equity, capital structure, return on invested capital, revenues and earnings and timing thereof, margins, operations and maintenance expense, dividends, credit ratings and profile, the regulatory environment, effects of regulatory disallowance, timing or effects of future regulatory proceedings or future regulatory approvals, regulatory prudence reviews, effects of regulatory mechanisms, including, but not limited to, SRRM and the Company’s infrastructure investments, effects of legislation, including but not limited to bonus depreciation and PHMSA regulations, and other statements that are other than statements of historical facts.

Forward-looking statements are based on our current expectations and assumptions regarding our business, the economy and other future conditions. Because forward-looking statements relate to the future, they are subject to inherent uncertainties, risks and changes in circumstances that are difficult to predict. Our actual results may differ materially from those contemplated by the forward-looking statements, so we caution you against relying on any of these forward-looking statements. They are neither statements of historical fact nor guarantees or assurances of future performance. Important factors that could cause actual results to differ materially from those in the forward-looking statements are discussed by reference to the factors described in Part I, Item 1A “Risk Factors,” and Part II, Item 7 and Item 7A “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” and “Quantitative and Qualitative Disclosure about Market Risk” in the Company’s most recent Annual Report on Form 10-K, and in Part I, Items 2 and 3 “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and “Quantitative and Qualitative Disclosures About Market Risk”, and Part II, Item 1A, “Risk Factors”, in the Company’s quarterly reports filed thereafter.

All forward-looking statements made in this presentation and all subsequent forward-looking statements, whether written or oral and whether made by or on behalf of the Company, are expressly qualified by these cautionary statements. Any forward-looking statement speaks only as of the date on which such statement is made, and we undertake no obligation to publicly update any forward-looking statement, whether as a result of new information, future developments or otherwise, except as may be required by law.

# Today's Agenda



- Procedures and Introductions
- IRP TWG Recaps
- Draft IRP Feedback
- Scenario Results
- Monte Carlo Stochastic Simulation Results
- Action Plan
- Open Q&A

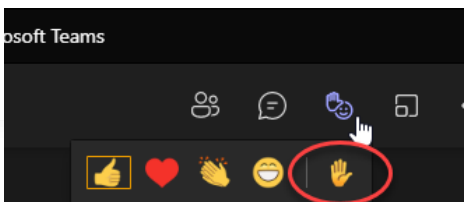
# Procedures for Participation

- Please mute your microphones during the presentation, except when commenting and or asking a question
- All participants are muted upon entry into the meeting

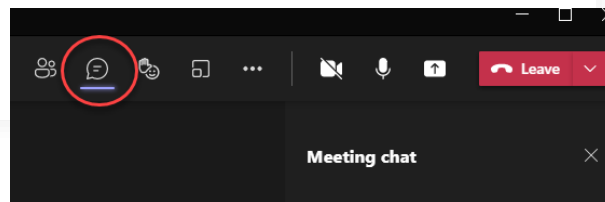
- Cameras are optional and up to each participant to use
- All participant cameras are set to off upon entry into the meeting

- Add a comment or question at any time using the “raised hand” or the chat box

*Raised hand function is found in the reactions*

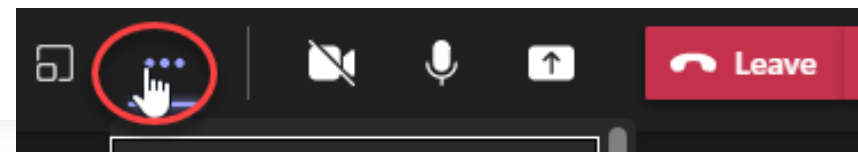


*Chat box will open when you click on the conversation bubble*



- Microsoft Teams has a live caption function for any participant to use

*Click the ellipses, then chose “turn on live captions”*



# 2 Minutes for Safety:



## Fire Prevention and Safety Tips



- Install smoke alarms on every level of your home, inside bedrooms and outside sleeping areas
  - Test smoke alarms monthly and replace batteries at least once per year
- Have a fire extinguisher in a central location and know how to use it
- Keep flammable items at least 3 feet away from anything that gets hot (ex. space heaters)
- Keep household appliances clean and in good working order (ex. heating sources, dryers, stoves)
- Don't leave candles or other open flames unattended
- Create a fire escape plan- talk about it and practice!
- In the event of a fire, GET OUT, STAY OUT, and CALL FOR HELP
  - Remember to **STOP, DROP, and ROLL** if clothing catches fire

# IRP Process, Objectives, and Evolution



The IRP process is a public process and we welcome your feedback and participation!

- IRP participants come to the process with varying backgrounds and familiarity with IRP planning, and that is ok! Our IRP benefits from diverse perspectives
- We strive to strike the right balance in terms of the technical material presented, but are always evaluating the appropriate level of detail and might not always get it right

NW Natural's views on scope and role of the IRP:

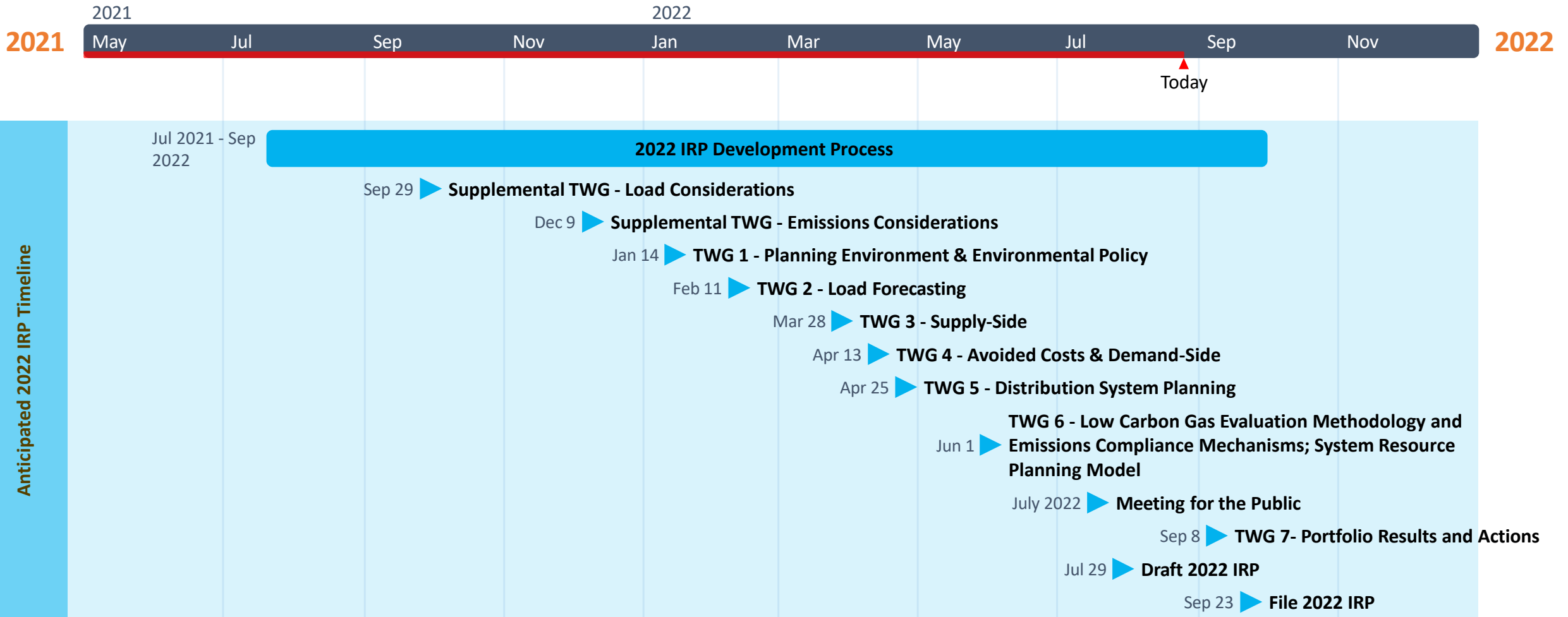
- Rules and guidelines from the legislature and our regulatory commissions define the scope and purpose of IRPs and are grounded in a least cost-least risk approach to utility resource planning
- IRP rules and guidelines require robust planning that is highly complex and requires advanced modeling techniques and tools that are critical to serving our customers' needs as best we can
- IRPs assess the implications of the policy and market environment and how changes to that environment would impact meeting customer needs
- The IRP process is not a policy *making* process nor the best forum to discuss what policies should (or should not) be adopted

NW Natural acknowledges that IRPs are evolving and the active discussions about the role of IRPs and ways to make the process more inclusive and transparent as well as coordinate work across utilities

- We are proactively looking at ways to improve our IRP process and outreach and are excited to be able to lean on the experience and expertise of the Community and Equity Advisory Group NW Natural is forming moving forward

We value open and constructive discussion and IRP workshops are *LONG* meetings; we are bound to misspeak from time to time and we apologize in advance!

# 2022 IRP Timeline



# IRP on the NW Natural website



Find information about NW Natural's IRP on our website

- Integrated Resource Plan page: <https://www.nwnatural.com/about-us/rates-and-regulations/resource-planning>

## Integrated Resource Plan

Resource planning process	+
IRP working groups & public meetings	+
Current and previous IRPs	+
2018 IRP - letter from David H. Anderson, NW Natural President and CEO	+

Click the tabs to expand each section



IRP working groups & public meetings

Please feel free to [get in touch with us](#) with questions about the IRP, or to be added to a workshop or Technical Working Group (TWG) for our next plan.

*All meetings listed below are tentative and subject to change.*

**Workshops**

TBD

2022 IRP Technical Working Groups (TWG)	Date
TWG 1 - Planning Environment and Environmental Policy <a href="#">Presentation - TWG 1 (.pdf)</a> <a href="#">Erratum Notice (.pdf)</a>	January 14, 2022
TWG 2 - Load Forecasting <a href="#">Presentation - TWG 2 (.pdf)</a> <a href="#">Erratum Notice (.pdf)</a>	February 11, 2022
TWG 3 - Avoided Costs and Demand-Side Resources	April 13, 2022
TWG 4 - Supply-Side Resources	March 28, 2022
TWG 5 - Distribution System Planning	April 25, 2022
TWG 6 - Portfolio Results & Actions	May 9, 2022

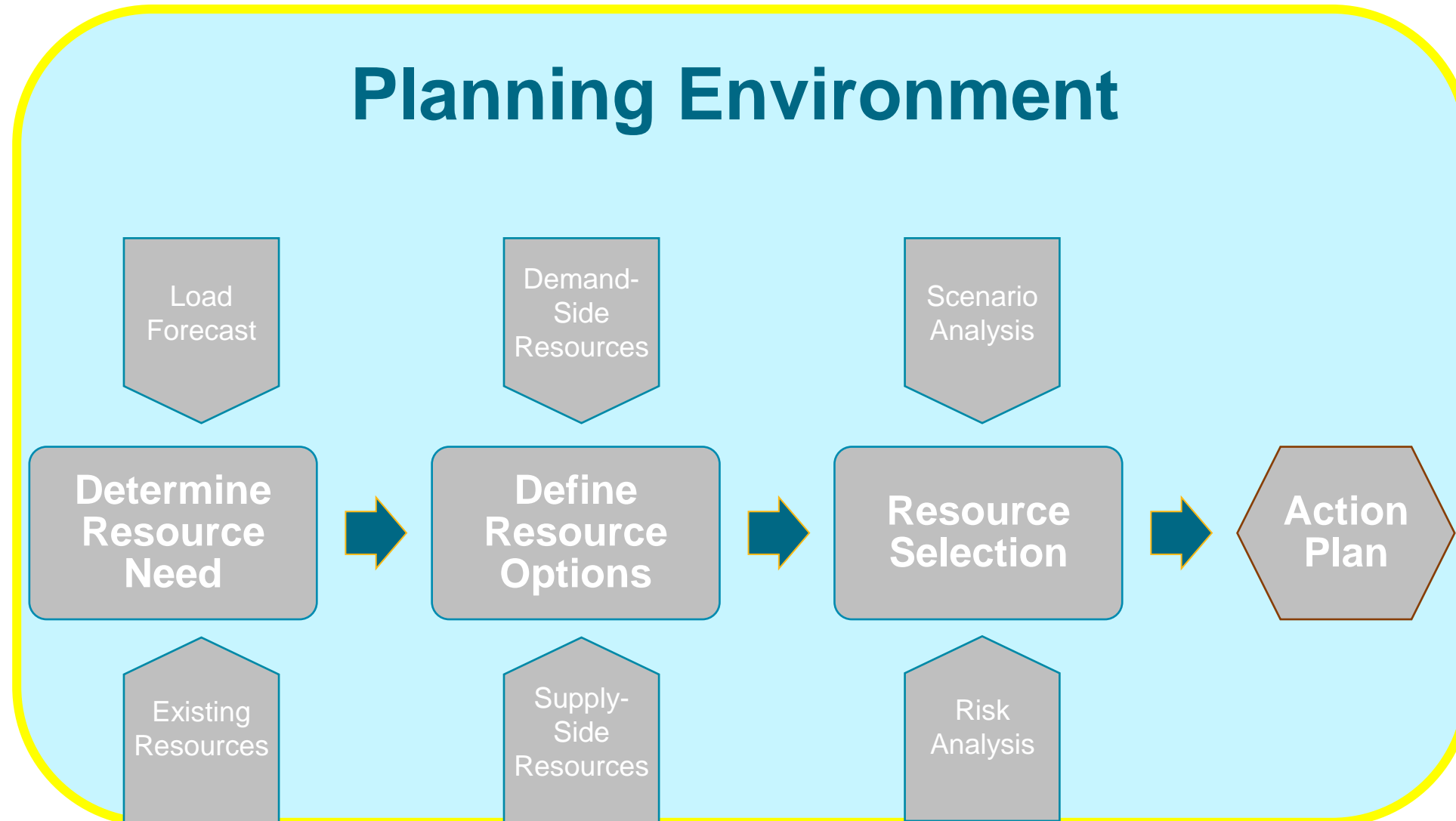
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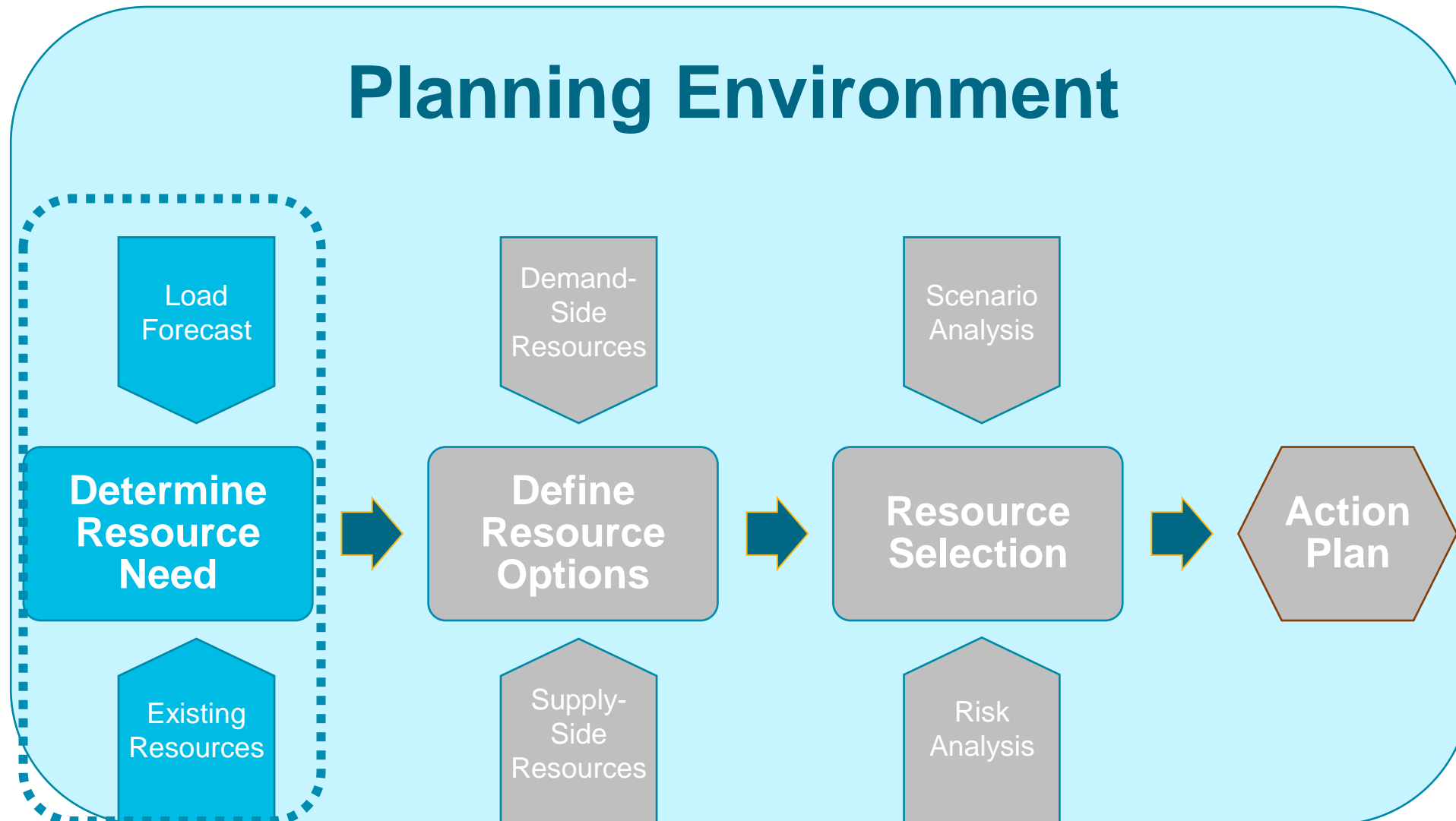
# IRP Process



# TWG 1- Planning Environment

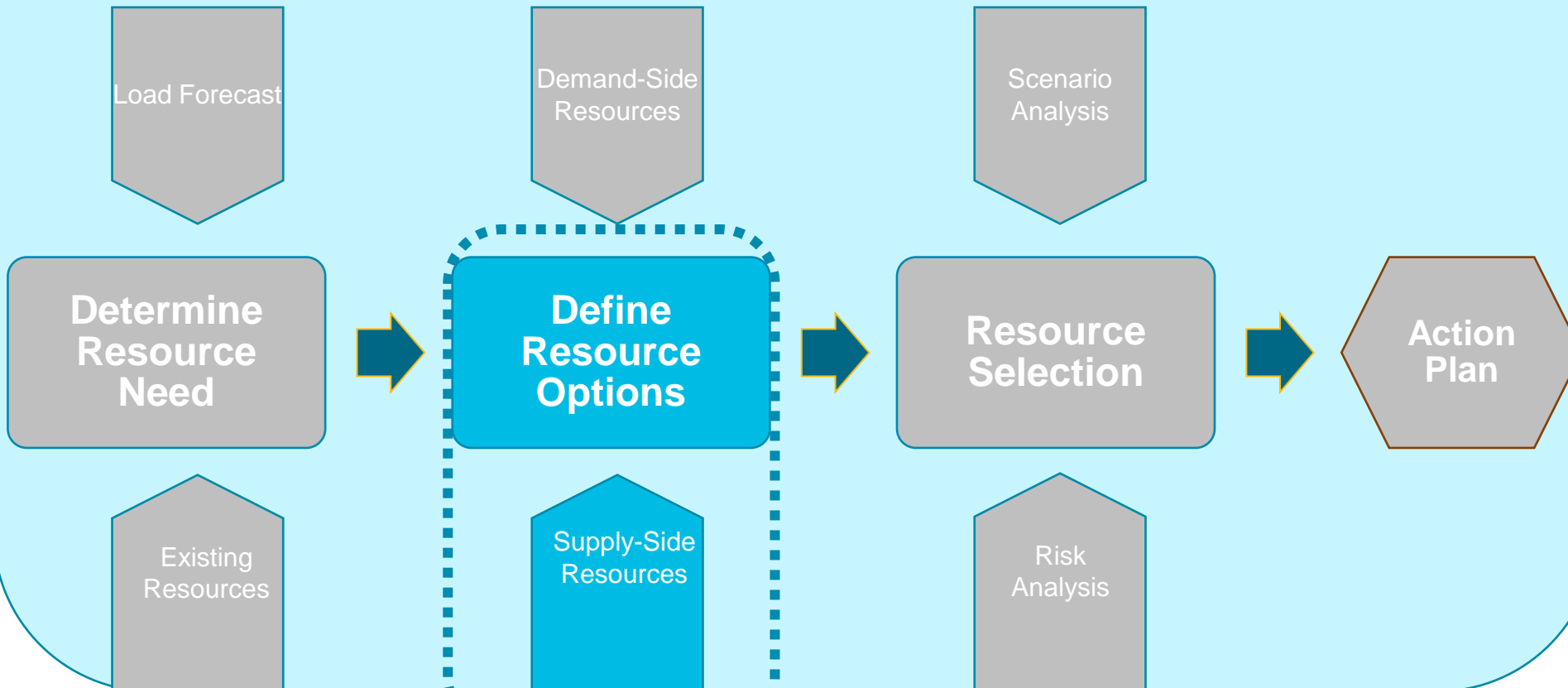


# TWG 2- Load Forecasting

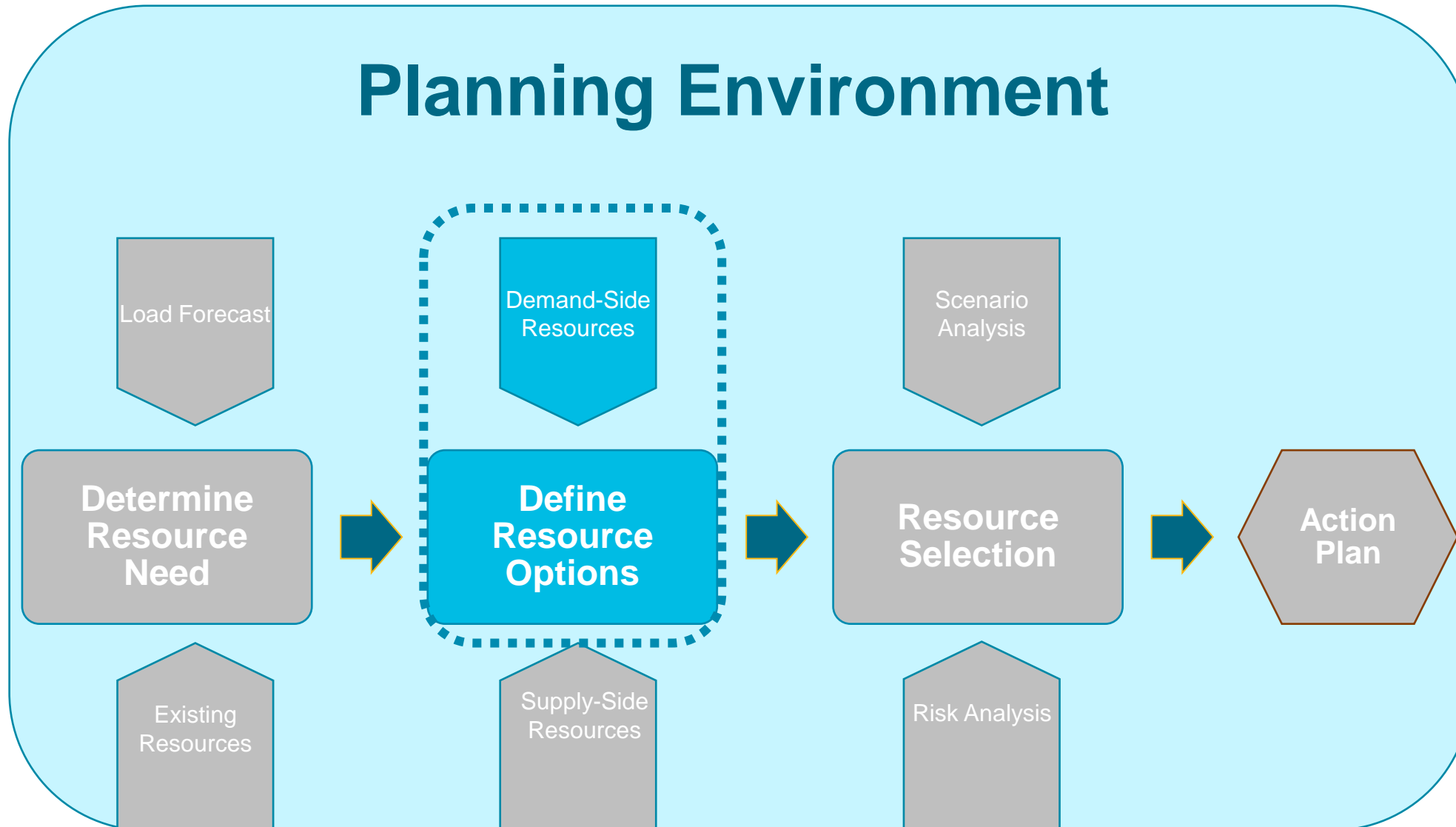


# TWG 3- Supply-Side Resources

## Planning Environment



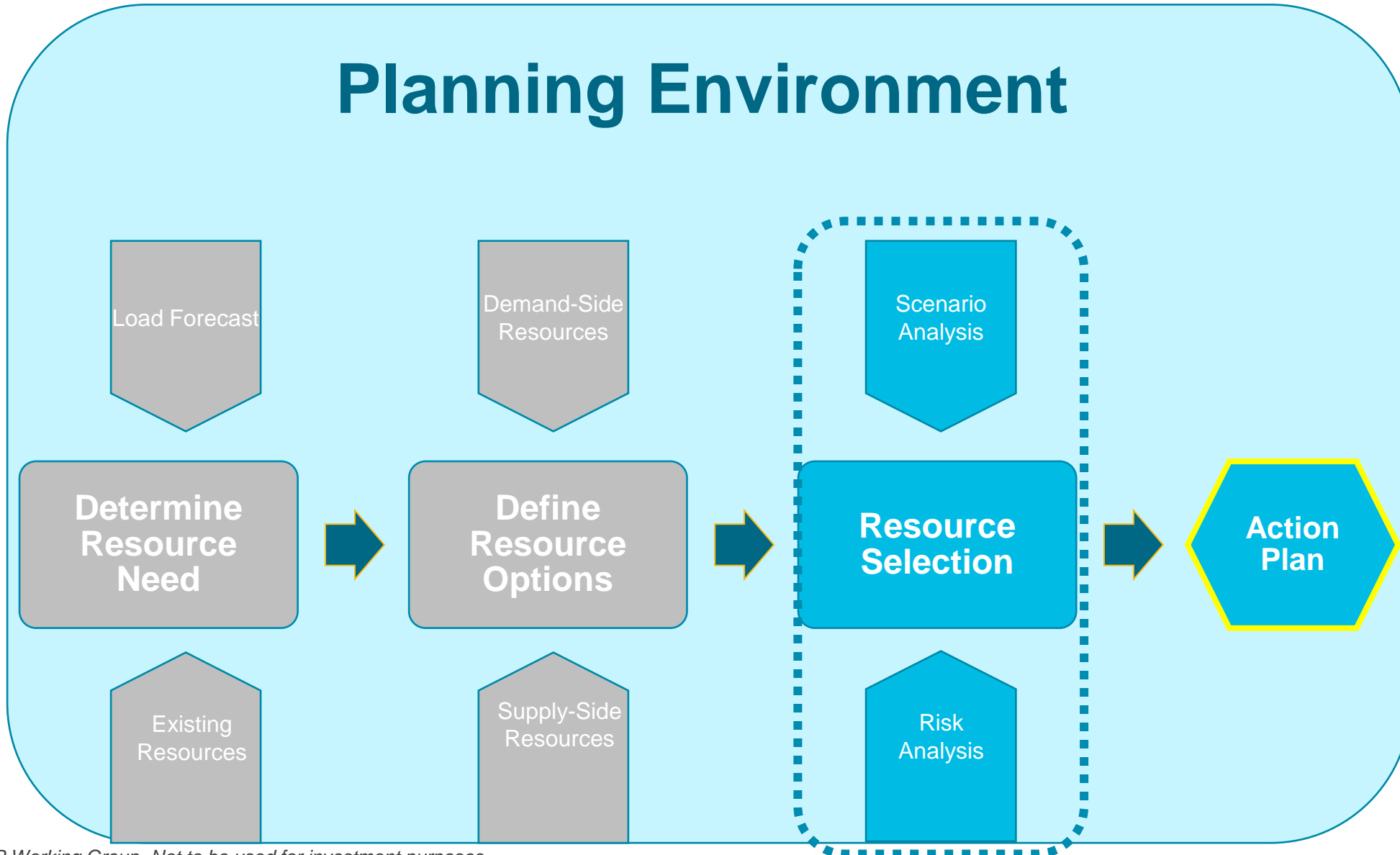
# TWG 4- Demand-Side Resources



# TWG 7 – Portfolio Results and Action Plan



## Planning Environment



# Risk Analysis: Scenario vs Simulation Analysis

NW relies upon both scenario analysis and stochastic simulation analysis to assess risk

Both types of risk analysis are aimed at arriving at robust resource decisions that represent the best combination of cost and risk

## Scenario Analysis

- Scenario development is important in determining modeling techniques and developing resource option inputs
- Comparing scenarios is helpful to understand how changes in key inputs would impact resource decisions and are often represent bookend results
- Unwise to change too many variables across scenarios as what is driving differences in results is harder to pull apart
- We are not “choosing” a scenario as an expected outcome or base case; we are looking across scenario results holistically to see key trends and understand the impact of different potential futures

# Risk Analysis: Scenario vs Simulation Analysis

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Both types of risk analysis are aimed at arriving at robust resource decisions that represent the best combination of cost and risk

## Stochastic Simulation (Monte Carlo) Analysis

- Uses many “draws” or simulations to generate a distribution of outcomes meant to represent the range of potential resource acquisitions
- NW Natural ran 500 draws that generates a resource portfolio from a stochastically generated set of inputs (load, RNG prices, weather, etc.) that is based upon statistics and scenario work
- Can be used to calculate risk metrics and help determine what strategies are riskier and which are less risky (low regret)
- Powerful in developing real world resource planning strategies under uncertainty
- As uncertainty increases, the more flexible and low regret strategies that can delay/avoid less flexible and higher regret decisions show as more valuable



# Draft IRP Feedback



- Numerous parties provided written feedback. Thank you all for the thoughtful engagement in our draft IRP
- We have attempted to address as many recommendations as we can for the final analysis we will show today
- We are incorporating many of the recommendations for inclusion and discussion in the final IRP
- IRPs are long-lead time and snapshots in time that are obsolete upon filing, which is more apparent in a dynamic environment (policy, market) like the one being experienced in the utility world right now
- Results for this IRP are “locked down”, but we will be doing this same process in 2 years with updated data and knowledge

# Putting Results in Context



- All scenarios and draws are required to meet NW Natural’s compliance obligations for each in year in the planning horizon in both Oregon and Washington
  - Exception for scenario 2, which has a carbon neutral emissions path, but is carbon neutral by 2050
- What is a “reference” or “business-as-usual” case?
  - A construct that represents the “but for” world where things continued on as they were at some point in the past
  - Allows the impact of actions or policies to be represented
- Loads are generated first, then the lowest cost supply-side resource portfolio is determined through optimization
- Costs are best understood on a per customer basis than on a total system cost basis

# Scenario Analysis

Capacity Planning

Energy Planning

Emissions Planning

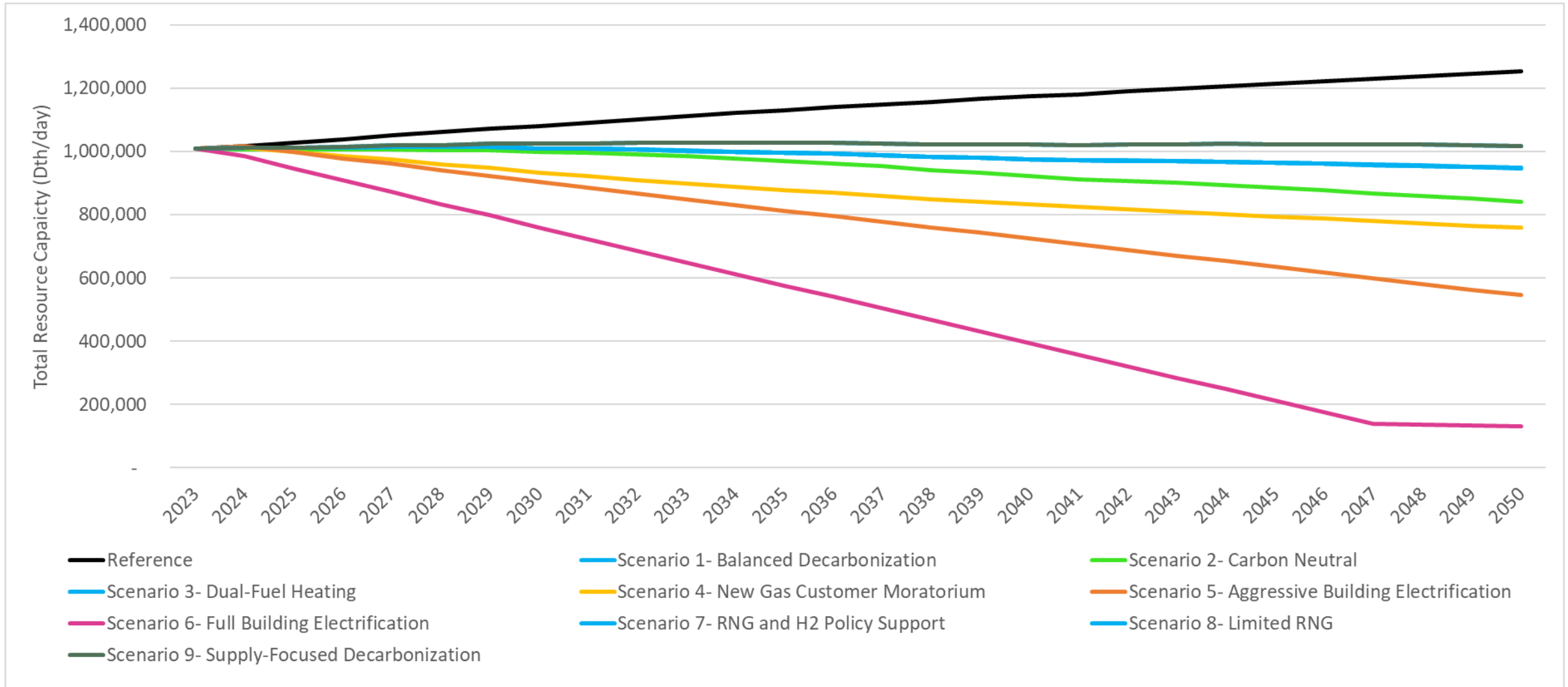
# Final 2022 IRP Scenarios



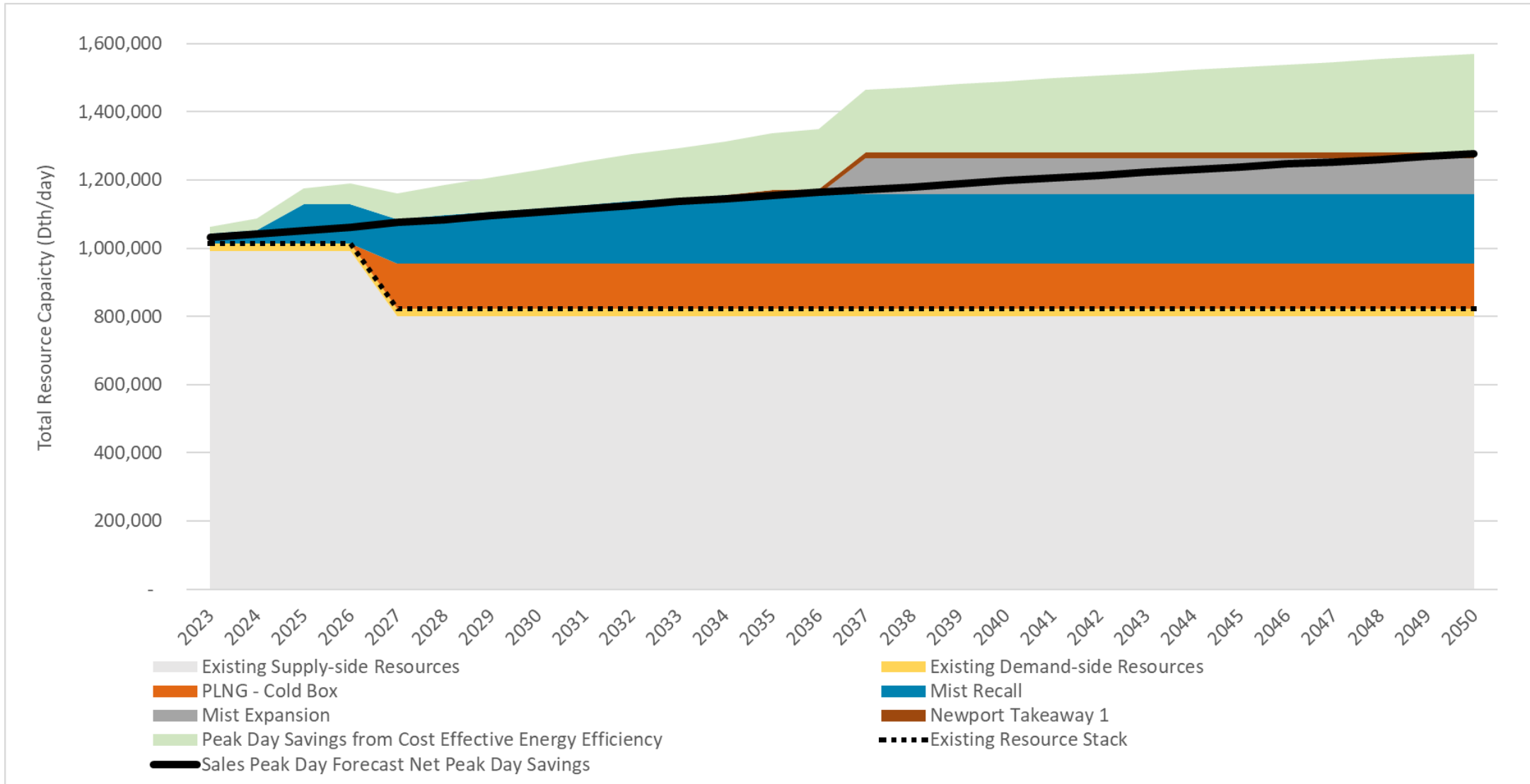
<u>2022 IRP Scenarios- Summary Version</u>		Reference (Trend Continuation) Case	1 Balanced Approach	2 Carbon Neutral by 2050	3 Dual-Fuel Heating Systems	4 New Direct Use Gas Customer Moratorium in 2025	5 Aggressive Building Electrification	6 Full Building Electrification	7 RNG and H2 Production Tax Credit	8 Limited RNG Availability	9 Supply-Focused Decarbonization	
<b>Demand-Side</b>	<b>Weather</b>	Climate change adjusted expected ("normal") weather in each year										
	<b>Customer Growth</b>	Current expectations				No New Customers After 2025				Current expectations		
	<b>Space and Water Heating Equipment</b>	Current EE expectations	Moderate gas powered heat pump and hybrid heating adoption		All residential and commercial space heating becomes hybrid heating by 2050	Moderate gas heat pump and hybrid adoption for existing customers	High electrification of existing residential and commercial load by 2050	Full electrification of existing residential and commercial load by 2050	Moderate gas heat pump and hybrid heating adoption		No gas powered heat pumps and low levels of hybrid heating	
	<b>Industrial Use Efficiency</b>		Consultant projection	High sensitivity	Consultant projection		60% Electrified by 2050	90% Electrified by 2050	Consultant projection			
	<b>Building Shell Improvement</b>		Energy Trust projection	Energy Trust high sensitivity projection	Ajusted Energy Trust projection				Energy Trust projection			
<b>Supply-Side Assumptions</b>	<b>Conventional Gas</b>	Expected pricing in each month										
	<b>Capacity Resources</b>	All capacity resources available at expected cost										
	<b>Renewable Natural Gas</b>	Expected availability and cost	Higher availability and expected cost	Expected availability and cost				High avail and low cost to customers	Low availability and high cost	Expected availability and cost		
	<b>Hydrogen</b>	20% Energy maximum (blended and dedicated) and expected cost	40% Energy maximum and expected cost	20% Energy maximum and expected cost				30% energy max and low cost to customers	12% energy max and high cost	35% max and expected cost		
	<b>Synthetic Methane</b>	No energy max and expected cost						No energy max and low cost to customers	No energy max and high cost	No energy max and expected cost		
<b>OR- CCIs</b>	Costs and limits defined in CPP rule											
<b>WA- Allowances &amp; Offsets</b>	Higher of social cost of carbon or California allowance projection in each year											

# Scenario Capacity Planning Results

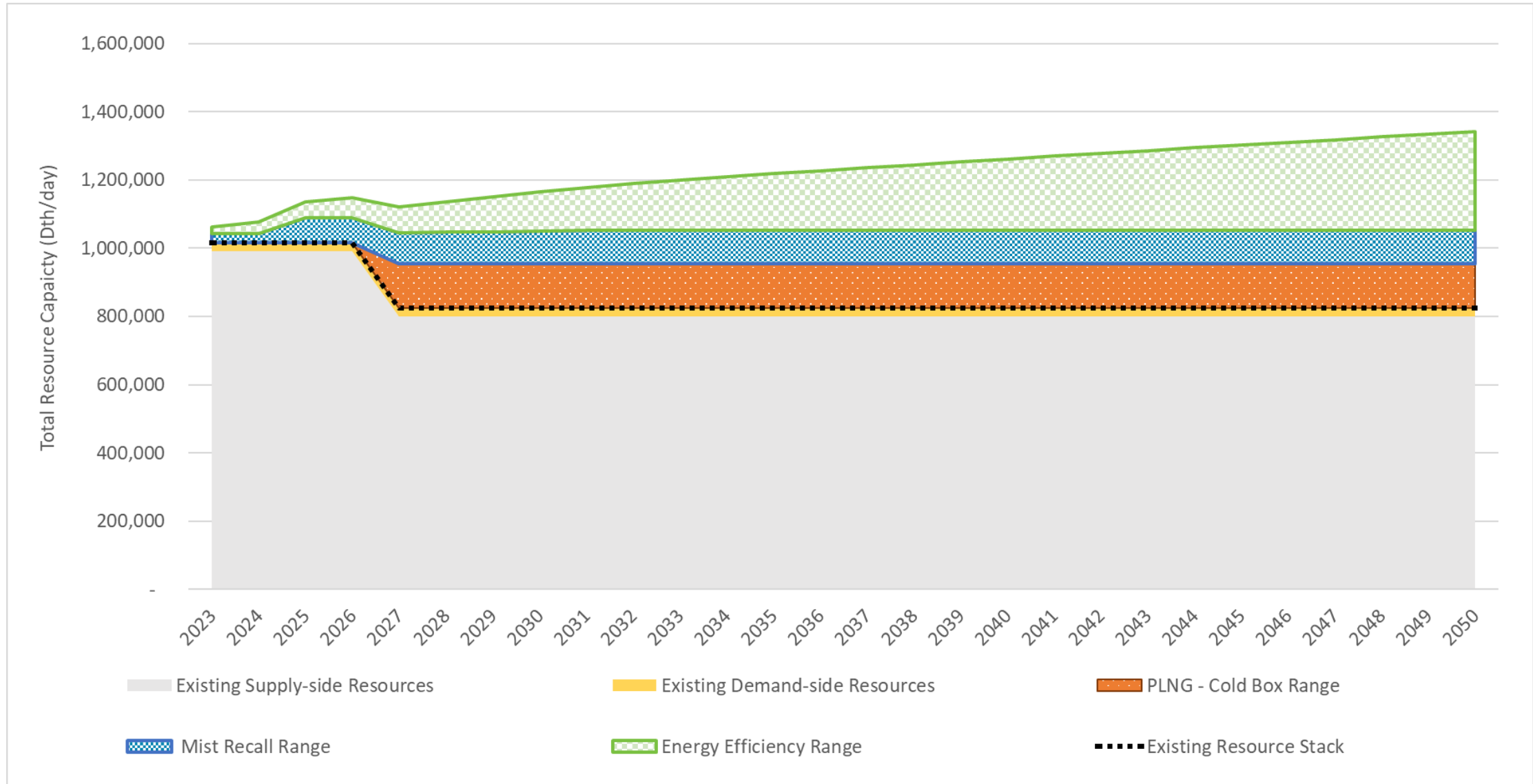
# Peak Day Firm Sales Forecast By Scenario



# Reference Case – Capacity Additions



# Scenarios 1-9 – Capacity Additions





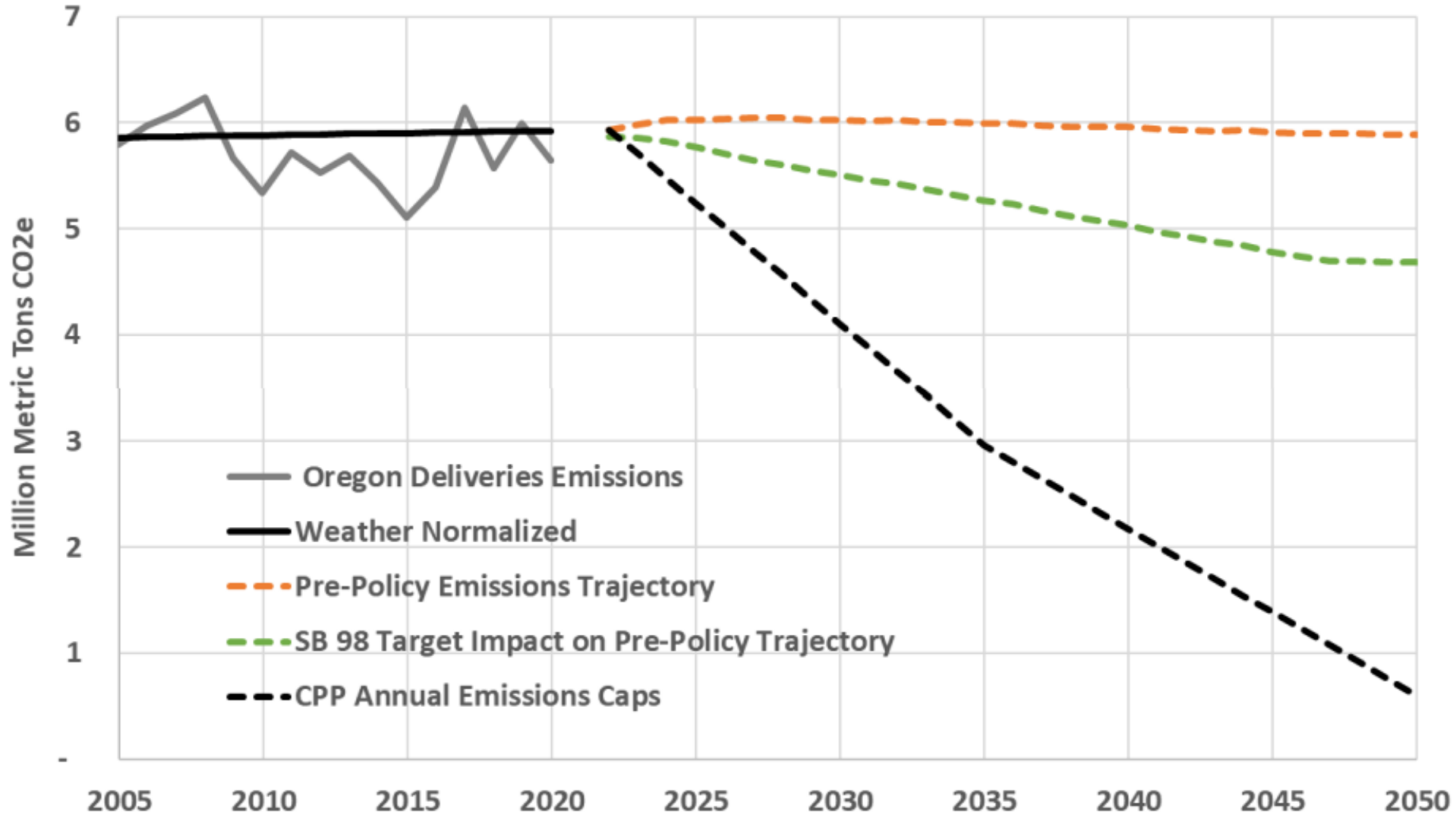
# Scenarios 1-9 – Capacity Additions



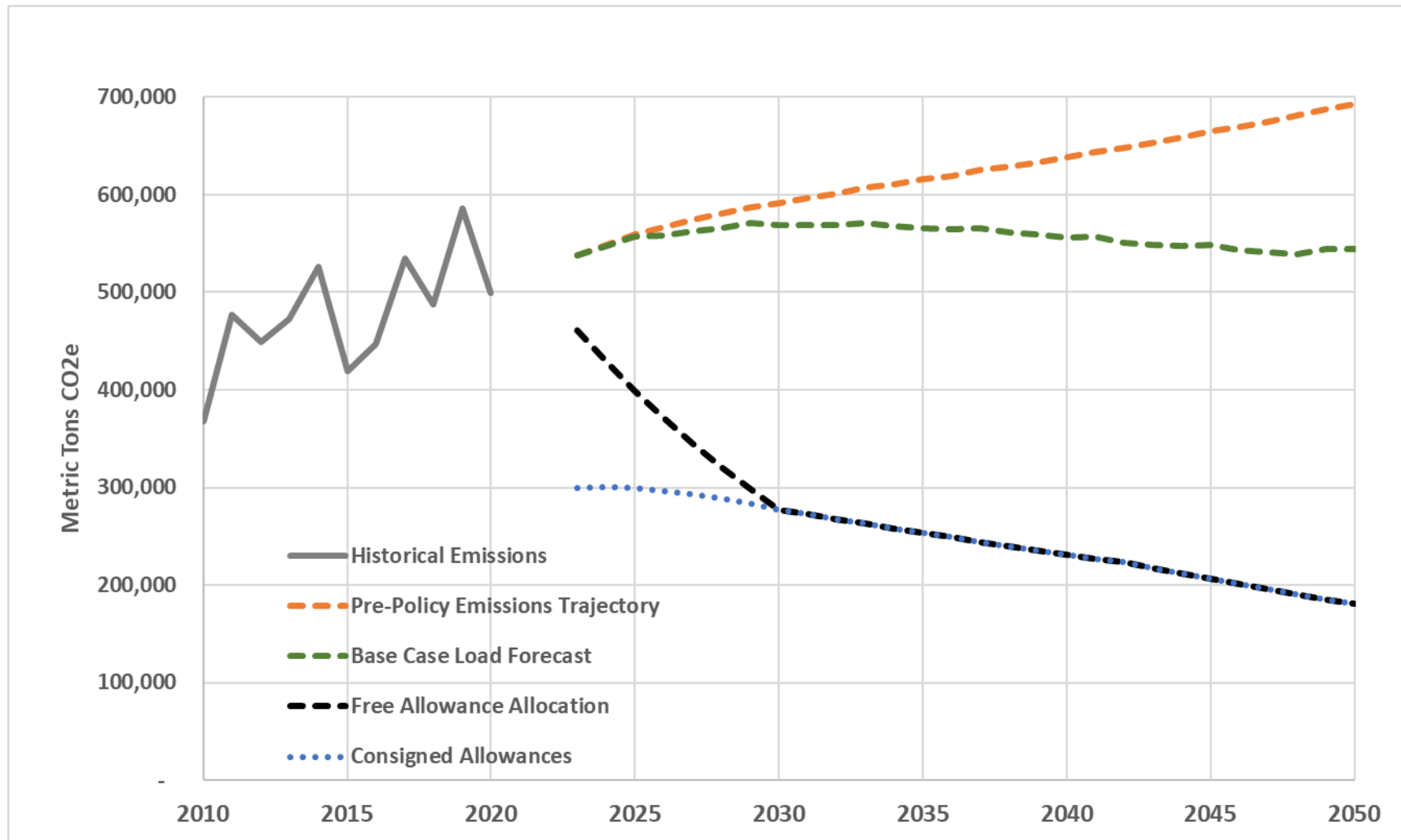
#	Scenario	Capacity Resource Additions	Year Mist Stops Being Recall and Percentage Recalled
0	Reference Case	Energy Efficiency, Mist Recall, Portland LNG Cold Box, Newport Takeaway 1, Mist Expansion	2036 (100%)
1	Balanced Decarbonization	Energy Efficiency, Mist Recall, Portland LNG Cold Box	2027 (42%)
2	Carbon Neutral	Energy Efficiency, Mist Recall, Portland LNG Cold Box	2027 (37%)
3	Dual-Fuel Heating	Energy Efficiency, Mist Recall, Portland LNG Cold Box	2031 (48%)
4	New Gas Customer Moratorium	Energy Efficiency, Mist Recall, Portland LNG Cold Box	2025 (15%)
5	Aggressive Building Electrification	Energy Efficiency, Mist Recall, Portland LNG Cold Box	2023 (13%)
6	Full Building Electrification	None	2022 (0%)
7	RNG and H2 Policy Support	Energy Efficiency, Mist Recall, Portland LNG Cold Box	2027 (42%)
8	Limited RNG	Energy Efficiency, Mist Recall, Portland LNG Cold Box	2027 (42%)
9	Supply-Focused Decarbonization	Energy Efficiency, Mist Recall, Portland LNG Cold Box	2031 (48%)

# Scenario Emissions Planning Results

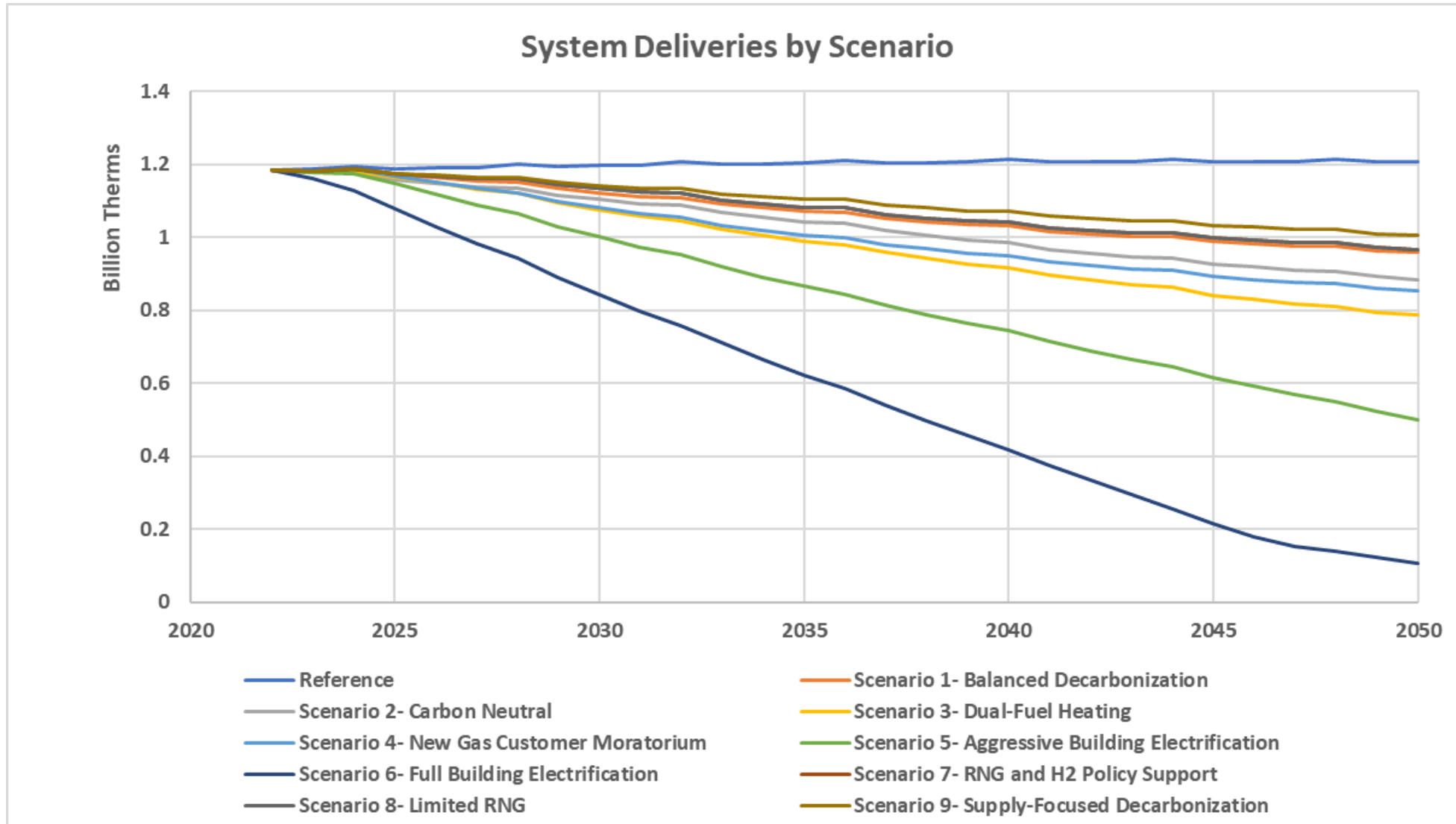
# Oregon Climate Protection Program Compliance



# Washington Cap-and-Invest Compliance



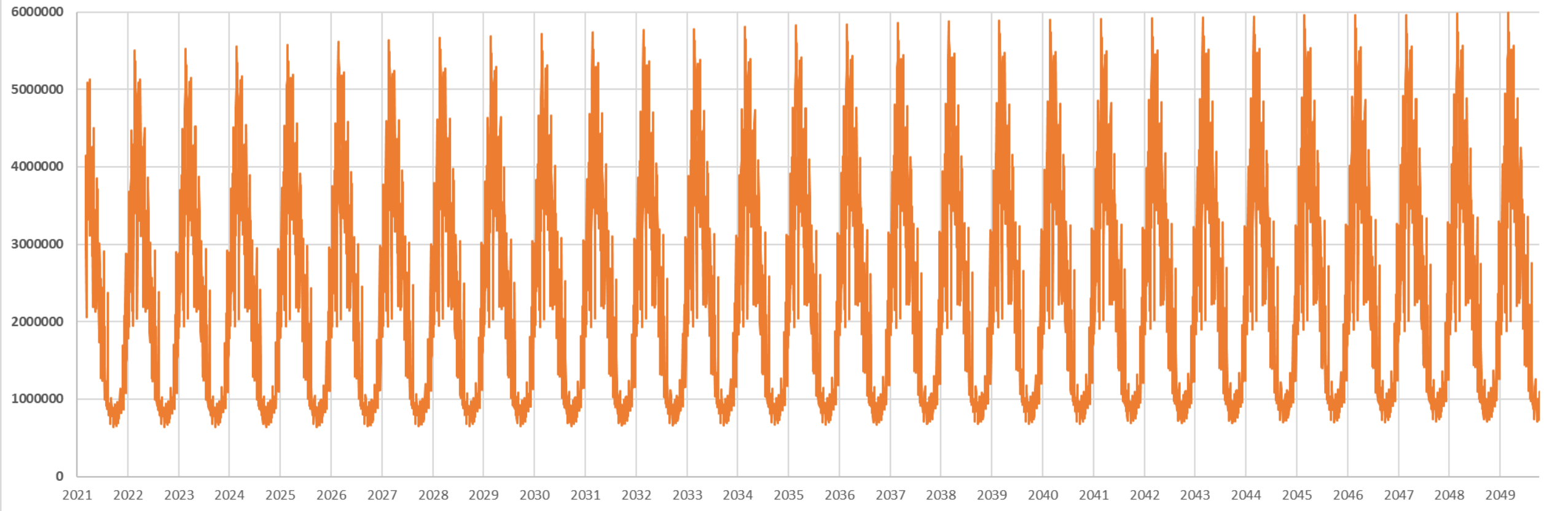
# Load by Scenario



# Loads are Daily



Reference Case Daily System Deliveries



# Supply-Side and Compliance Instrument Resources



OR Community Climate Investments (CCI)			
Compliance Period	Reference Case Cost		Reference Case Volumes
	\$/Metric Tones CO2e	\$/Dth	
2022-2024	\$109	\$5.79	10% of Load
2025-2027	\$112	\$5.89	15% of Load
2028-2031 ..... 2049-2051	\$115 ..... \$135	\$6.10 ..... \$7.17	20% of Load

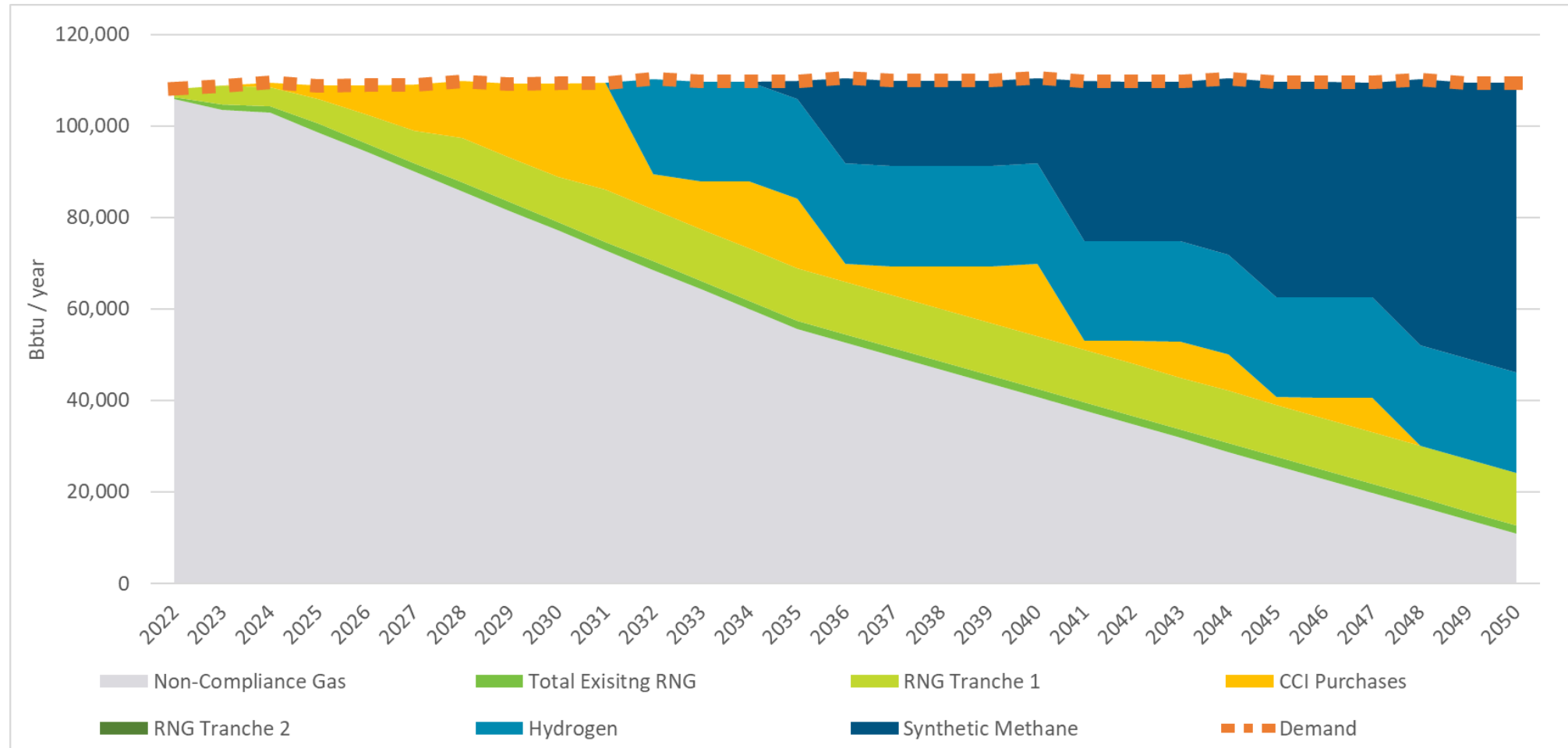
	Reference Case Bundled Cost (\$ / Dth)	Reference Case Volumes
Biofuels RNG Tranche 1	\$14.00	13 Million Decatherms
Biofuels RNG Tranche 2	\$19.00	27 Million Decatherms
Hydrogen		20% combined blending and dedicated systems
2022	\$23.00	
2050	\$6.00	
Synthetic Methane		Unlimited
2022	\$32.00	
2050	\$9.00	

WA Compliance Instruments			
	Reference Case Cost		Reference Case Volumes
	\$/Metric Tones CO2e	\$/Dth	
<b>Allowances (Max of SCC/Allowance Price Forecast)</b>			
2023	\$82	\$5.11	No Current Limits for NW Natural
2050	\$120	\$7.63	
<b>Offsets</b>			
2023	\$12	\$0.63	Percent of Deliveries 8% - first compliance period 6% - compliance period
2050	\$91	\$4.83	

Oregon

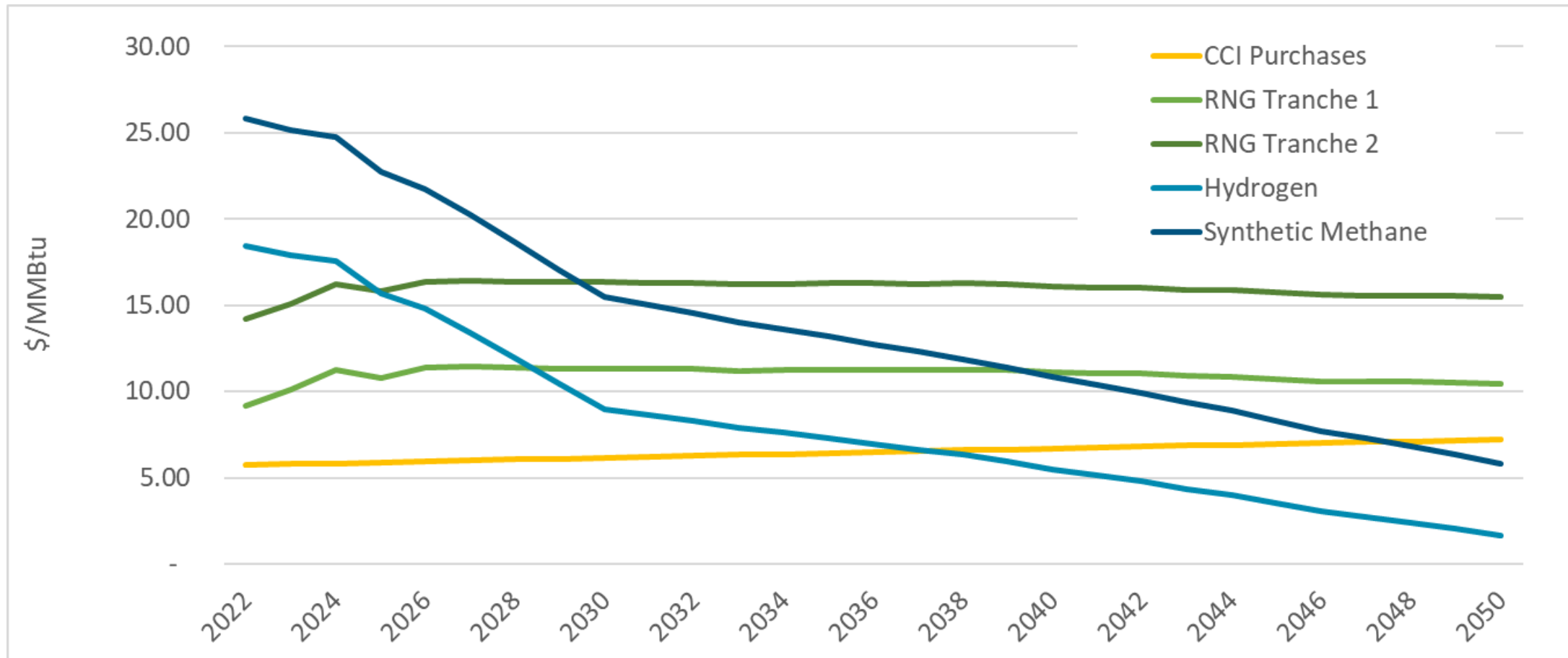
Washington

# Oregon - Reference Case

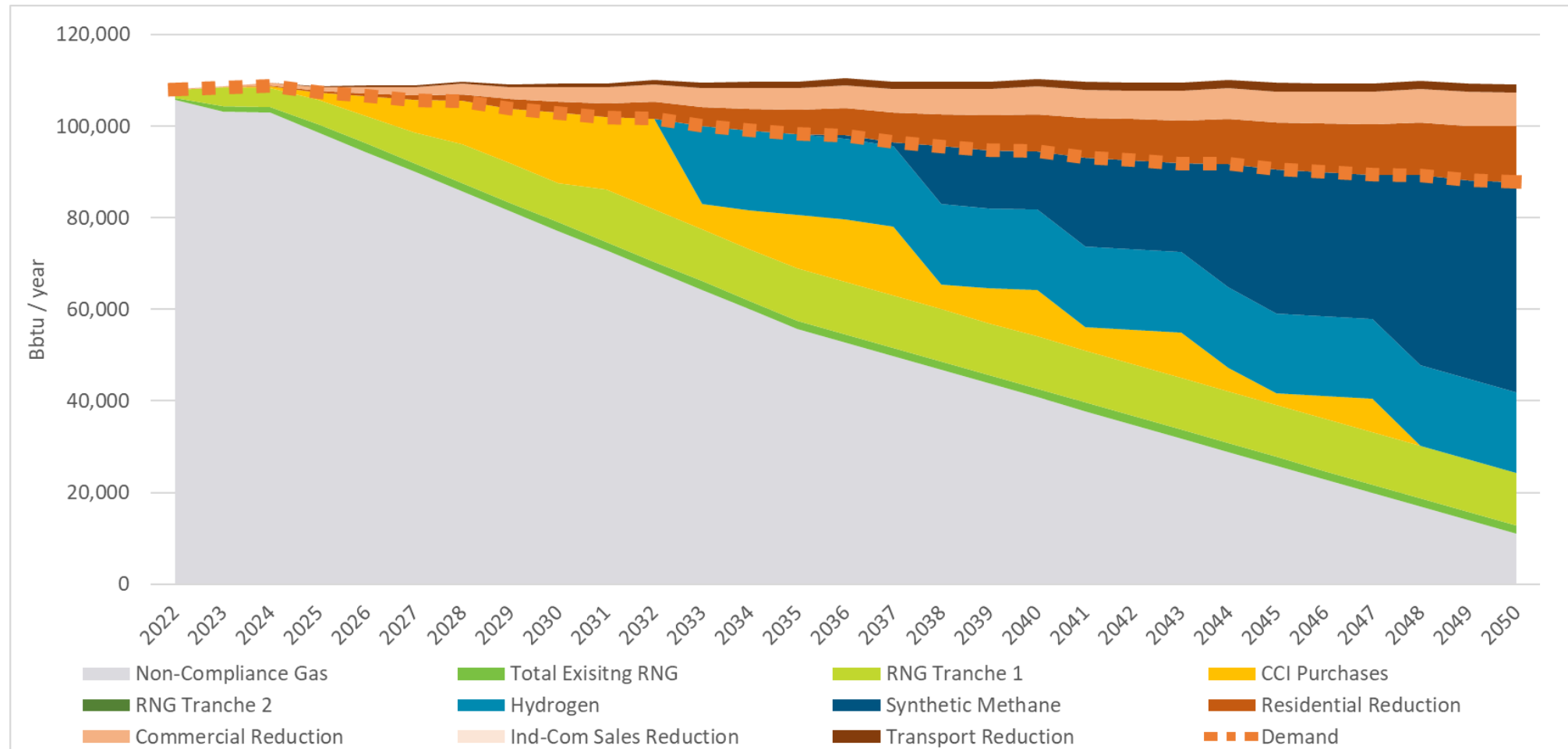




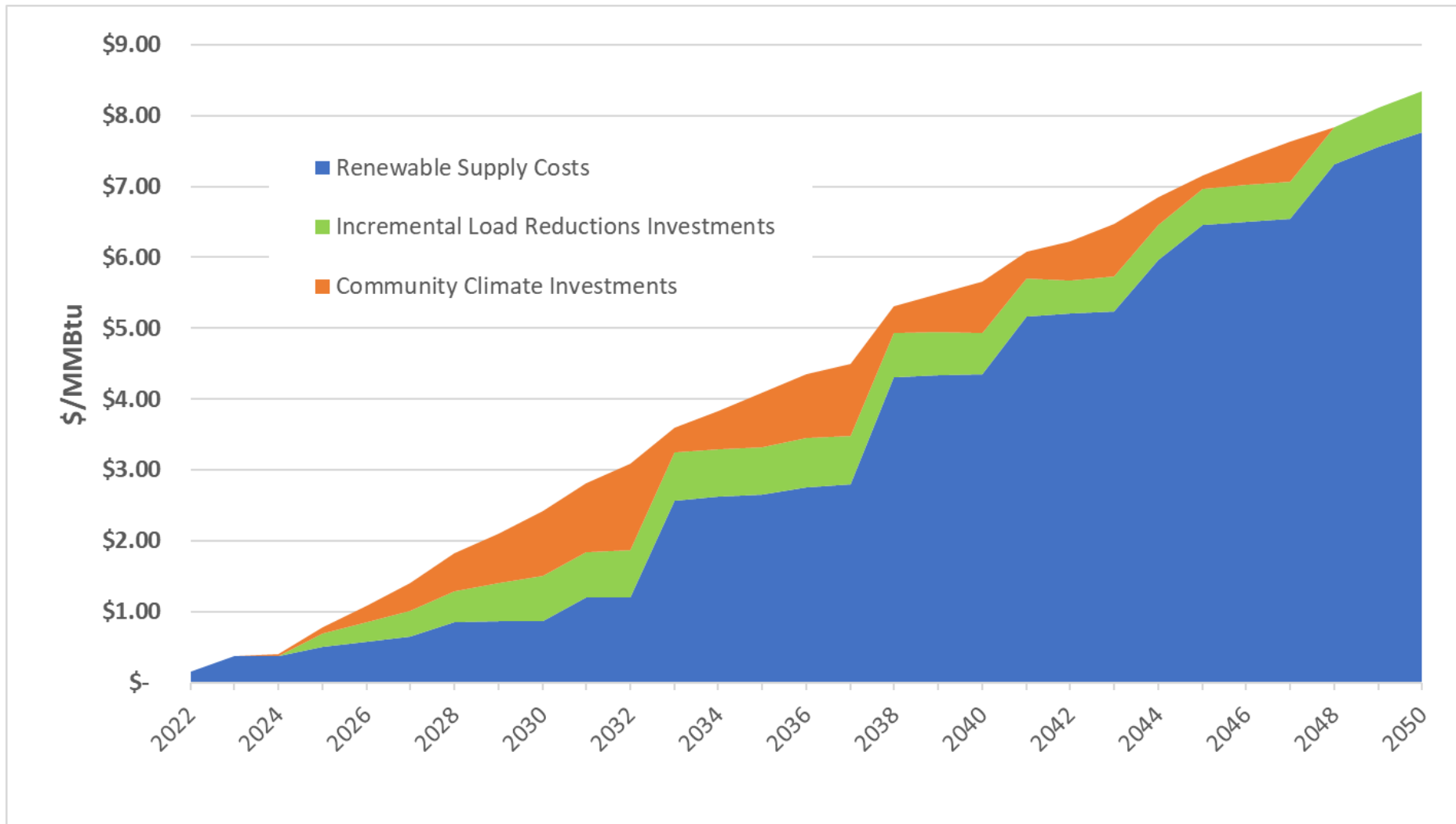
# Oregon - 1 Balanced Decarbonization



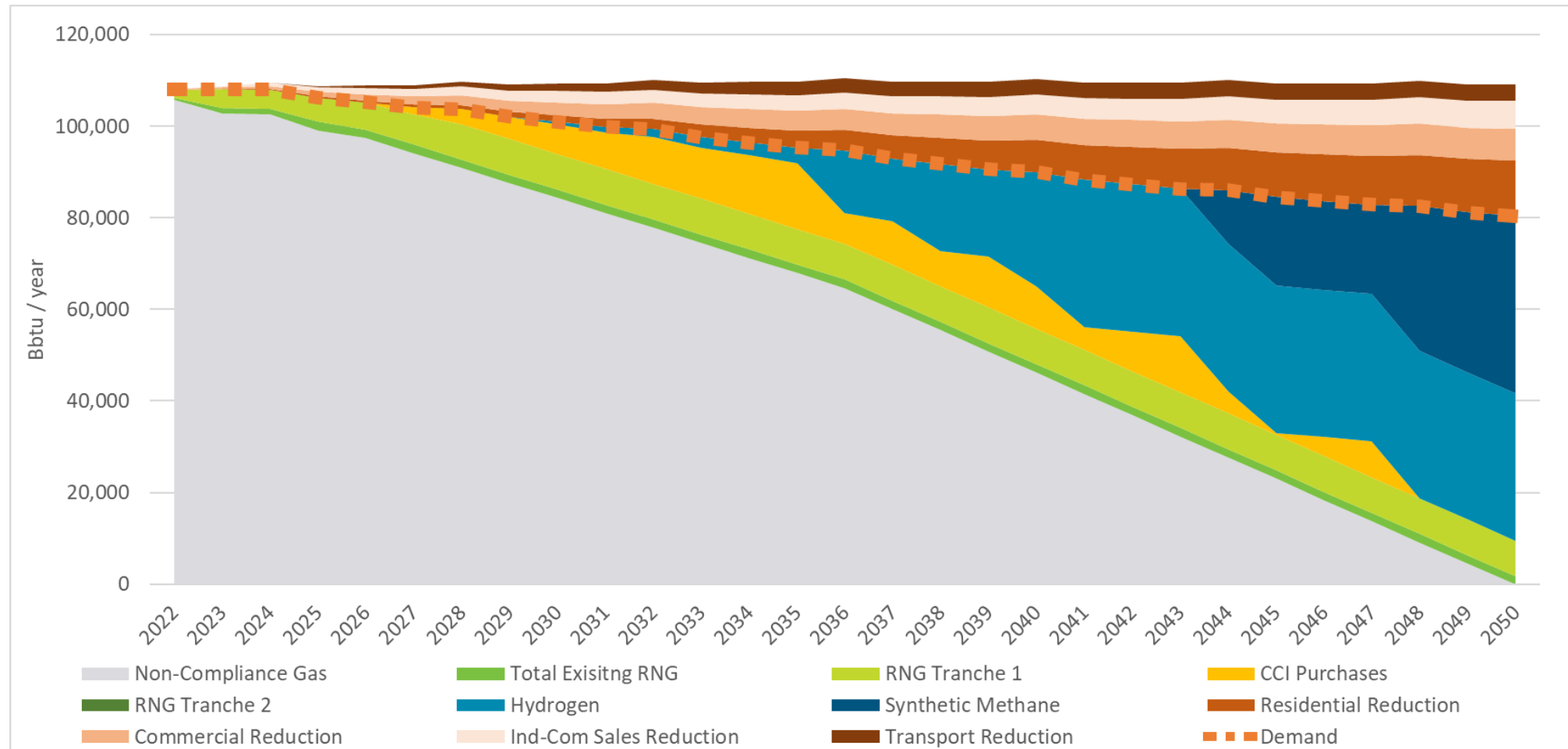
# Oregon - 1 Balanced Decarbonization



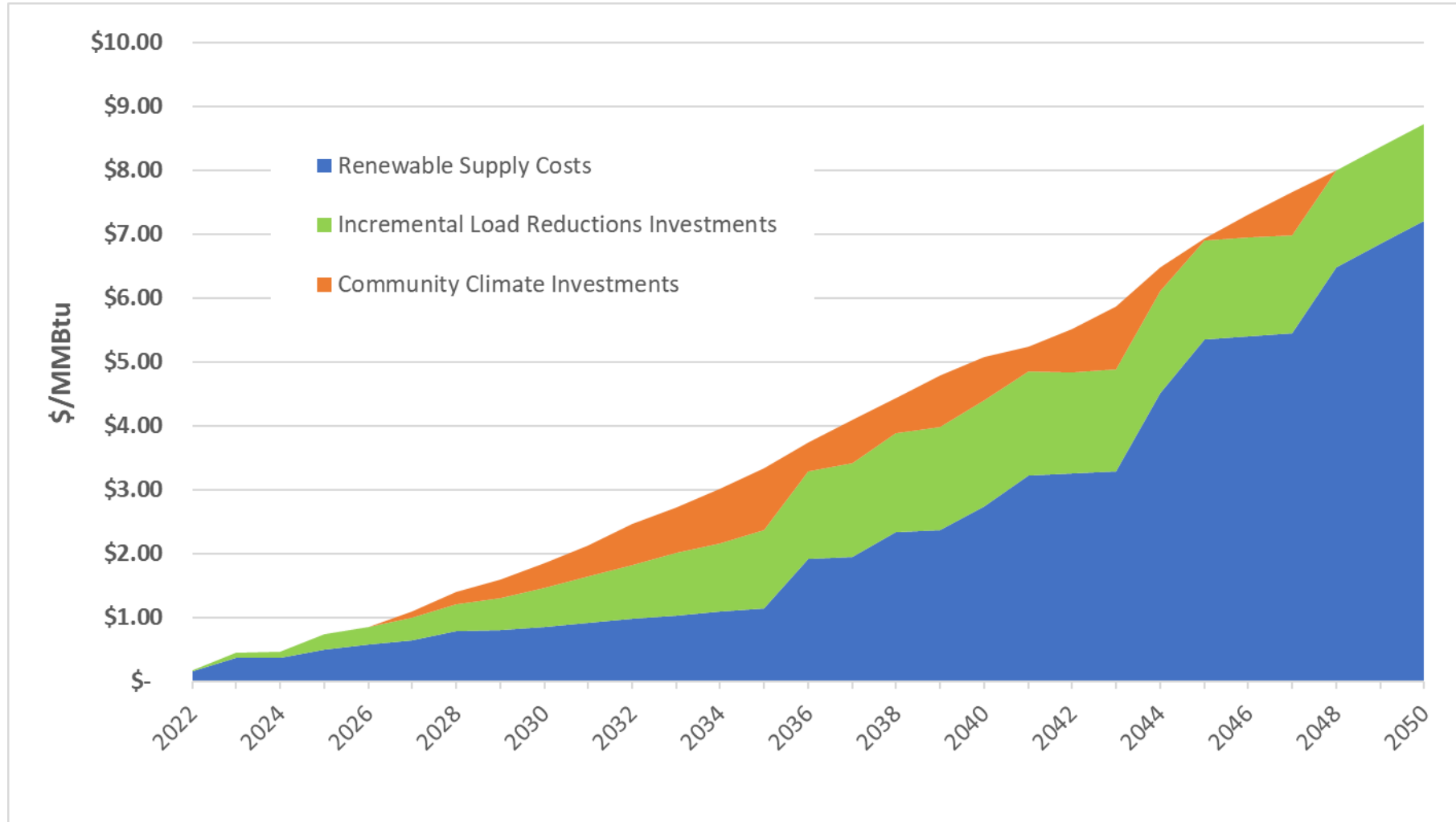
# Oregon - 1 Balanced Decarbonization



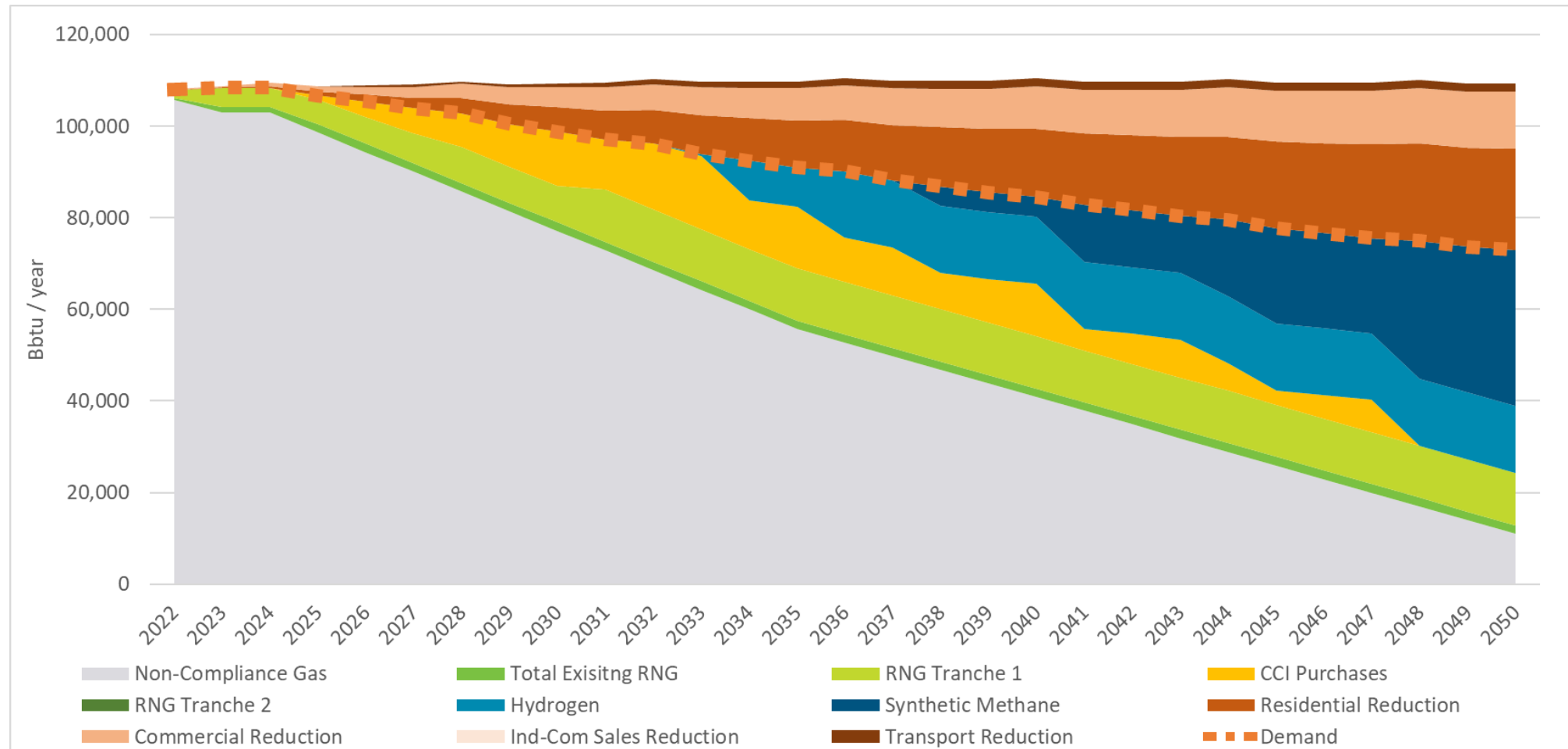
# Oregon - 2 Carbon Neutral



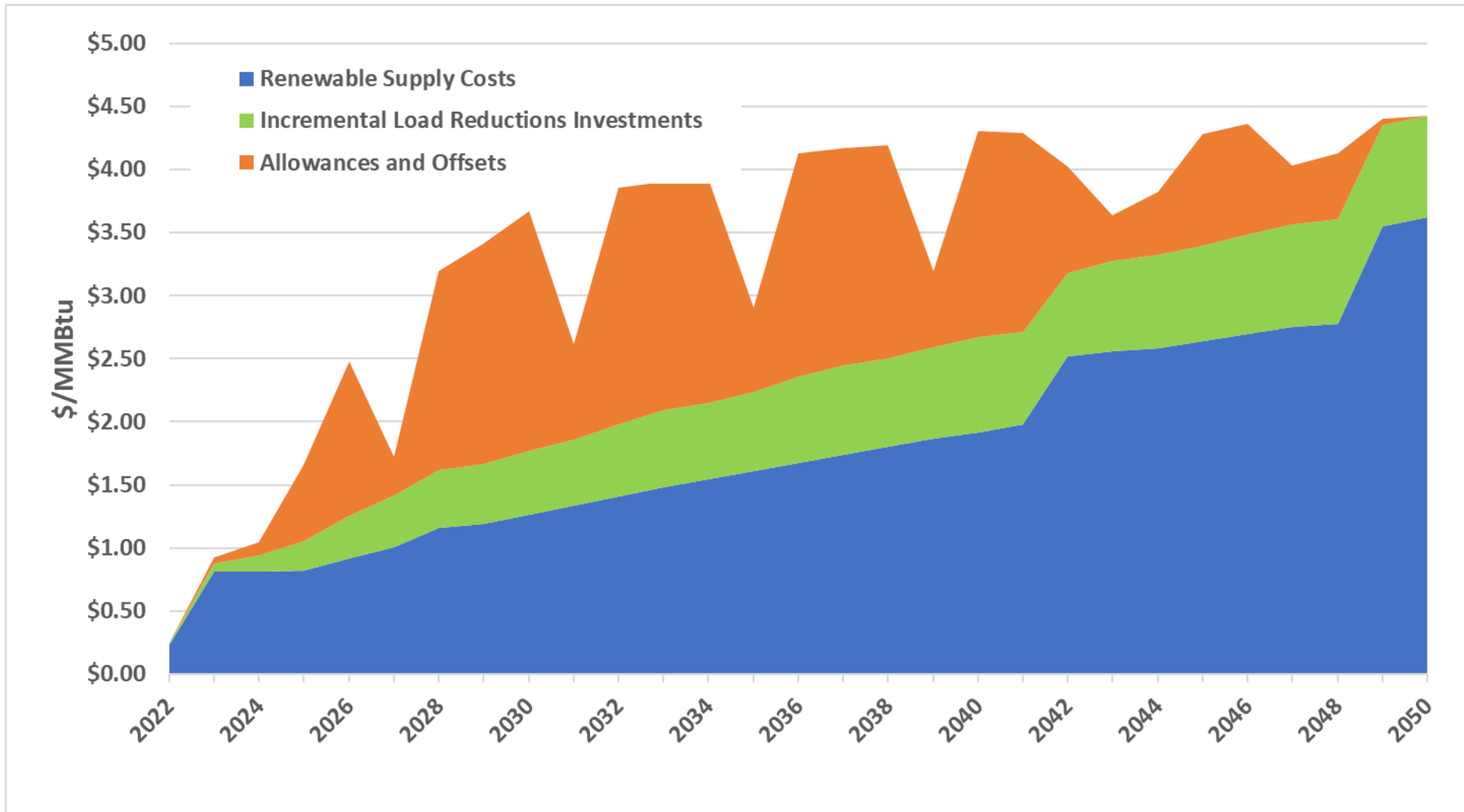
# Oregon - 2 Carbon Neutral



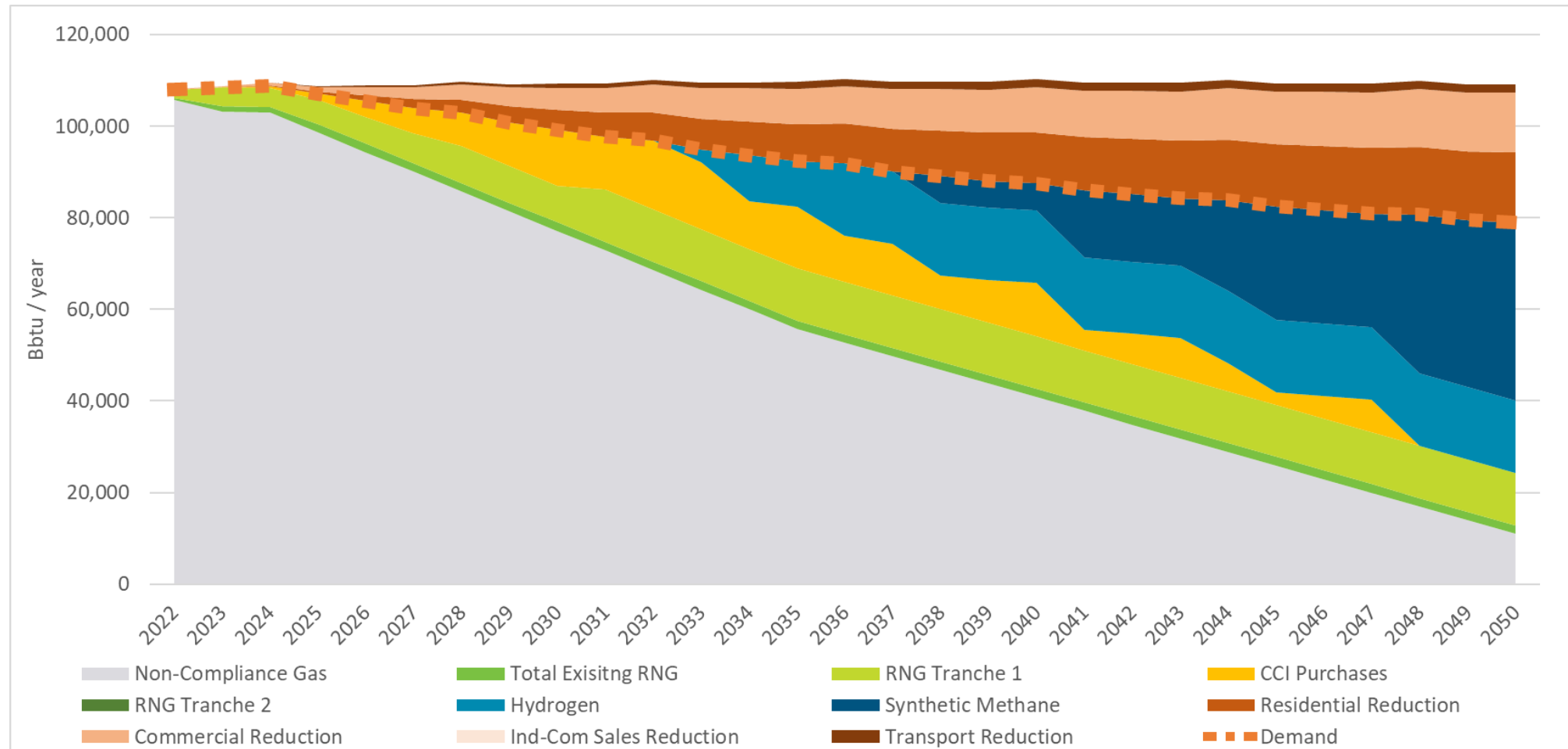
# Oregon - 3 Dual-Fuel Heating



# Oregon - 3 Dual-Fuel Heating

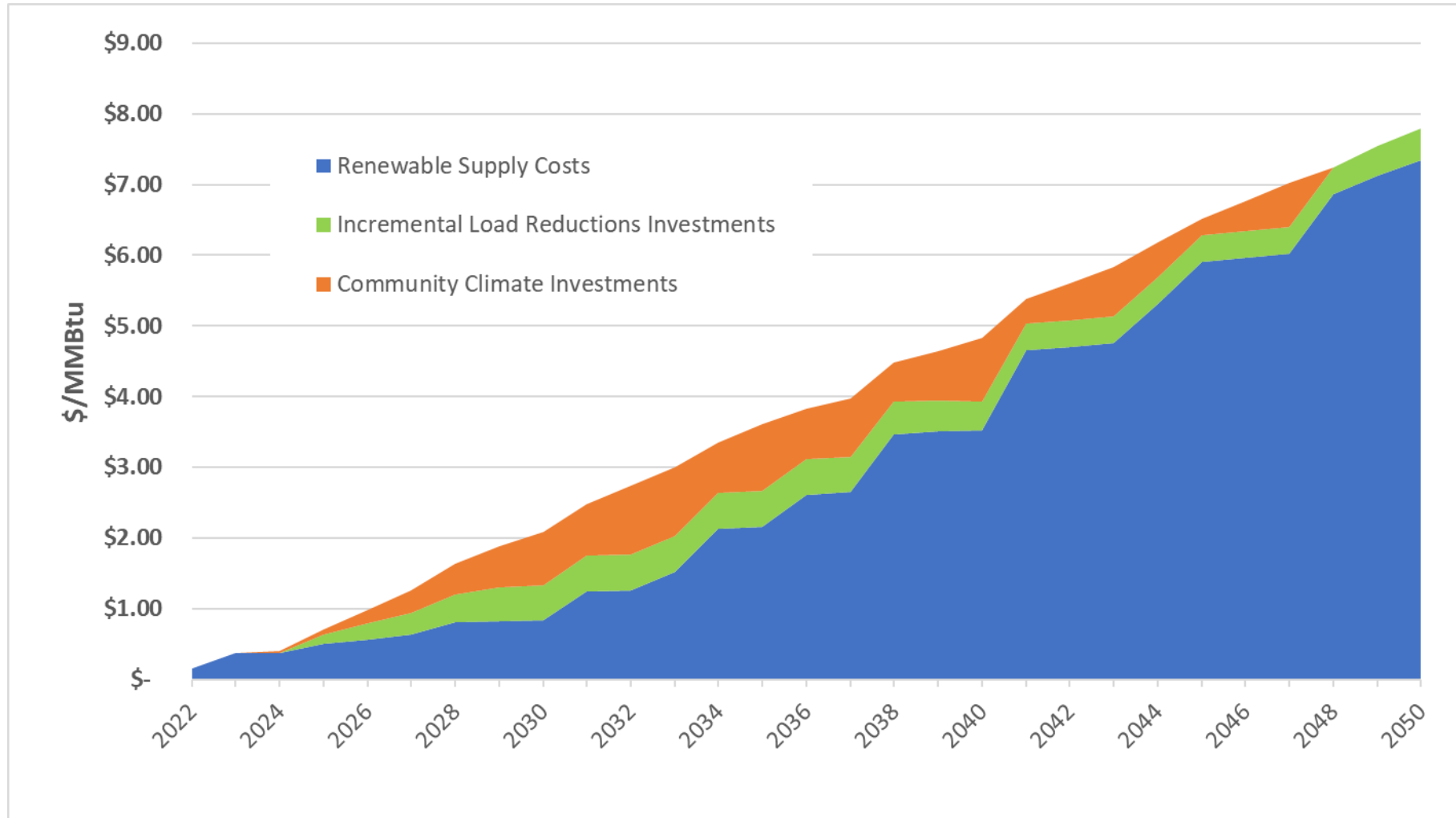


# Oregon - 4 New Gas Customer Moratorium

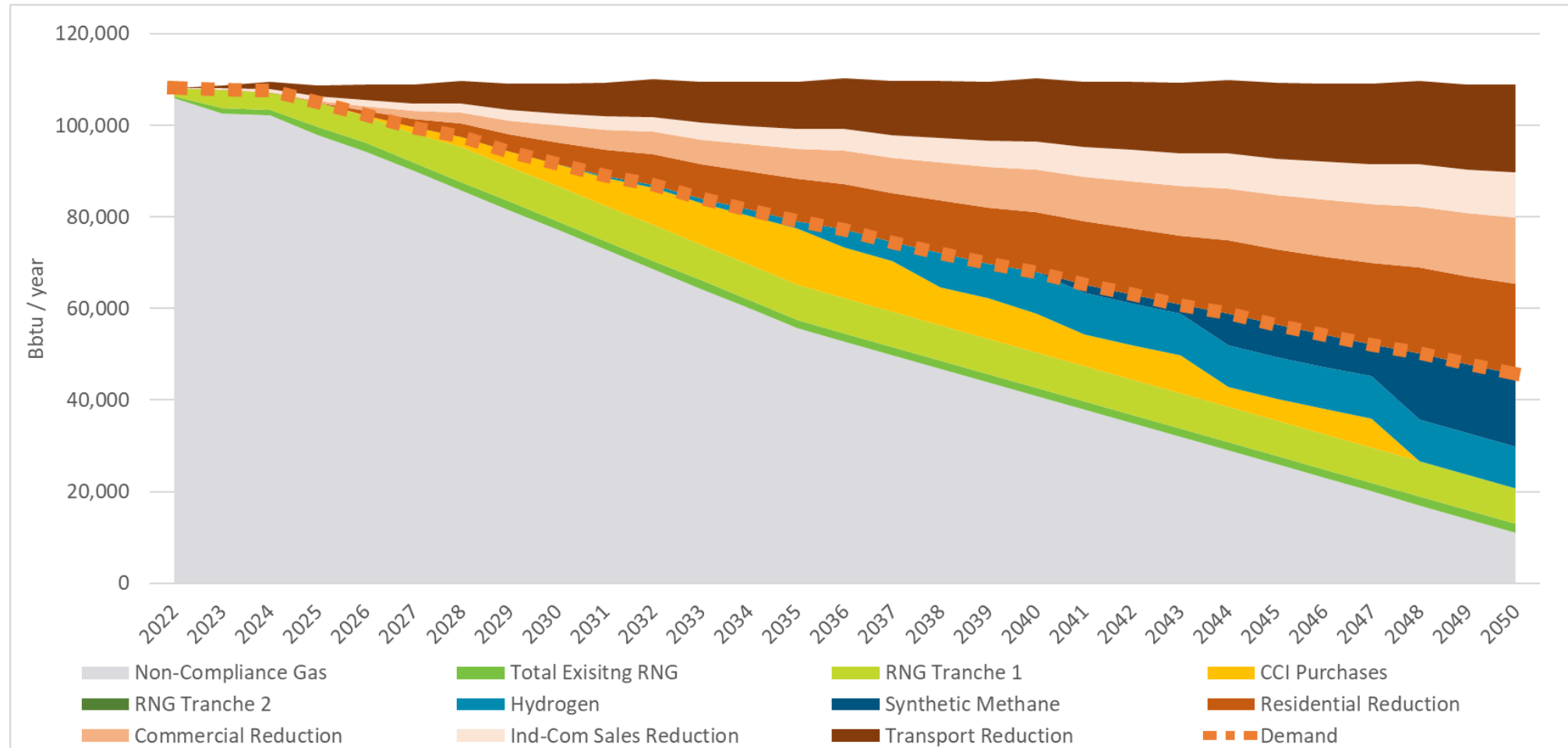




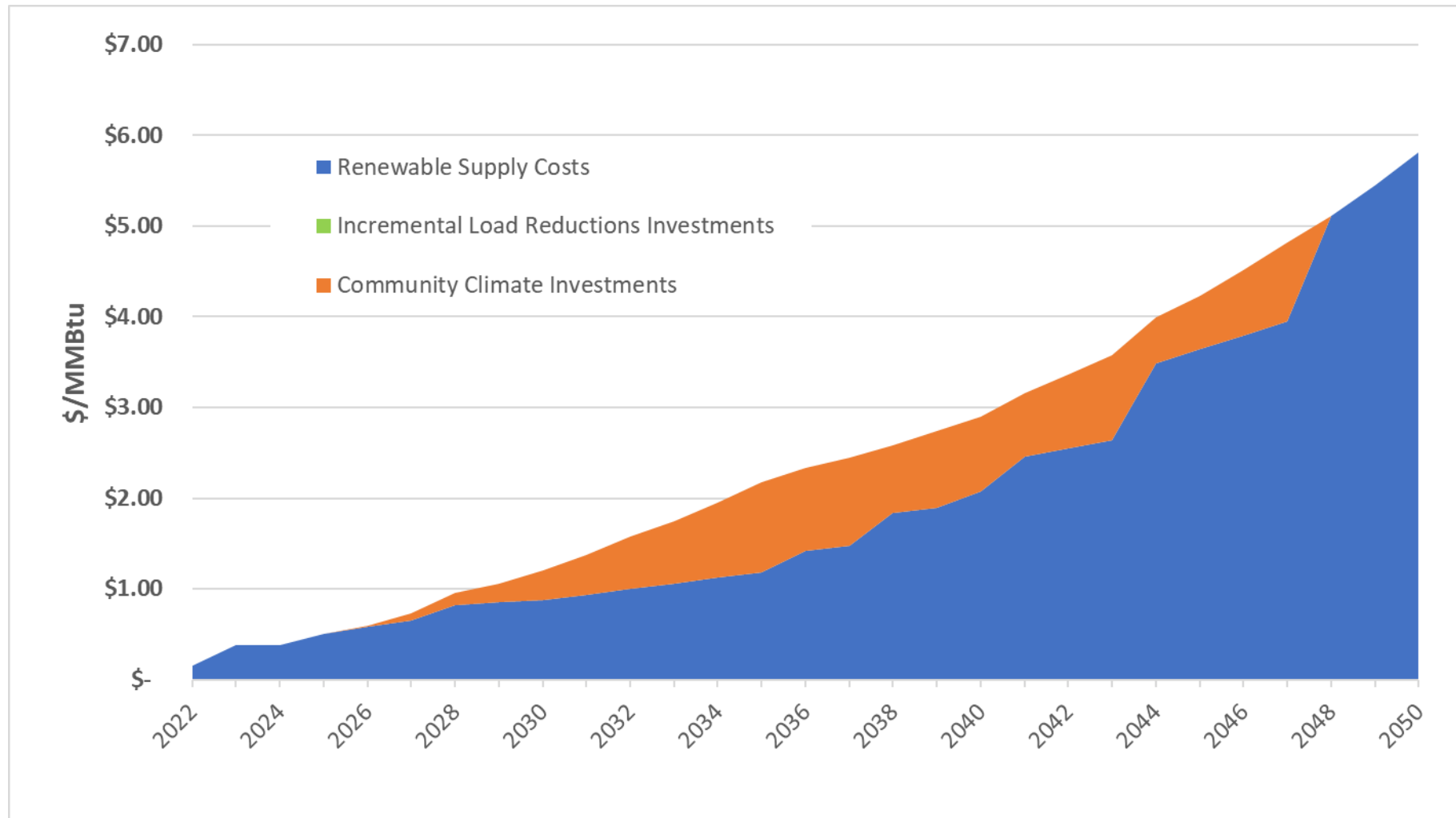
# Oregon - 4 New Gas Customer Moratorium



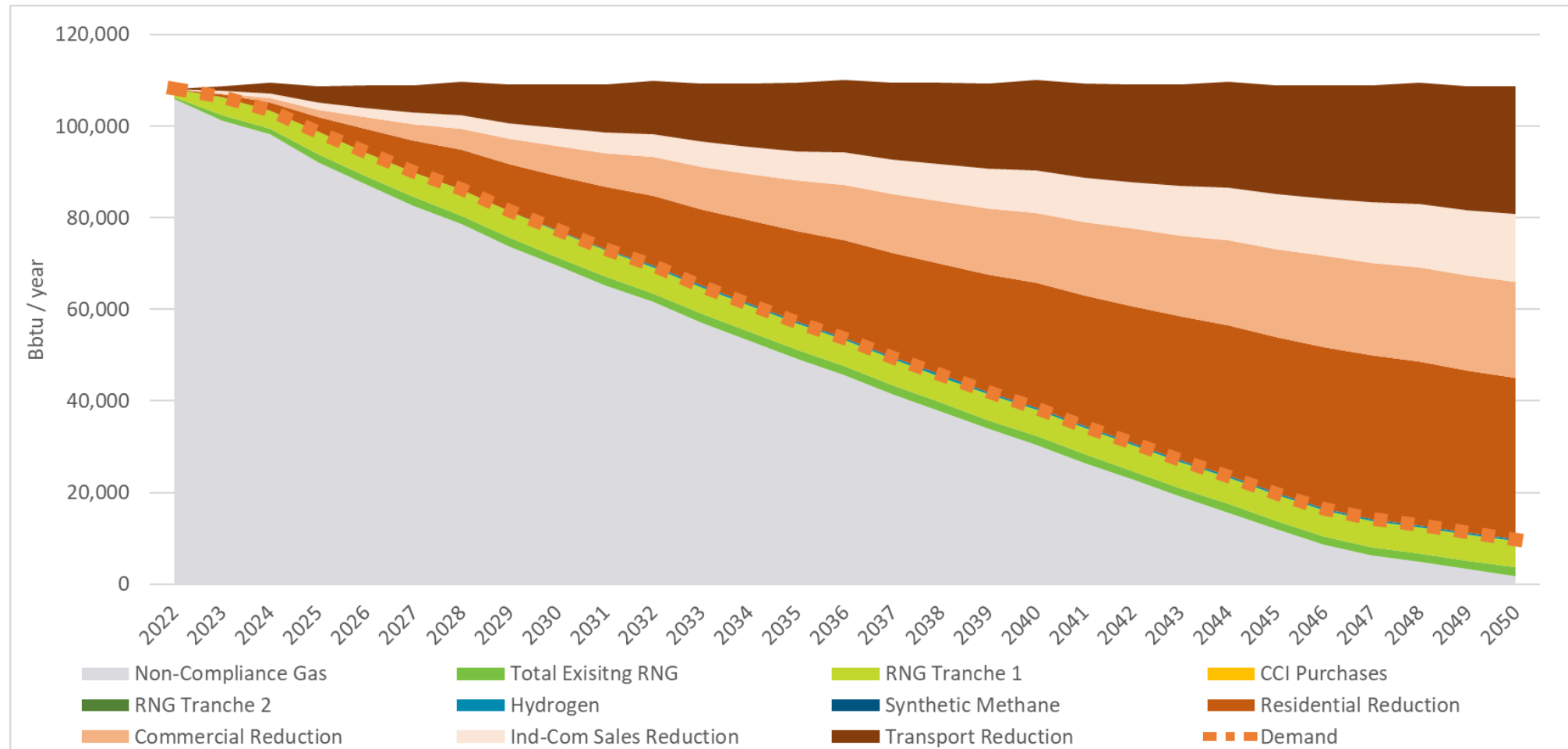
# Oregon - 5 Aggressive Building Electrification



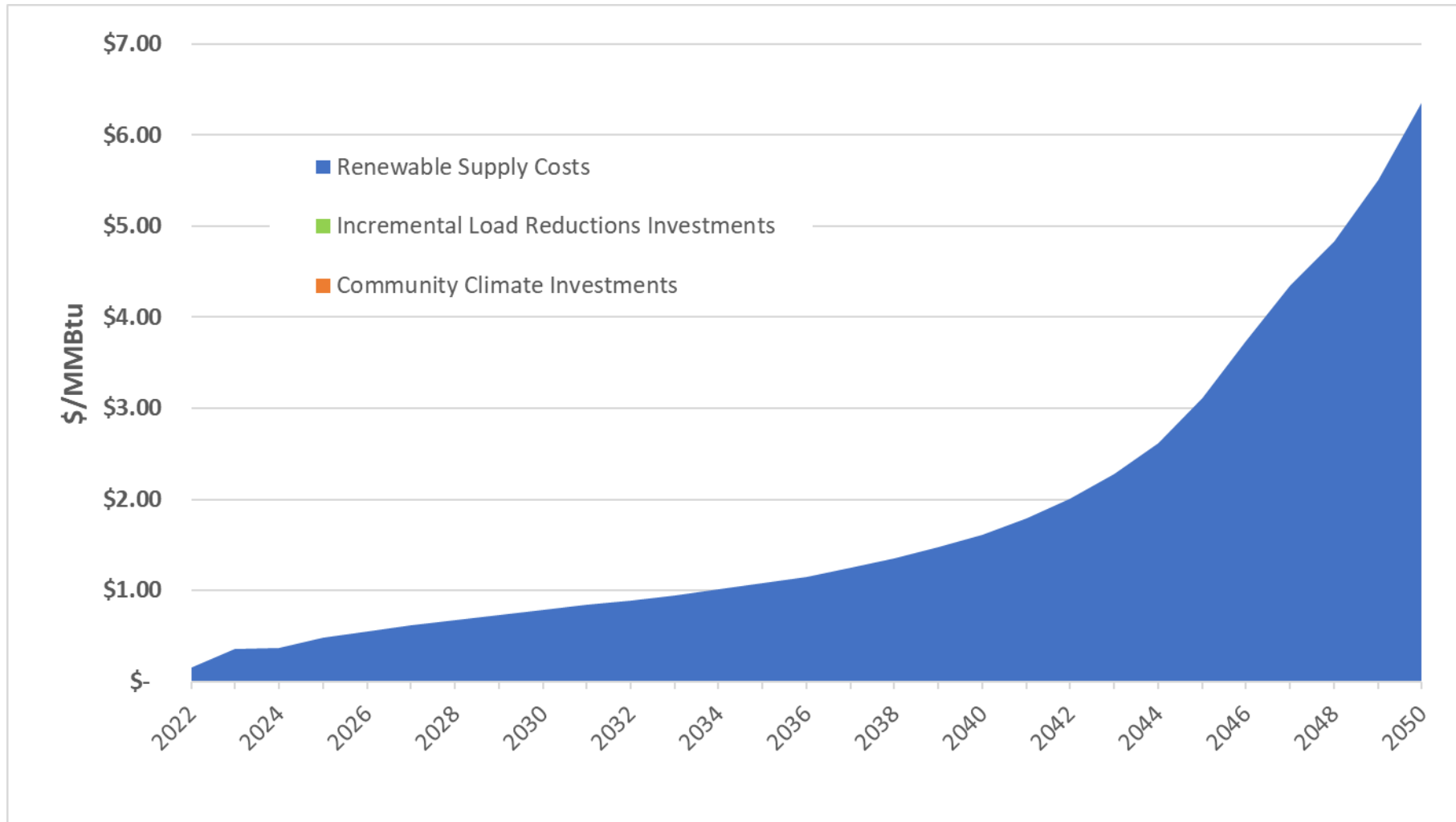
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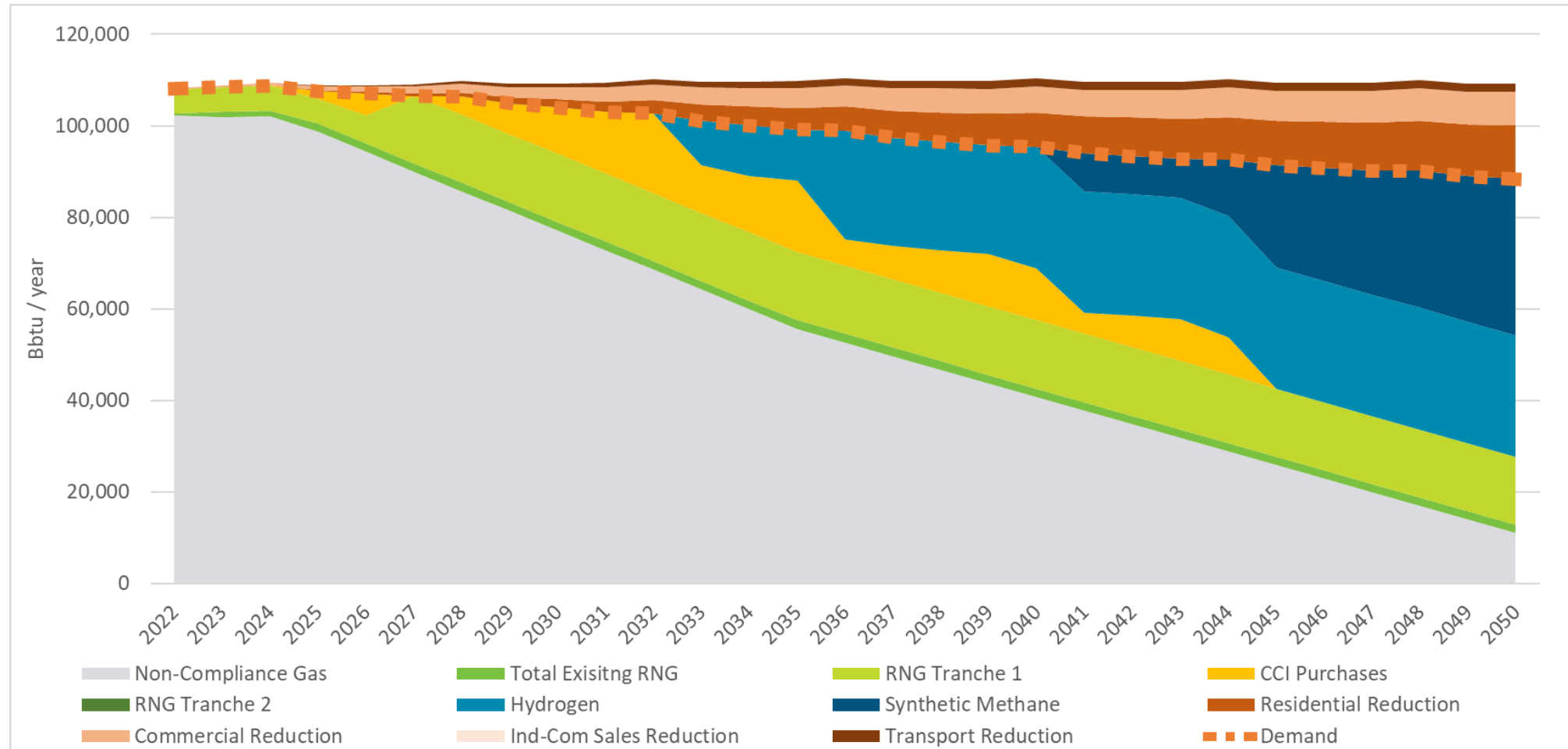
# Oregon - 6 Full Building Electrification



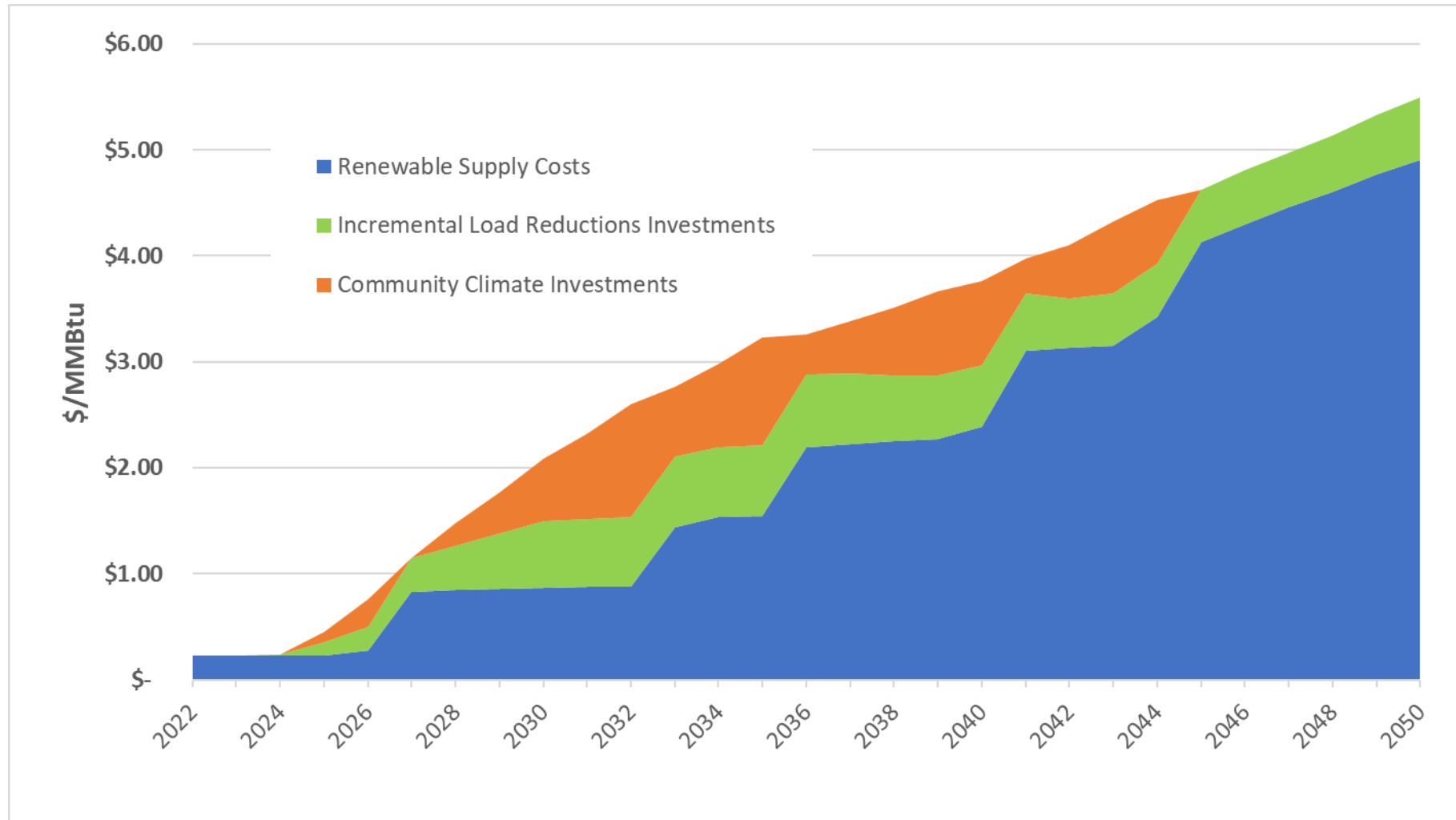
# Oregon - 6 Full Building Electrification



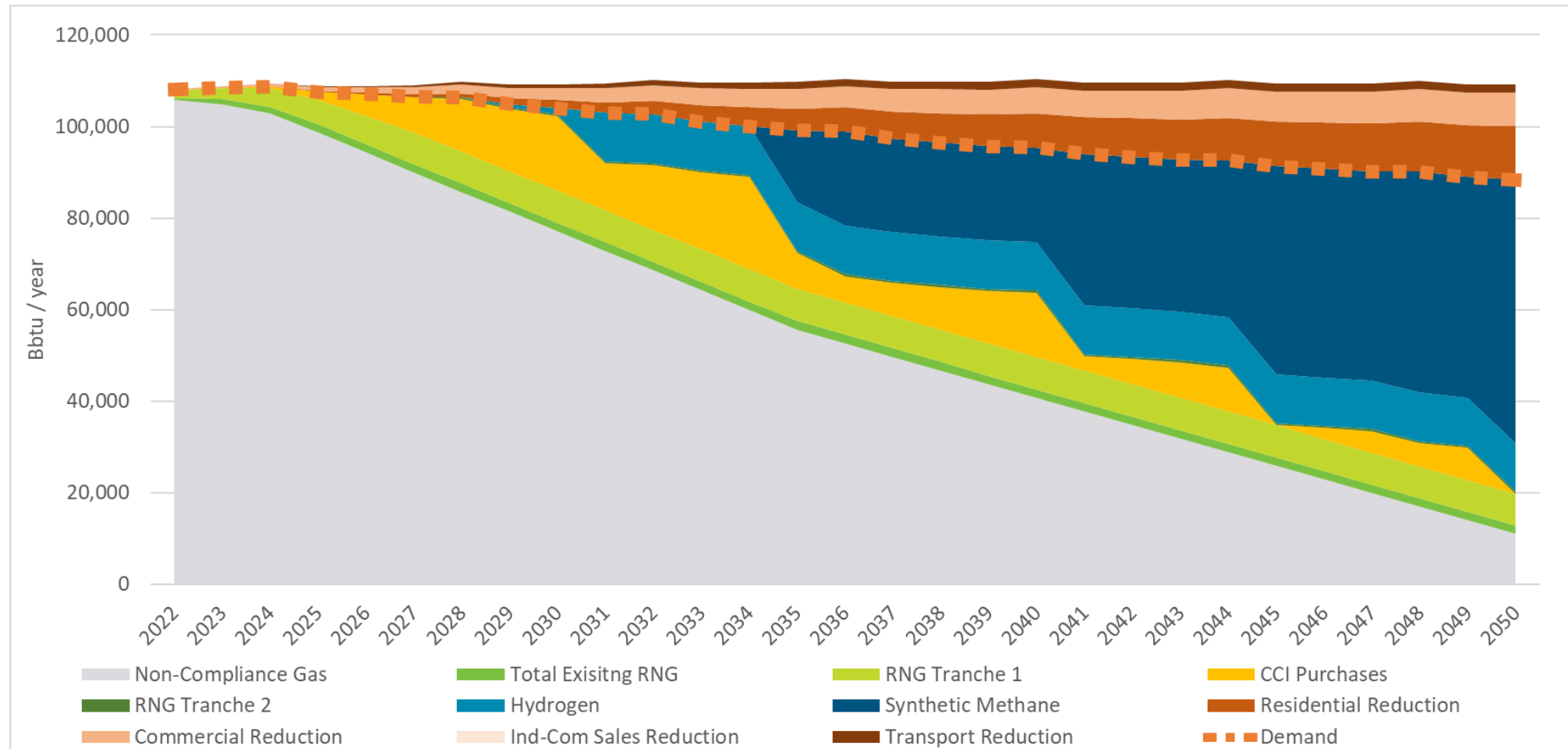
# Oregon - 7 RNG and H2 Policy Support



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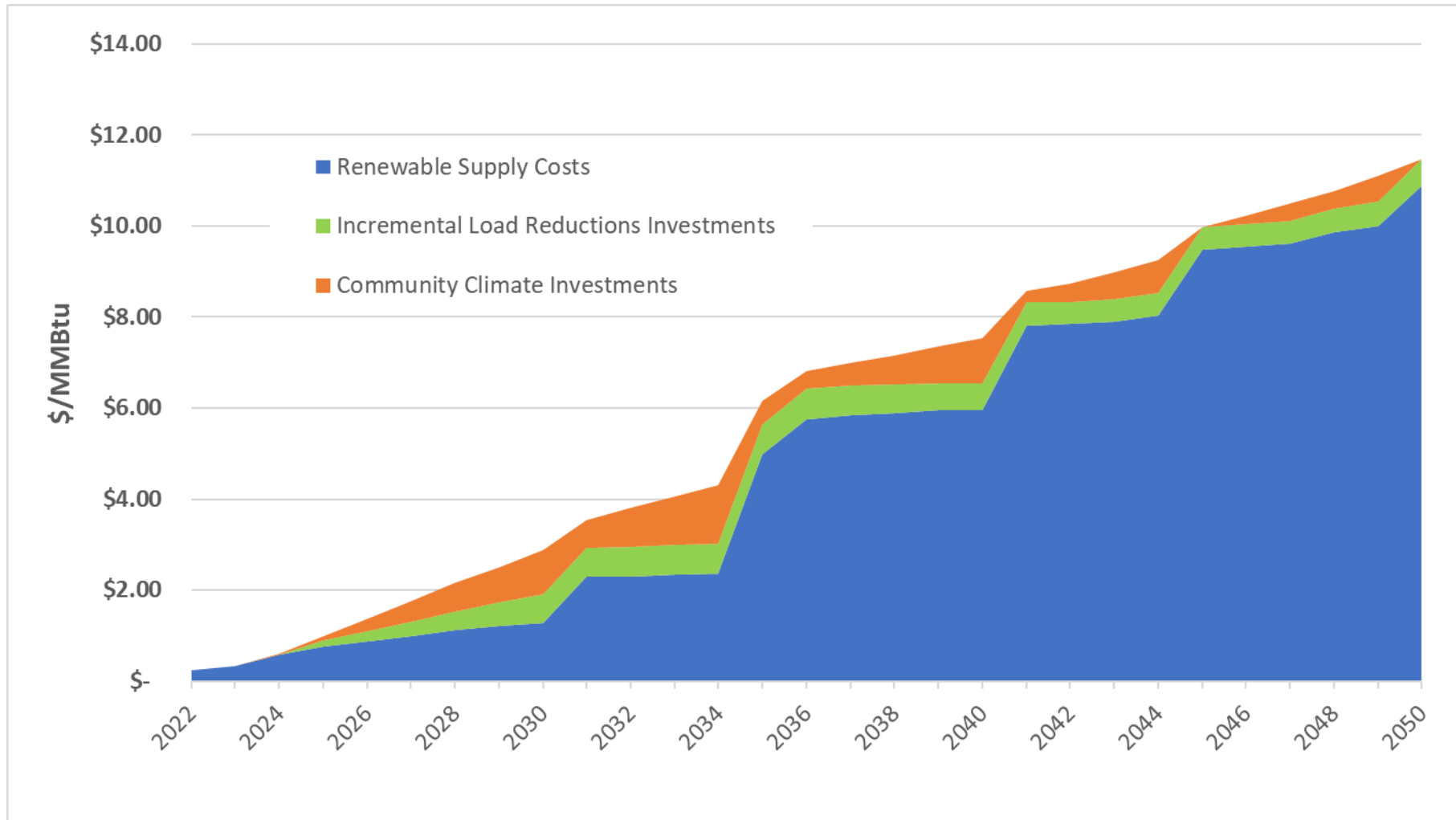


# Oregon - 8 Limited RNG

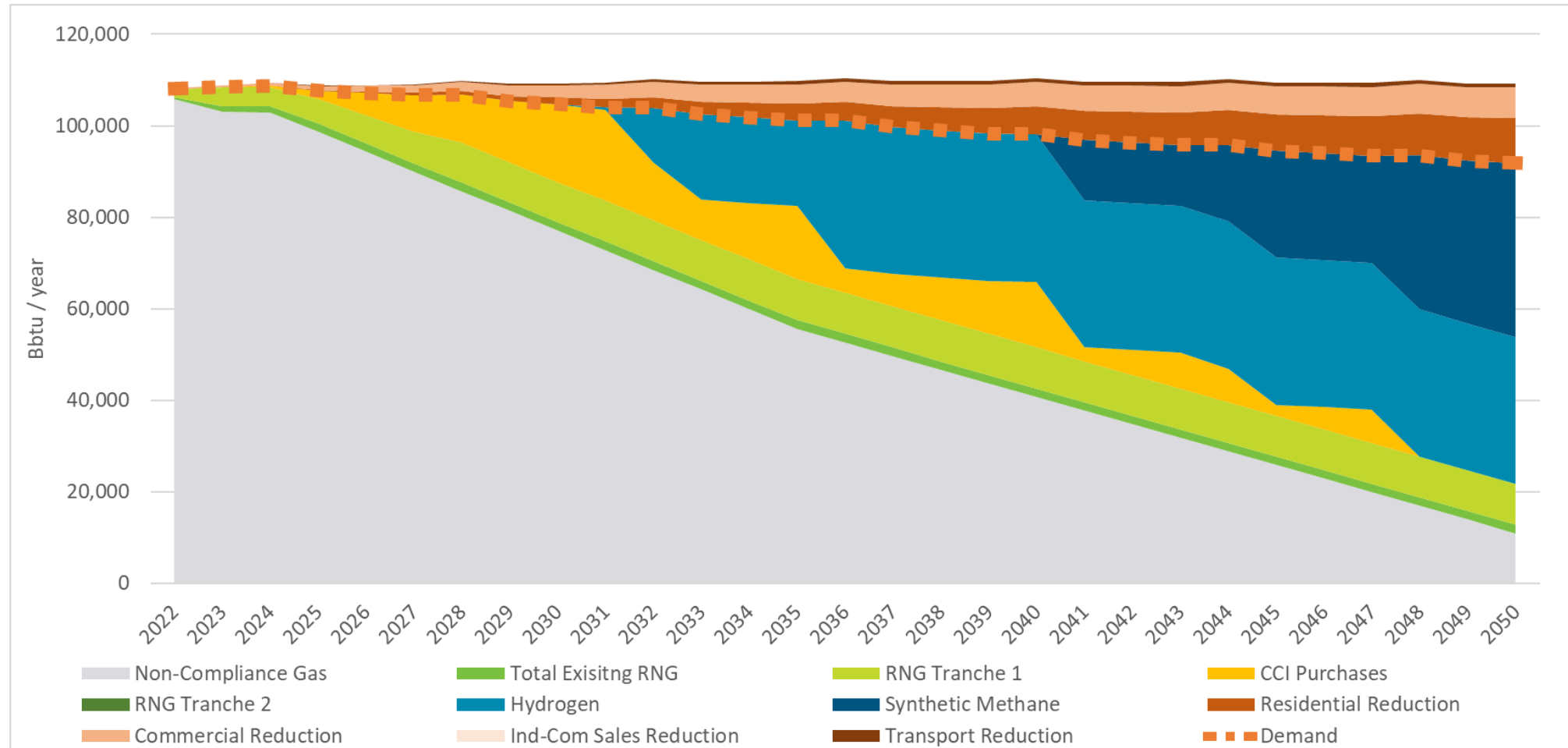




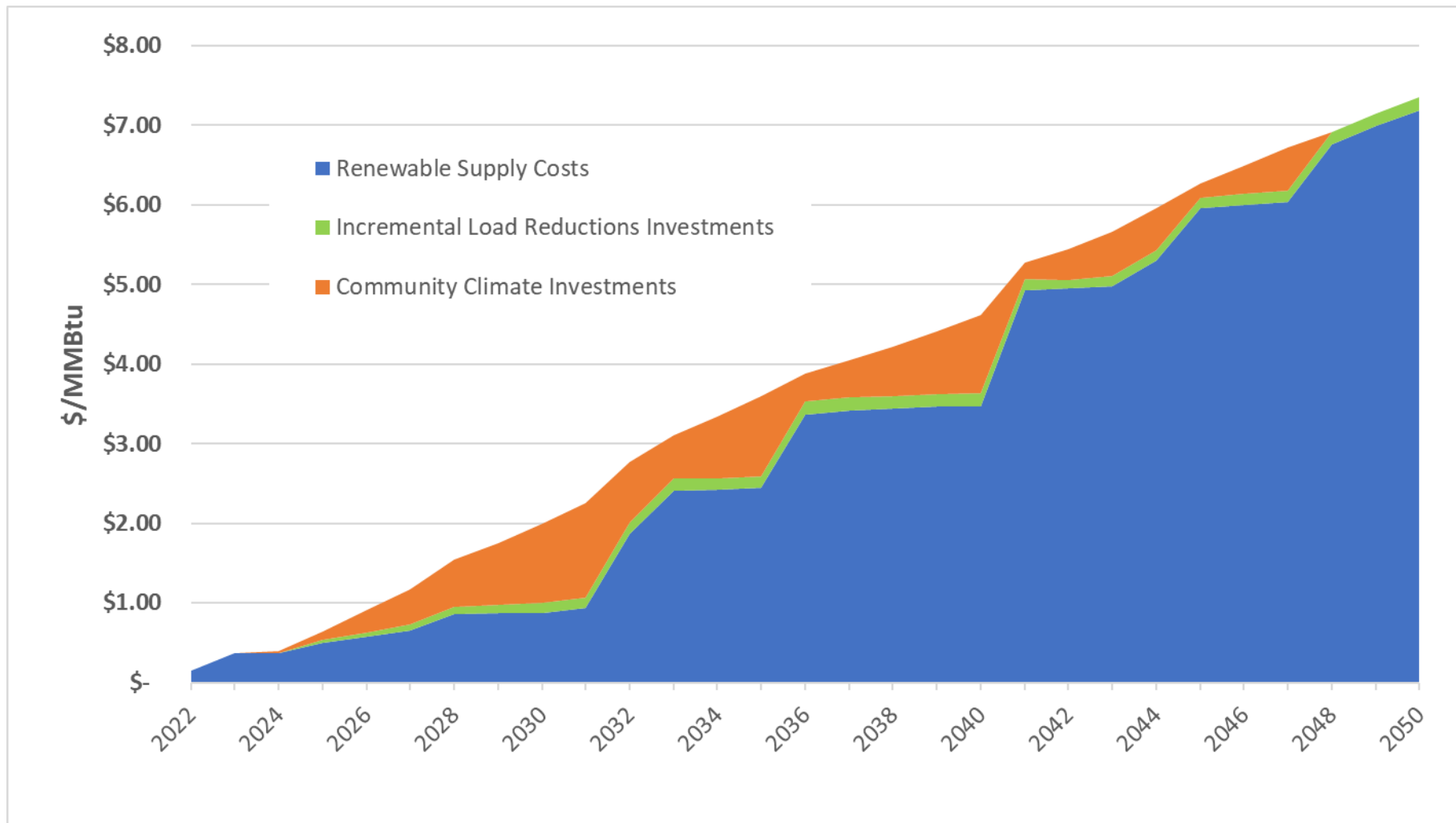
# Oregon - 8 Limited RNG



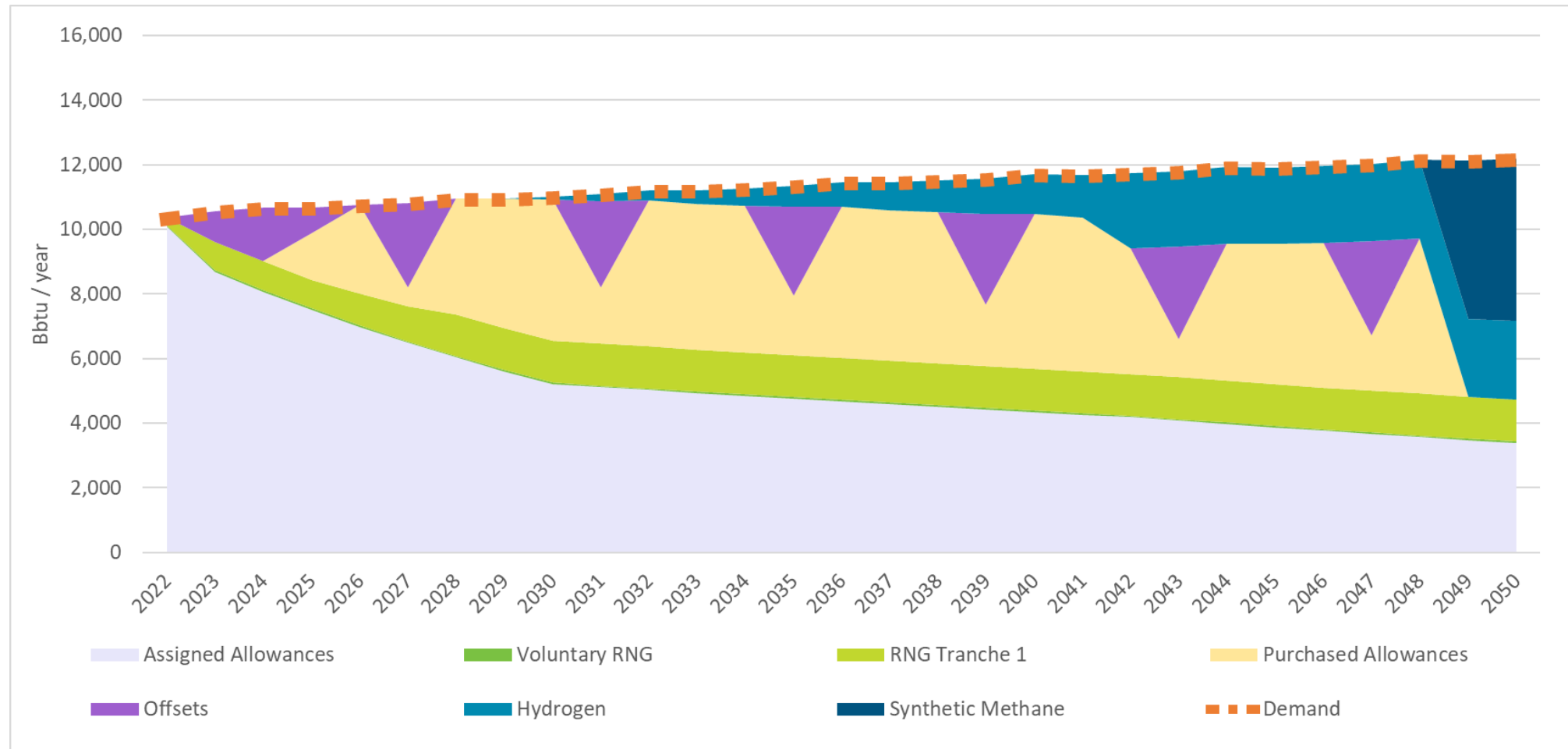
# Oregon - 9 Supply-Focused Decarbonization



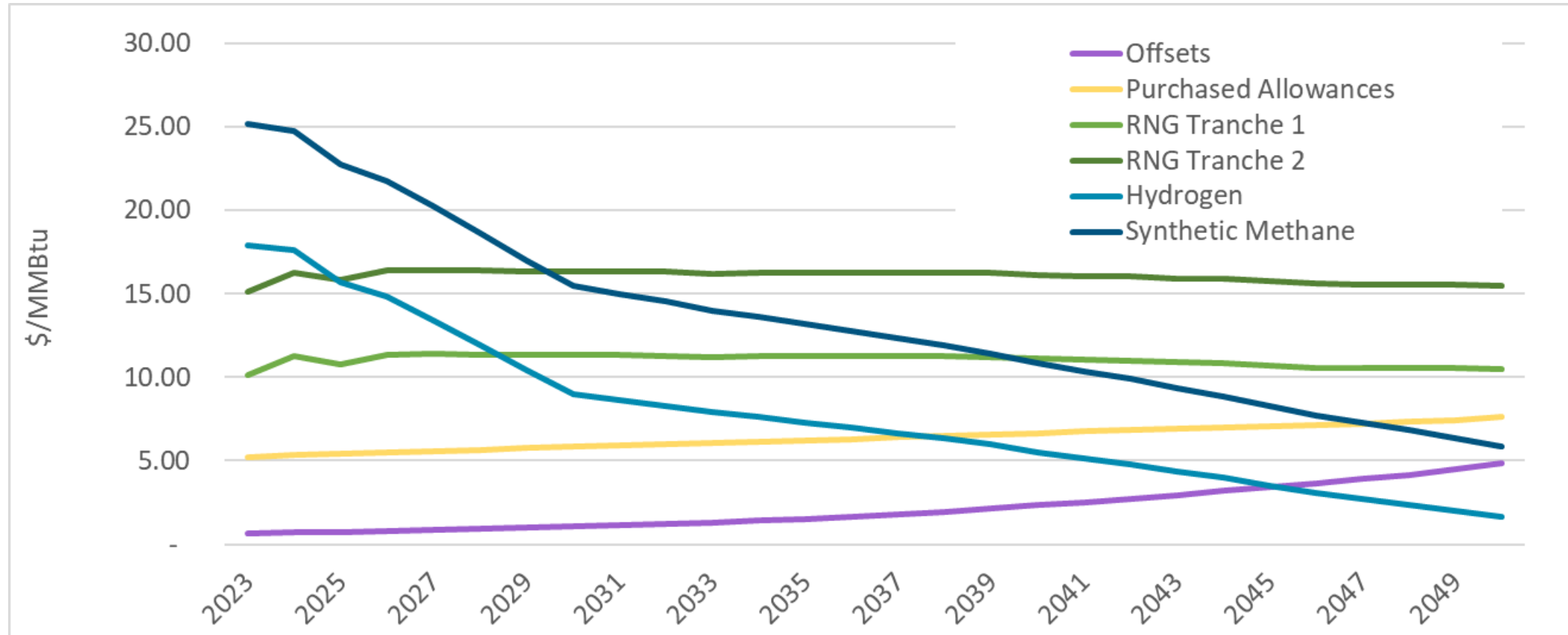
# Oregon - 9 Supply-Focused Decarbonization



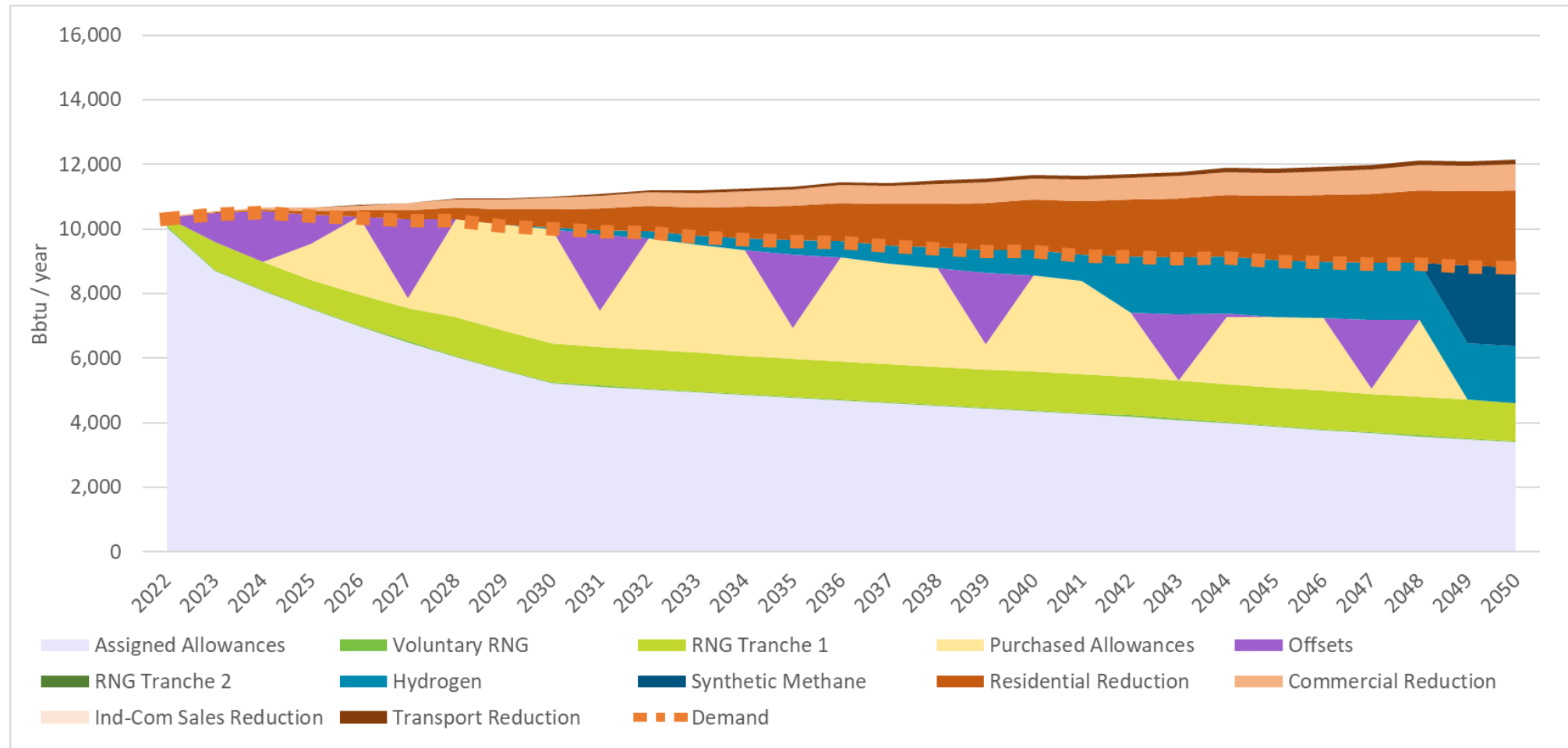
# Washington - Reference Case



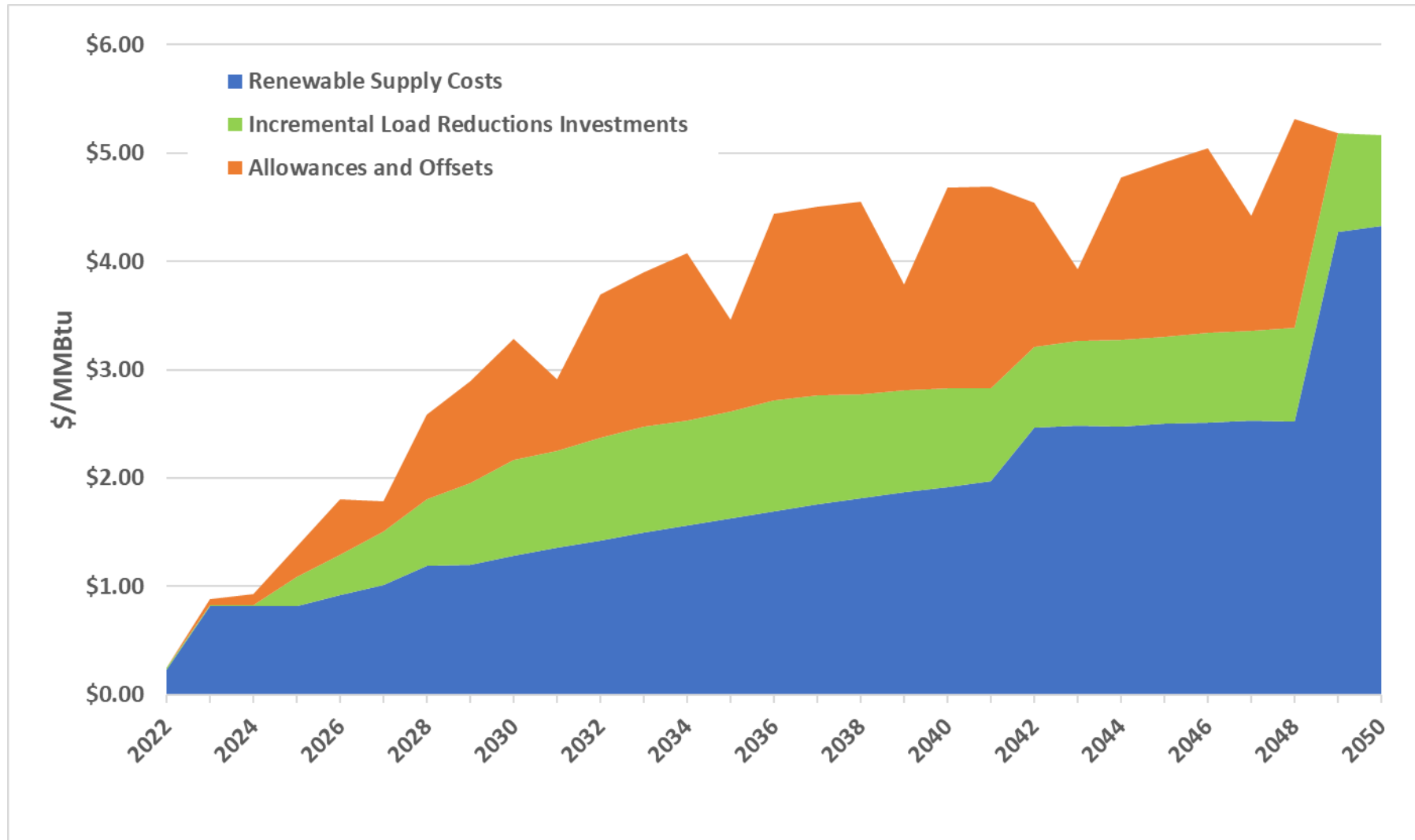
# Washington - 1 Balanced Decarbonization



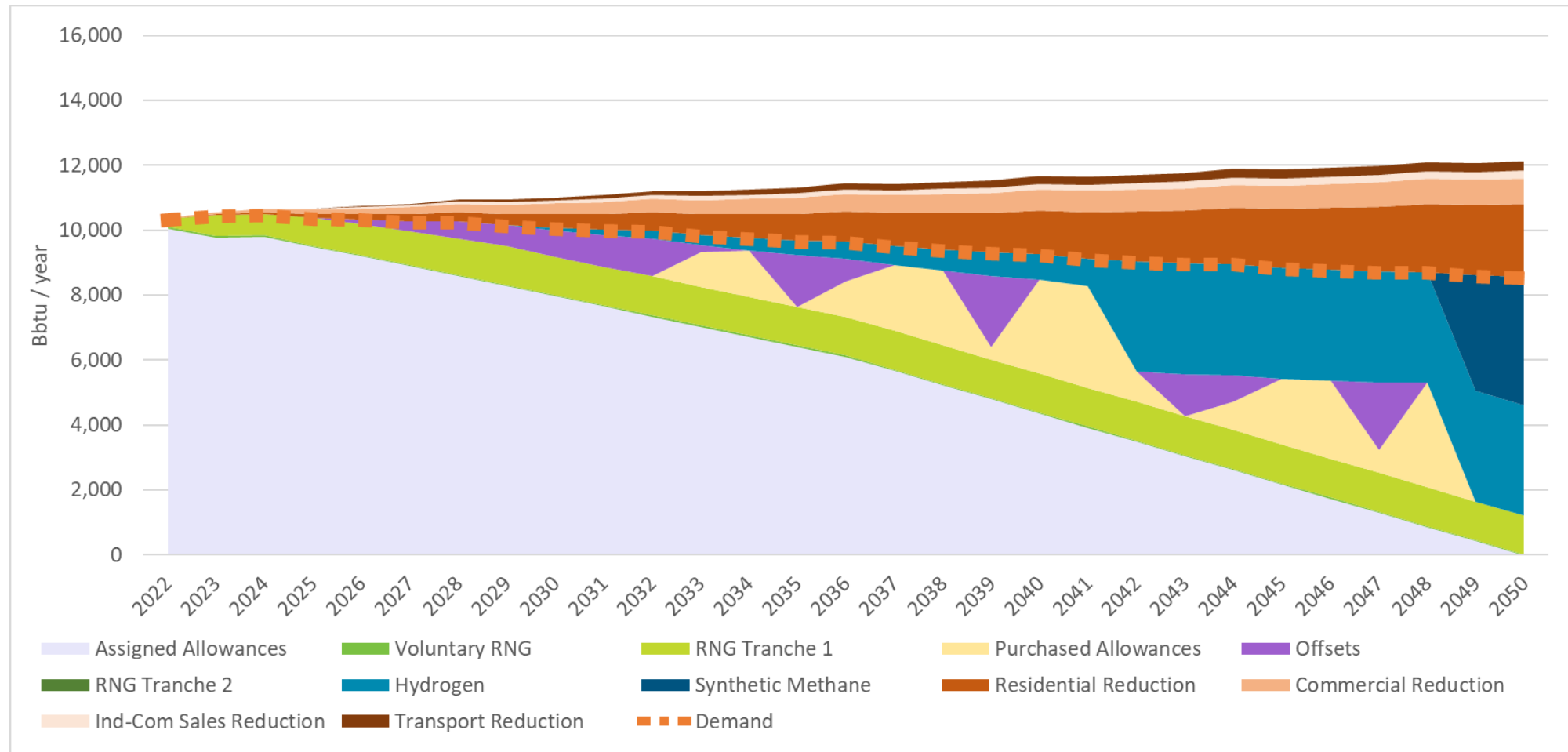
# Washington - 1 Balanced Decarbonization



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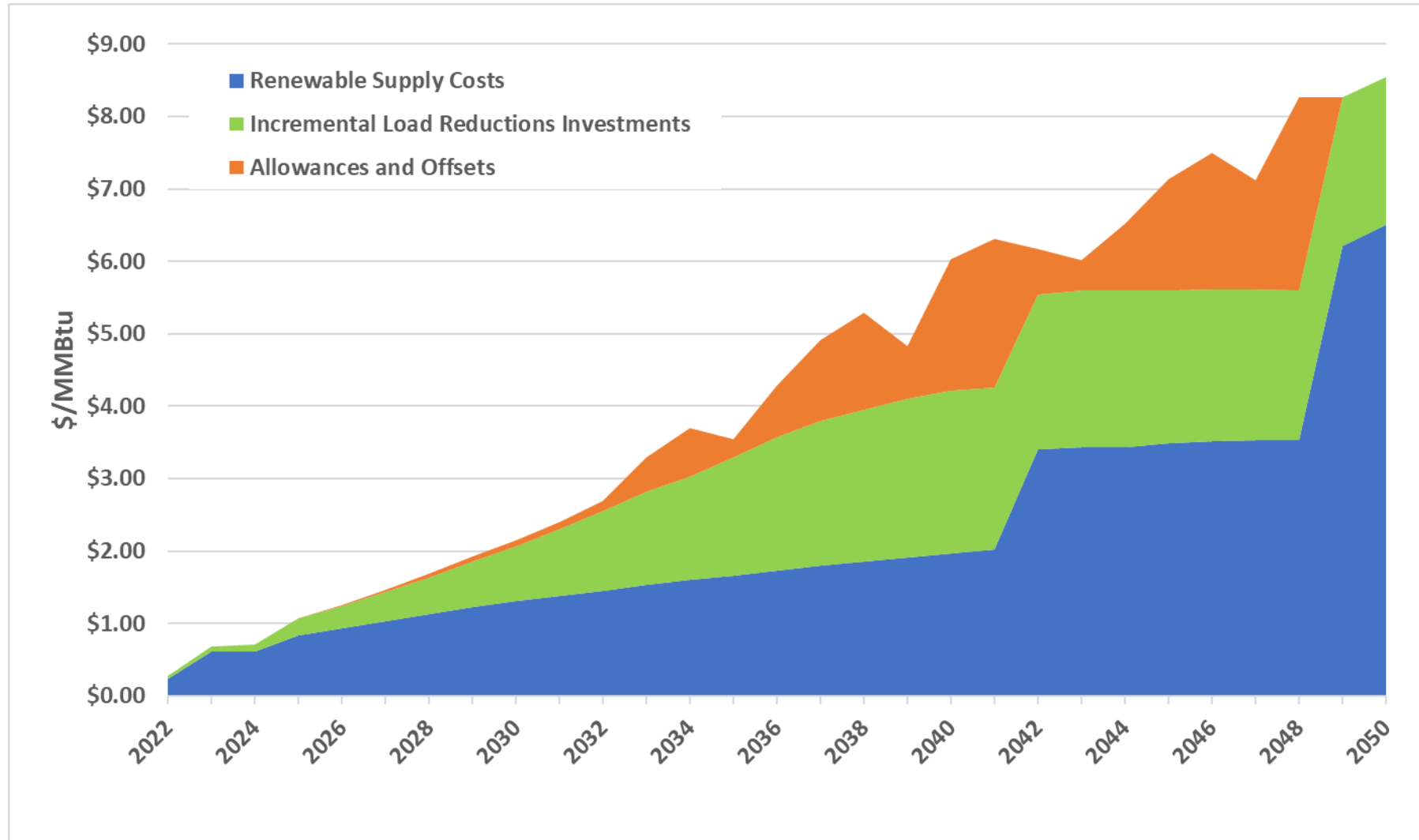


# Washington - 2 Carbon Neutral

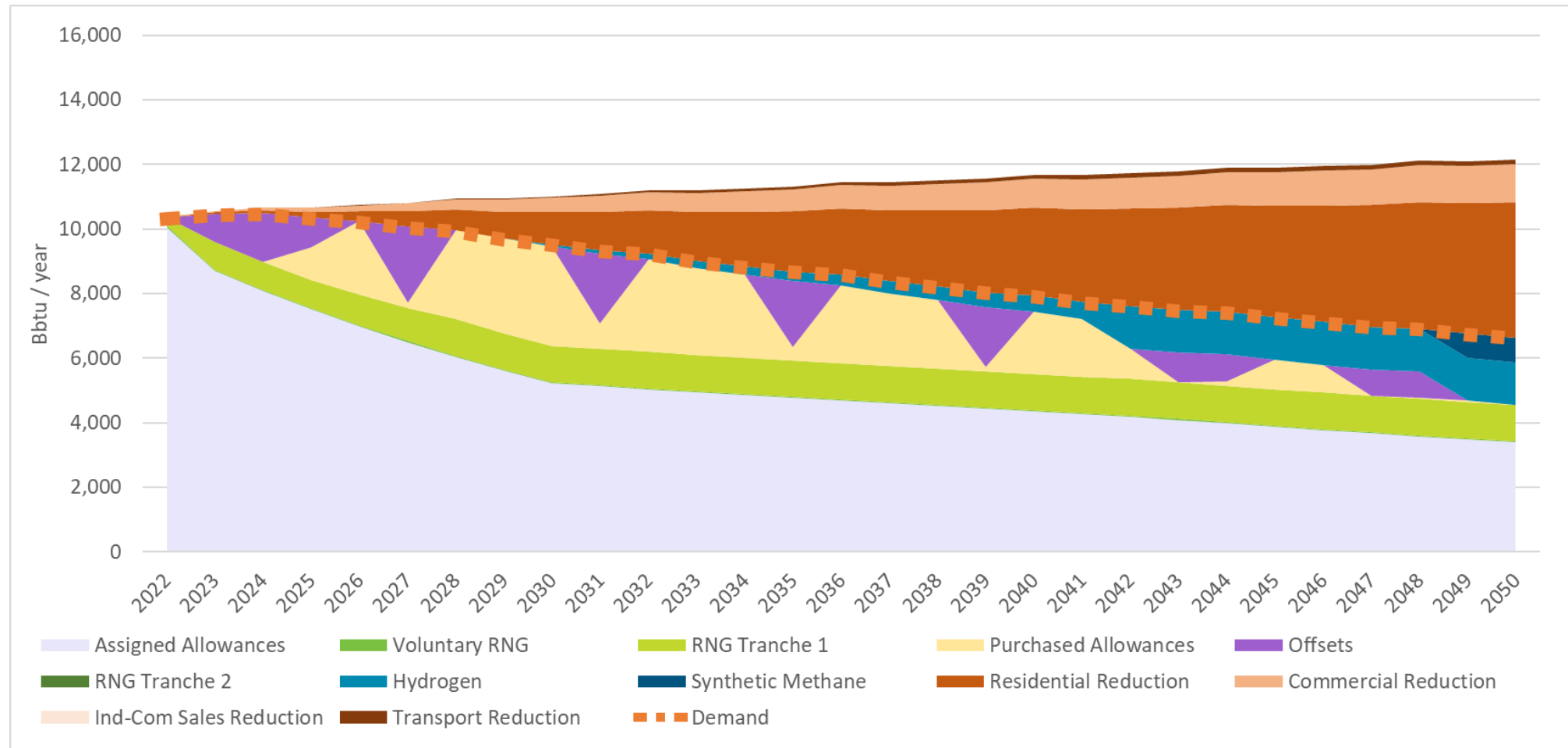




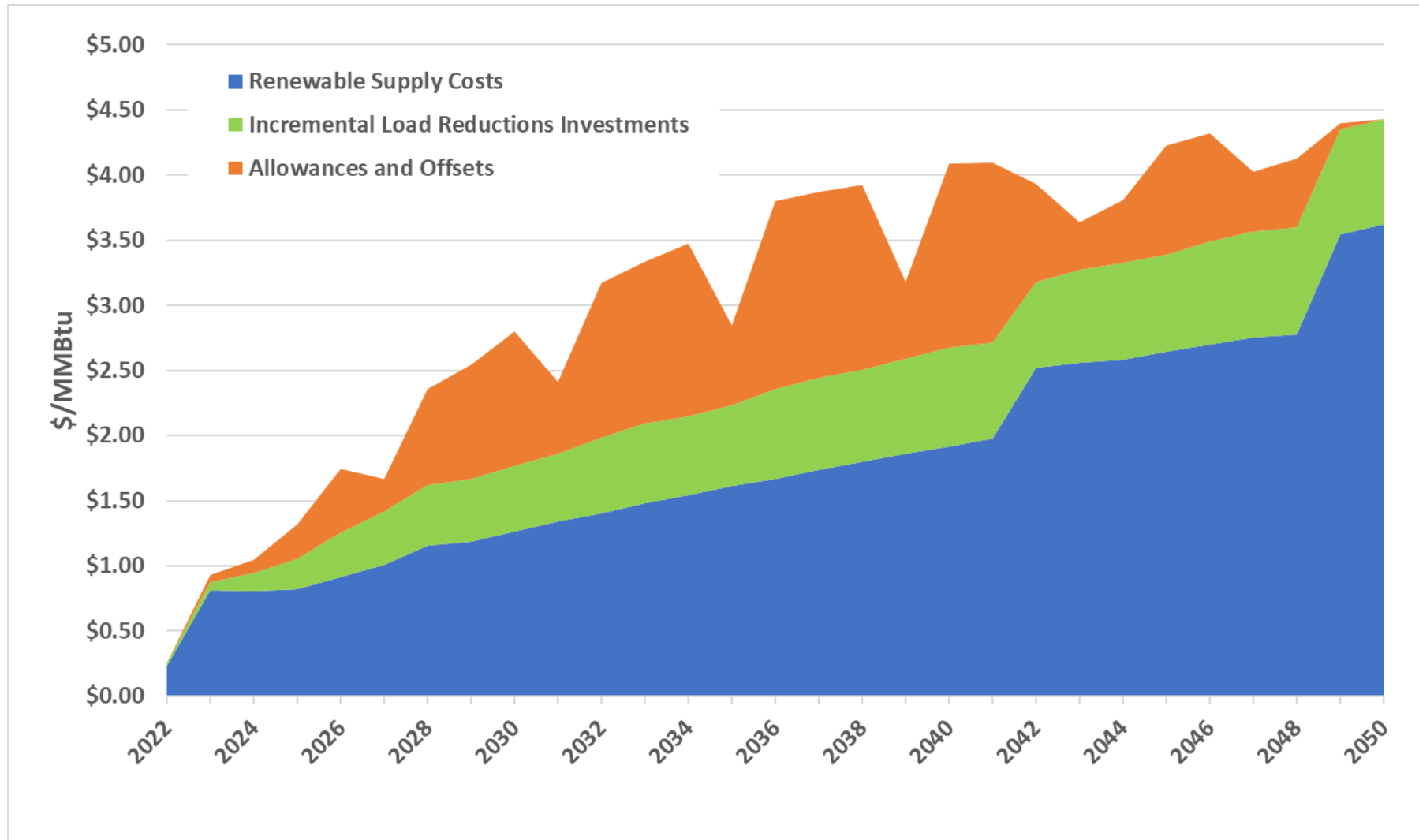
# Washington - 2 Carbon Neutral



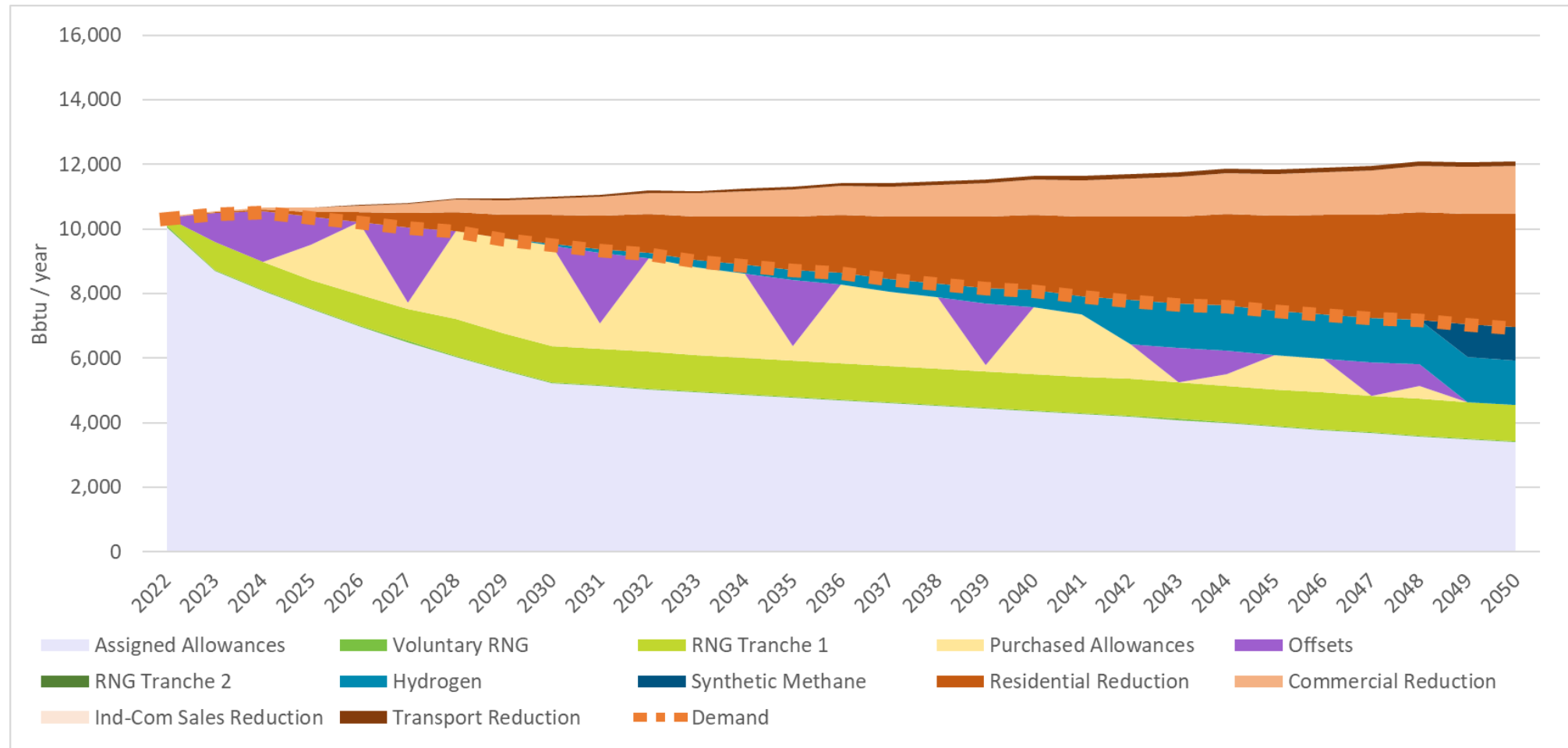
# Washington - 3 Dual-Fuel Heating



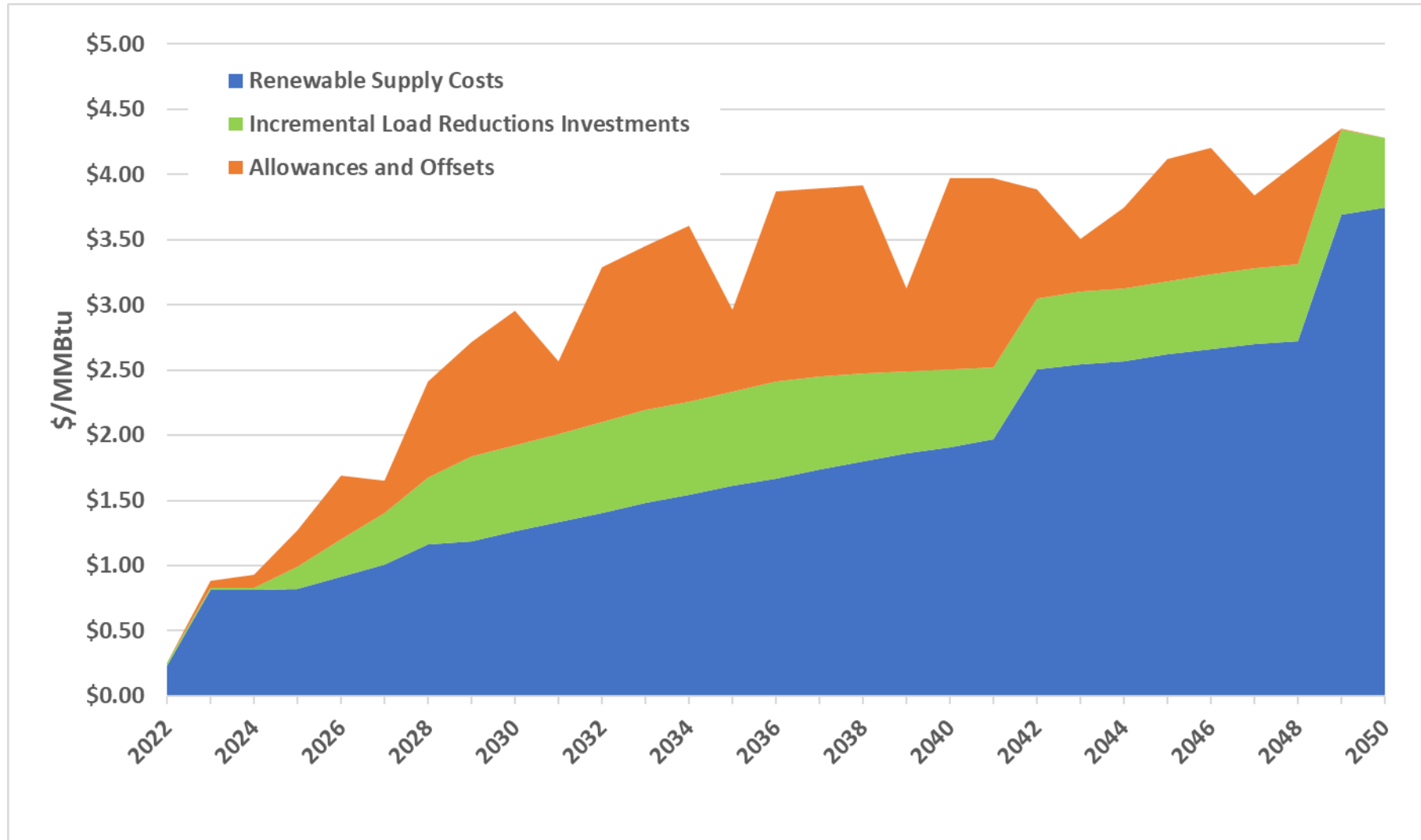
# Washington - 3 Dual-Fuel Heating



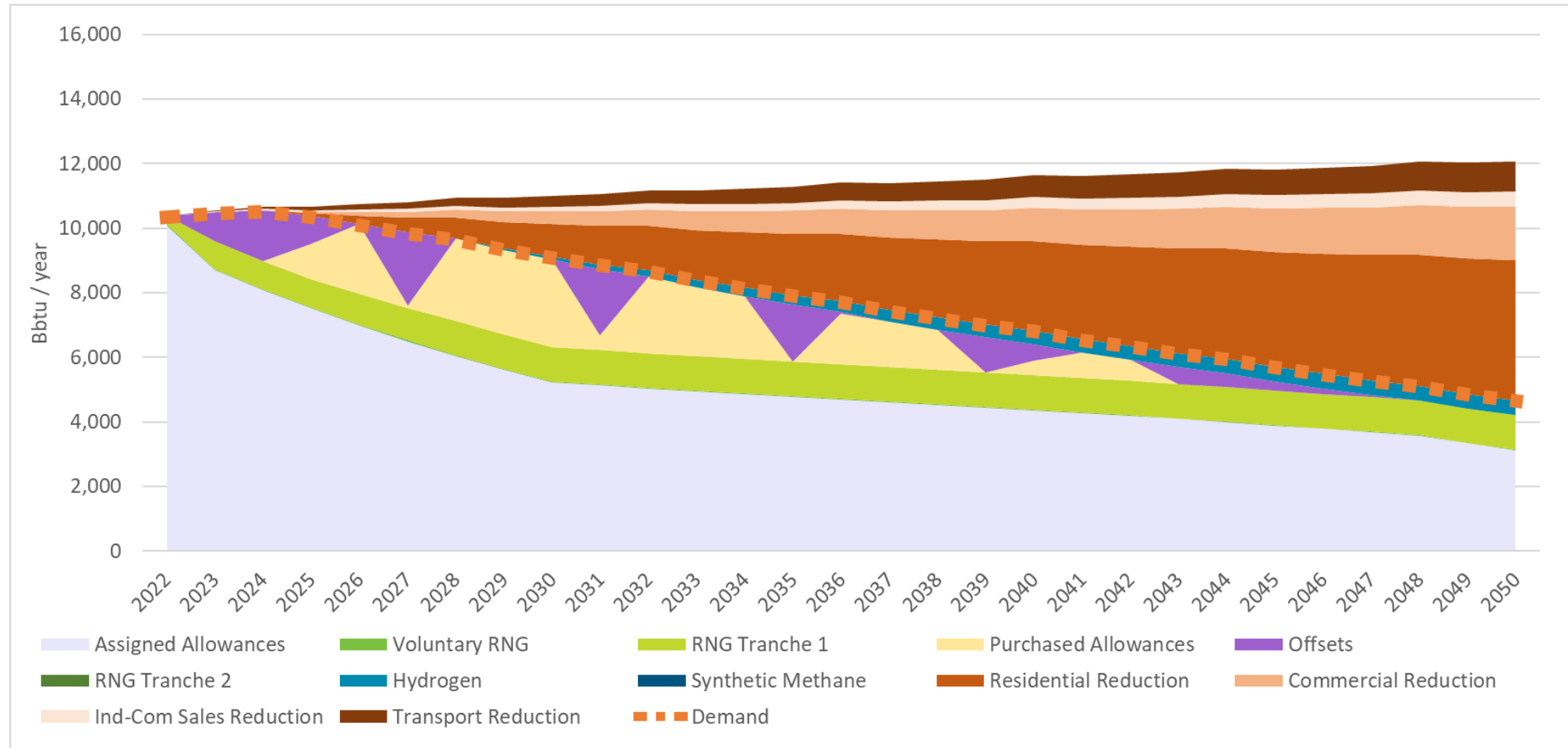
# Washington - 4 New Gas Customer Moratorium



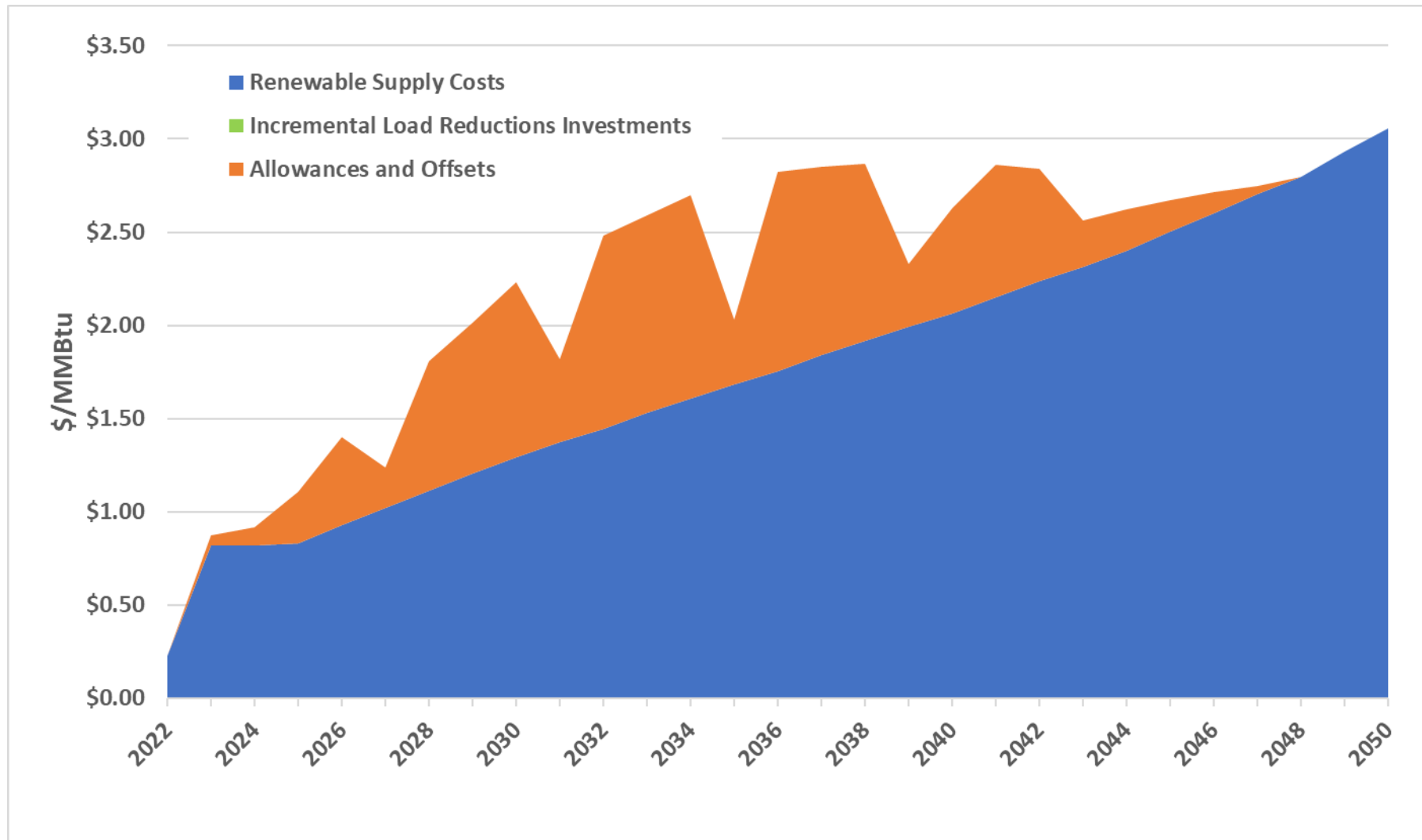
# Washington - 4 New Gas Customer Moratorium



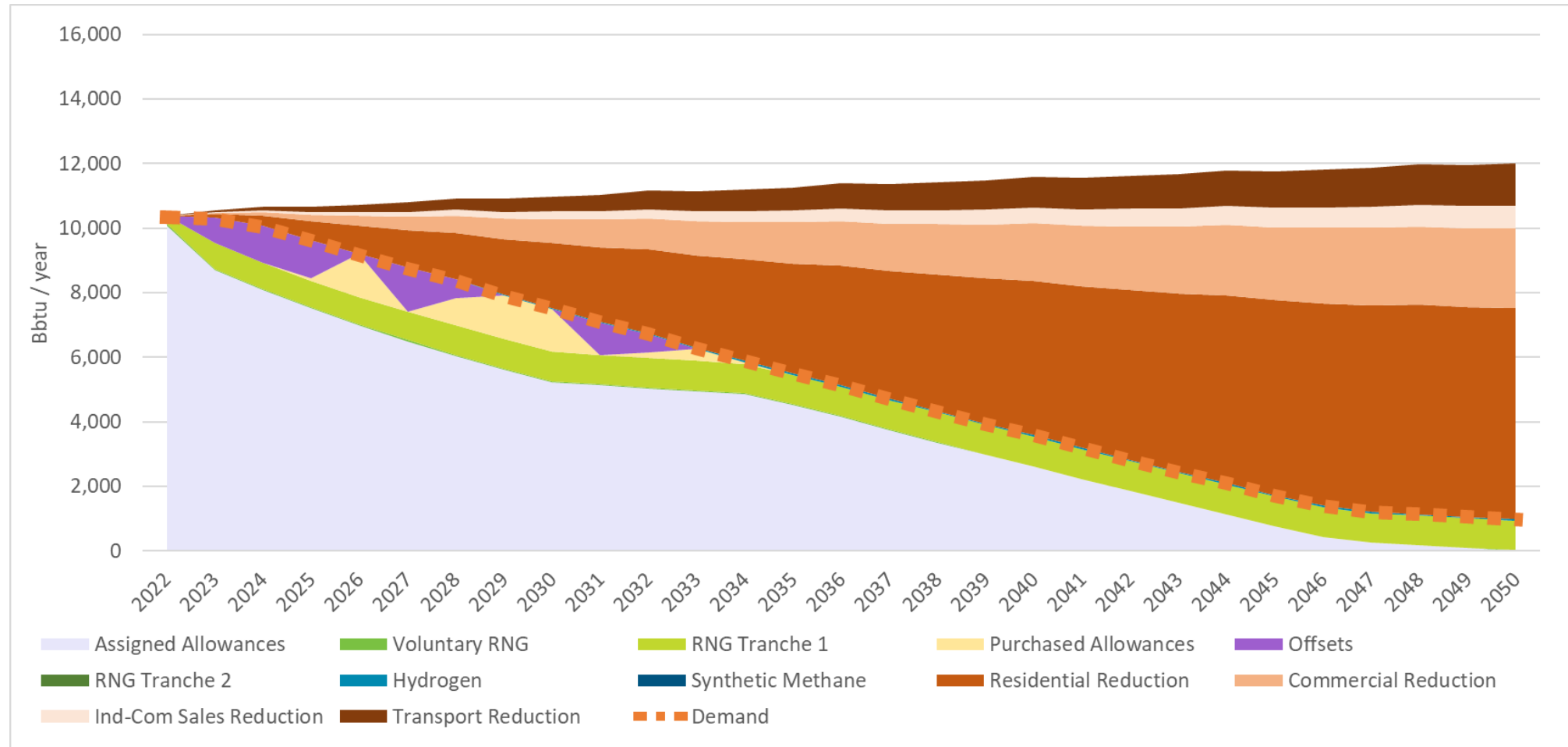
# Washington - 5 Aggressive Building Electrification



# Washington - 5 Aggressive Building Electrification

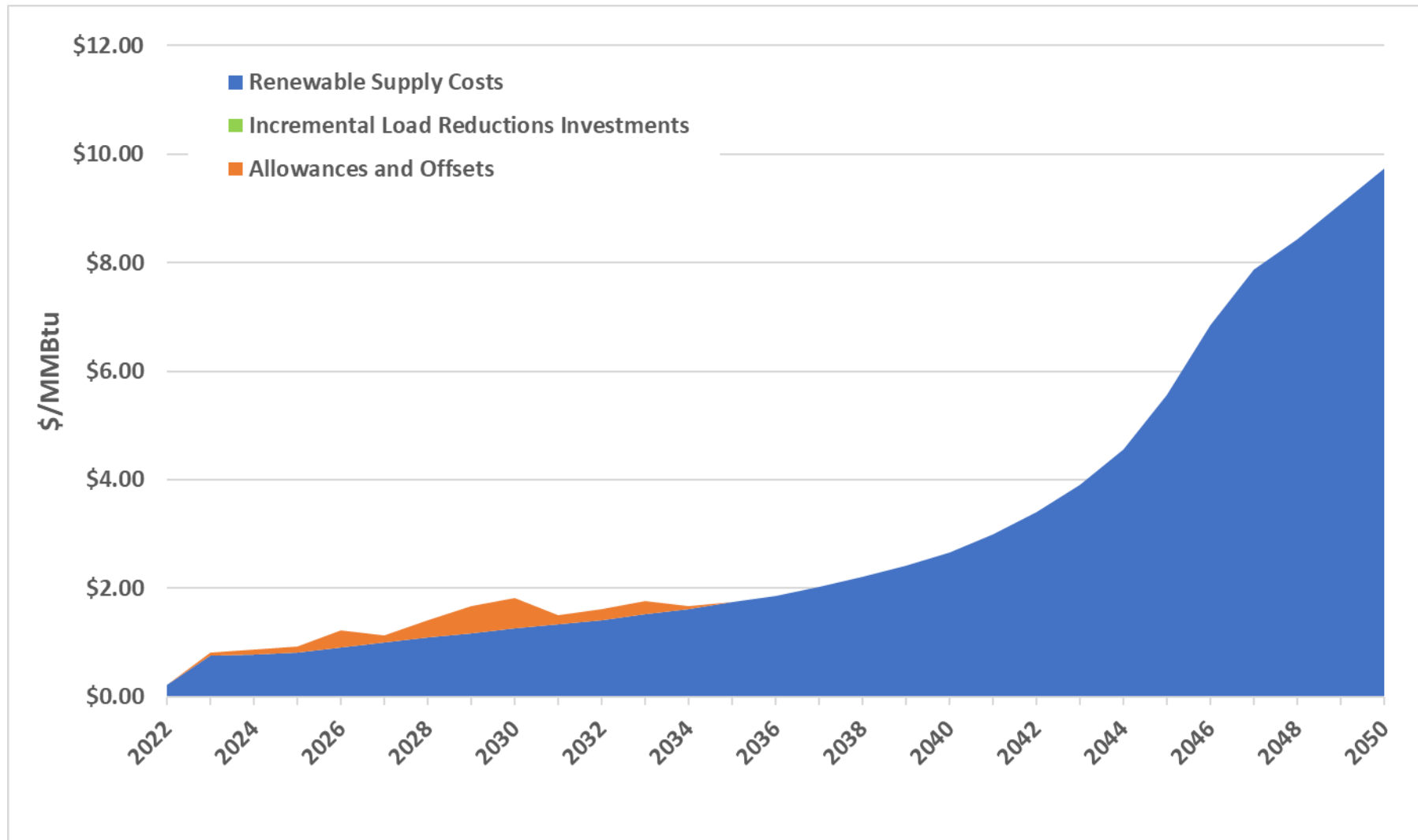


# Washington - 6 Full Building Electrification

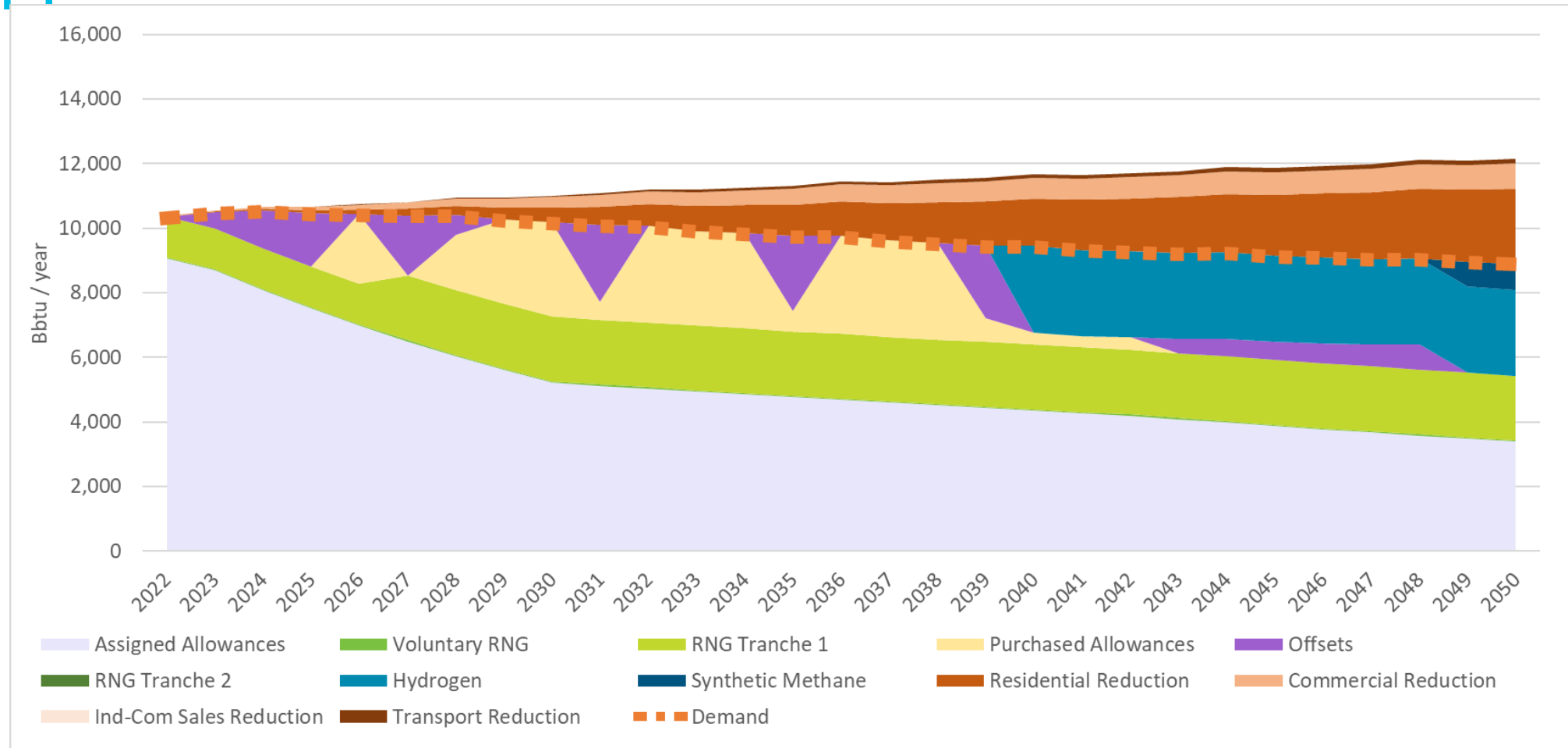




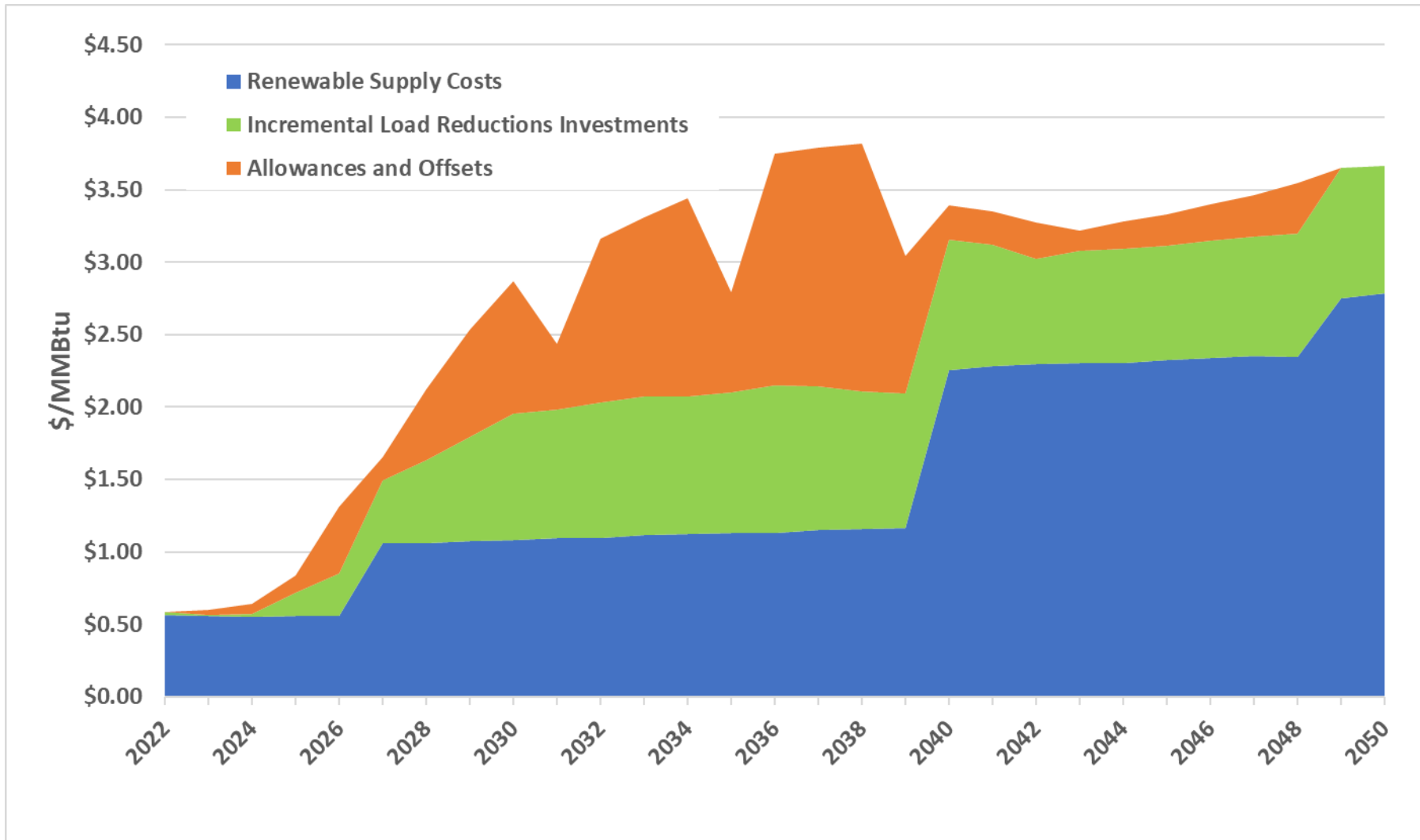
# Washington - 6 Full Building Electrification



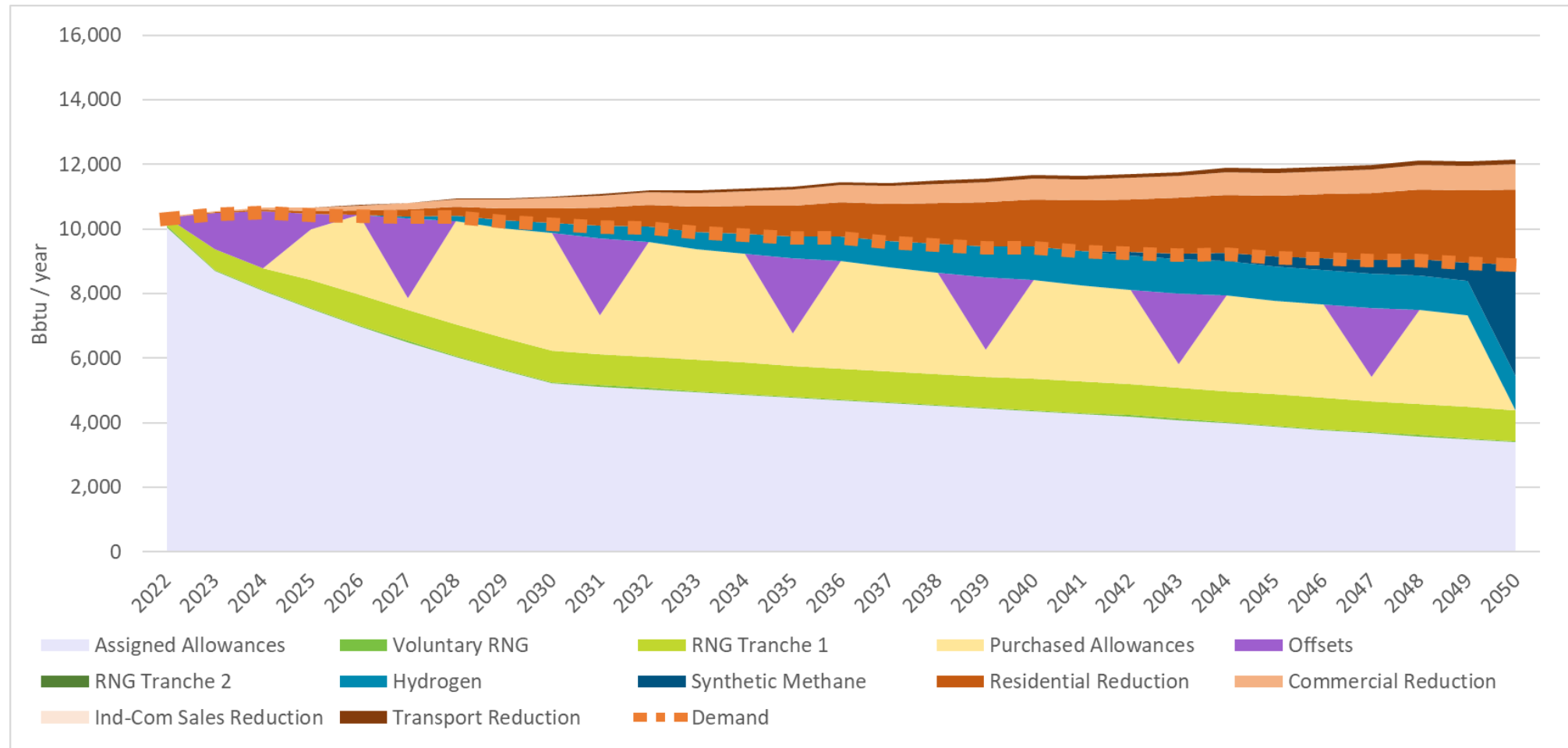
# Washington - 7 RNG and H2 Policy Support



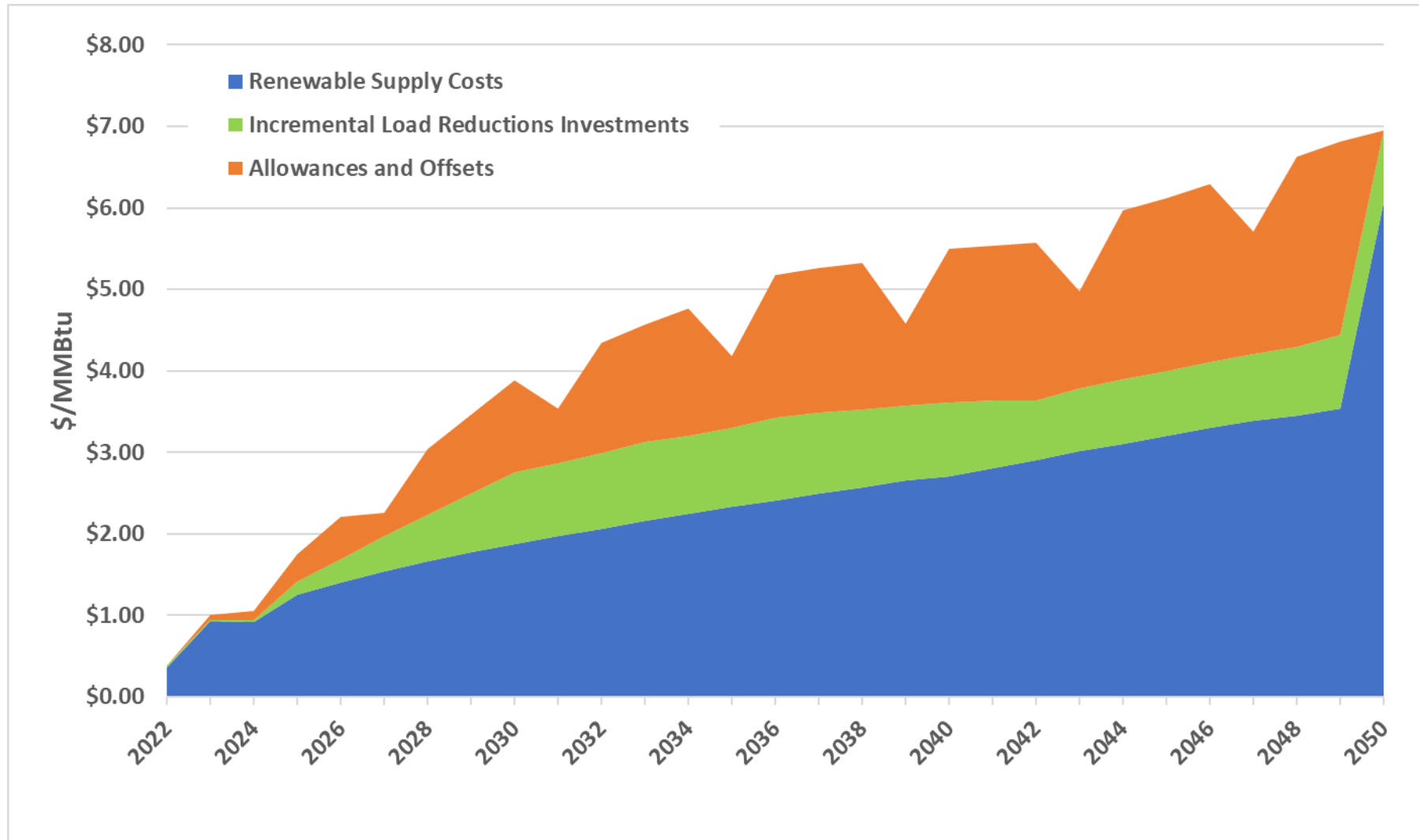
# Washington - 7 RNG and H2 Policy Support



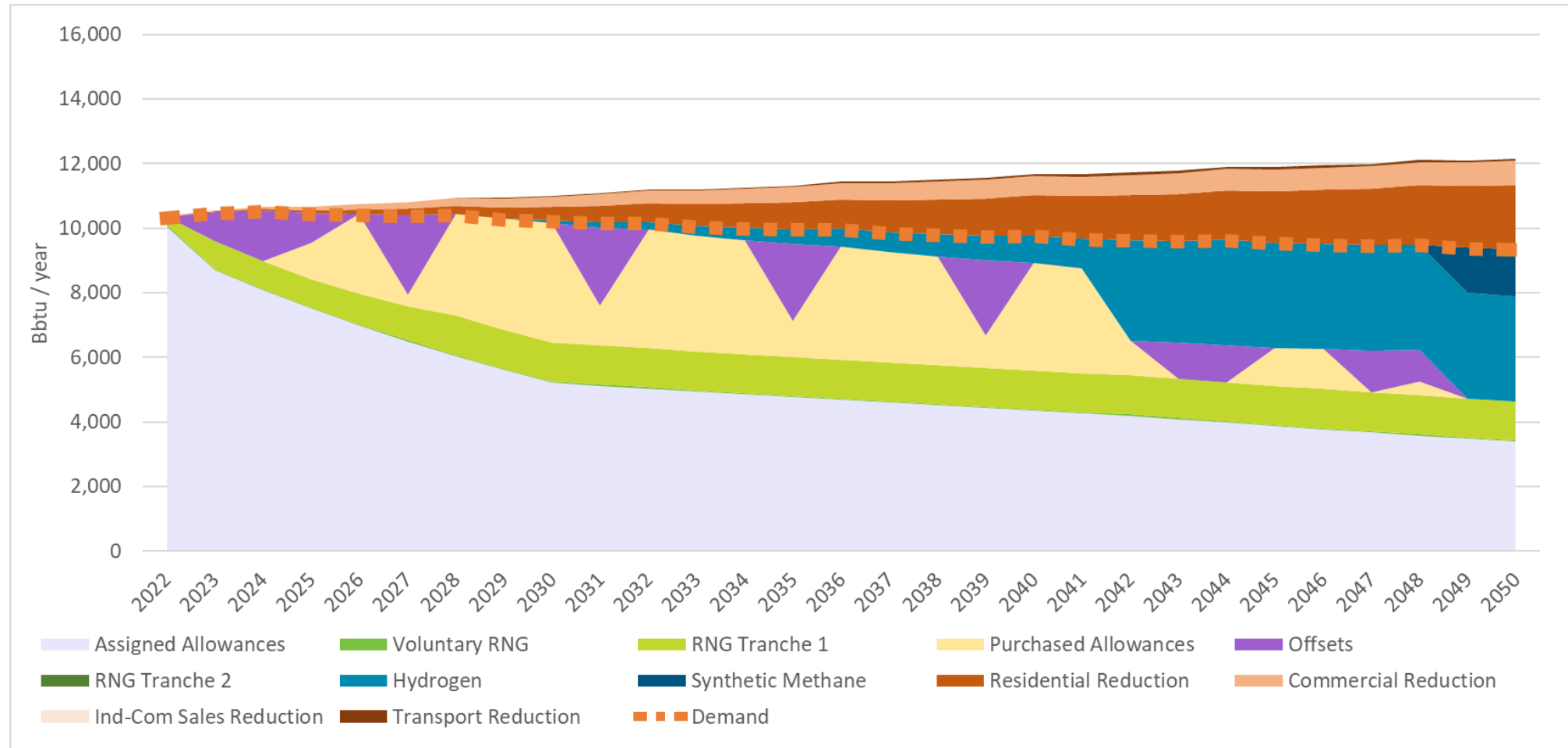
# Washington - 8 Limited RNG



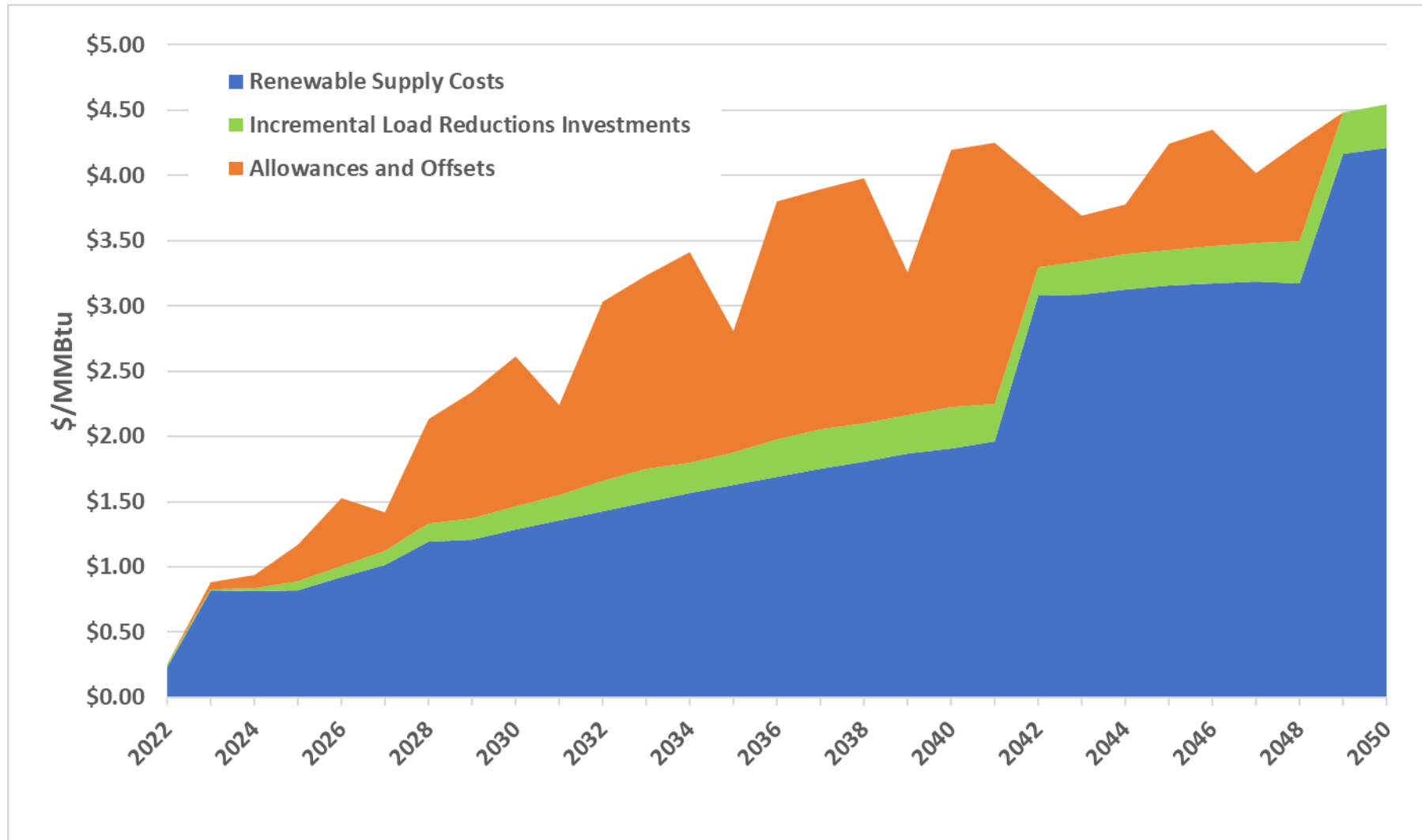
# Washington - 8 Limited RNG



# Washington - 9 Supply-Focused Decarbonization



# Washington - 9 Supply-Focused Decarbonization



# Monte Carlo Inputs



# Monte Carlo Simulations on Inputs into PLEXOS



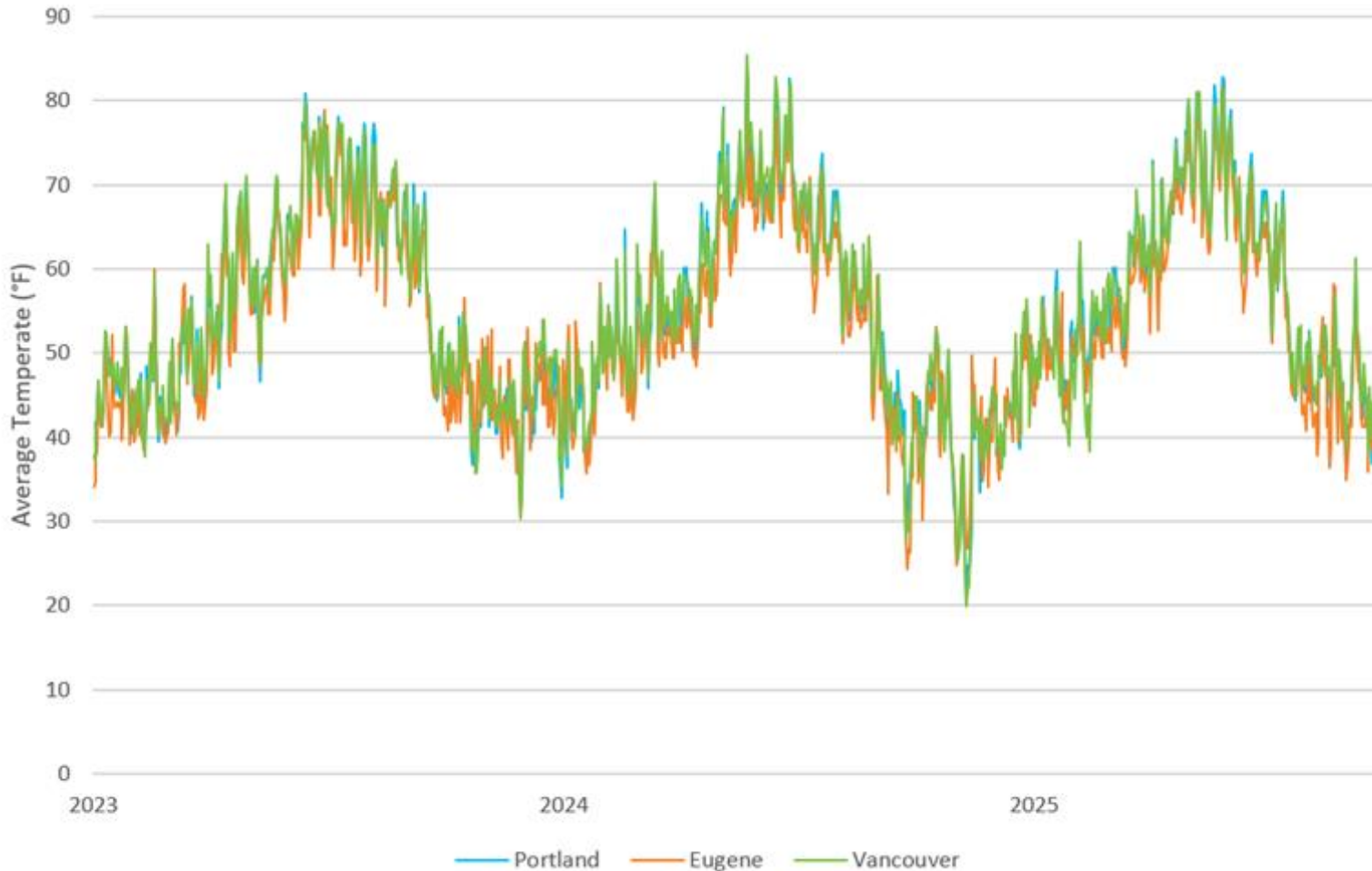
## Supply-side simulations

- Gas Prices – AECO, Opal, Sumas West Coast Station 2
- Renewable Gas Prices – RNG Tranche 1, RNG Tranche 2, Hydrogen, Synthetic Methane
- Compliance Tool Prices for WA – Offsets, Allowance prices
- Renewable Gas Quantities – RNG Tranche 1, RNG Tranche 2, Maximum Hydrogen constraint
- Capacity Resource Costs – Mist Recall, Newport Takeaway Projects, Mist Expansion, Interstate Pipeline Expansion, Portland LNG Cold Box, Enhanced Mist Takeaway, Enhanced NWP Takeaway

## Demand-side simulations

- Daily temperatures by load center
- Energy efficiency projection for sales load
- Energy efficiency projection for transport load
- Natural gas heat pump deployment (space and water heating)
- Hybrid heating deployment
- Electrification
- Population growth
- Industrial energy needs

# Weather Simulation - Single Draw

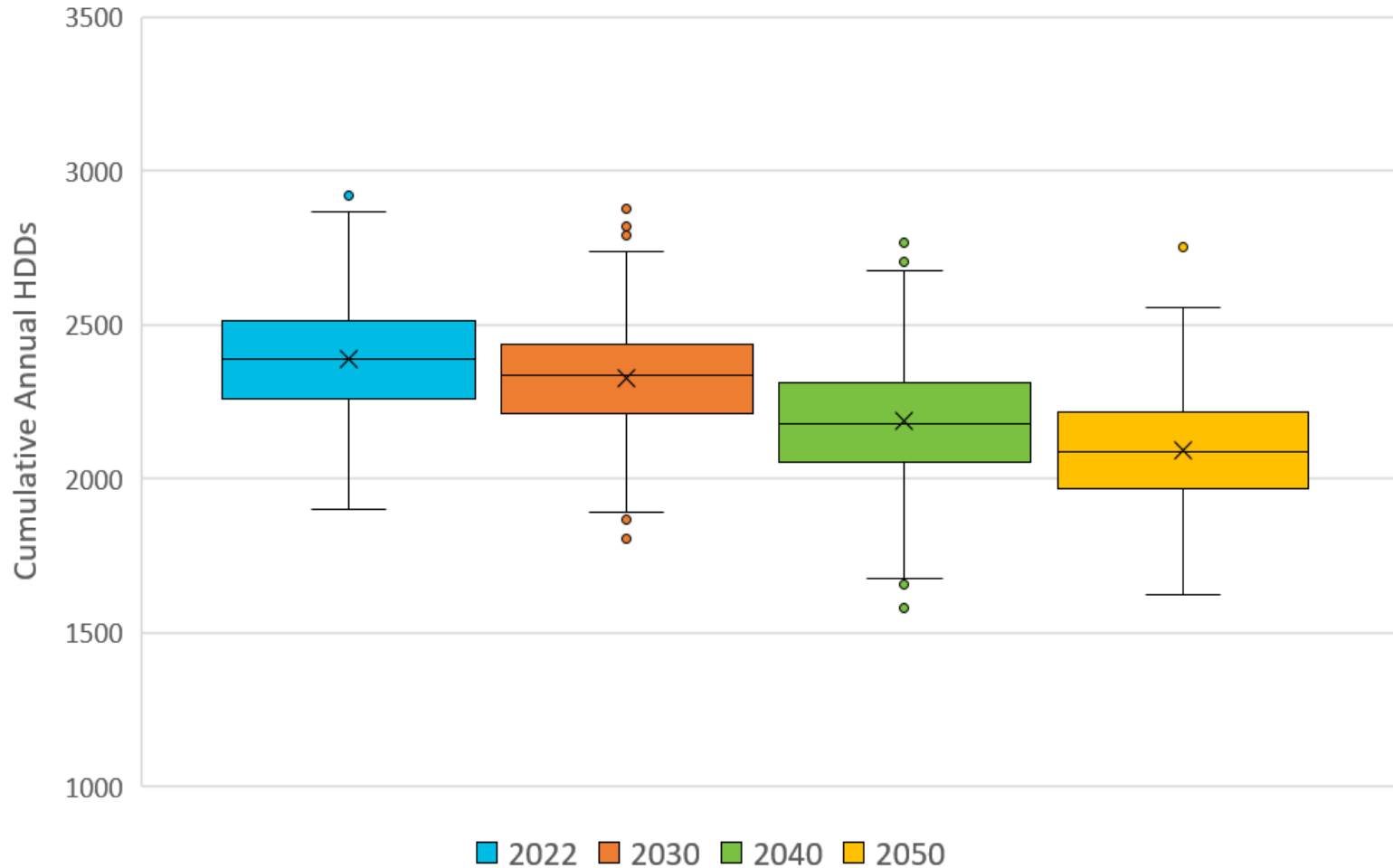


Correlation across locations – when it is cold in Eugene it is likely cold in Portland, but the relationship between any two locations is not deterministic and can vary

In January of 2013 temperatures in Eugene plummeted to historic lows, while temperatures across the rest of the service territory were much milder in comparison.

This correlation is captured within a single draw, shown by the graph

# Weather Simulation – Across Draws



All locations are Portland, OR.

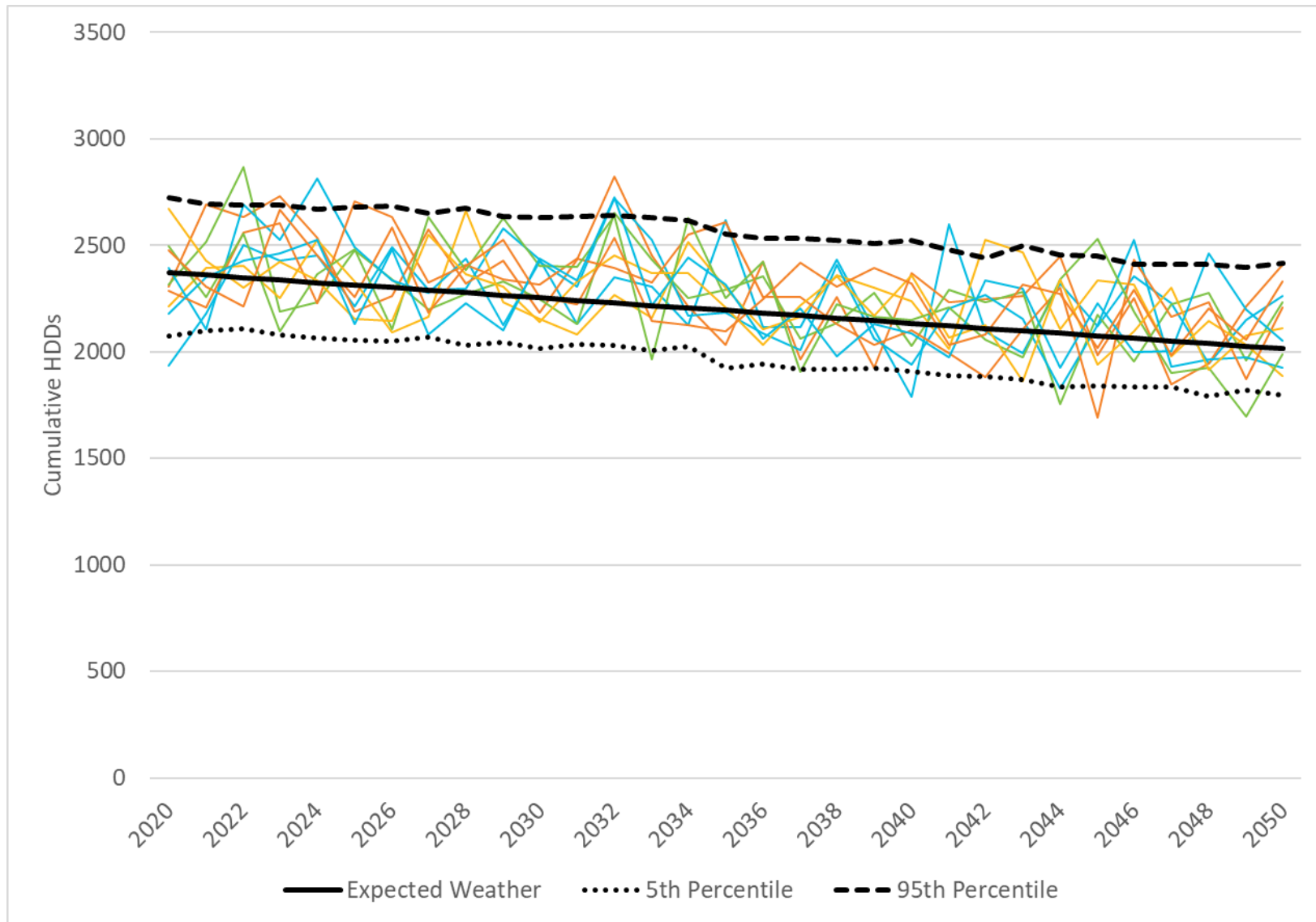
We incorporate correlation with climate change trends in overall temperatures across draws

Within a draw the year-over-year cumulative HDDs is random

The trend of cumulative HDD is decreasing over the planning horizon

Graph show cumulative annual HDDs over the planning horizon for Portland, OR.

# Weather Simulation – Across Draws



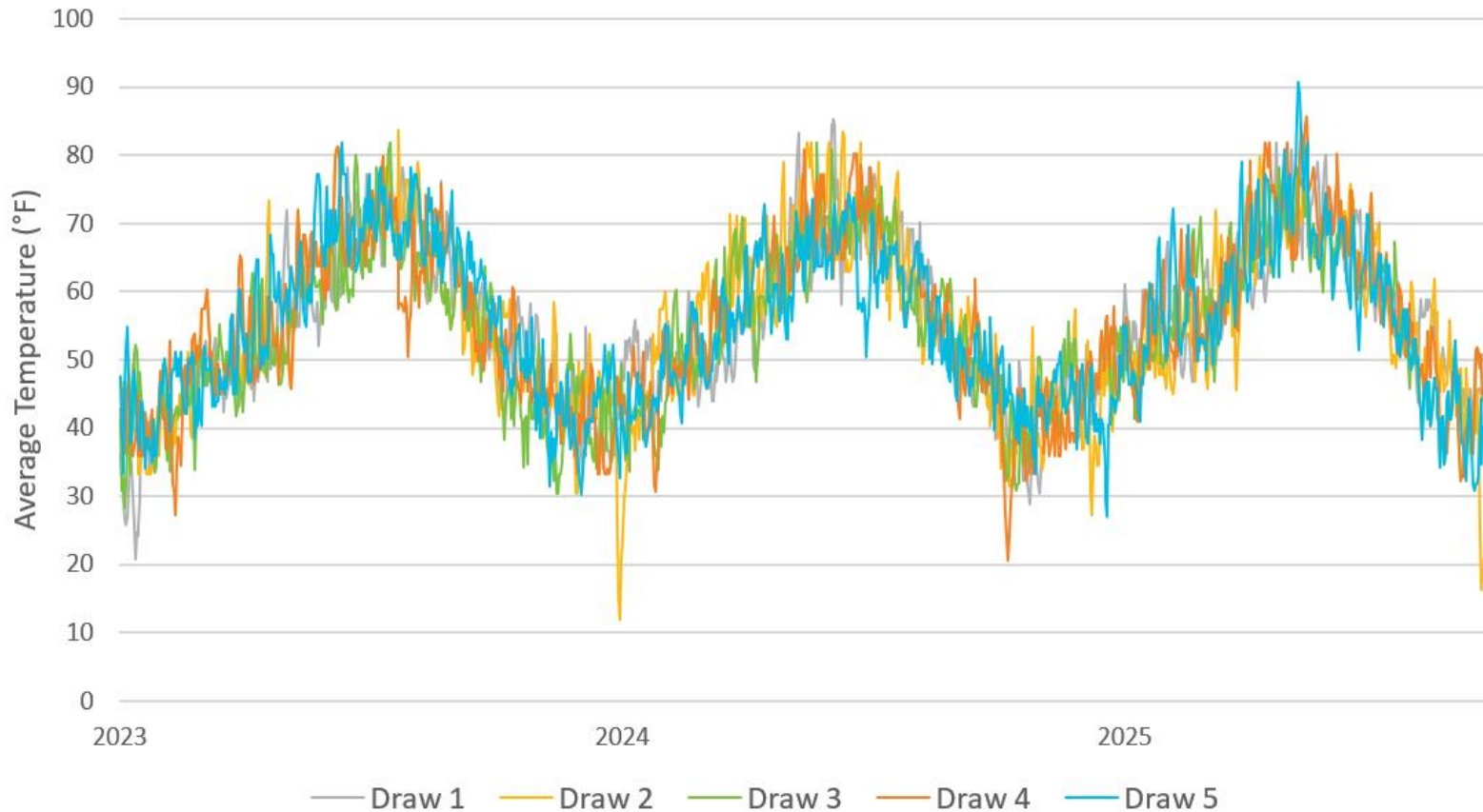
We incorporate correlation with climate change trends in overall temperatures across draws

Within a draw the year-over-year cumulative HDDs is random

The trend of cumulative HDD is decreasing over the planning horizon

These graphs show cumulative annual HDDs over the planning horizon for Portland, OR.

# Weather Simulation – Portland, OR



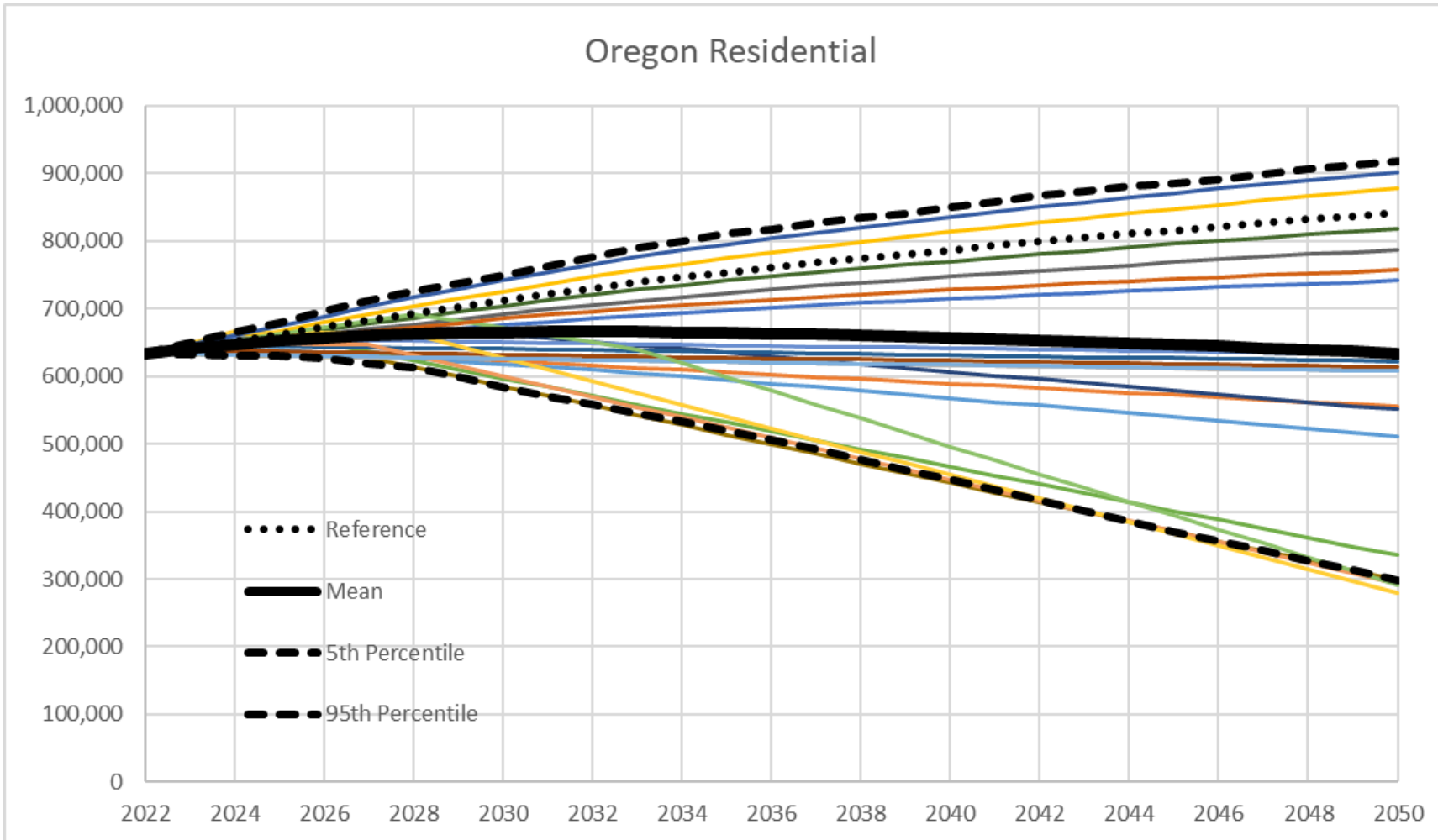
All draw represent Portland, OR.

Daily temperatures are simulated daily base on historical weather patterns

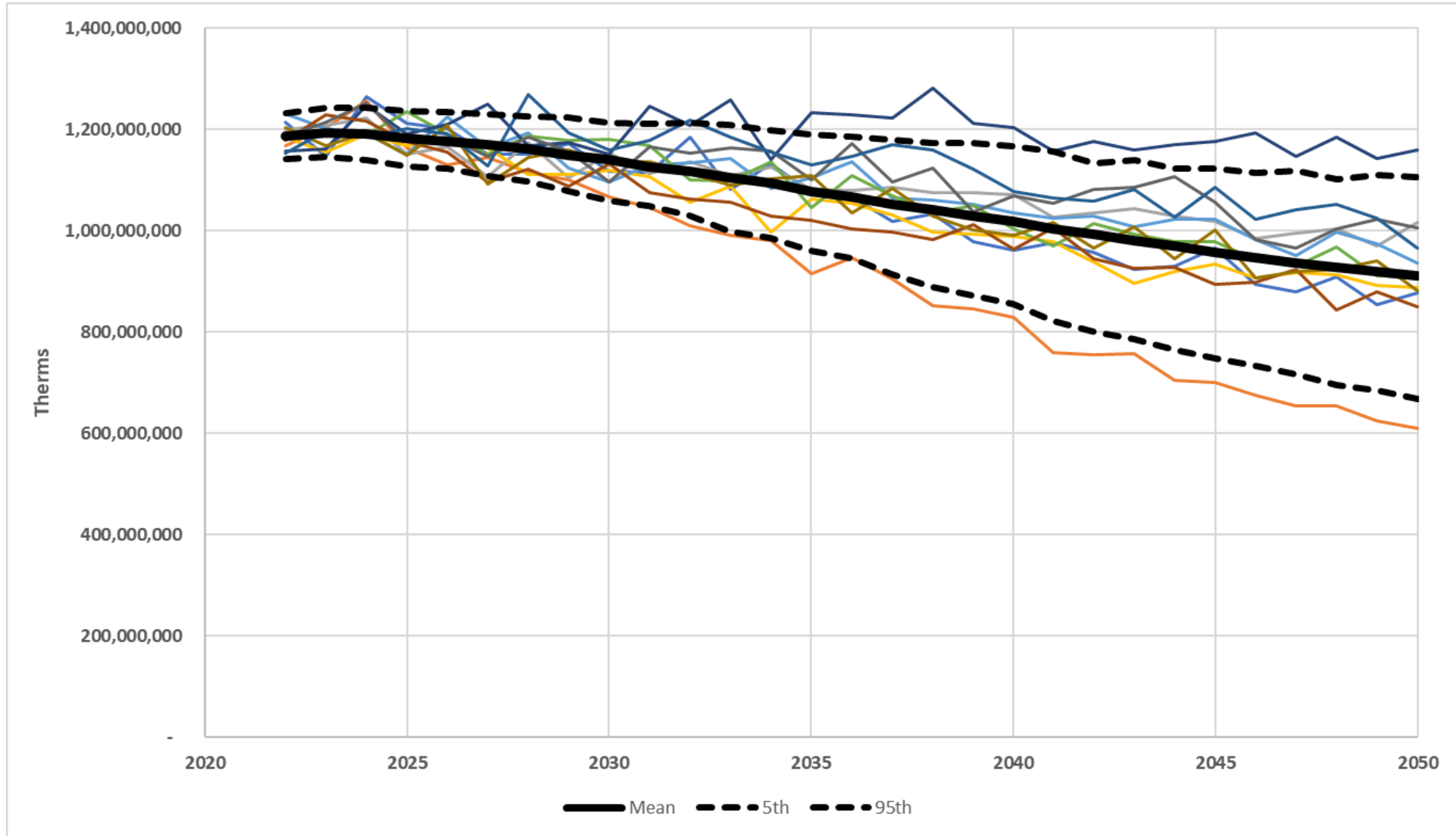
Daily temperatures are incrementally adjusted across all draws for a given future year until the average cumulative annual HDDs reflects the climate change trends shown by the expected weather

Graph shows 5 simulations for Portland, OR.

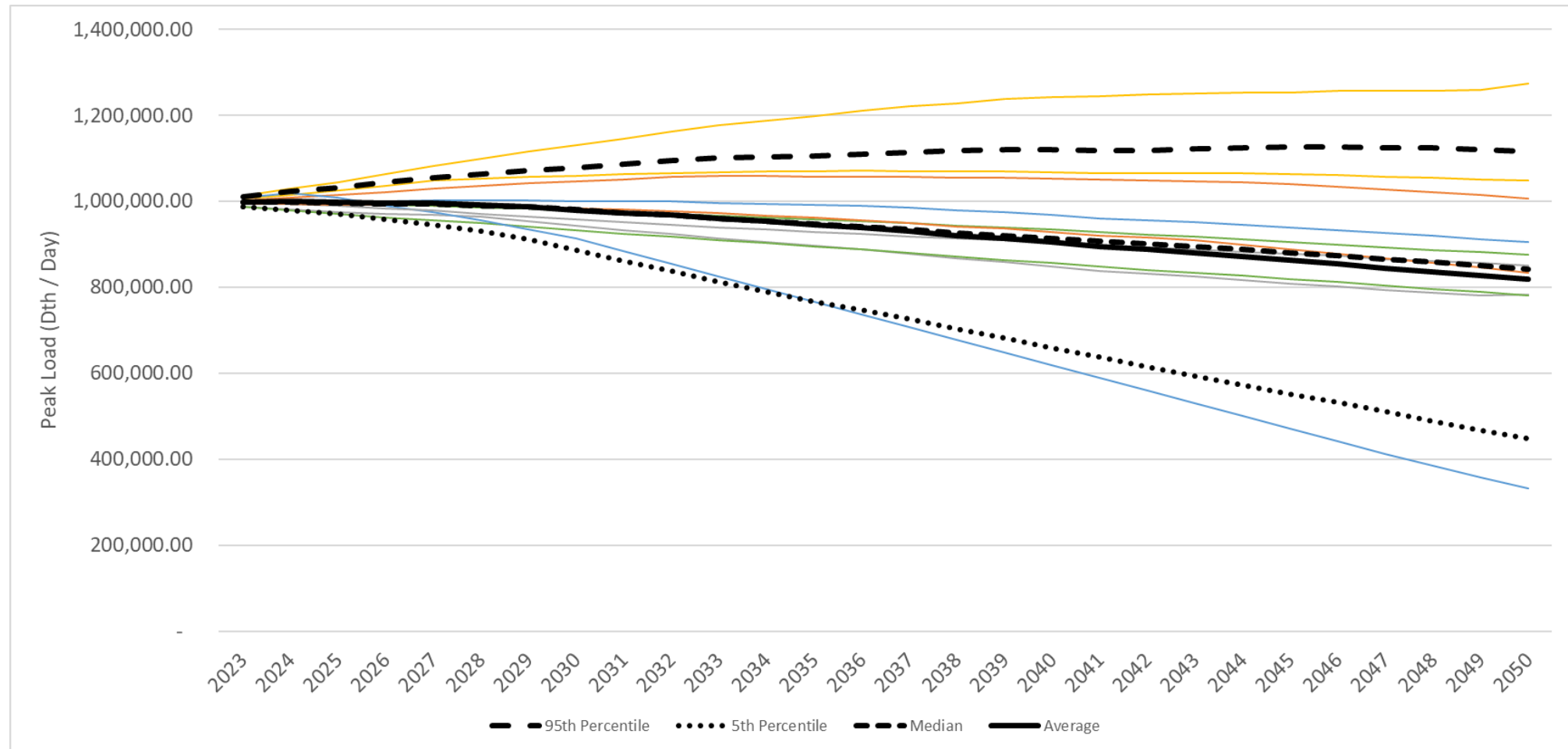
# Oregon Residential Customers



# Total Deliveries

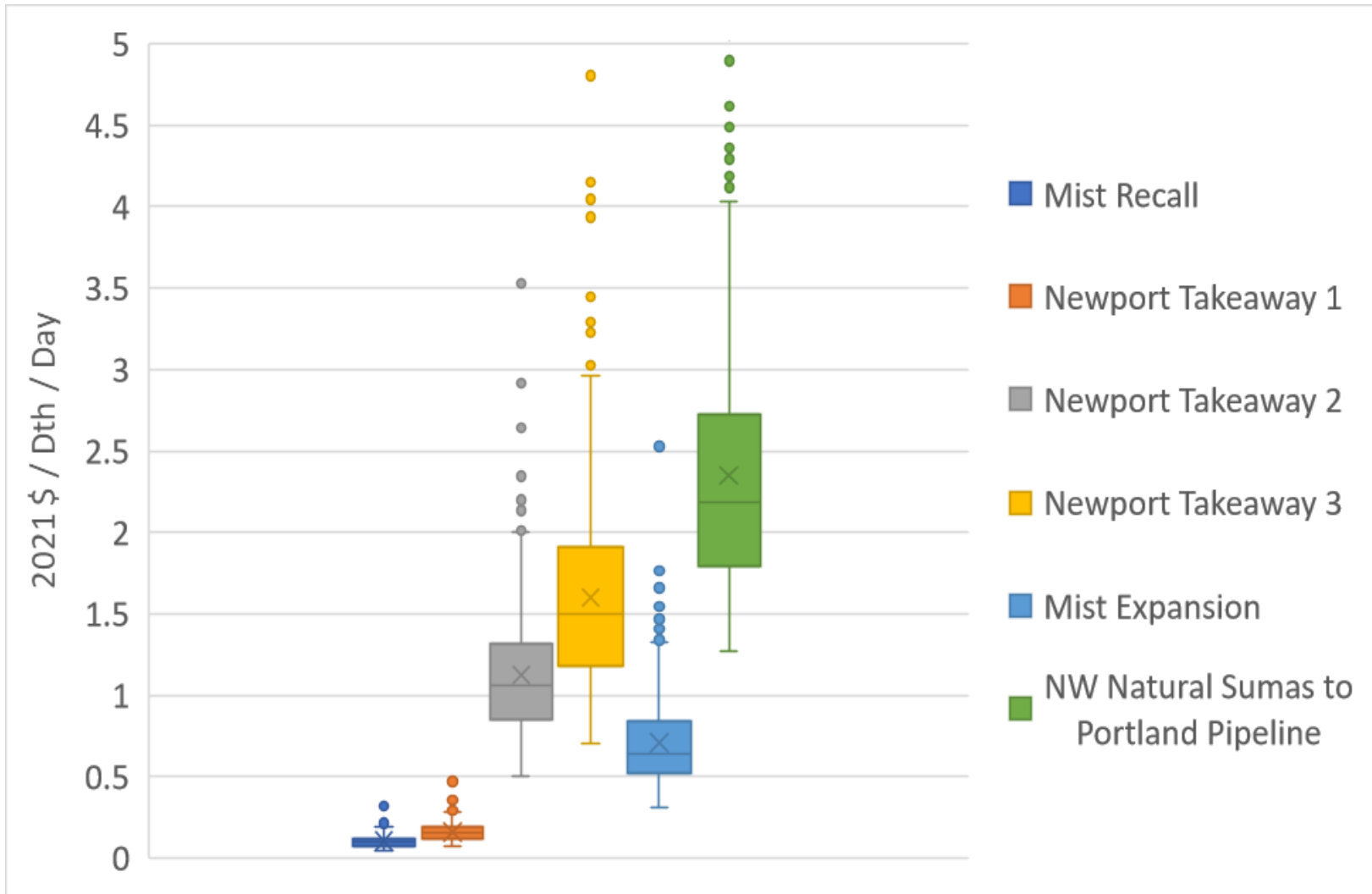


# Peak Day Firm Sales





# Capacity Resource Demand Charge



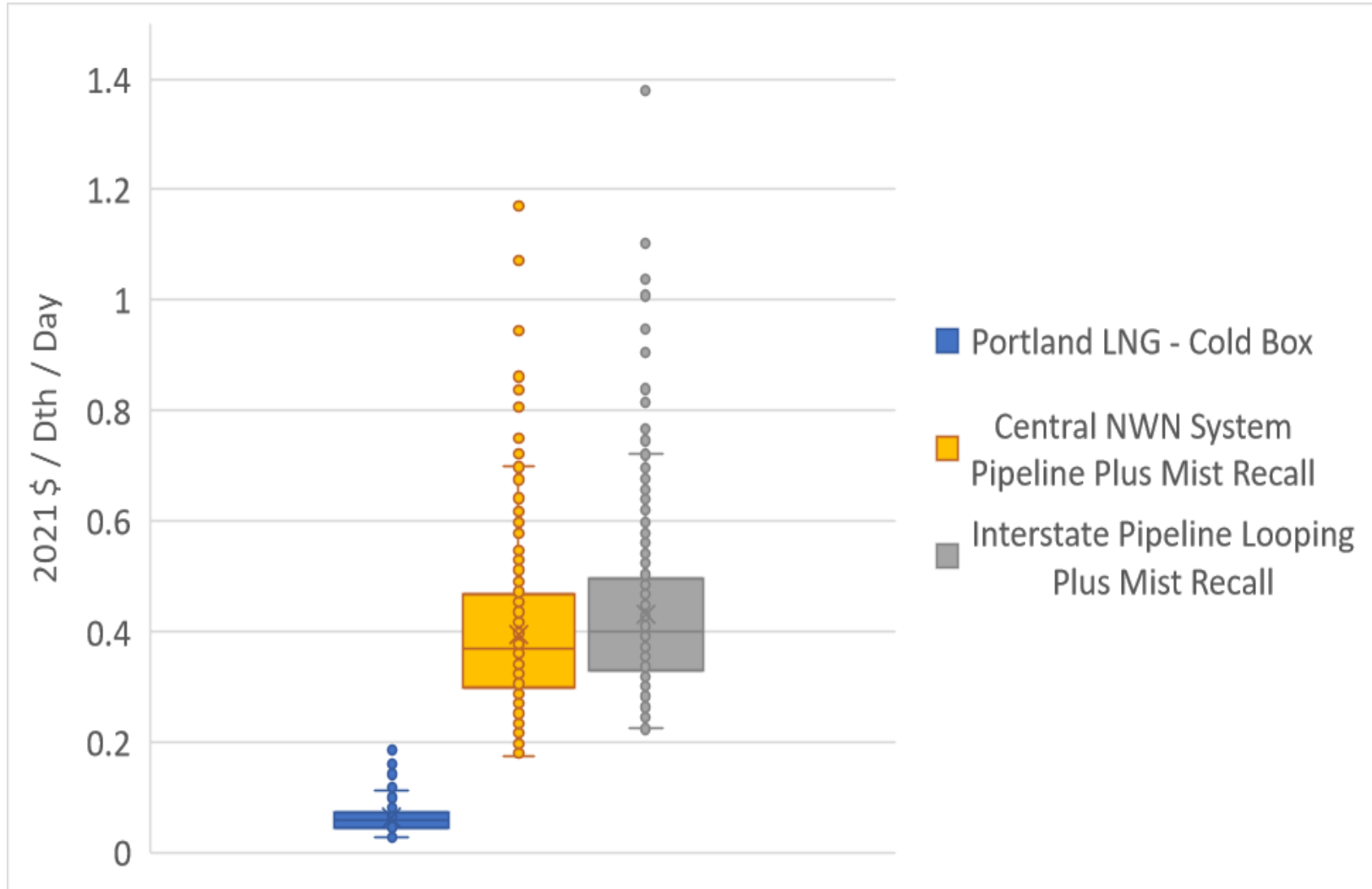
Demand charges are fixed daily charges that are incurred if the resource is selected

Mist Recall continues to be the cheapest capacity resource option for customers

Newport Takeaway 1 is another low-cost option if Mist Recall is exhausted

Correlation within draws is incorporated as construction, labor and material costs are likely to be correlated across these projects

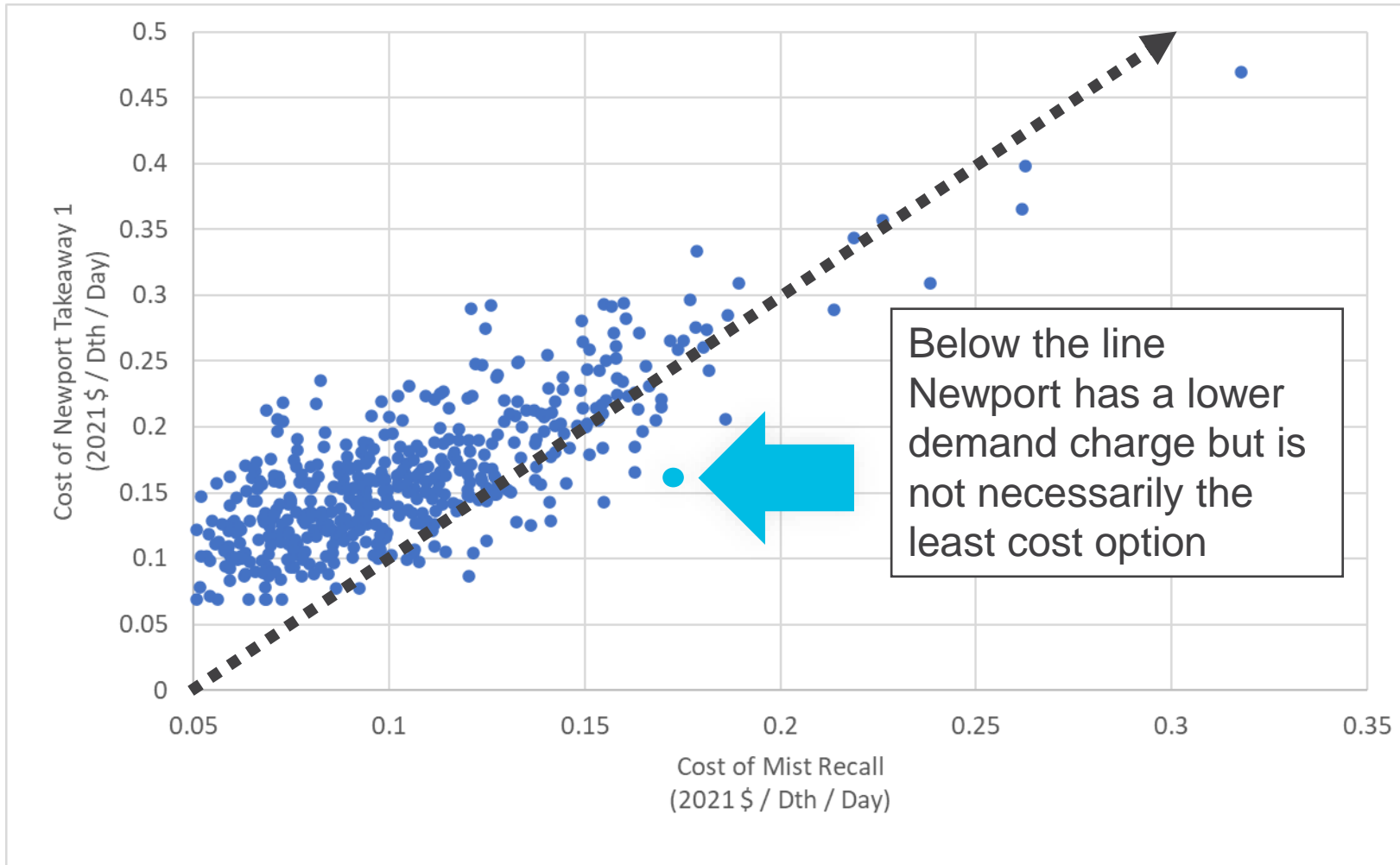
# Portland LNG Cold Box and Portland LNG Alternatives



The graph shows the dispersion of resource cost for the cold box and the potential alternative that would be needed if Portland LNG was shutdown

The graph shows an apples-to-apples for demand charges associated with the cost of capacity as the alternatives would also require Mist Recall equal to the capacity of Portland LNG

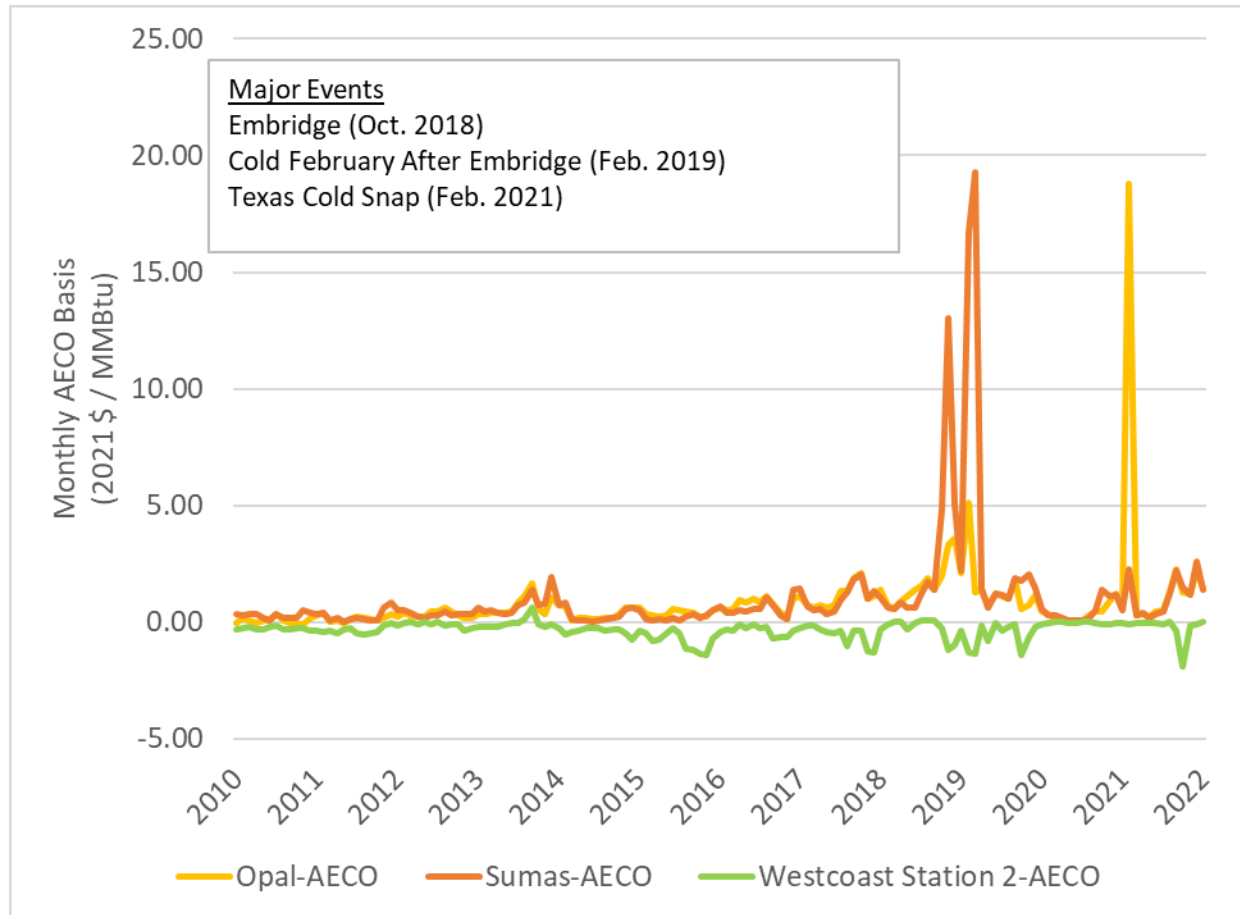
# Capacity Resource Demand Charge



While this graph shows the correlation between resource demand charges, it does NOT provide all the information needed to decide on the least costs resource option

Resources offer different benefits, for example, Mist Recall has a much higher storage capacity to storage deliverability ratio relative to Newport

# Gas Price Simulation – Historical Monthly Basis



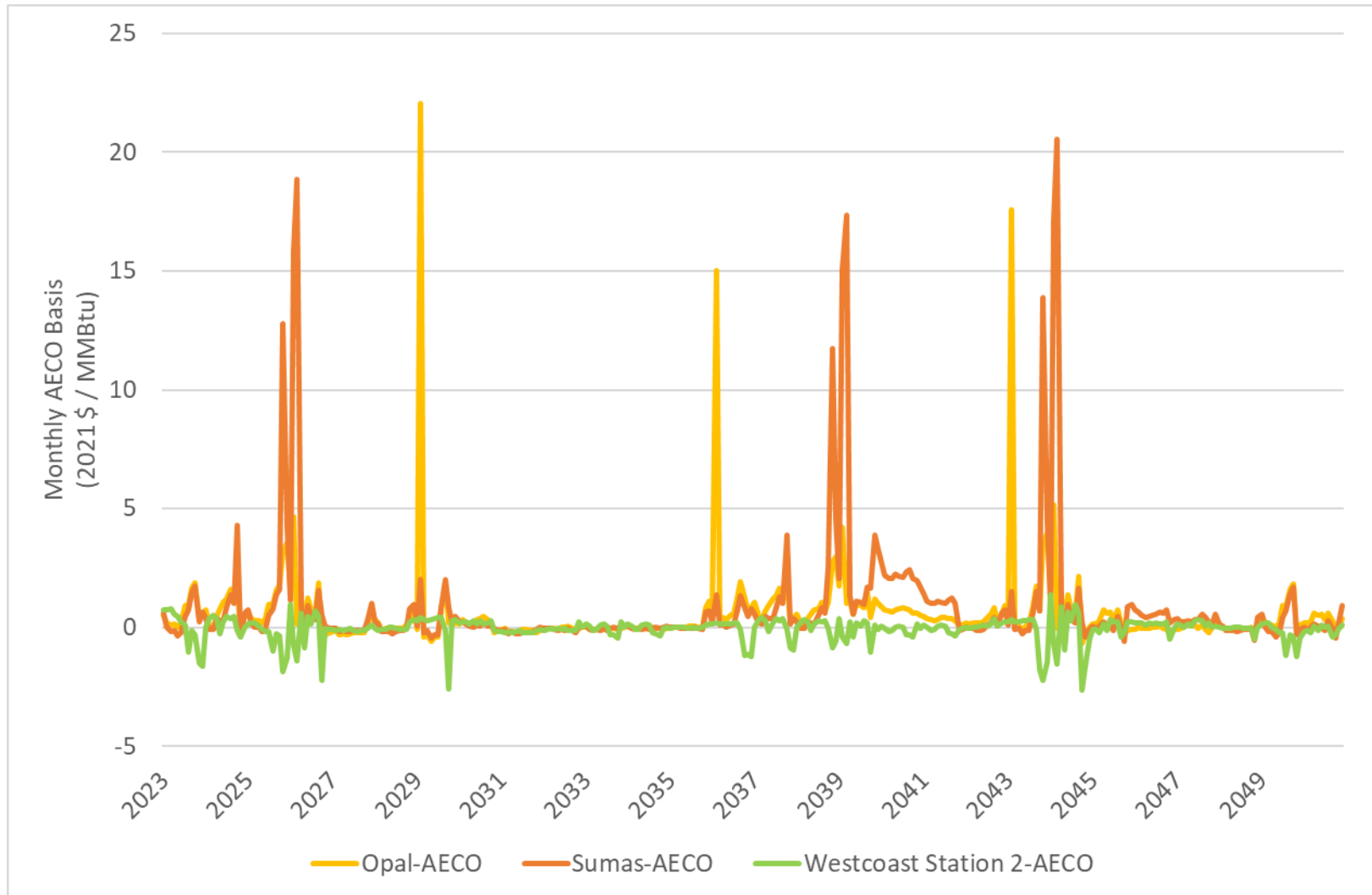
The relationship between gas price hubs was consistent from 2010 to 2017

Westcoast Station 2 typically is less expensive than AECO

Opal and Sumas are generally more expensive relative to AECO

Recent events have shown the extreme volatility in prices at Opal and Sumas

# Gas Price Simulation – Single Draw

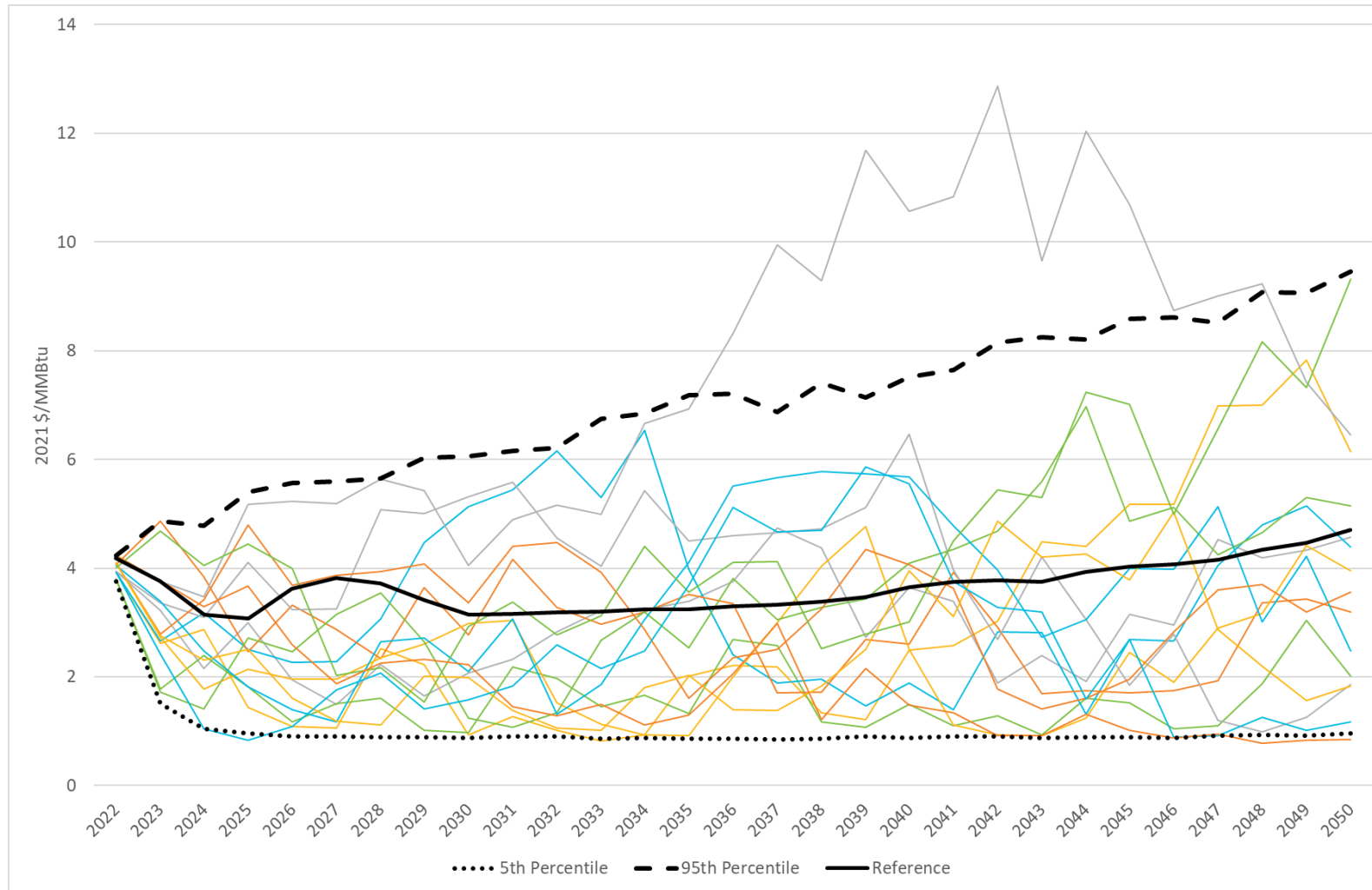


Gas price simulations must simultaneously incorporate correlation across time and the correlation across purchasing hubs

The gas prices simulation uses historical data to incorporate these two correlations

This graph show a single simulation showing the difference between AECO and the other three hubs where NW Natural purchase gas

# AECO Price Simulation

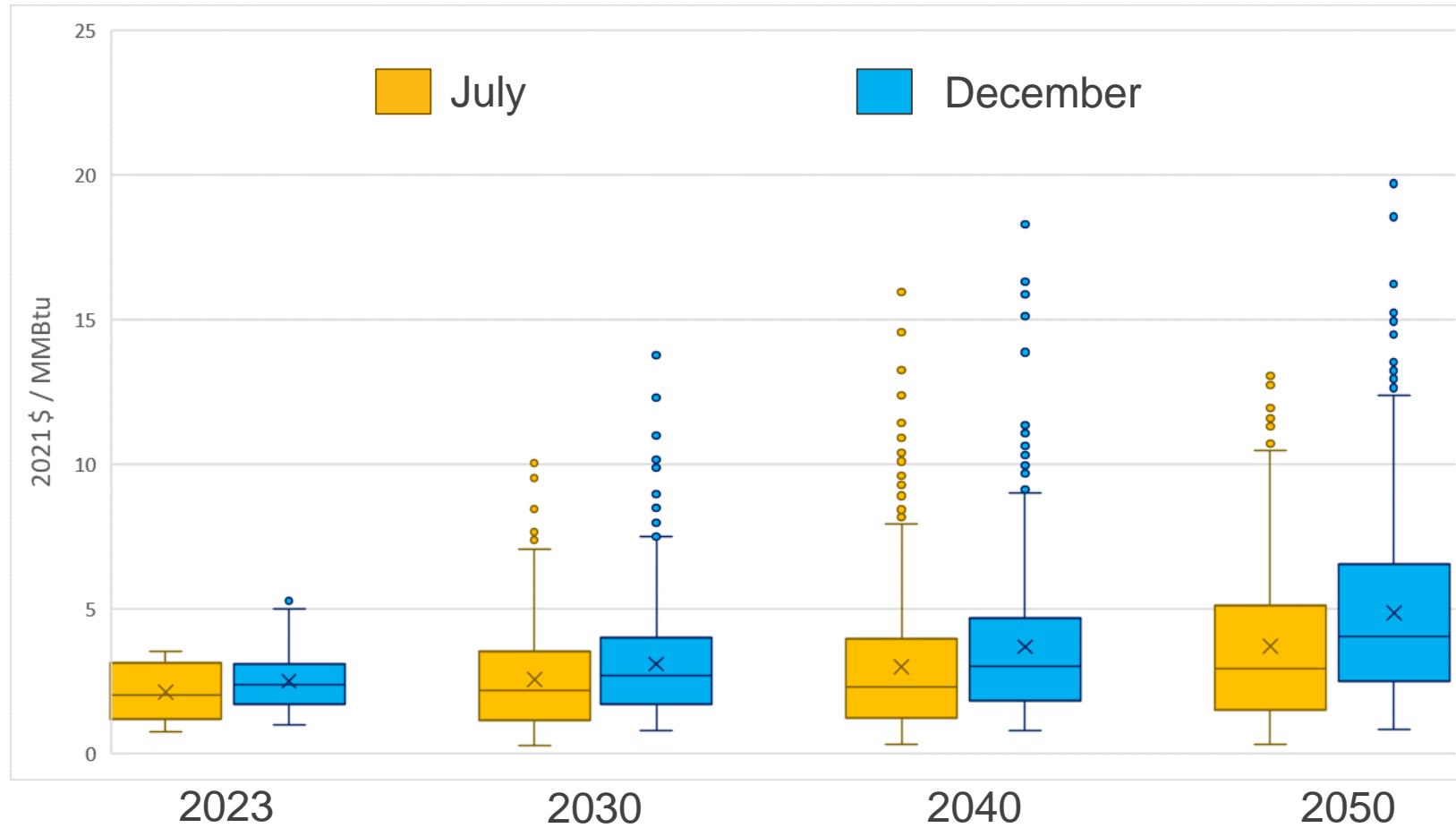


Gas prices do have seasonality in the historical data, which is reflected by higher December prices on average

This simulation is based on historical data from 2010 through 2020 gas year and used the 2020 gas year as the launch point for the simulation

The long-term uncertainty in gas prices increases further out in time

# AECO Price Simulation



Gas price do have seasonality in the historical data, which is reflected by higher December prices on average

This simulation is based on historical data from 2010 through 2020 gas year and used the 2020 gas year as the launch point for the simulation

The long-term uncertainty in gas prices increases further out in time

# Monte Carlo Outputs



# Capacity Resource Summary



Capacity Resource	Number of Draws where Resource is Selected	If Selected Average Year
Some Mist Recall	496	2023
All Mist Recall	144	2036
Mist Expansion	17	2037
Newport Takeaway 1	21	2036
Newport Takeaway 2	9	2044
Newport Takeaway 3	6	2046
Interstate Pipeline Capacity	3	2043
Portland LNG Cold Box	500	2027 <sup>†</sup>

The Portland Cold Box is selected in all 500 draws

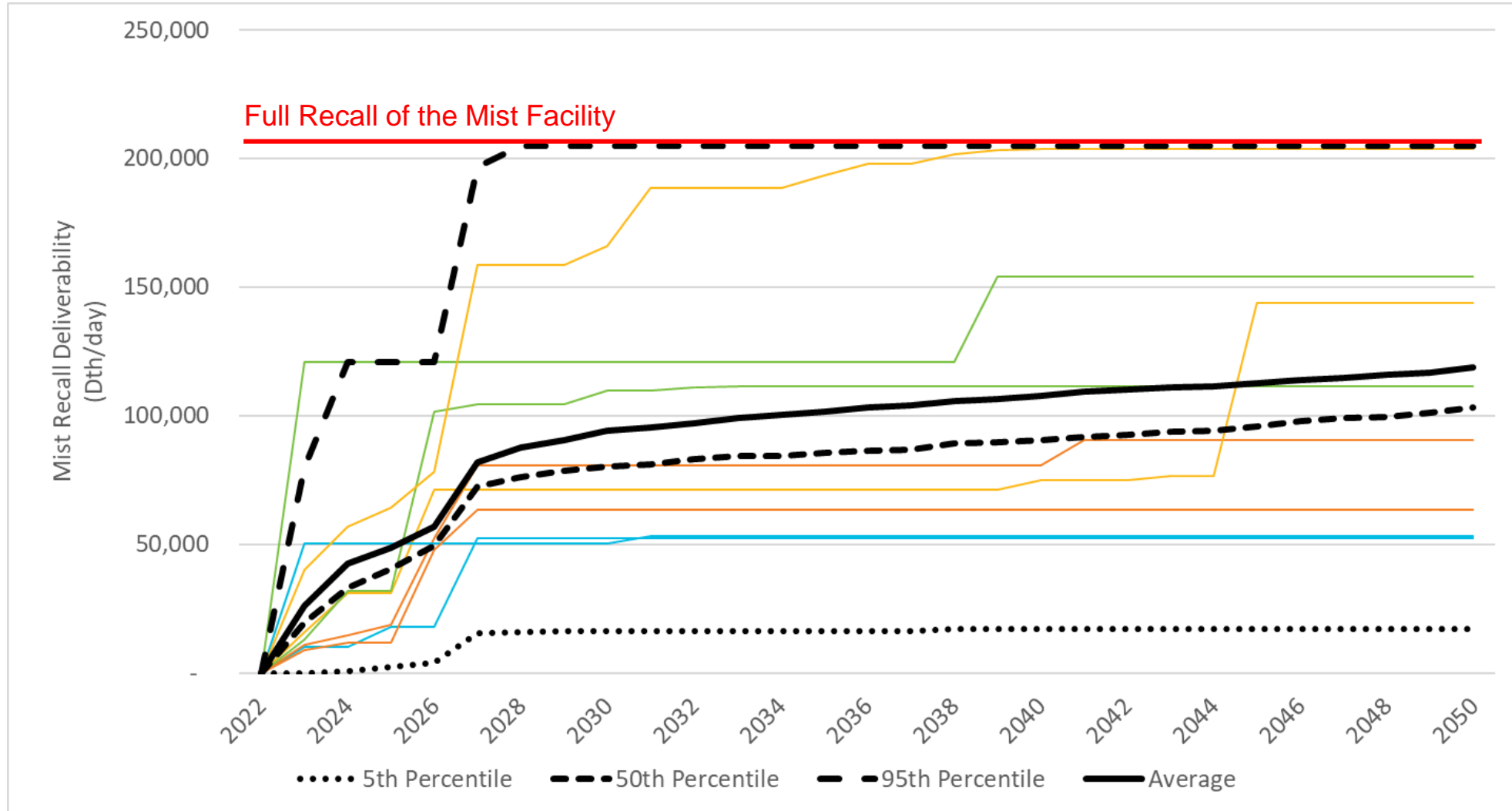
99% of the draws select some amount Mist Recall

29% of the draws recall the full Mist Facility

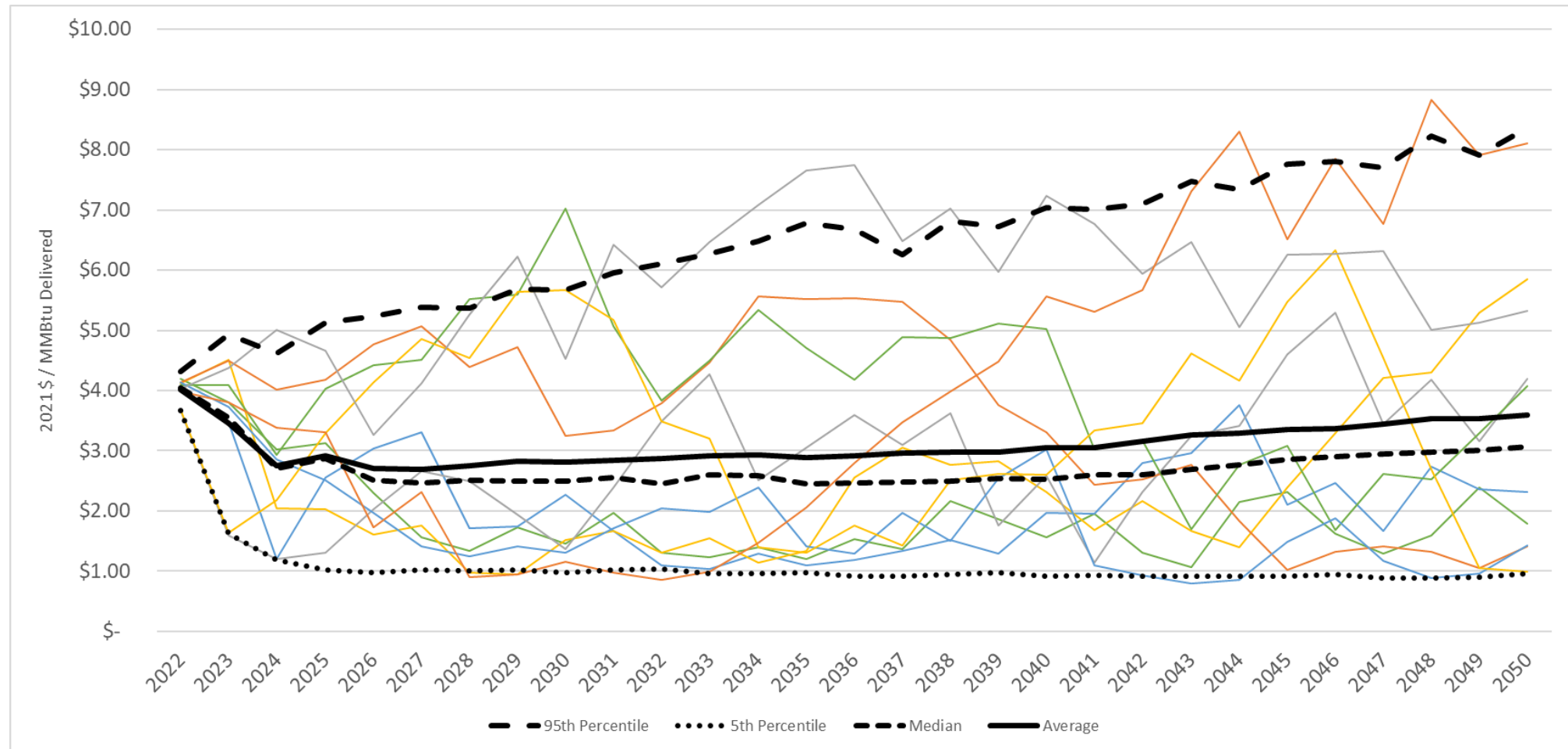
Mist is sufficient to serve peak day capacity requirements in 96% of the draws

<sup>†</sup> Portland LNG Cold Box or an alternative must be selected in 2027

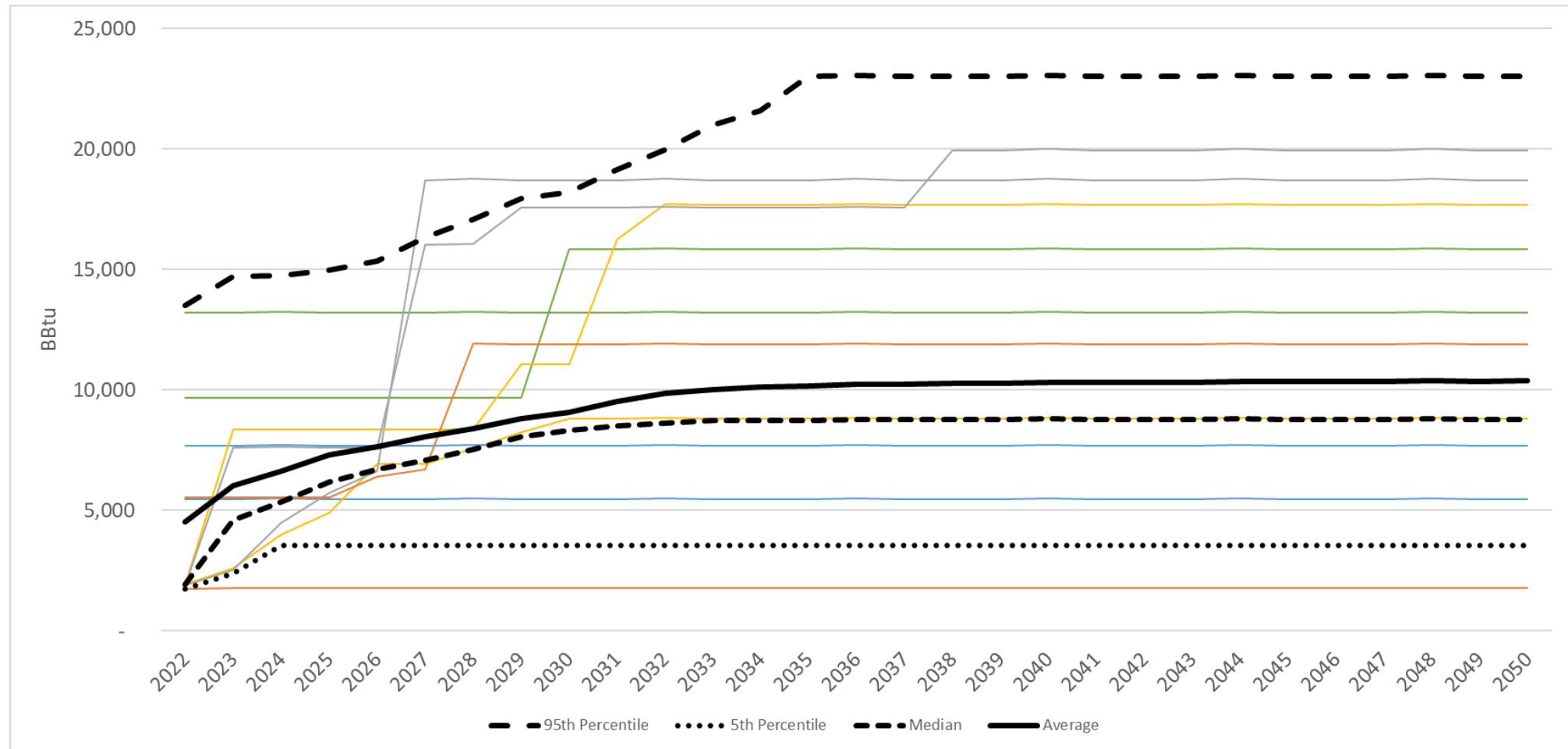
# Mist Recall Projections



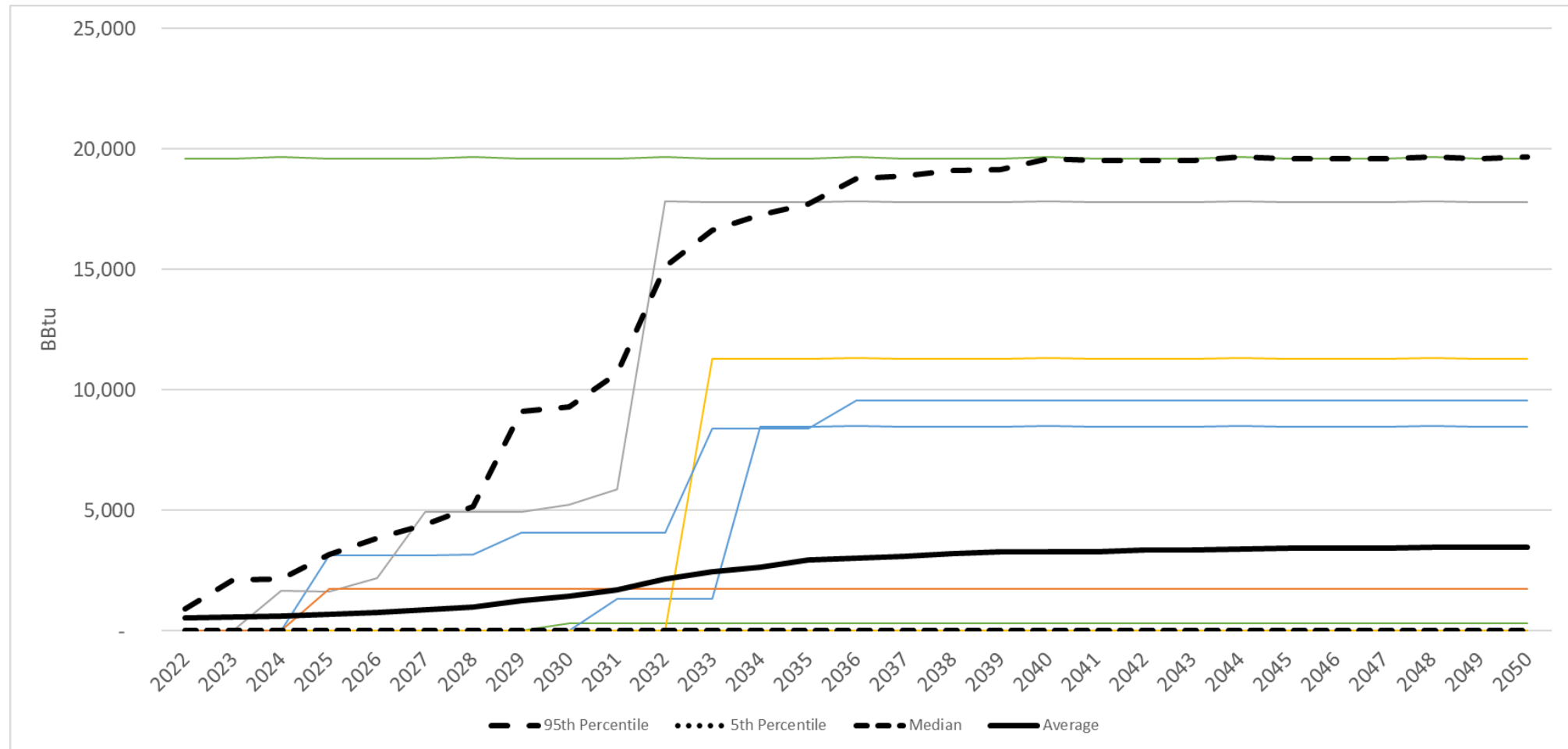
# Weighted Average Cost of Gas (WACOG)



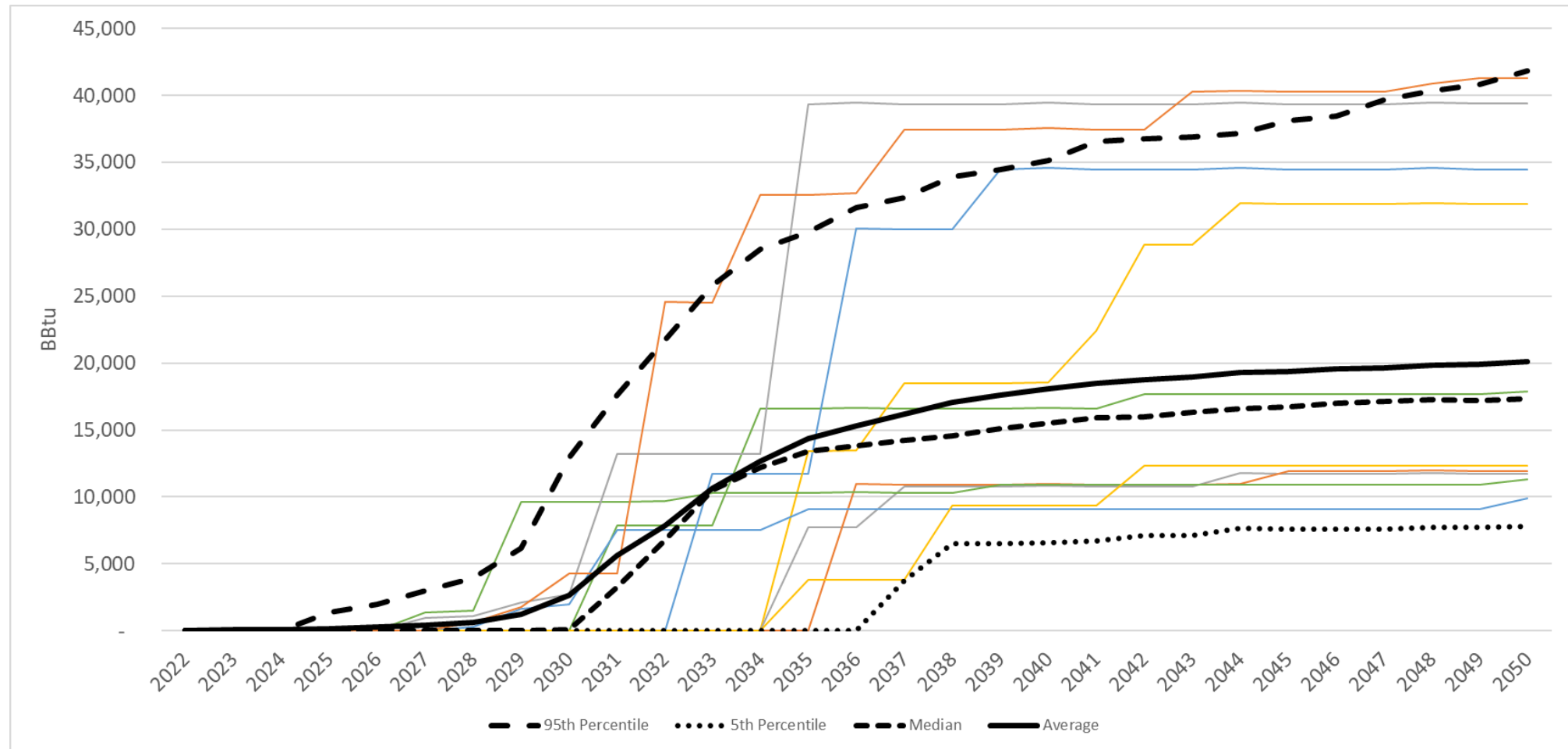
# RNG Tranche 1 – System Quantities



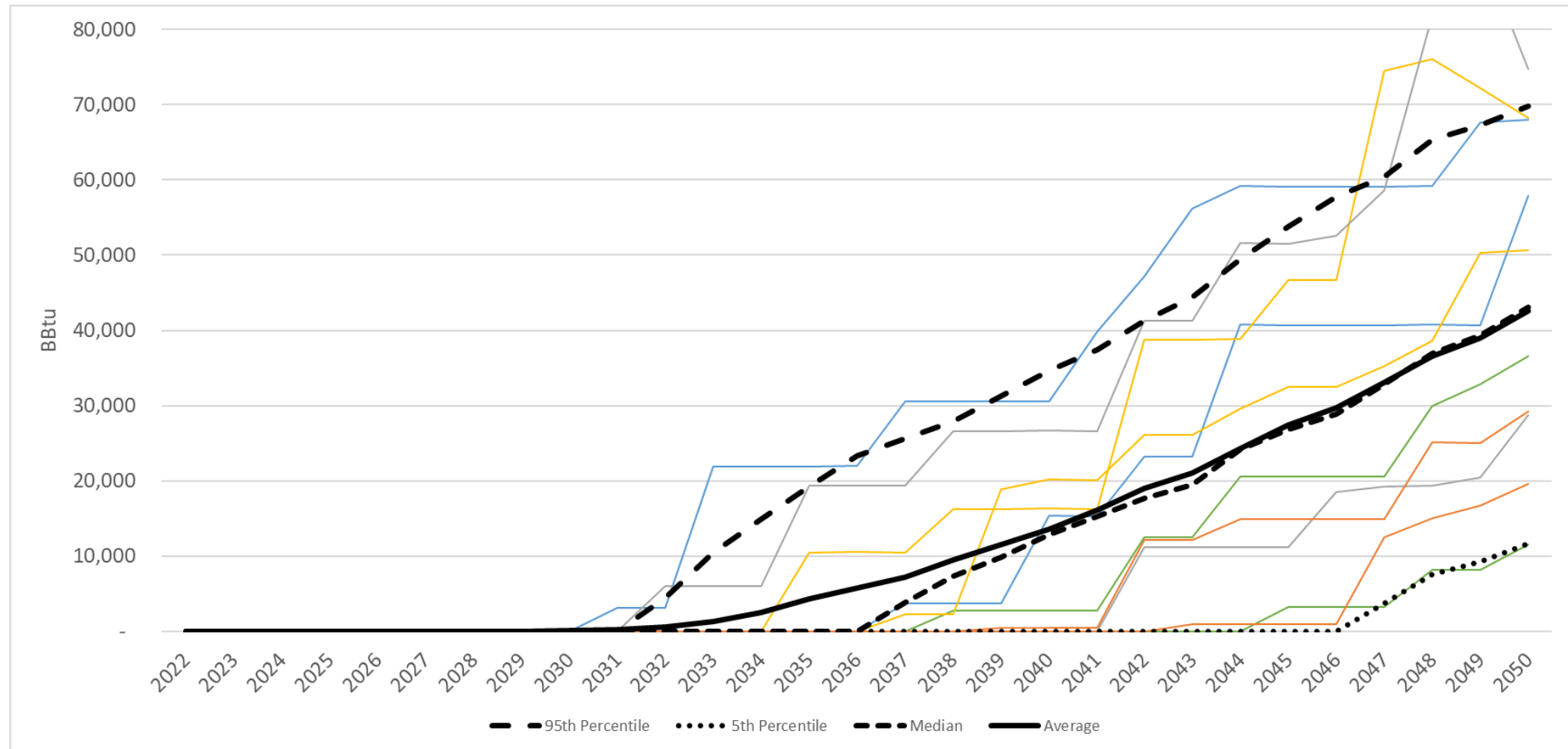
# RNG Tranche 2 – System Quantities



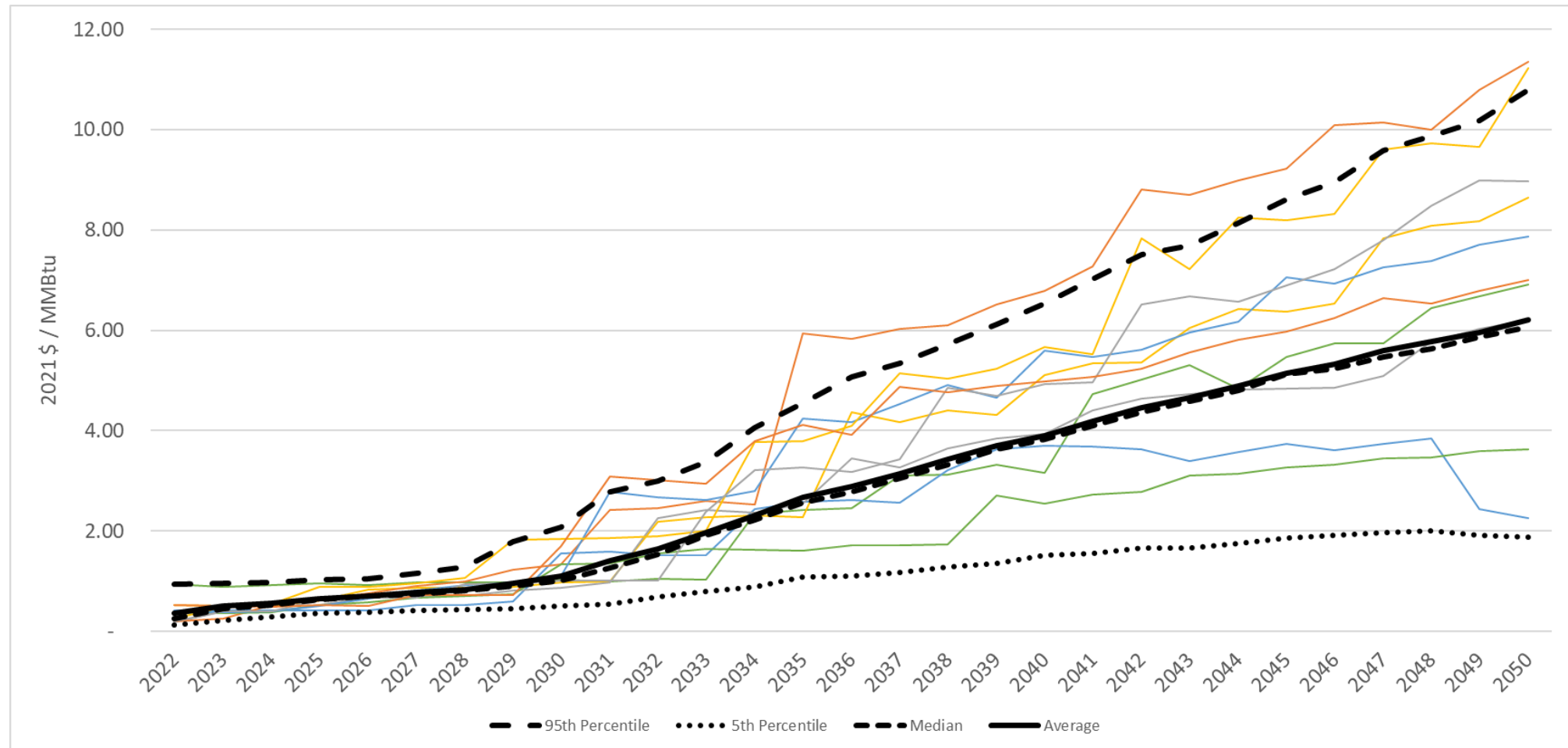
# Hydrogen – System Quantities



# Synthetic Methane – System Quantities

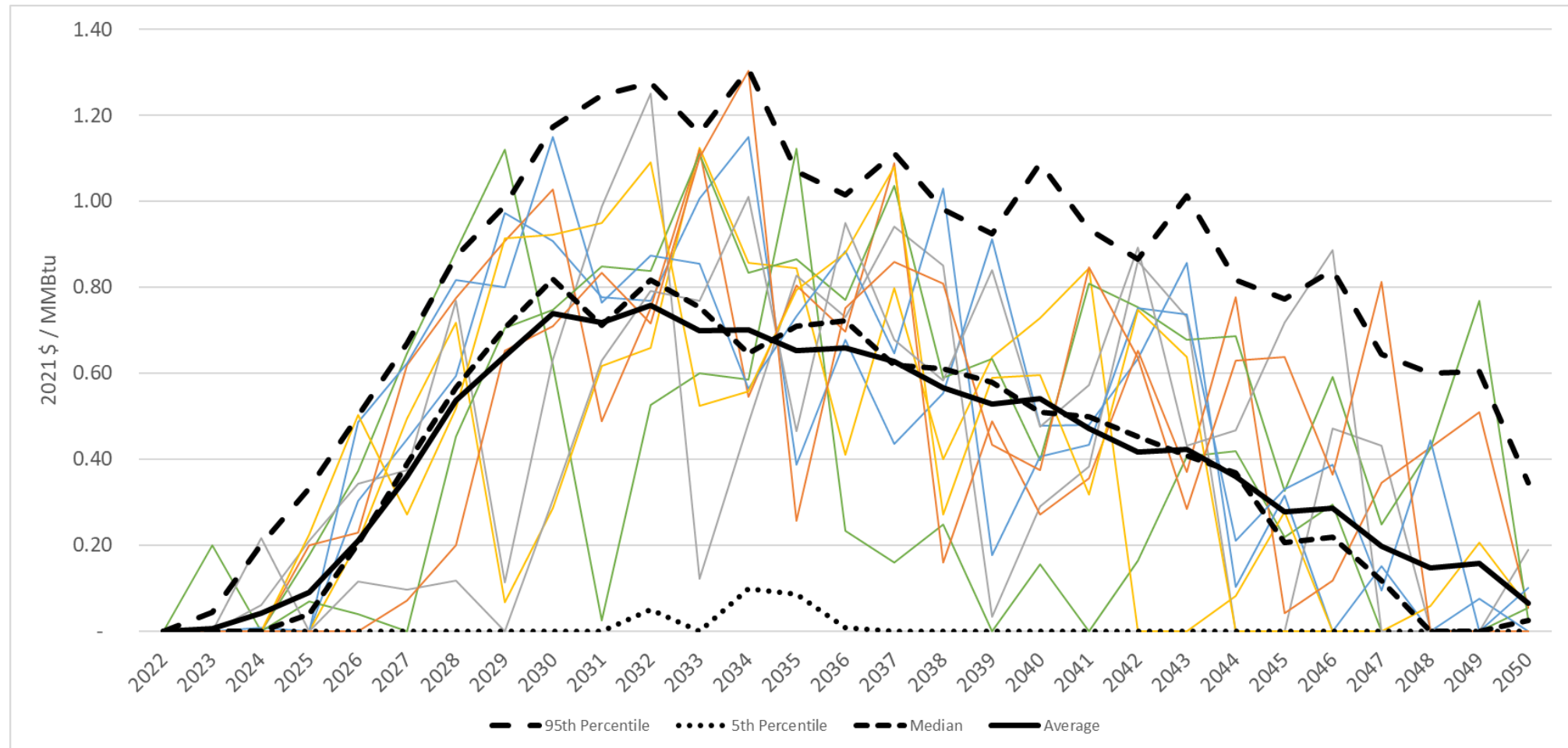


# Oregon - Weighted Costs of Decarbonization (WACOD) from Renewables

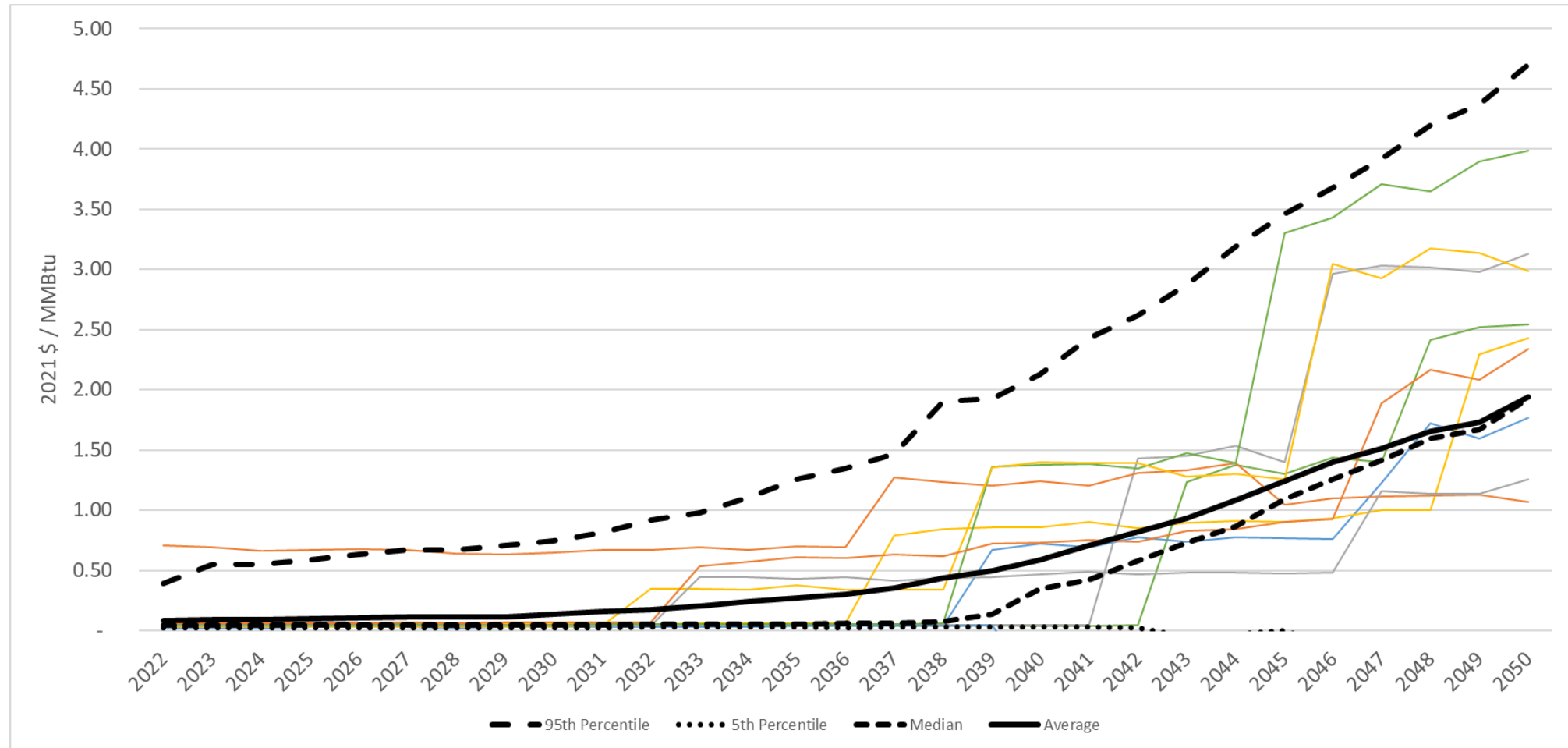




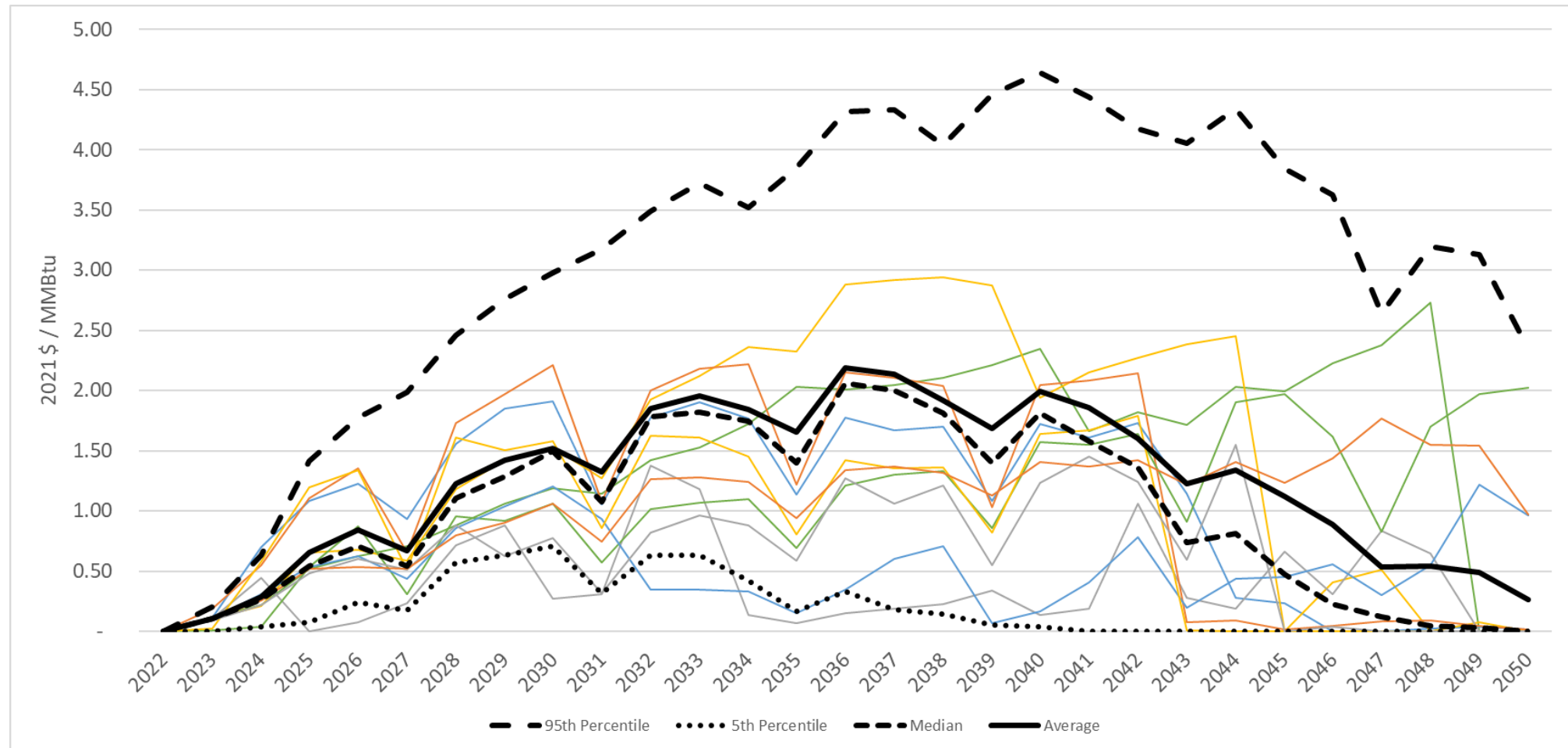
# Oregon - WACOD from CCIs



# Washington - WACOD from Renewables



# Washington - WACOD from Allowance Purchases and Offsets



# Action Plan

# Action Plan Context



- Actions are not based upon the results of a single (or “base case”) resource portfolio
- Accounts for risk and is sufficiently flexible to meet compliance needs, policy developments, and market conditions
- Actions are proposed to comply with laws and regulations and to meet current needs
- Relies upon most flexible option to fill compliance need gaps as required
- Proposes actions require a decision (inclusive of project lead times) that can wait for commission review, but are required prior to filing of the next IRP

# Capacity Resource Action Items



1. Acquire 20,000 Dth/day of deliverability from either recalling Mist, a city gate deal, or a combination of both for the 2023-24 gas year. Based upon updated load forecast in upcoming IRP updates recall Mist capacity as required for the 2024-25 and 2025-26 gas years.
2. Replace the Cold Box at the Portland liquified natural gas (LNG) facility for a targeted in-service date of 2026 at an estimated cost of \$7.5 to \$15 million.
3. Scope a residential and small commercial demand response program to supplement our large commercial and industrial programs and file by 2024.

# Oregon Emissions Compliance Action Items



1. Working through Energy Trust of Oregon acquire 8.2 million therms of first year savings in 2023 and 9.4 million therms of first year savings in 2024, or the amount identified by the Energy Trust board.
2. In Oregon, to achieve SB 98 targets, seek to acquire 3.5 million Dths of renewable natural gas (RNG) in 2024 and 4.2 million Dths of RNG in 2025, representing 5% and 6% normal weather sales load in 2024 and 2025.
- ~~3. Work with Energy Trust of Oregon, the Alliance of Western Energy Consumers and other stakeholders to develop energy efficiency programs for transportation schedule customers by 2024.~~
4. In Oregon, purchase Community Climate Investments representing any additional Climate Protection Plan (CPP) compliance needs for years 2022 and 2023 in Q4 2023 and for year 2024 in Q4 2024 based upon actual emissions to ensure compliance with the 2022-2024 compliance period.

# Washington Emissions Compliance Action Items



1. In Washington, acquire carbon offsets compliant with the Climate Commitment Act's Cap-and-Invest program for 5% of expected weather emissions in year 2023 and 2024. Seek to acquire additional offsets representing 3% of expected weather emissions allowed for CCA compliance on tribal lands, and if they can be acquired for a lower price than the program allowance price floor for years 2023 and 2024, acquire these offsets.
2. In Washington, to support HB 1257, seek to acquire 600,00 Dths of renewable natural gas (RNG) in 2024 and 800,000 Dths of RNG in 2025, representing 6% and 8% of normal weather compliance gas in 2024 and 2025.
3. In Washington, purchase emissions allowances equal to emissions at an estimate of the 95<sup>th</sup> percentile of need for annual compliance net of voluntary RNG, carbon offsets, and freely allocated but not consigned allowances.



# Distribution System Action Item



1. In Oregon, uprate the Forest Grove Feeder (also known as the McKay Creek Feeder) to be in service for the 2025 gas year at an estimated cost of \$3.0 to \$7.0 million.



# Questions/Feedback

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[irp@nwnatural.com](mailto:irp@nwnatural.com)