Northwest **Power** and **Conservation** Council

February 4, 2025

MEMORANDUM

TO: **Council Members**

FROM: **Tomás Morrissey**

SUBJECT: **Proposed Ninth Power Plan Natural Gas and Coal Price Forecast**

BACKGROUND:

Presenter: Tomás Morrissey

Summary: Natural gas and coal are key fuels for the Northwest power system. Over the past decade coal usage has declined, but natural gas usage has hit record levels. Natural gas prices were low in 2024, but there have been periods of volatility and higher prices throughout the past decade.

This presentation will cover recent work conducted through the Fuels Advisory Committee to create a natural gas price forecast for the Ninth Power Plan. The presentation discusses power generation trends, fuel production trends, fuel price forecasts, and price volatility forecasts. A coal price forecast, largely derived from the US Energy Information Administration (EIA), will be presented as well. We are looking for feedback from the Council on both proposed forecasts, including a general head nod of support if members are comfortable with the approach.

Relevance: Natural gas and coal prices feed into many parts of the Power Plan, including the capital expansion models. The forecasts influence many factors in the models, including power plant dispatch, electricity prices, and resource selection.

Workplan: B.2.1. Develop an updated fuels price forecast.

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Agenda

- Natural gas and the Northwest power system
- Proposed natural gas price forecast
- Natural gas price forecast volatility and seasonality
- Proposed coal price forecast

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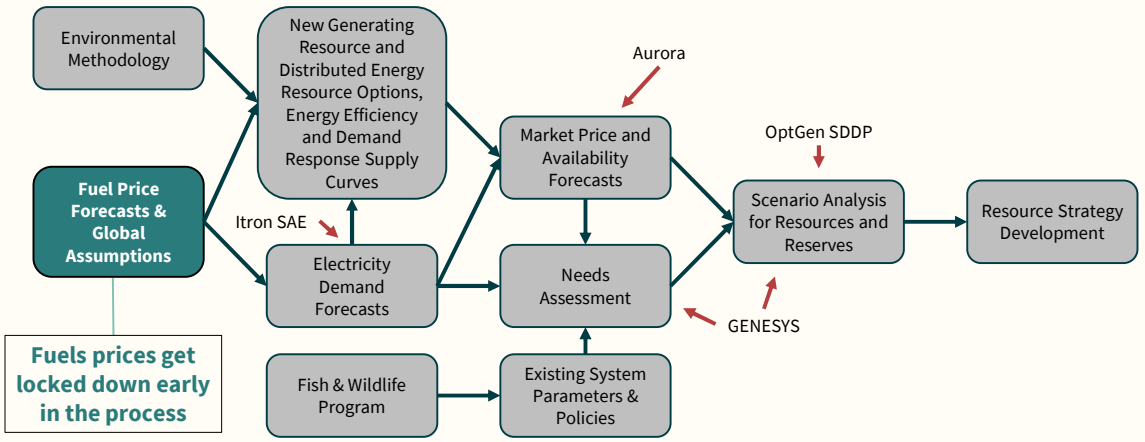
Ninth Plan Workflow



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Natural gas and the Northwest power system

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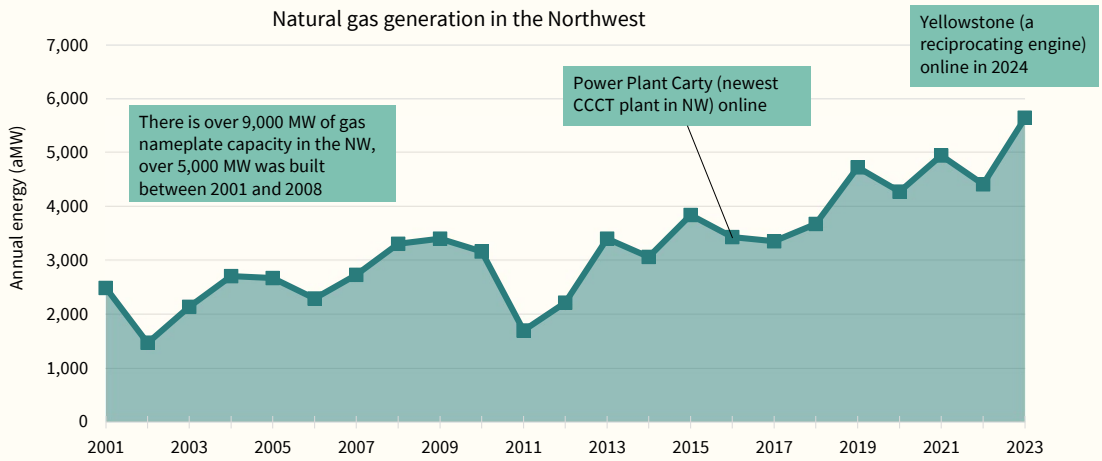
Data from the US EIA
Total natural gas generation in ID, MT, OR, WA

Natural gas generation trending up



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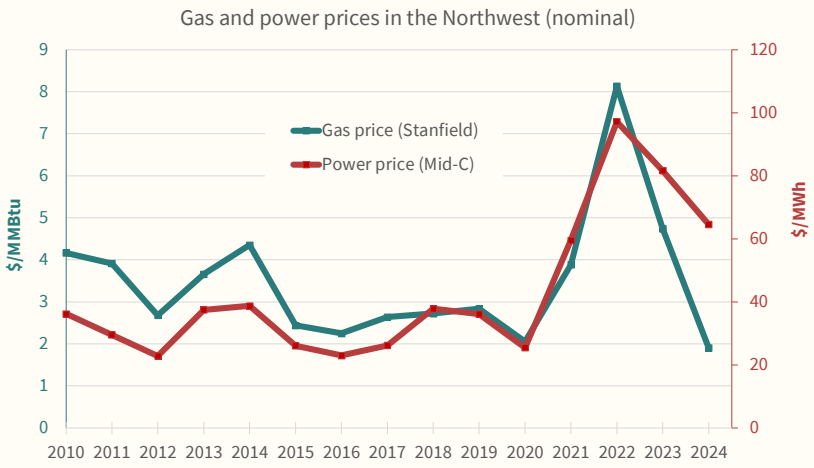
Data from SNL (daily spot prices averaged into annuals), nominal $

Natural gas and power prices

Gas prices and power prices have historically had a positive relationship



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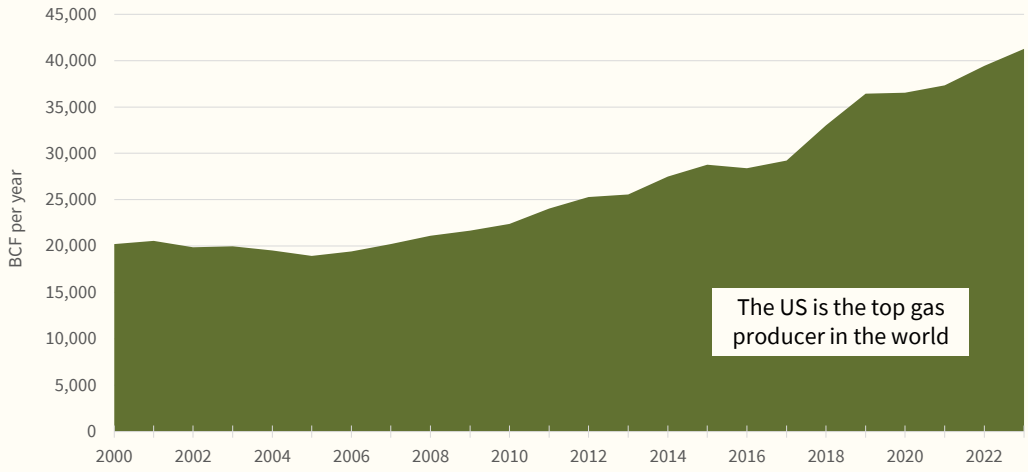
Marketed natural gas production, US



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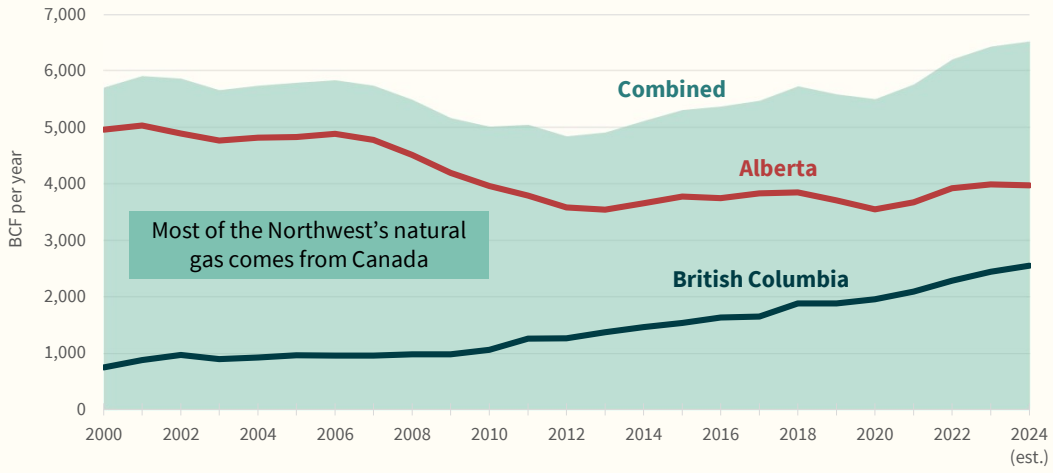
Data from the Canada energy regulator

Marketed natural gas production, BC & AB



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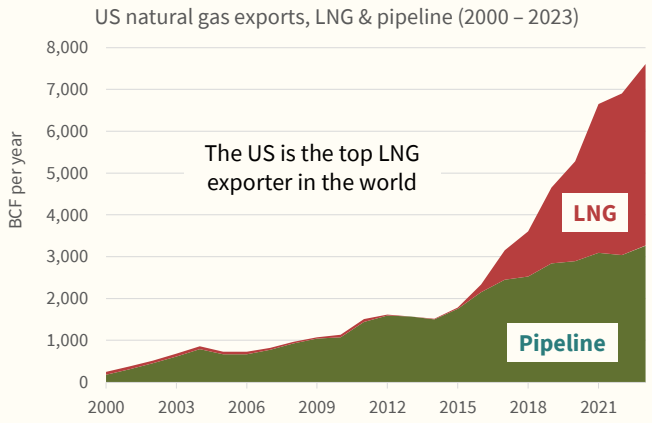
Data from the EIA

LNG coming to the West

- **Woodfibre LNG** (British Columbia) expected online in 2027, could pressure gas prices before potential 2029 pipeline expansion
  - We've included a price bump for select hubs from 2027- 2029 to account for this
- **LNG Canada** likely online in 2025 (BC), has a dedicated pipeline from production areas (facility already receiving gas & testing)
- **Costa Azul**, in BC Mexico, projected online in 2026



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Potential policy turbulence

- The policy landscape is shifting with the new administration
- Policy items we are tracking include potential tariffs on Canadian natural gas
- We are planning to include an evolving federal policy landscape scenario in the Ninth Plan, this scenario may include altered fuel prices due to tariffs and other policies

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Proposed Ninth Plan Gas Price Forecast

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Council natural gas forecast process

1. A Henry Hub forecast is created using an aggregation of Committee member forecasts, IRP forecasts, EIA & CEC forecasts, and price futures (NYMEX)
2. The Henry Hub forecast is translated into annual hub level forecasts (Sumas, AECO, etc.) using historical annual price differences
3. The hub level forecasts are made monthly using historical hub prices
4. For the Power Plan additional volatility is added into the forecast

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Natural gas price forecast development

- **Early Oct 2024:** During a Committee meeting the upcoming Ninth Power Plan natural gas price forecast and survey were discussed
- **Late Oct 2024:** A survey was sent to the Fuel Advisory Committee asking for natural gas price forecasts
- **Nov 2024:** The Committee reviewed the draft price forecast and provided feedback
- **Jan 2025:** The Committee reviewed the draft volatility forecast and provided feedback *(the draft coal forecast was also shared at this meeting)*
- **Feb 2025:** Draft forecasts were shared with the System Analysis Advisory Committee
- **Feb 2025:** Proposed forecast brought to the Council for feedback

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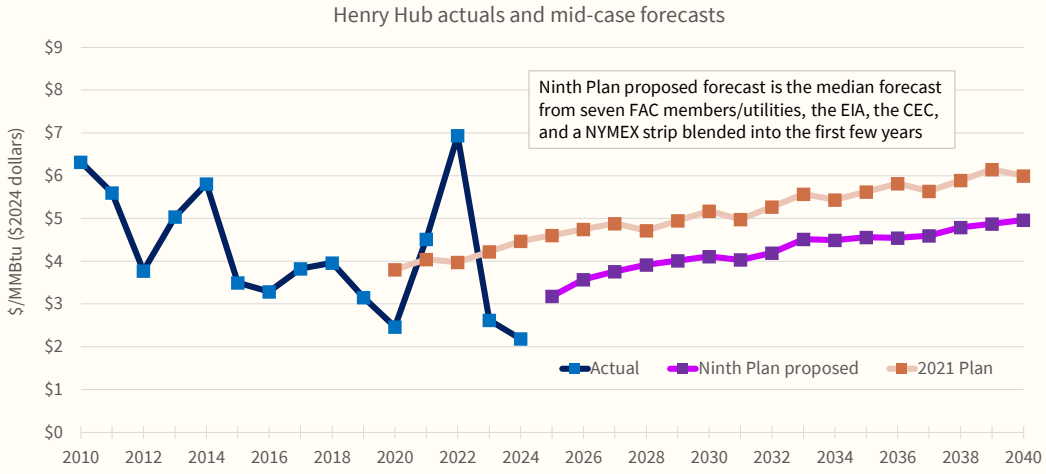
Historical price data from SNL (daily spot prices averaged into annuals), nominal $

Annual Henry Hub prices (real $2024)



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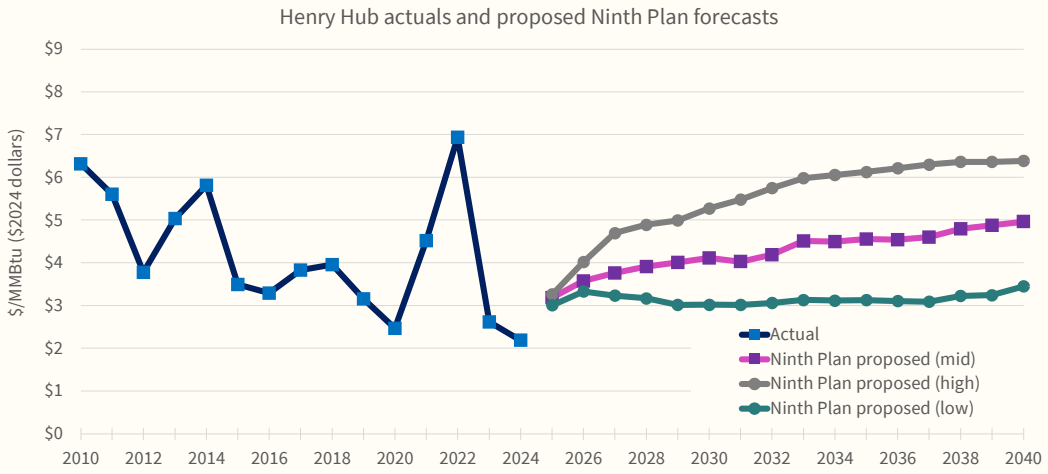
Annual Henry Hub prices (real $2024)



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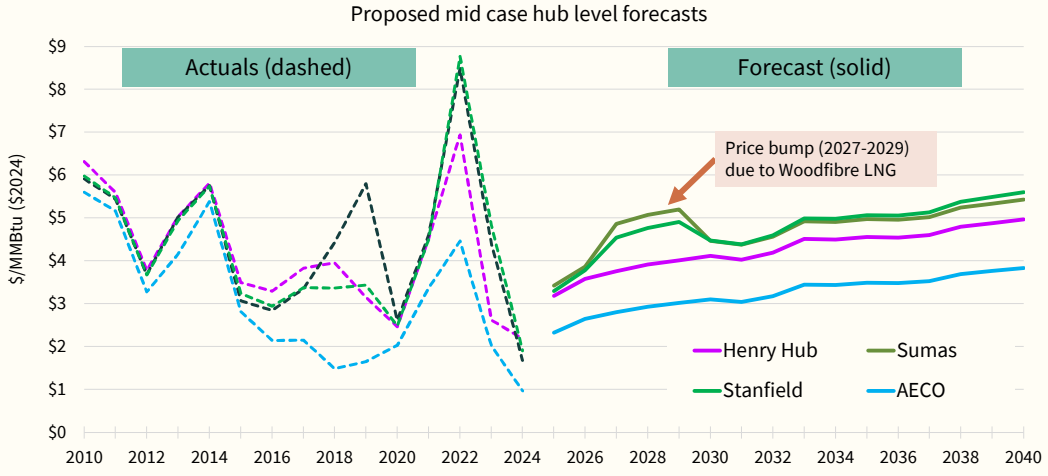
Historical price data from SNL (daily spot prices averaged into annuals), nominal $
Prices do not include transportation cost (likely will be around $0.40 per MMBtu)

Annual hub level prices (real $2024)



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Volatility, seasonality, and prices

- Our power price model simulates marginal power prices; resultingly we include volatility beyond the low/mid/high forecast
  - Utilities are often insulated from marginal gas prices via physical and financial strategies
- We plan to use the past 10-years of historical monthly spot prices for volatility and seasonality (and repeat the pattern to make it 20 years)

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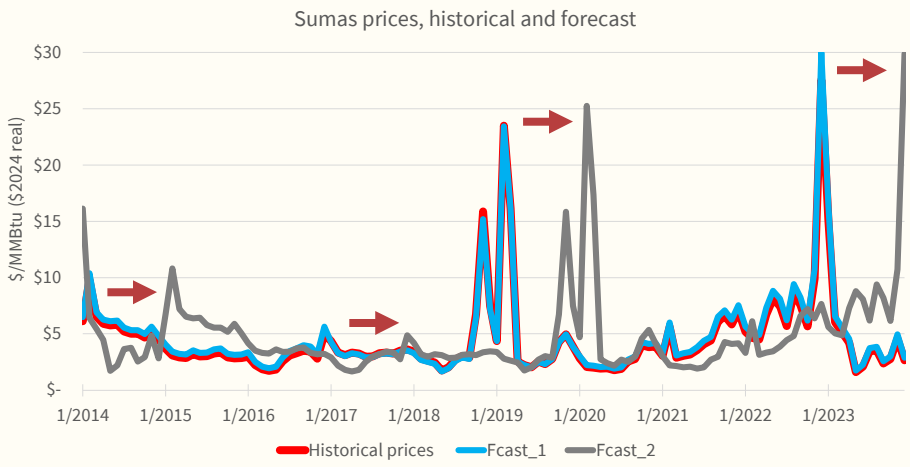
Historical price data from SNL (daily spot prices averaged into annuals), nominal $
Prices do not include transportation costs

Sumas forecast volatility example



Forecast 1 matches historical prices closely

Forecast 2 has the same pattern but is shifted over one-year

This shift continues through the ten forecasts

The pattern repeats for a total of 20-years (not shown)

We don't expect historical events to repeat, but we hope they will serve as proxies for future price excursions

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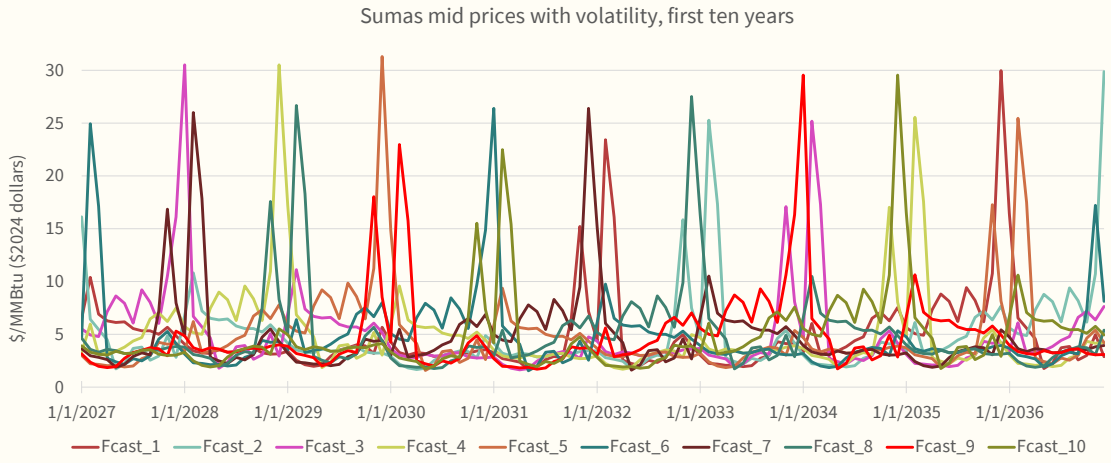
Sumas forecast volatility example 2



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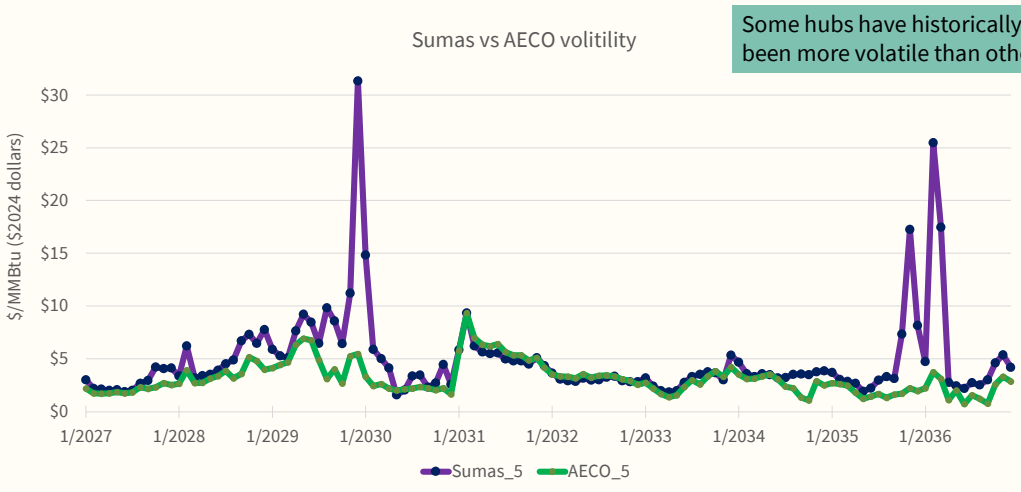
Sumas vs AECO volatility example



Some hubs have historically been more volatile than others

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Proposed coal price forecast

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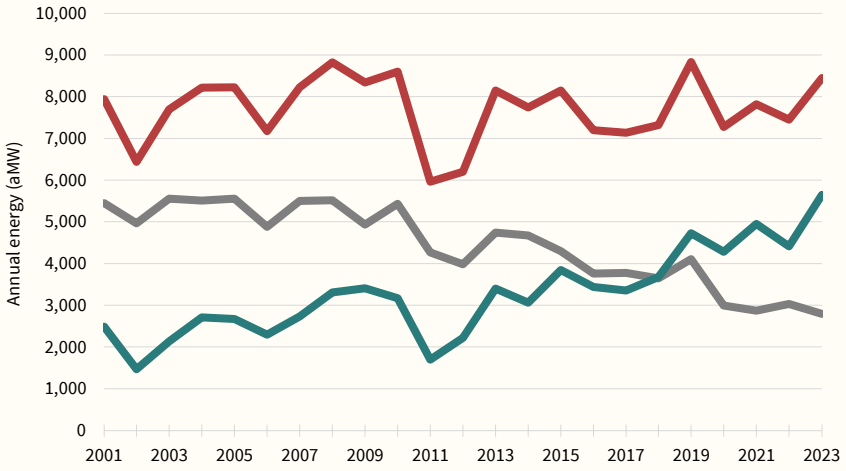
Data from the US EIA, generation in OR, WA, ID, MT, and coal plants Jim Bridger (WY) and North Valmy (NV)

Natural gas and coal generation in the Northwest



Combined gas & coal generation has been steady over past 20 years

Natural gas usage has increased and is hitting record levels

Coal usage has declined, partly due to retirements

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Coal price forecast sources

- Planning to use two EIA sources:
  - The EIA 2023 Annual Energy Outlook delivered electric power coal price forecast (EIA is not publishing a 2024 AEO)
  - EIA data on delivered coal prices by state
- We are starting with a three-year average of delivered state prices and applying the AEO forecast percentages to those values
- We do not have a coal reference plant in the Ninth Power Plan

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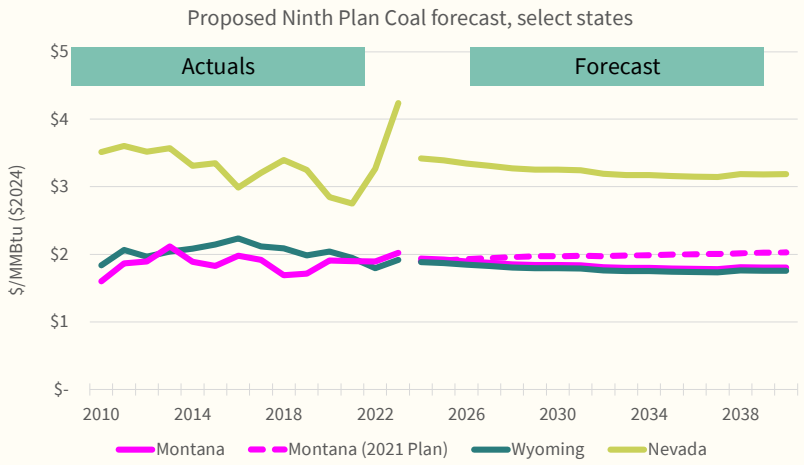
Proposed coal price forecast

Forecast is mostly flat in real dollar terms (per the EIA AEO forecast).

We may revisit the forecast if it makes for strange dispatches in the model (between gas and coal).



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Questions & feedback

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Extra slides

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Gas transportation prices

- General approximations for how much it costs to move gas from the hub to the power plant
- Approximations for three regions based on pipeline tariffs:
  - Washington west-of-the cascades (based on Sumas to plant)
  - Oregon west-of-the-cascades (based on Sumas to plant)
  - East of the cascades (based on AECO to plant)
- Based off input from the Fuels Advisory Committee will likely be using a value around $0.40/MMBtu for all regional plants *(this may change based on follow-up discussions with stakeholders)*

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Northwest natural gas infrastructure

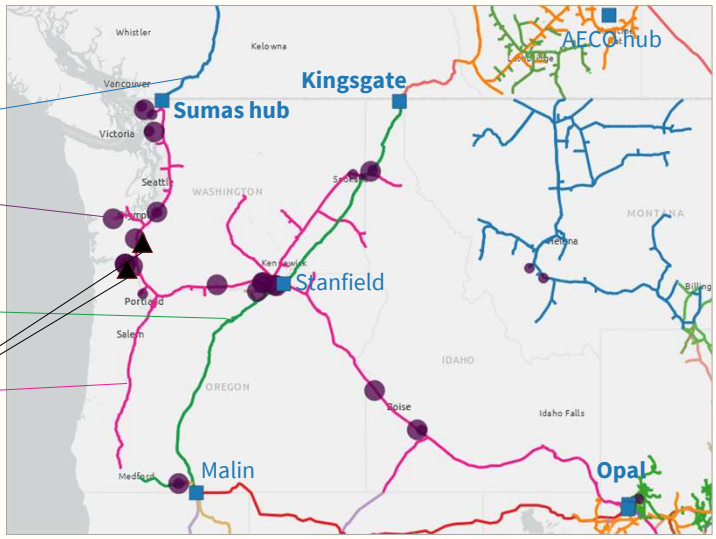
Westcoast Pipeline (Enbridge)

Over 9,000 MW of natural gas power generation

Gas Transmission Northwest (TC Energy, minor expansion underway)

Northwest Pipeline (Williams)

Underground gas storage



Map does not include LNG storage, the Fortis BC system, and other gas infrastructure elements. Made with S&P Capital IQ maps.

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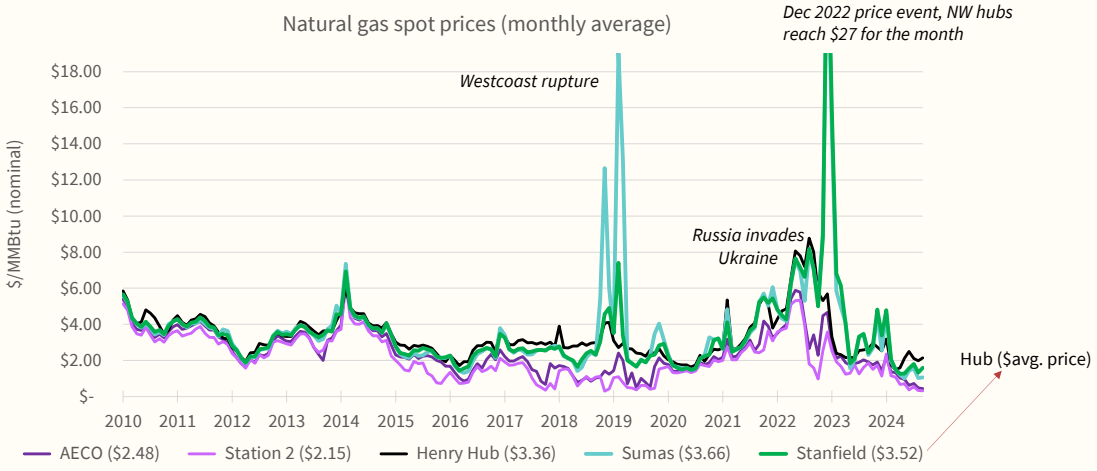
Natural gas spot price history, NW hubs



SNL spot prices from S&P Capital IQ

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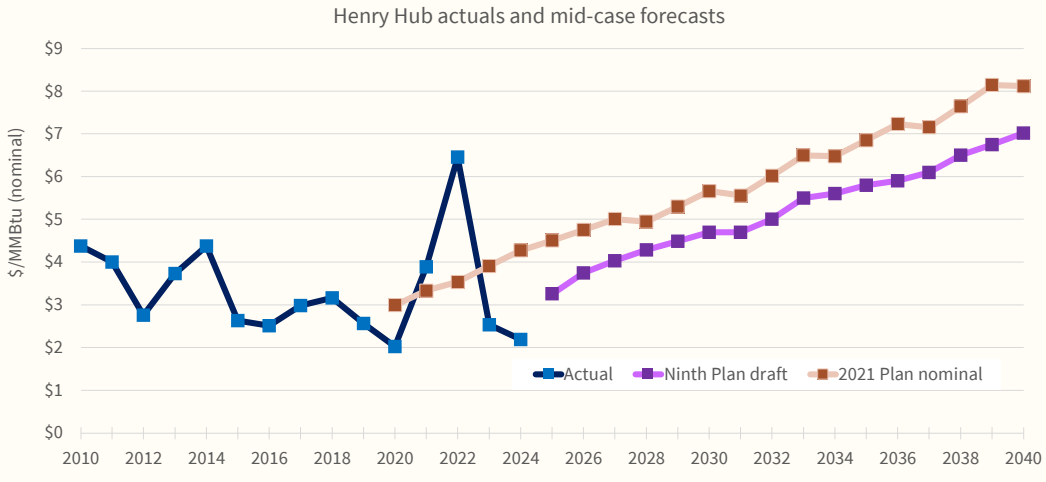
Annual Henry Hub prices (nominal)



SNL spot prices from S&P Capital IQ. The 9th Plan draft uses
Nominal 2021 Plan prices have been readjusted using historical inflation through 2023 and the 9th Plan forecast thereafter.

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