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Washington

Patrick Oshie
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Ginny Burdick
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Northwest **Power** and **Conservation** Council

Jim Yost
Idaho

Jeffery C. Allen
Idaho

Doug Grob
Montana

Mike Milburn
Montana

November 09, 2021

MEMORANDUM

TO: **Council Members**

FROM: **Steven Simmons**

SUBJECT: **Natural Gas Price Update**

BACKGROUND:

Presenter: Steven Simmons

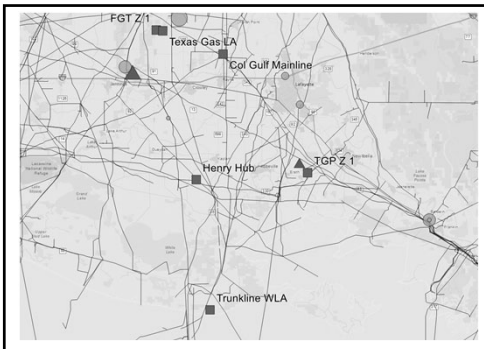
Summary: Natural gas prices began a run-up from $2.75 per MMBtu in mid-June of this year all the way up to $6.00 in October before leveling off. Gas prices can rise or fall based on supply and demand fundamentals, or, even just the perception of fundamentals. In the near-term, these fundamentals include pre-winter storage levels, production outlooks, and demand and weather forecasts.

This presentation provides a review of historic and current fundamentals and prices, and a brief review of the regional natural gas system and the related analytic products that the Council delivers as part of the power plan.

Relevance: Natural gas prices can influence many factors in power planning such as gas consumption, power plant dispatch, energy cost, and emission levels.

Workplan: A.4. Forecasting and Economic Analyses

Background: A detailed review of the natural gas work for the 2021 Power Plan may be found in the supporting materials: https://www.nwcouncil.org/2021powerplan_sitemap



Natural Gas Price Update

Steven Simmons

November 16, 2021

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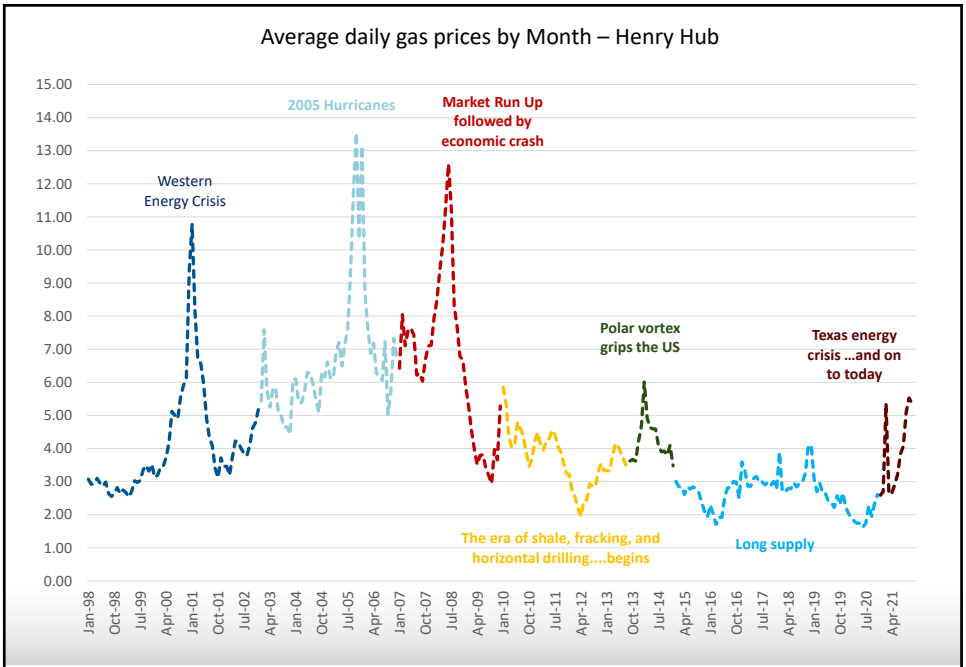

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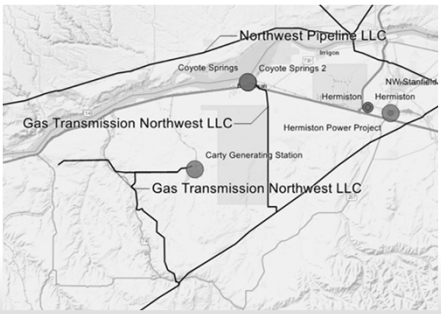
Todays Discussion

1. Fuels work here at the Council
2. Gas fundamentals
3. Prices



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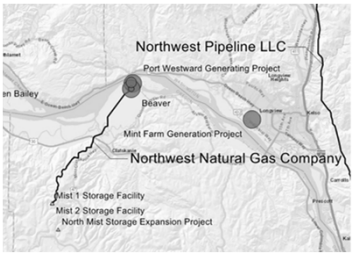
Fuel Work Products

1. Long term natural gas price forecast
   a) A long-term, base forecast with low, mid and high is developed using direct input from the NGAC
   b) WECC-Wide hub price forecast for planning models
   c) Power plant & city gate price points
   d) Stochastics for risk planning
   e) Fixed fuel costs
2. End-use natural gas demand forecast and RNG
3. Upstream Methane Emissions
4. Hydrogen production and demand



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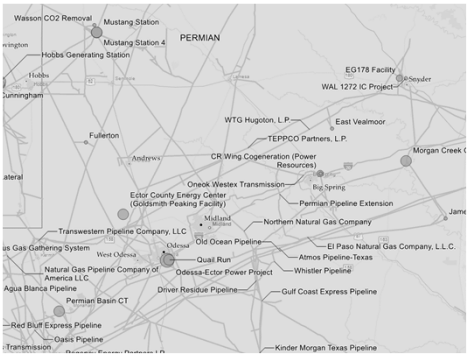

Natural Gas Price Update
11.16.2021

FUNDAMENTALS

PRODUCTION-IMPORT/EXPORT-STORAGE-CONSUMPTION

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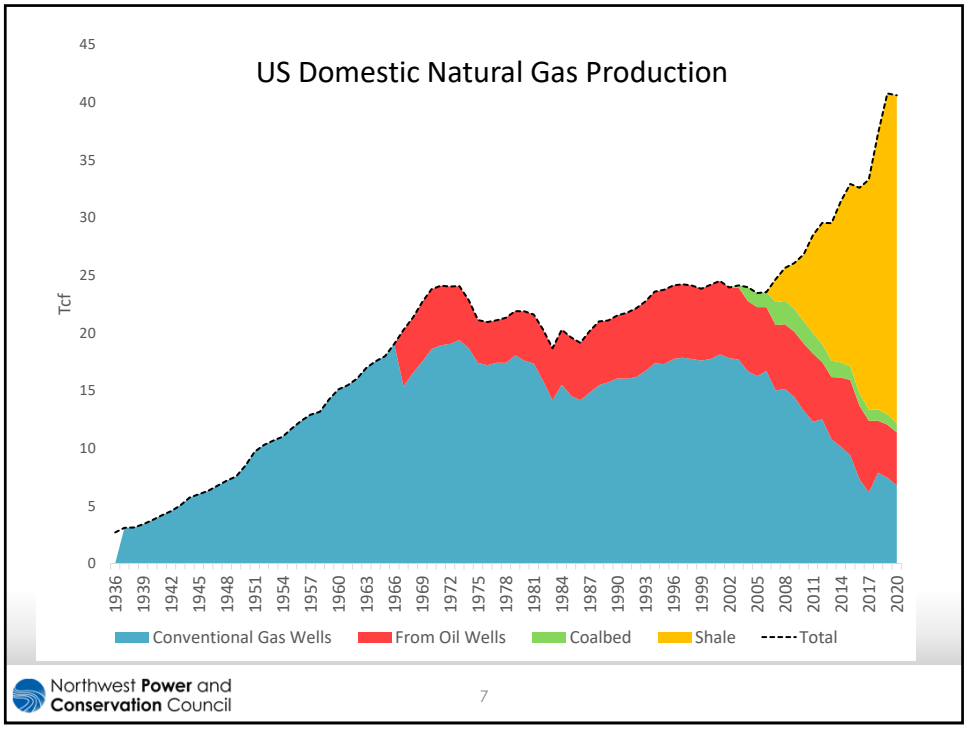
US Domestic Natural Gas Production
Tcf
45
40
35
30
25
20
15
10
5
0
1936 1939 1942 1945 1948 1951 1954 1957 1960 1963 1966 1969 1972 1975 1978 1981 1984 1987 1990 1993 1996 1999 2002 2005 2008 2011 2014 2017 2020
Conventional Gas Wells
From Oil Wells
Coalbed
Shale
Total
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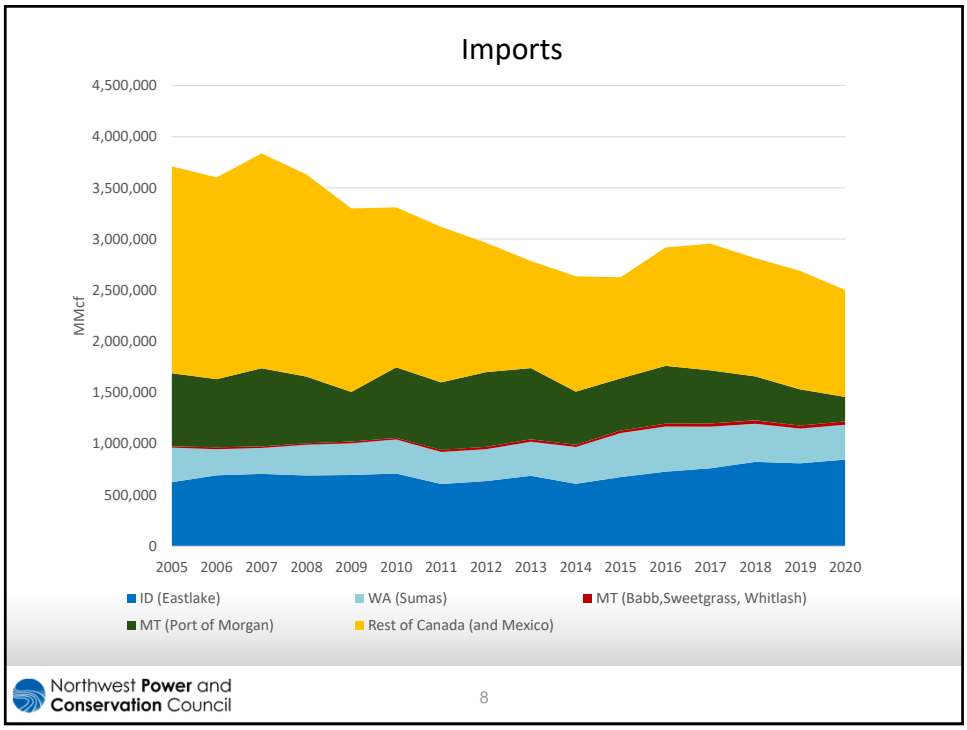
Imports
MMcf
4,500,000
4,000,000
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
ID (Eastlake)
WA (Sumas)
MT (Babb,Sweetgrass, Whitlash)
MT (Port of Morgan)
Rest of Canada (and Mexico)
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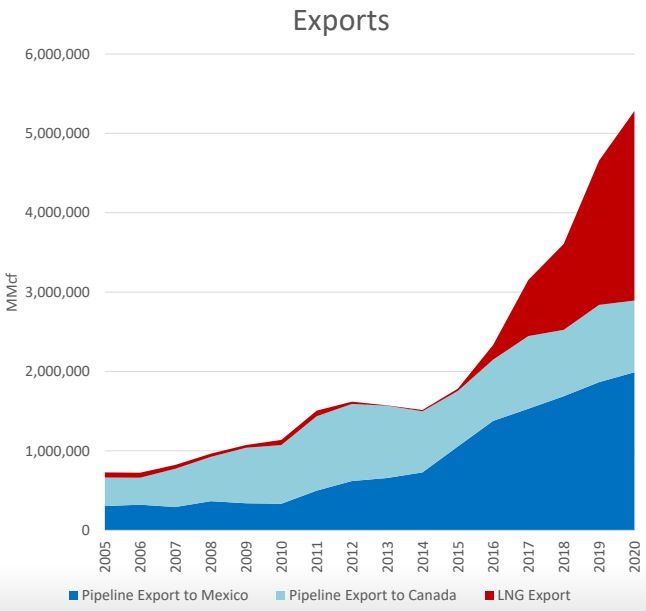

Percent US LNG exports by destination in 2021	
Korea	13.7
China	12.5
Japan	10.7
Brazil	8.3
India	6.2
Netherlands	4.9
France	4.8
Chile	4.4
United Kindom	4.2
Spain	4

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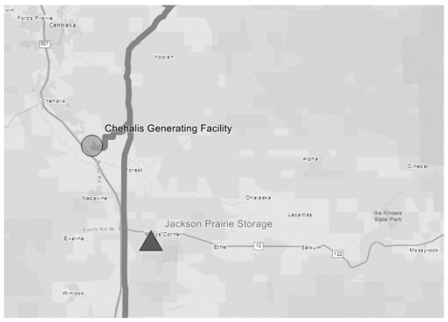
Storage

- Storage re-fill season for winter typically runs from April thru October each year
- Re-fill lagged this year during the summer months – Hurricane Ida hindered inventory buildup and continued strong LNG exports
- As recently as mid September national storage levels were 93% that of the 5 year average level for the same time frame (2016-2020)
- Strong injection rates recently have pulled storage levels up to 97% of average (Oct 29)
- Concern over a repeat of a deep freeze event like February



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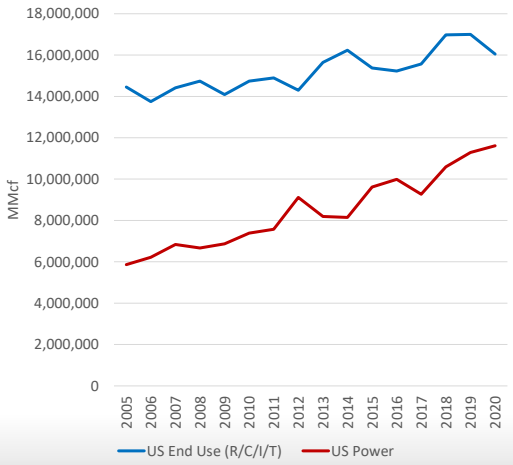
US Annual Gas Consumption



- Since 2005 consumption for power generation has doubled
- Growth in consumption for end uses (residential, commercial, industrial and transportation) has grown by 11%
- Most of the growth in end-use is in the industrial sector

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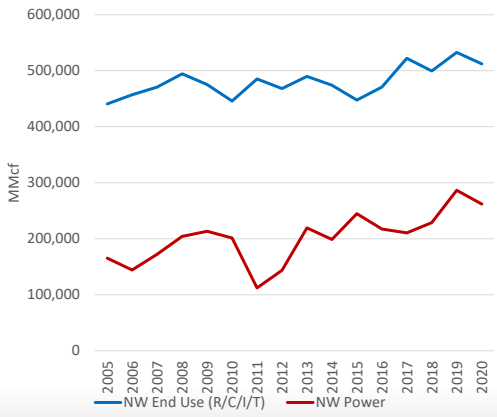
NW Annual Gas Consumption



- Growth in consumption for Power Generation – but highly variable from year to year
- General growth in consumption for end uses (residential, commercial, industrial and transportation)
- Growth in end-use across all sectors

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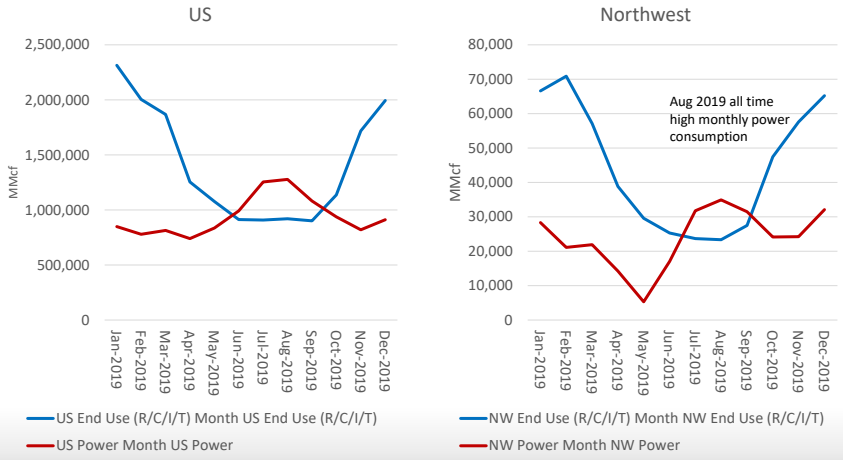
Single Year Monthly Gas Consumption



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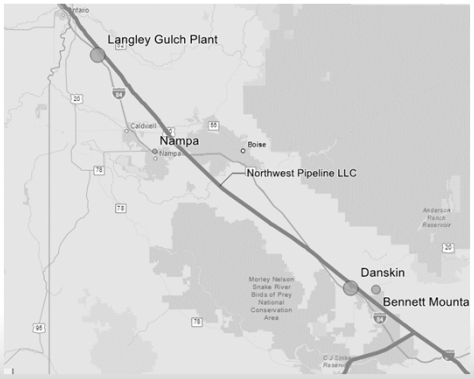
11.16.2021

PRICES



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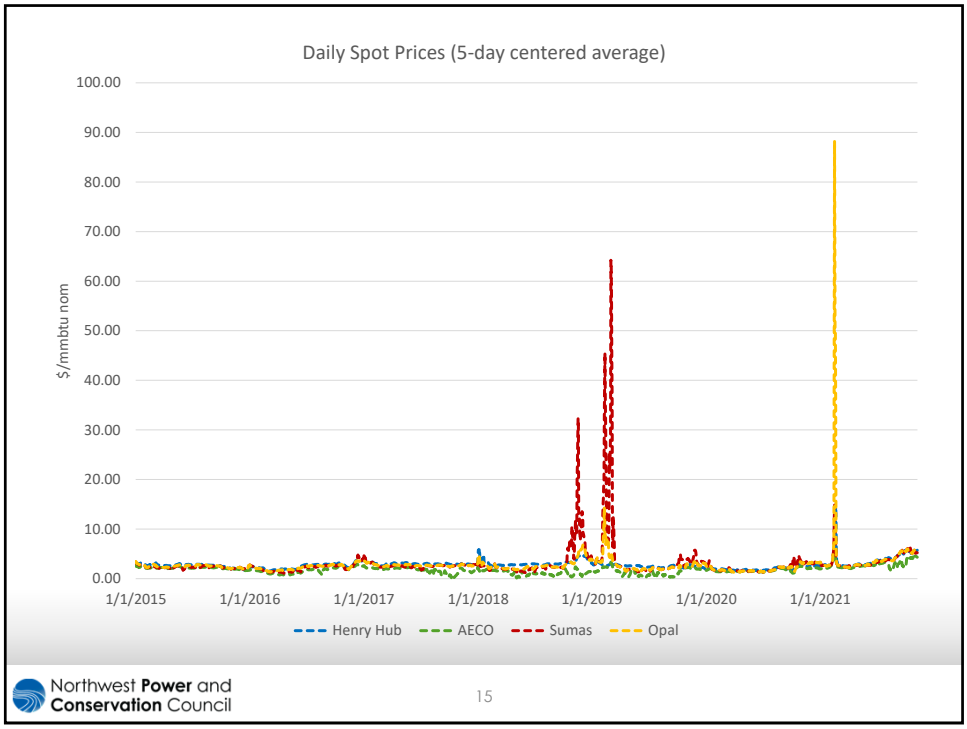
Daily Spot Prices (5-day centered average)
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
$/mmbtu nom
1/1/2015
1/1/2016
1/1/2017
1/1/2018
1/1/2019
1/1/2020
1/1/2021
Henry Hub
AECO
Sumas
Opal
Northwest Power and Conservation Council
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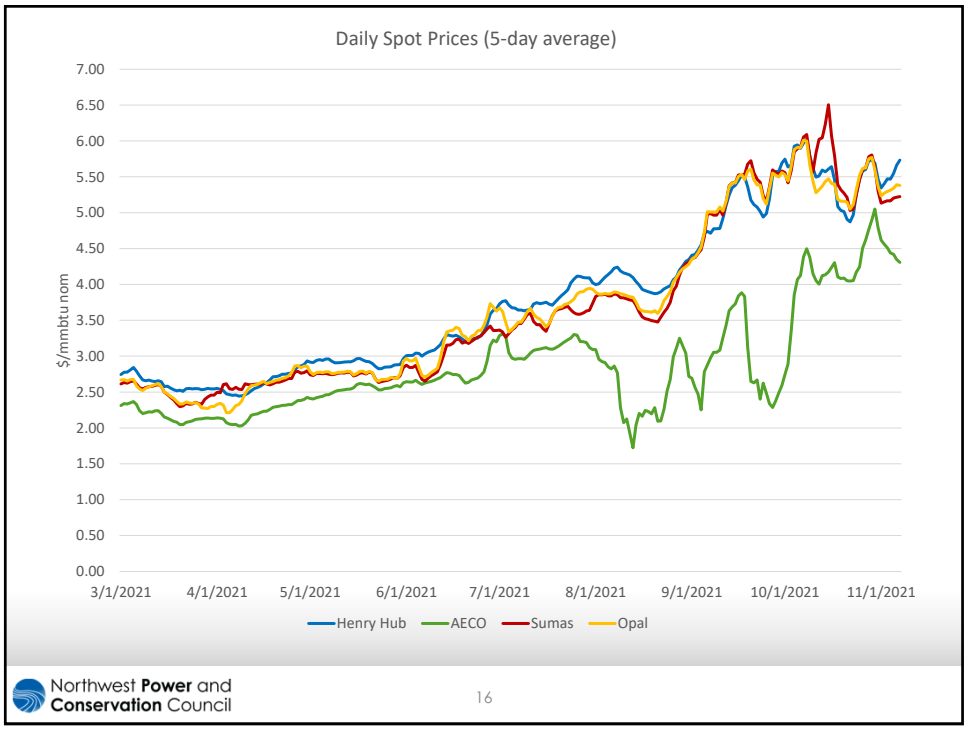
Daily Spot Prices (5-day average)
7.00
6.50
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
$/mmbtu nom
3/1/2021
4/1/2021
5/1/2021
6/1/2021
7/1/2021
8/1/2021
9/1/2021
10/1/2021
11/1/2021
Henry Hub
AECO
Sumas
Opal
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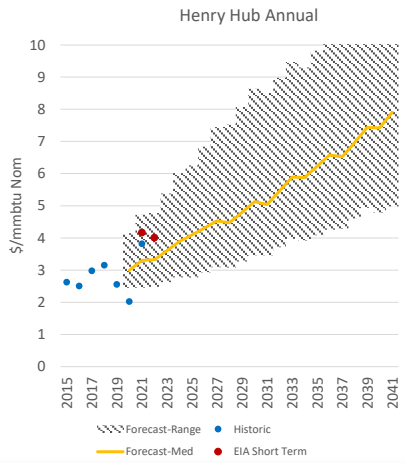
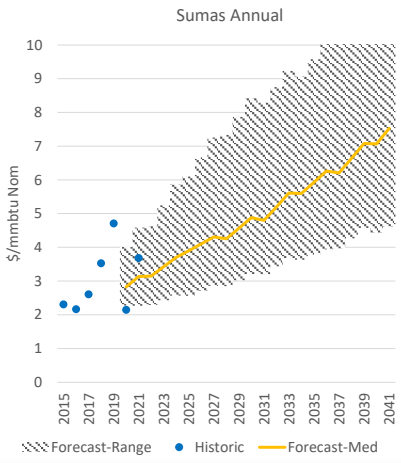
Annual Prices Historic and Forecast – Henry Hub & Sumas





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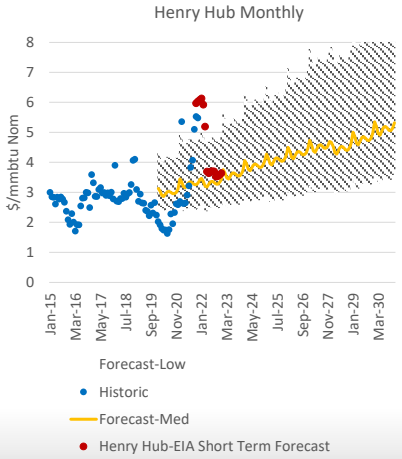
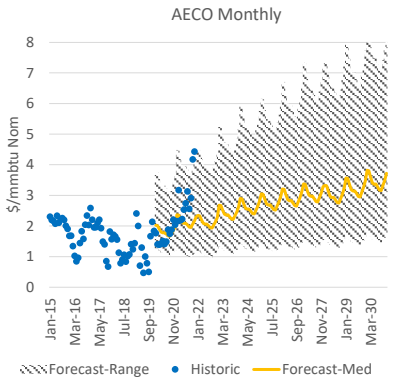
Monthly Prices Historic & Forecast
Henry Hub & AECO





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Wrap Up

- Run up in domestic natural gas prices since July 2021
  - Record high prices for gas in Asia and Europe – driving big growth for US LNG exports
  - Hurricane Ida slows storage inventory re-fill for winter. Though levels now near average
  - Producers careful with capital spending plans and concerns about long term demand prospects for the product
- Fundamentals seem to suggest prices to fall back in spring?
  - Winter 2021/2022 and LNG export market are factors