CASCADE NATURAL GAS CORPORATION®
A Subsidiary of MDU Resources Group, Inc.

In the Community to Serve®

Integrated Resource Plan Targeted Technical Advisory Group Meeting #3

JUNE 10, 2026

MICROSOFT TEAMS/TELECONFERENCE

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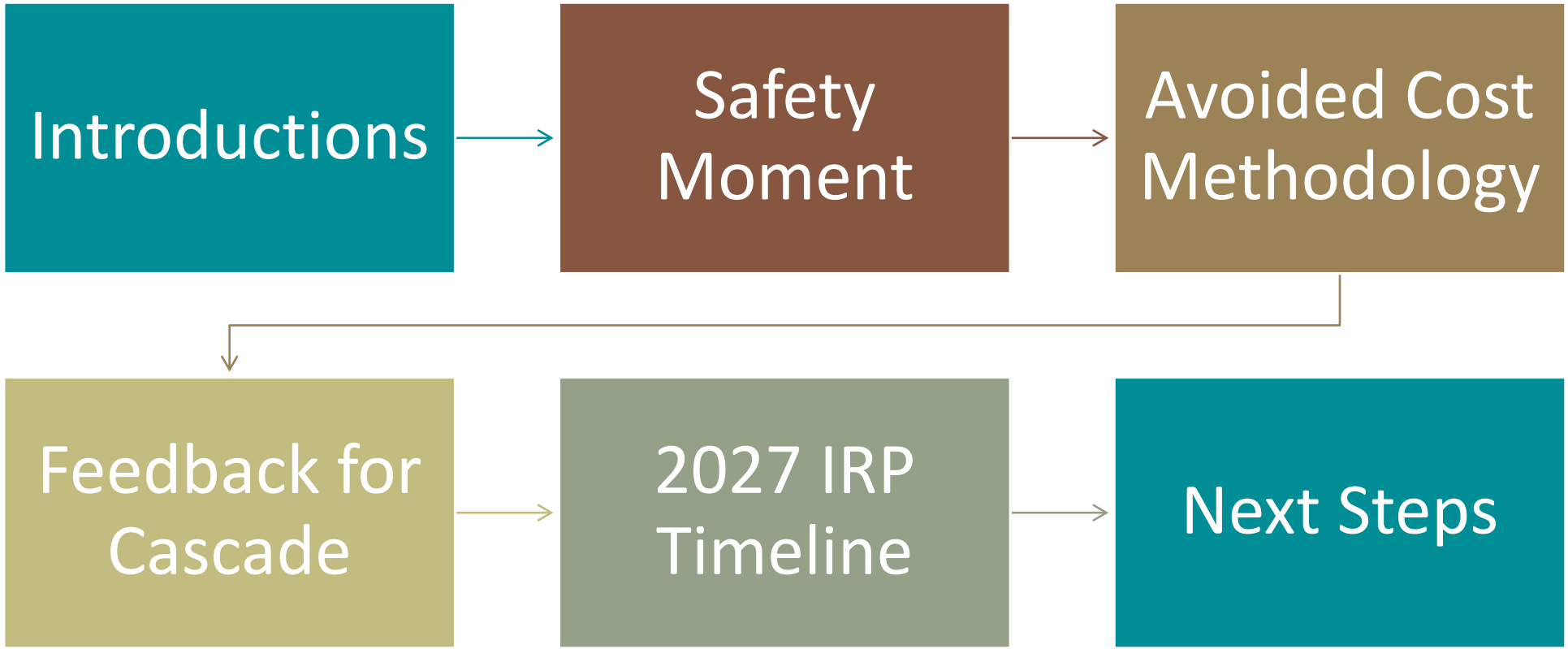
Agenda


Introductions
Safety Moment
Avoided Cost Methodology
Feedback for Cascade
2027 IRP Timeline
Next Steps

Safety Moment

Get Grilling Safely

- Grill outside and away from buildings
- Station grill on a level surface and stable ground
- Keep it clean
- Take care when lighting
- Keep children and pets away from grilling area
- Be ready to put out the fire - - DO NOT use water
- Practice good food safety; ensure food is cooked to correct temperature before serving

Avoided Cost Methodology and Calculation

Avoided Cost Overview

As part of the IRP process, Cascade produces a 24-year price forecast and 45 years of avoided costs.

The avoided cost is an estimated cost to serve the next unit of demand with a supply side resource option at a point in time. This incremental cost to serve represents the cost, including environmental impacts, that could be avoided through energy conservation.

The avoided cost forecast can be used as a guideline for comparing energy conservation with the cost of environmental impacts, acquiring, and transporting natural gas to meet demand.

Avoided Cost Overview

For the 2027 IRP, Cascade will continue to use the information learned from prior IRPs to create a transparent and intuitive final avoided cost.

The various elements of the avoided cost have been reconsidered with regards to emissions reductions goals.

The Company produces an expected avoided cost case based on peak day and, in the case of distribution system costs, peak hour.

Avoided Cost Formula

The components that go into Cascade's avoided cost calculation are as follows:

$$AC_{nominal} = (TC_v + TC_F + SC_v + CC + E_{Comp} + DSC + RP) * E_{adder}$$

Where:

$AC_{nominal}$ = The nominal avoided cost for a given year. To put this into real dollars you must apply the following: Avoided Cost/(1+Discount Rate)^Years from the base year.

TC_v = Variable Transportation Costs

TC_F = Fixed Transportation Costs (When Avoidable)

SC_v = Variable Storage Costs

CC = Commodity Costs

E_{Comp} = Environmental Compliance Costs

DSC = Distribution System Costs

RP = Risk Premium

E_{adder} = Environmental Adder, as recommended by the Northwest Power and Conservation Council

Transportation Costs

Variable Transportation costs are pulled directly from the major pipelines that Cascade utilizes (NWP, GTN, Enbridge, Ruby, Nova Gas Transmission (NGTL) and Foothills).

Upstream transportation costs can be broken out into two elements: fixed costs and variable costs.

- Fixed costs or reservation costs are what Cascade pays to the upstream pipelines regardless of whether gas flows on the pipeline. In previous IRPs, these were considered not avoidable for existing contracts. In the current IRP, since growth is relatively flat, Cascade is considering including fixed transportation costs in the avoided cost.
- Variable costs are paid when gas flows on the upstream pipeline. These are avoidable costs.
  - Different upstream pipelines charge different rates for their variable costs. Since the avoided costs is concerned with the marginal cost of the next therm that flows, Cascade takes an average of these pipelines variable rates. Since it's not known which pipeline that therm will flow on.
- Fixed costs on proposed incremental upstream transportation are considered an avoidable cost and can be part of the final calculation.

Storage Costs

Storage costs are only captured if there is an avoidable future storage.

- An example of this would be an on-system storage facility that is utilized to serve peak day demand.
- For Cascade's system, all storage is off-system and provides a net-positive benefit to customers, so it does not qualify as an avoided cost.

Commodity Costs

Cascade's avoided commodity cost approach is intended to represent the marginal cost of procuring physical gas supply. This is appropriately captured through the Company's 24-year price forecast, which reflects expected market-based commodity costs.

In past IRPs, there were questions about the cost of low carbon alternative fuels such as RNG being used as the commodity cost. Those costs are captured in the environmental compliance cost.

Environmental Compliance Costs

For Washington, Cascade is including the Social Cost of Carbon with a 2.5% discount rate, adjusted to real 2026 dollars.

- This is done in accordance with RCW80.28.395 which requires the use of the Social Cost of Carbon to value cost of greenhouse gas emissions resulting from the use of natural gas.

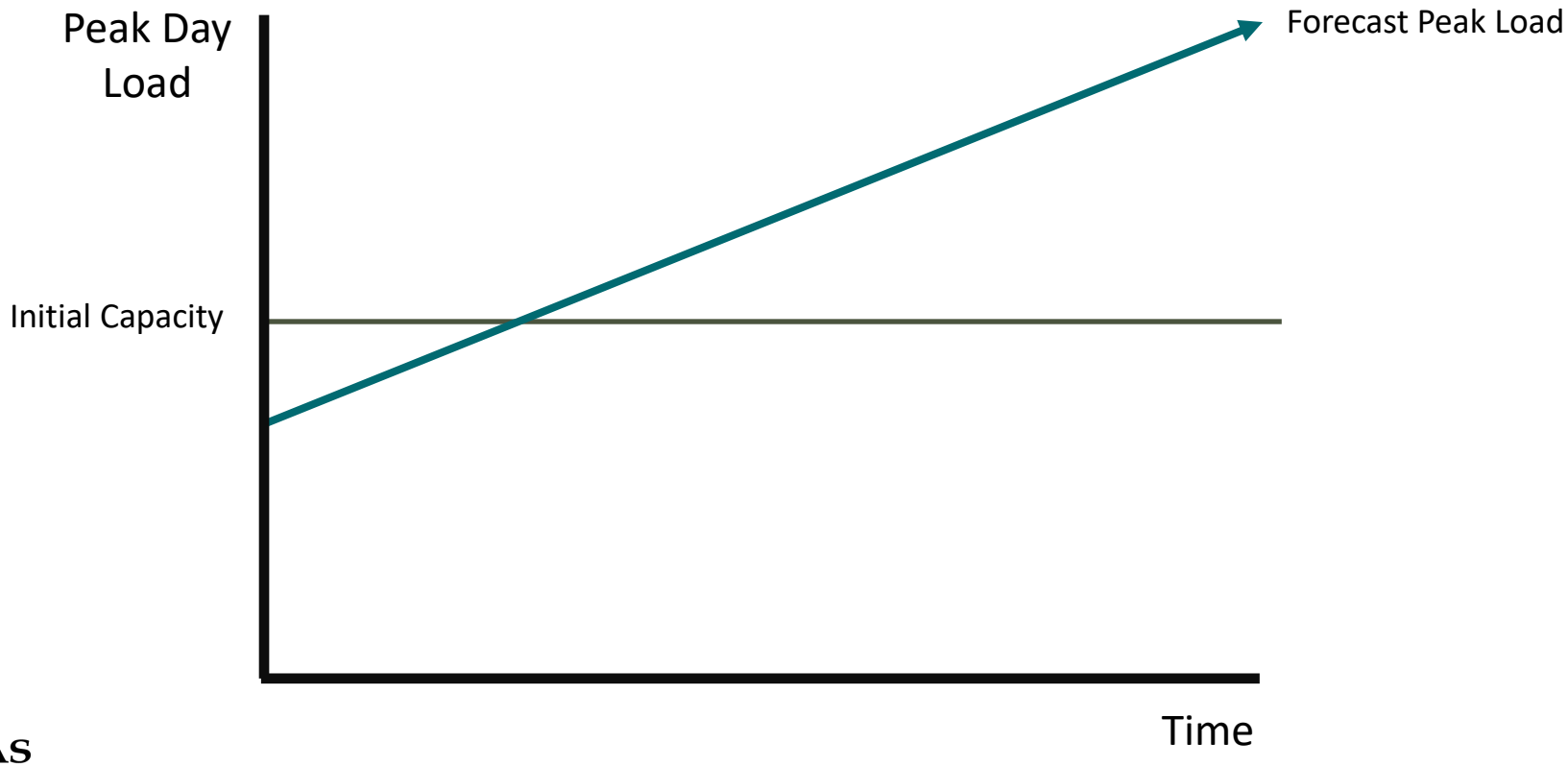
Cascade also includes the company's marginal compliance cost to meet the Climate Commitment Act and the Climate Protection Program.

- For example, projected cost of CCA allowances or Renewable Thermal Credits from a low carbon alternative fuel.

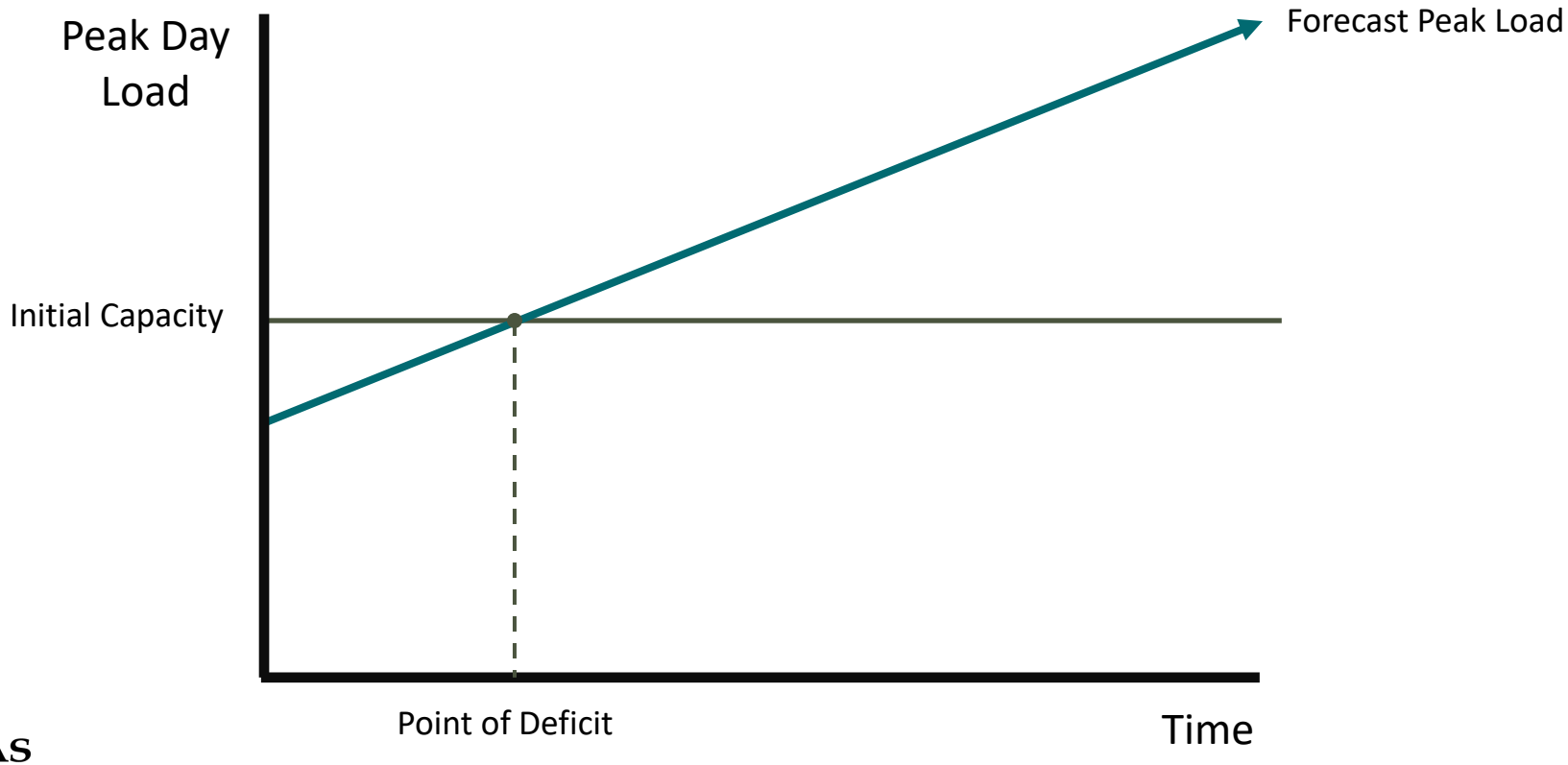
Methodology – Distribution System Costs

- The Company's distribution system cost calculation looks at forecasted capital expenses related ONLY to growth and uses the company's load growth forecast to translate these costs to a per therm basis.
  - Additionally, it's important to recognize that while energy efficiency may not be able to fully eliminate the need for a distribution system enhancement, it can defer the need for these enhancements to a later year. Because of the economic principle of the time value of money, this deferral has value, and that value is the avoided distribution system cost.
- Since Avoided Cost is based on peak day, this deferral value is then multiplied by the ratio of peak day demand to an average day's demand to get the impact on peak day.
- Distribution system analysis is concerned with the pressure during peak hour, so the daily number must then be multiplied by the ratio of peak hour demand to that day's average hourly demand.

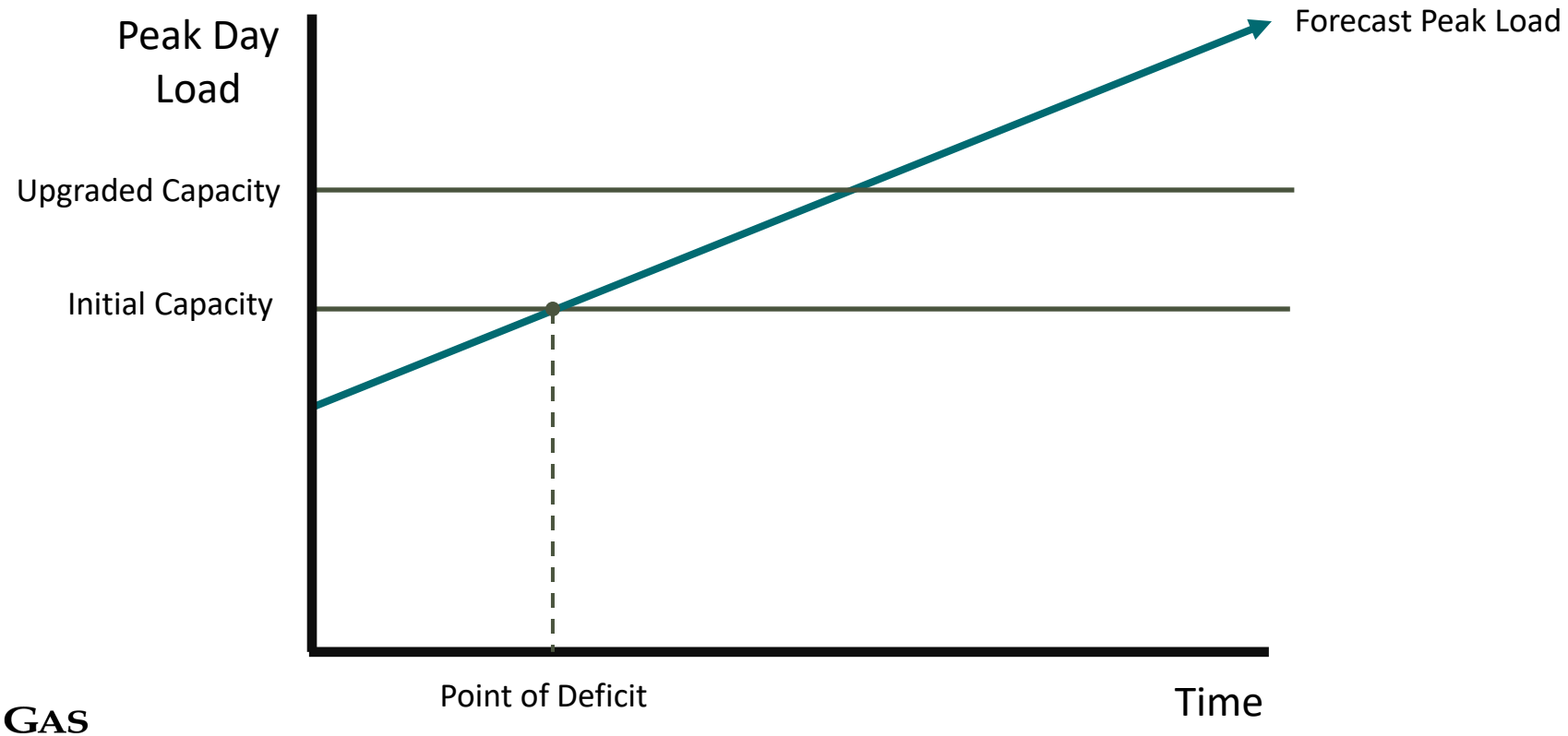
Capacity Modeling



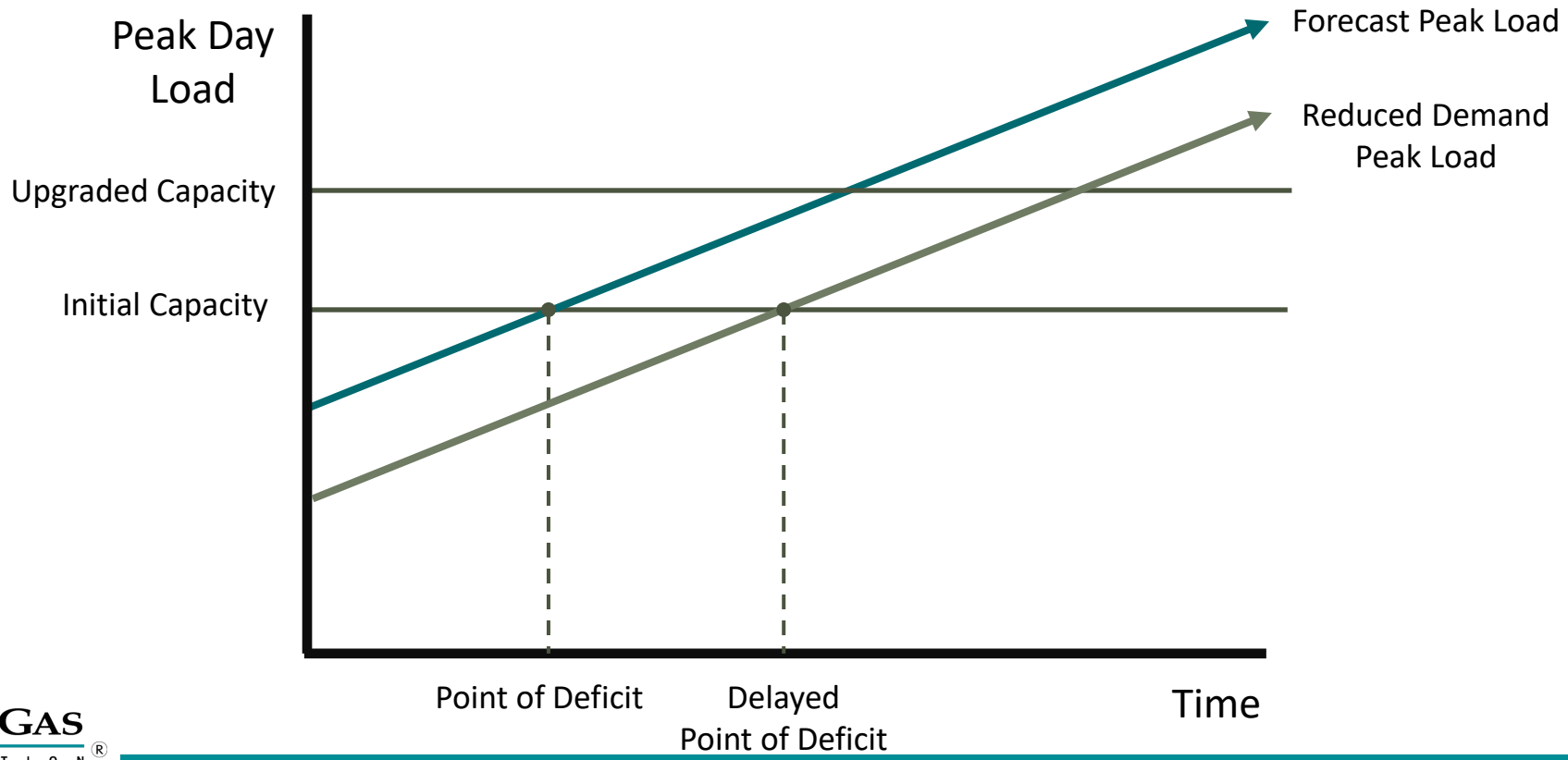
Capacity Modeling



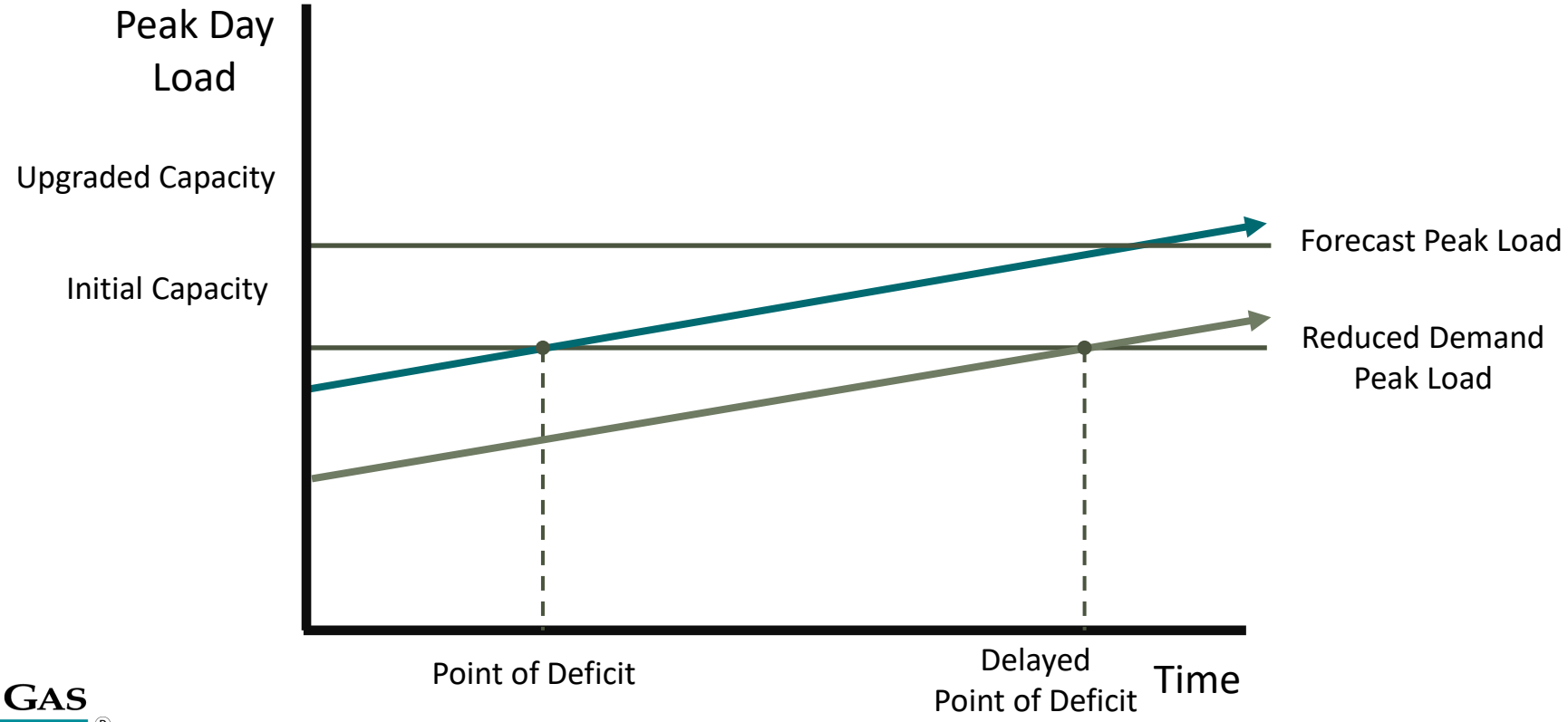
Capacity Modeling



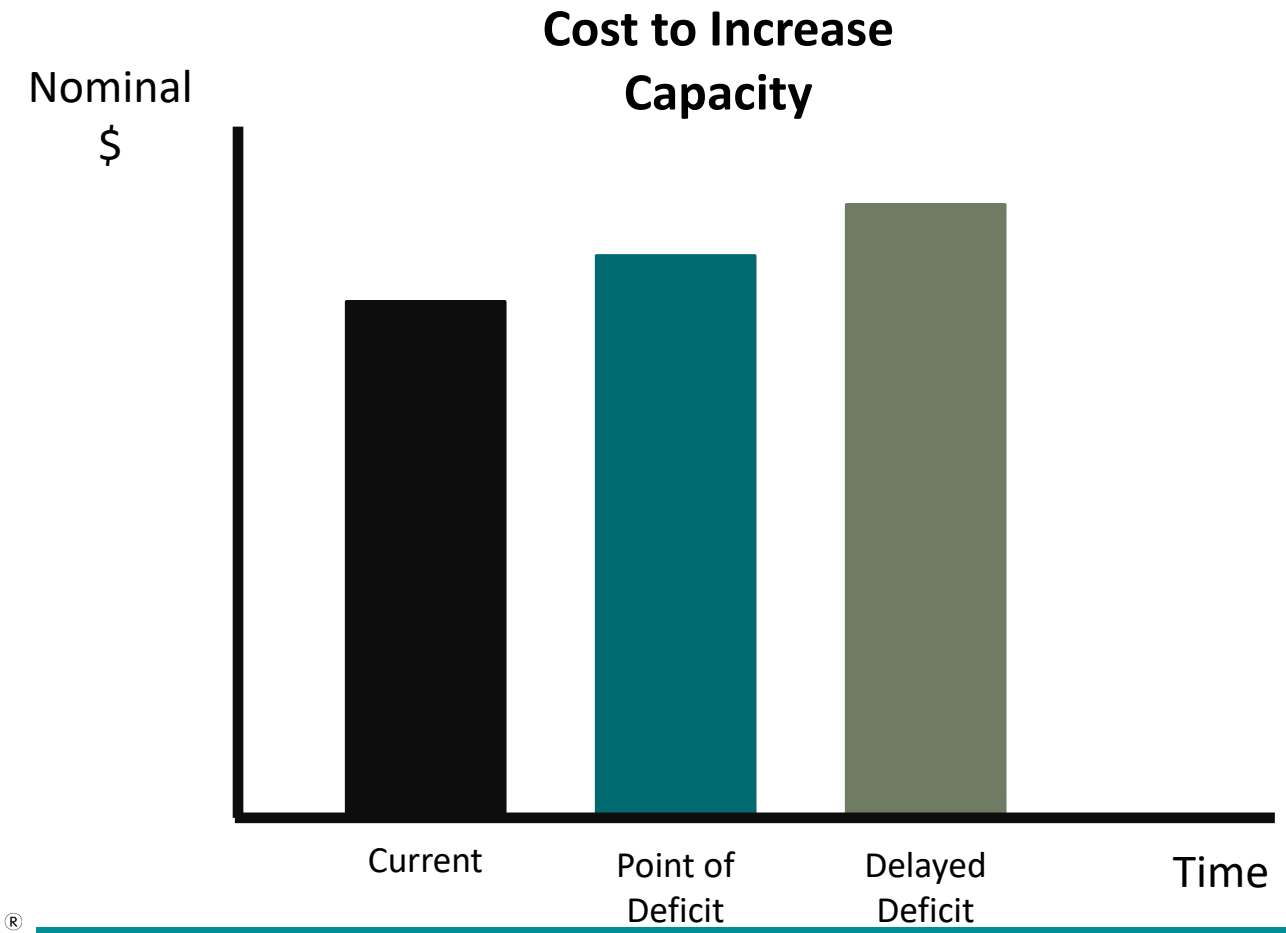
Capacity Modeling



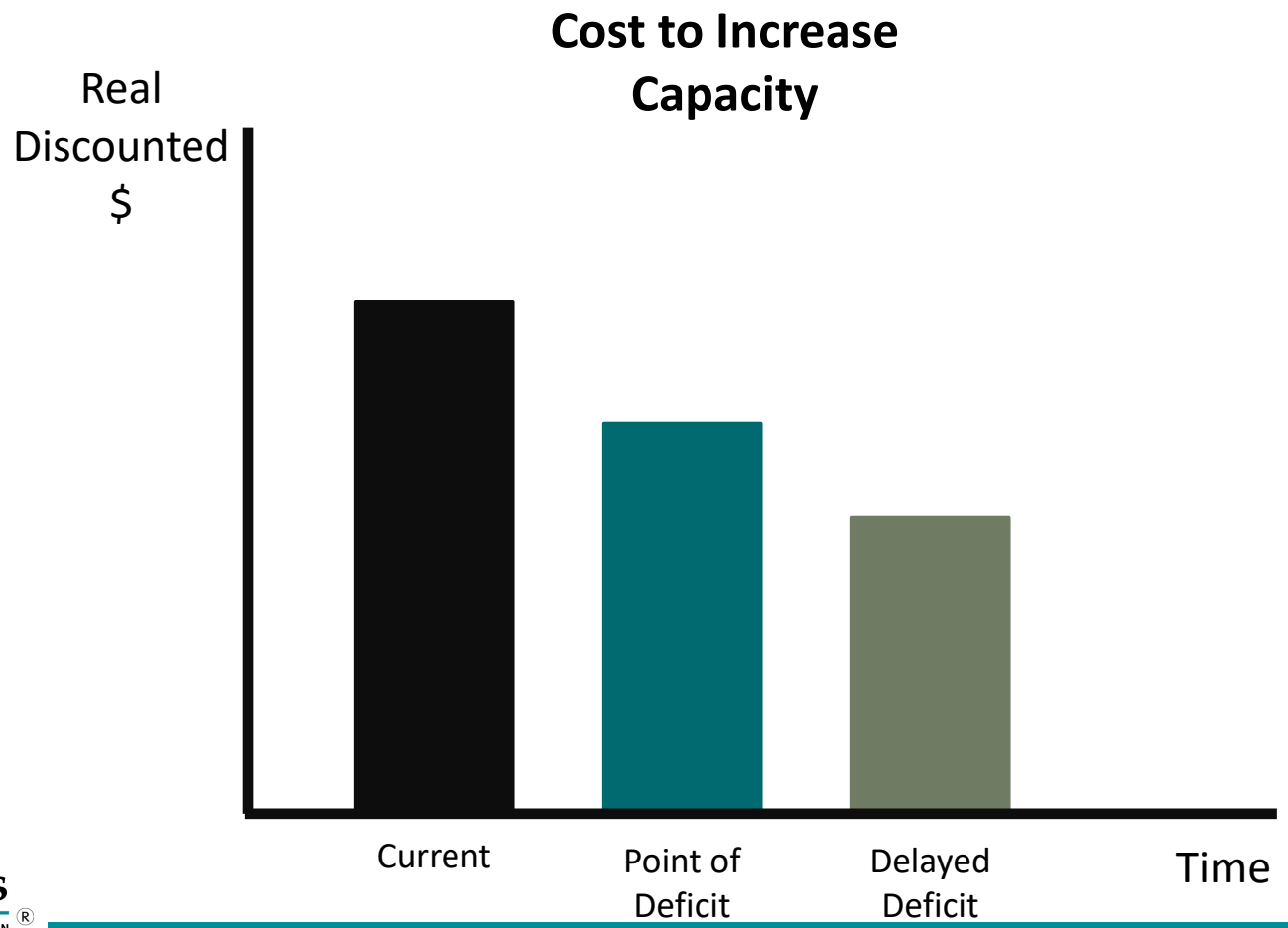
Capacity Modeling



Cost of Capacity Enhancement



Deferral Valuation



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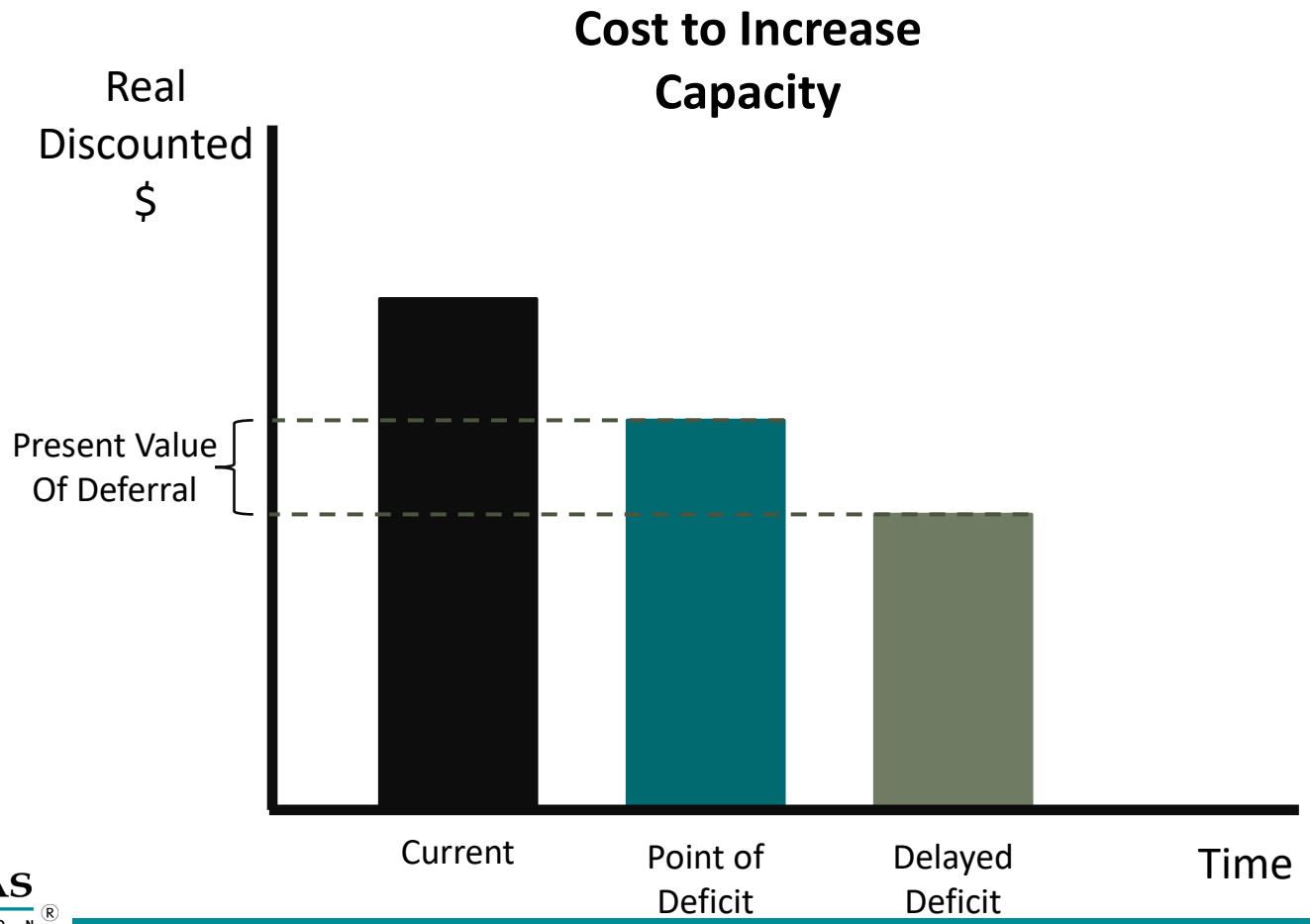
Deferral Valuation



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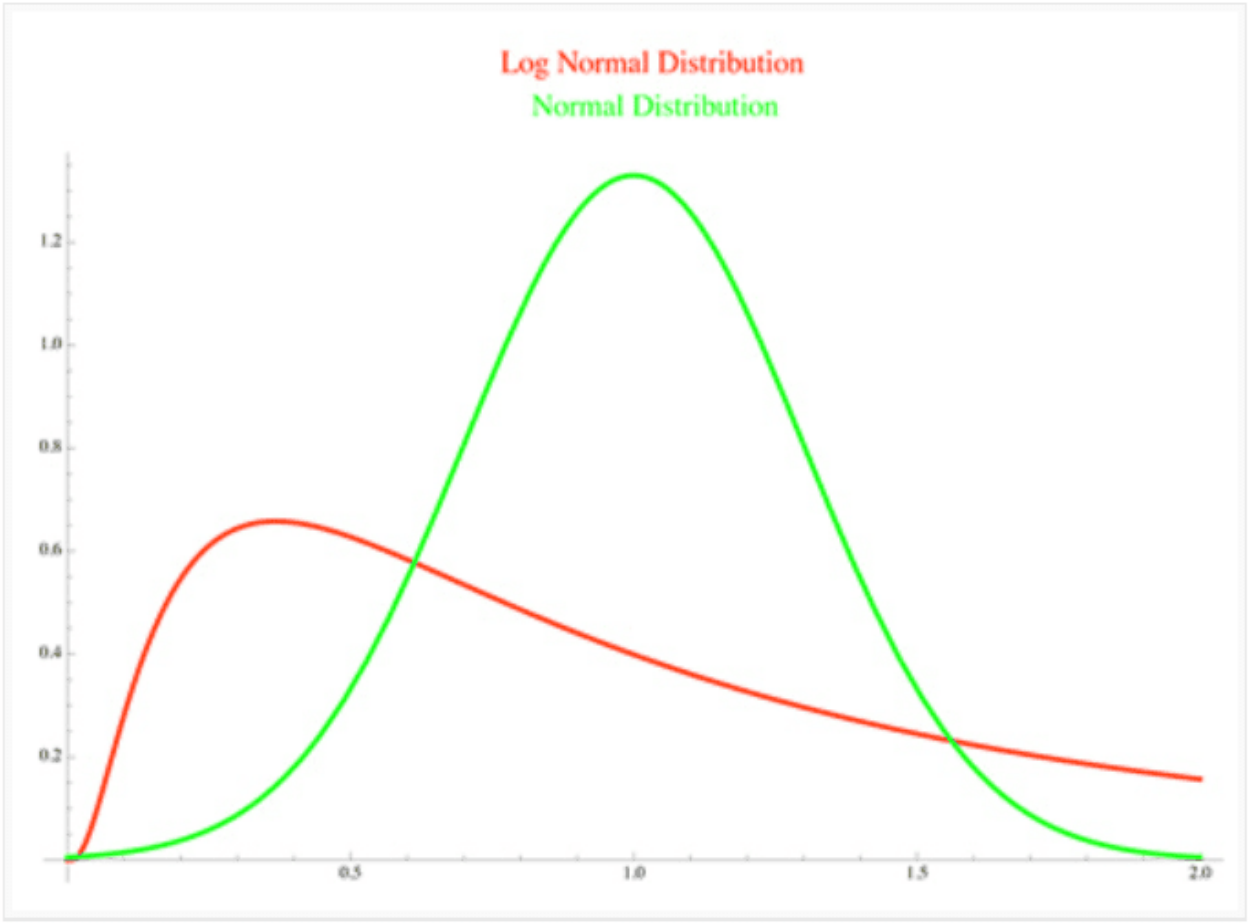
Methodology – Risk Premium

Cascade defines risk premium as the difference between the impacts of a potential extreme upward price movement versus that of an extreme downward price movement.

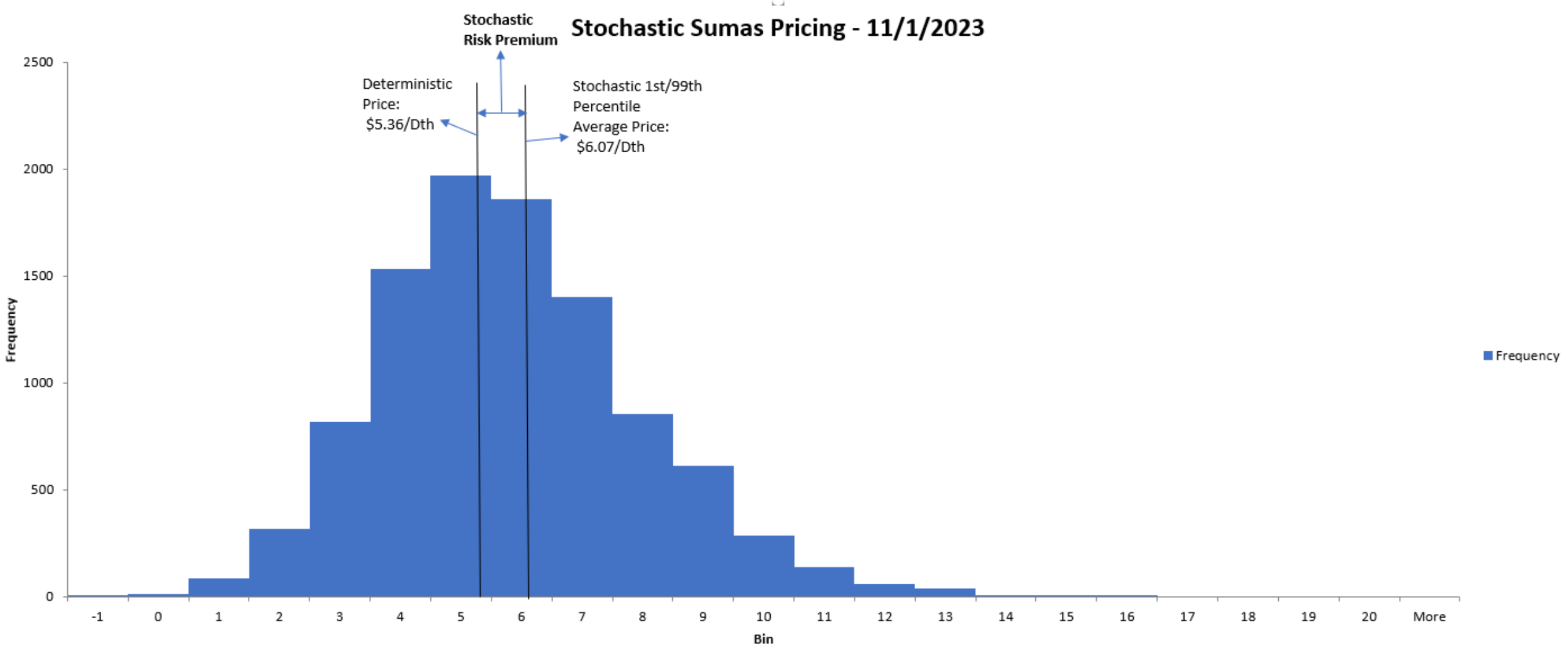
Due to the lognormal nature of stochastic gas prices, the risk presented from rising prices will typically exceed that of falling prices.

This analysis is used in a risk-adjusted price calculation, where the stochastic risk premium is compared to an annualized deterministic price to calculate the final risk premium.

Cascade includes a risk premium to commodity costs of natural gas as well as the cost of carbon compliance.



A Quick Visual: Normal vs. Lognormal Distributions



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Risk-Adjusted Risk Premium Final Calculation

(Deterministic Price * .75 + (((99th Percentile Stochastic Price + 1st Percentile Stochastic Price) /2) * .25)) - Deterministic Price

- Captures the difference between expected pricing and a blend of deterministic and stochastic pricing.
- This methodology is consistent with other risk-adjusted processes in Cascade's IRP, and informed by the calculations performed by other regional LDCs.
- Accurately captures the increasing uncertainty around pricing, as nominal risk premium generally increases over time.

2025 IRP Avoided Cost Risk Premium

Year	Risk Reduction Value ($/Dth)	Environmental Compliance Risk Reduction Value ($/Dth)
2026	-$0.010	$ -
2027	-$0.009	$ 0.036
2028	$0.009	$ 0.036
2029	$0.035	$ 0.041
2030	$0.070	$ 0.045
2031	$0.046	$ 0.049
2032	$0.057	$ 0.068
2033	$0.055	$ 0.070
2034	$0.054	$ 0.075
2035	$0.092	$ 0.079
2036	$0.083	$ 0.084
2037	$0.087	$ 0.088
2038	$0.085	$ 0.091
2039	$0.101	$ 0.095
2040	$0.072	$ 0.101
2041	$0.078	$ 0.106
2042	$0.049	$ 0.111
2043	$0.037	$ 0.115
2044	$0.070	$ 0.120
2045	$0.160	$ 0.124
2046	$0.219	$ 0.129

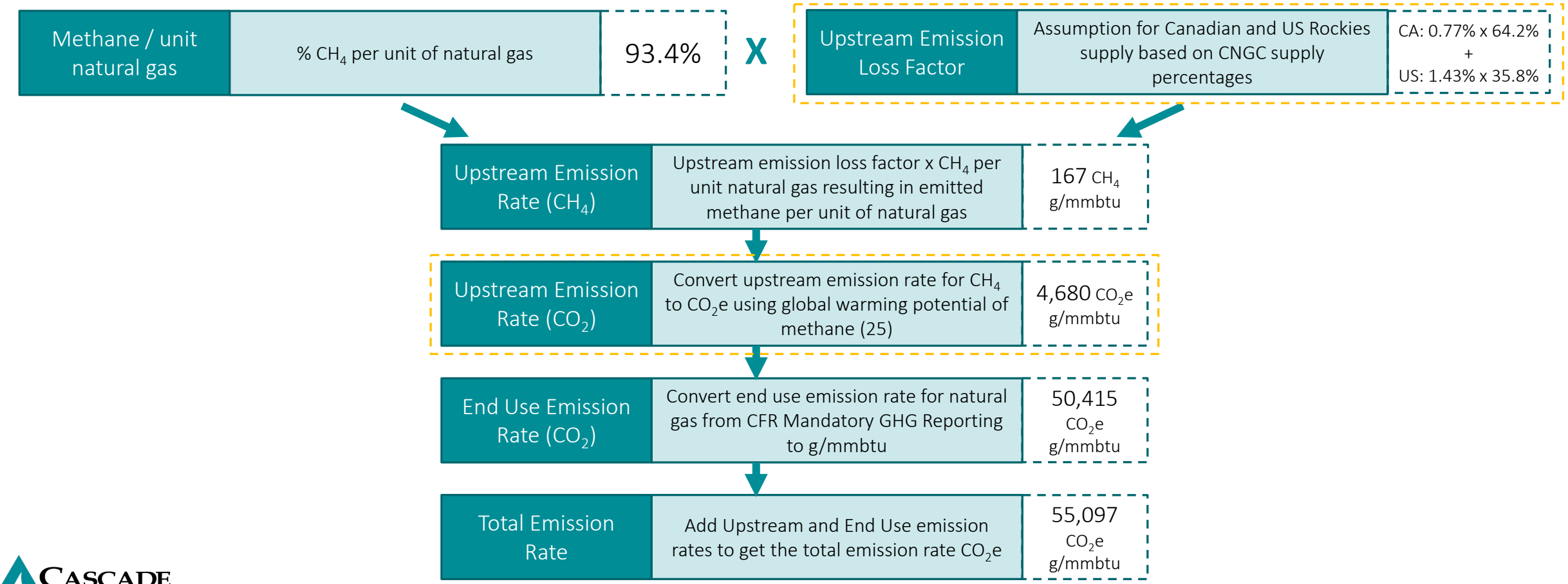
Environmental Adder

Environmental adder applies to all elements of the avoided cost, at 10%, per the Pacific Northwest Electric Power Planning and Conservation Act.[1]

1 HTTPS://WWW.NWCOUNCIL.ORG/REPORTS/NORTHWEST-POWER-ACT/

Cascade's Upstream Emission Rate Methodology (WA)

Equation: $Emission\ Rate_{Total} = \mathbf{Upstream\ Emission\ Rate_{CO_2e}} + Customer\ Emission\ Rate_{CO_2e}$



Scenarios

Typically, Cascade includes scenarios around low, reference case, and high growth avoided costs.

Cascade plans to also include an avoided cost scenario where Cascade aligns emissions with state emission goals. This will have an impact to the avoided cost in both states.

Avoided Cost - Conclusion

Cascade appreciates any feedback related to any element of the avoided cost calculation.

Cascade's resource planning team plans to provide its avoided cost figures to the Company's energy efficiency team around the first full TAG 1 meeting; they will be sending back a conservation potential assessment based on these inputs.

Feedback for Cascade?

Any other changes or ideas that Cascade should consider for calculating the Avoided Cost?

Process Item	Date	Process Element
Targeted-TAG	Wednesday, July 1, 2026	Energy Efficiency
Targeted-TAG	Wednesday, July 22, 2026	Equity in the IRP
Targeted-TAG	Wednesday, August 12, 2026	CCA/CPP Compliance Modeling
Targeted-TAG	Wednesday, September 2, 2026	Distribution System Planning
Targeted-TAG	Wednesday, September 23, 2026	Resource Integration
TAG 1	Wednesday, October 14, 2026	Process, Key Points, IRP Team, Timeline, Regional Market Outlook, Planned Scenarios and Sensitivities, Stakeholder Engagement, Demand and Customer Forecast and Non-Core Outlook, Drilling down into segments of demand forecast. Upstream Pipeline presentation.
TAG 2	Wednesday, November 18, 2026	Respond to TAG 1 Feedback, Distribution System Planning, Alternative Resources, Price Forecast, Avoided Costs, Current Supply Resources, Transport Issues, Carbon Impacts, Energy Efficiency, Bio-Natural Gas, Preliminary Resource Integration Results.
First Draft	Wednesday, December 16, 2026	
Comments Due	Wednesday, January 20, 2027	
TAG 3	Wednesday, February 10, 2027	Respond to TAG 2 feedback, Final Integration Results, finalization of plan components, Proposed new 2- to 4-year Action Plan
Final Draft	Friday, March 12, 2027	
Comments Due	Friday, April 9, 2027	
TAG 4 (if needed)	Wednesday, April 28, 2027	
Final Complete By	Wednesday, May 19, 2027	
File	Friday, May 21, 2027	

2027 IRP Schedule

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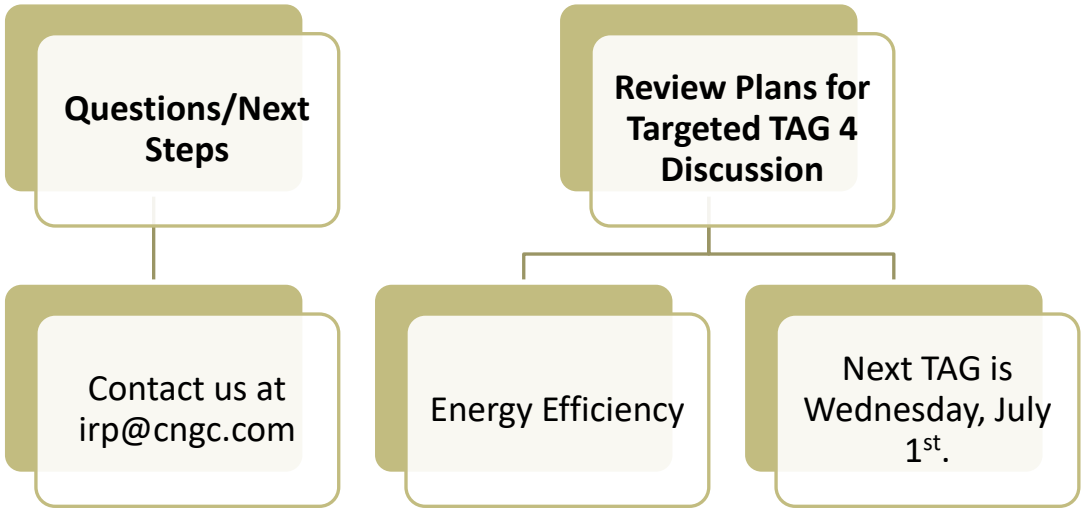

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