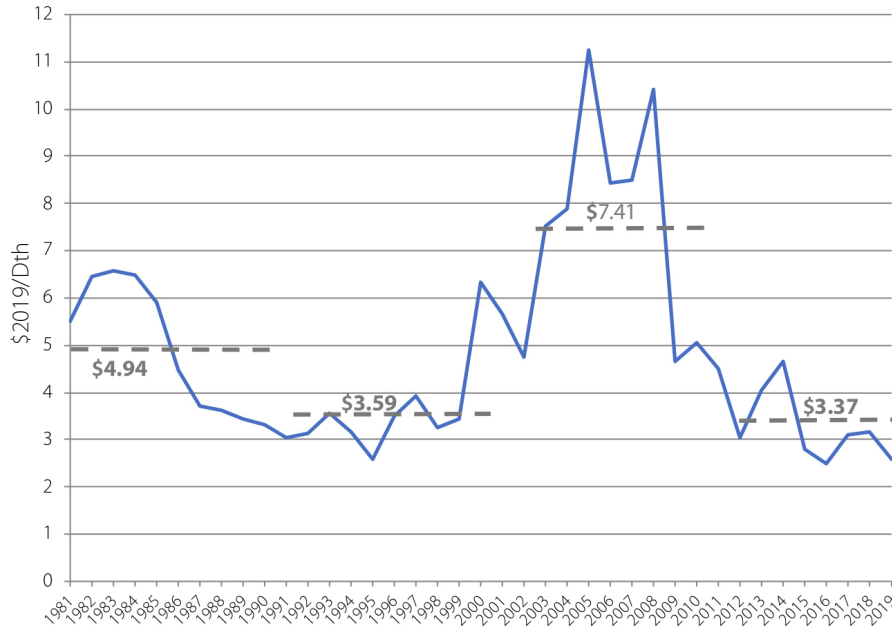


2020 GAS OUTLOOK • COMMODITY PRICES



The commodity cost of natural gas has plummeted with the surge in supply over the last decade (see Figure P1), saving regional consumers across all economic sectors hundreds of millions of dollars. Commodity prices are expected to remain below \$5/Dth through 2050 (see Figure P2). High demand coupled with infrastructure constraints may periodically cause short-lived regional price volatility. The price of natural gas is also advantageous relative to other transportation fuels (see Figure P3).

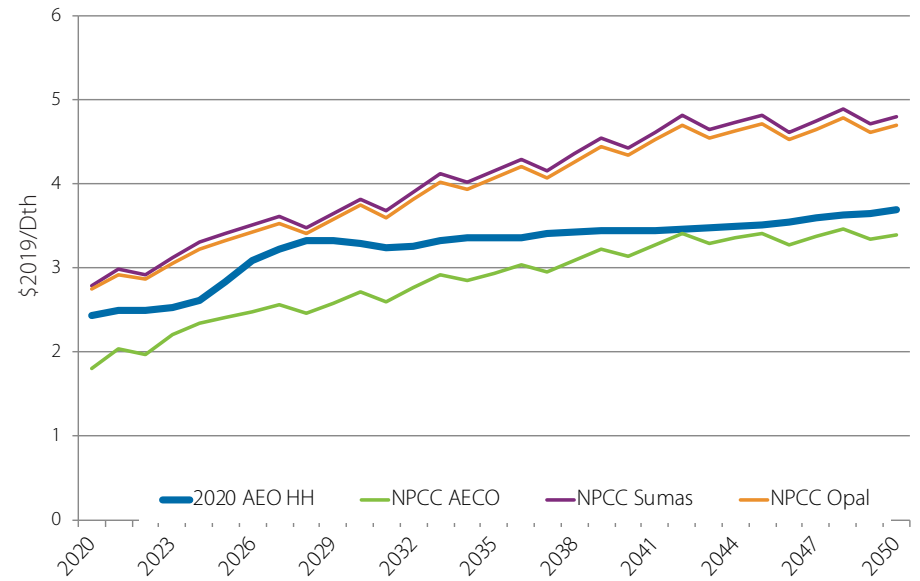
FIGURE P1. Historic Natural Gas Prices



Source: U.S. EIA Natural Gas Wellhead Prices at Henry Hub. (Henry Hub is a trading point in Louisiana that serves as a benchmark for North American natural gas pricing.)

¹The price differential between Henry Hub and AECO is explained here: <https://open.alberta.ca/dataset/3b7ec04e-fd07-4518-bfde-d8cb857d9587/resource/896c312a-7efb-442f-8f9a-5b62bb46e1c0/download/19-explaining-gas-price-differentials.pdf>

FIGURE P2. Natural Gas Price Forecast Comparisons

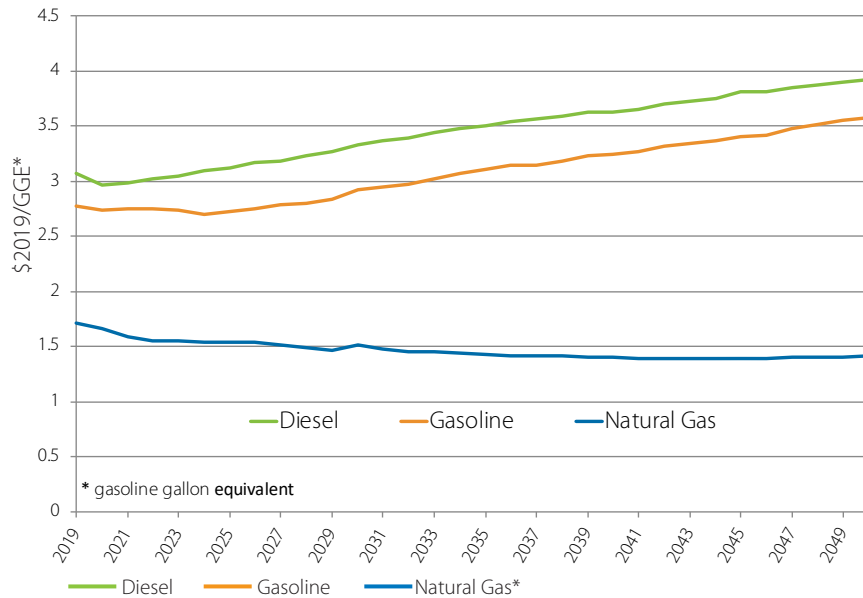


Source: EIA 2020 Annual Energy Outlook; NPCC – Fuel Price Forecast, June 2019 Update

NOTES: Price forecasts reflect the existence of and an ongoing expectation for robust natural gas supplies throughout the forecast period (2029) and beyond.

The Northwest Power and Conservation Council (NPCC) forecasts natural gas prices at trading hubs where the Pacific Northwest sources its gas: AECO⁵ and Sumas for natural gas originating in Alberta and British Columbia, and Opal for gas produced in the U.S. Rocky Mountain states of Colorado, Utah and Wyoming.

The price of natural gas coming from the supply areas upon which the Pacific Northwest relies is typically lower than the North American benchmark at Henry Hub.

FIGURE P3. Transportation Fuel Price Forecast

Source: EIA 2020 Annual Energy Outlook, Table A3 – Energy Prices by Sector and Source

NOTES: Forecast prices for transportation fuels include the commodity cost and all costs associated with delivery to the station (transport, distribution) and dispensing to the vehicle (pumping). According to the EIA, prices for natural gas as a transportation fuel are expected to decline over the forecast period because:

- 1) In the near term, prices reflect mostly compressed natural gas (CNG) purchased and delivered by utilities (higher commodity cost), and at a higher capital cost per unit of fuel dispensed (smaller stations with lower utilization).
- 2) Over time, it is expected that more heavy-duty vehicles (freight carriers and marine vessels) will transition to liquefied natural gas (LNG) purchased directly from the spot or futures markets (lower commodity cost) and dispensed through stations with greater economies of scale (lower capital costs per unit of fuel dispensed). Refer to the EIA's Natural Gas Market Module assumptions document for more detail: <https://www.eia.gov/outlooks/aeo/assumptions/pdf/natgas.pdf>

NGVS: ECONOMICALLY AND ENVIRONMENTALLY BENEFICIAL

As illustrated in Figure P3, natural gas promises to deliver substantial economic value now and in the future relative to other transportation fuels. Natural gas engines also produce superior environmental performance (e.g., reduced greenhouse gas emissions) compared to gasoline and diesel engines. This is especially true for production of such pollutants as nitrous and sulfur oxides (NO_x, SO_x), which can cause serious health issues.

For instance, contemporary natural gas engines operate well below the below the U.S. Environmental Protection Agency's (EPA) threshold for NO_x emissions of 0.2 grams/brake horsepower (0.2g/bhp) even while idling. And while the newest diesel engine technology can achieve the EPA standard, it only does so when it is operating at about 40 miles per hour. This means emissions largely remain over the EPA threshold, given the stop-and-go driving patterns typical of heavy trucks and buses operating in urban areas, where vulnerable populations often live. (Click here to see an NWGA fact sheet on vehicle emission comparisons).

For more information on how using natural gas for transportation provides both an environmental and economic solution to our region's air quality issues, visit www.nwalliance.net.