

# Updated TAC Schedule

**TAC 6: Wed. 17 July 2024: 10:30 am to 12:00 pm (PTZ)**

- Feedback from prior TAC (10 min.)
- Load Forecast – AEG (80 min.)

**TAC 7: Wed. 21 Aug. 2024: 10:30 am to 12:00 pm (PTZ)**

- Feedback from prior TAC (10 min.)
- Natural Gas Market Overview and Price Forecast (40 min.)
- Avoided Costs Methodology (30 min.)

**TAC 8: Wed. 25 Sept. 2024: 10:30 am to 12:00 pm (PTZ)**

- Feedback from prior TAC (10 min.)
- Heat Pump COP (30 min.)
- Electrification (40 min.)

**TAC 9: Wed. 30 Oct. 2024: 10:30 am to 12:00 pm (PTZ)**

- Feedback from prior TAC (10 min.)
- NEI Study (30 min.)
- New Resource Options Costs and Assumptions (40 min.)

**TAC 10: Wed. 18 Dec. 2024: 9:00 am to 12:00 pm (PTZ)**

- All assumptions review (20 min.)
- Conservation Potential Assessment (AEG) (30 min.)
- Demand Response Potential Assessment (AEG) (20 min.)
- Conservation Potential Assessment (ETO) (30 min.)
- Scenario Results (20 min.)
- Scenario Risks (20 min.)
- PRS Overview of selections and risk (20 min.)
- Per Customer Costs by Scenario (10 min.)
- Cost per MTCO<sub>2e</sub> by Scenario (10 min.)



# Avista Energy Natural Gas Forecasting



Prepared for Avista Energy TAC Meeting July 2024

# Background



AEG has worked with Avista for multiple Conservation Potential Assessments going back to 2010



As part of the CPA, AEG creates a baseline projection at the segments and end use level, which provides granular insight changes in individual technology classes and populations



Now Avista is using AEG's LoadMAP™ end use model directly to inform its official load forecast, including effects of state energy codes, potential electrification and market trends in a clear and direct manner.

# Major Modeling Inputs and Sources



## Avista foundational data

Avista power sales by schedule  
Current and forecasted customer counts  
Retail price forecasts by class



## Survey data showing presence of equipment

Avista: Residential customer survey conducted in 2013  
NEEA: Residential and Commercial Building Stock Assessments (RBSA 2016 and CBSA 2019)  
US Energy Information Administration: Residential, Commercial, and Manufacturing Energy Consumption Surveys (RECS 2020, CBECS 2018, and MECS 2015)



## Technical data on end-use equipment costs and energy consumption

Regional Technical Forum workbooks  
Northwest Power and Conservation Council's 2021 Power Plan workbooks  
US Department of Energy and ENERGY STAR technical data sheets  
Energy Information Administration's Annual Energy Outlook/National Energy Modeling System data files



## State and Federal energy codes and standards

Washington State Energy Code  
Idaho Energy Code  
Federal energy standards by equipment class



## Market trends and effects

RTF market baseline data  
Annual Energy Outlook purchase trends (in base year)

# Forecast Process

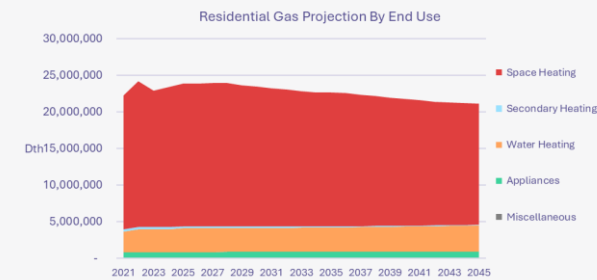
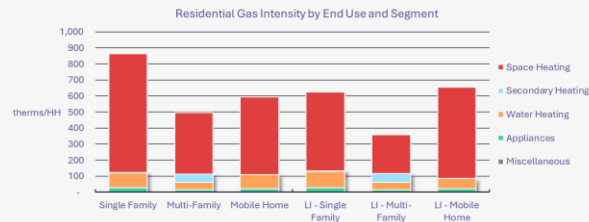
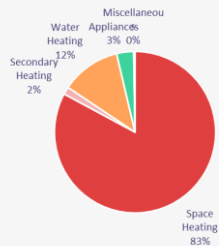


## Market Characterization

- Segmentation
- End Use and Technology List
- Allocate electric loads & calibrate

## Run Baseline Projection (Annual)

- Customer Forecast
- Stock Turnover
- Purchase Decisions



# Existing vs New Buildings



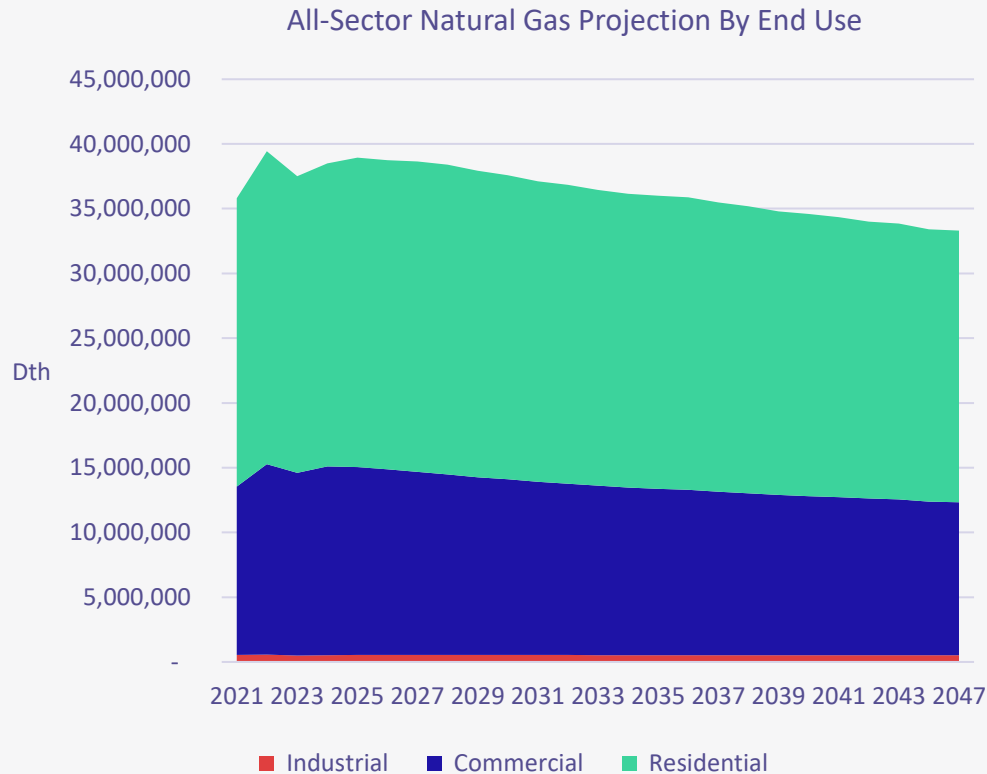
- Modeling tracks existing building stock separately from new code-compliant buildings
  - Buildings also undergo renovation at a rate consistent with the DOE's National Energy Modeling System, converting them into code-compliant structures
- Presence of equipment in new buildings is adjusted to comply with energy codes where applicable
  - For example, all new residential structures are assumed to use electric or dual-fuel heat pumps for space heating, which dramatically lowers gas loads in new construction



# System Total Load Forecast



WA + ID + OR, Excludes Transport

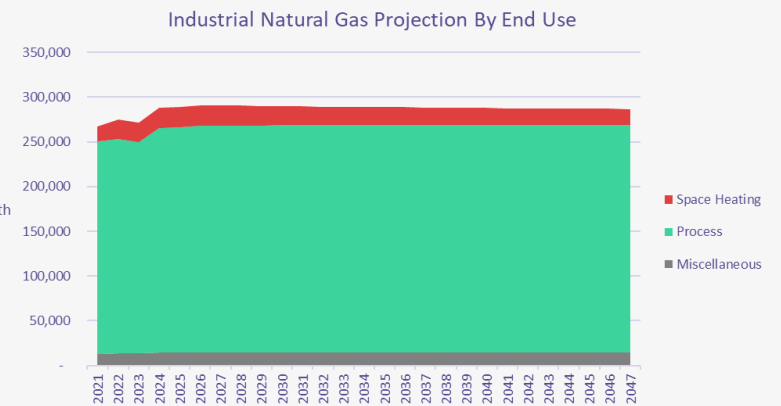
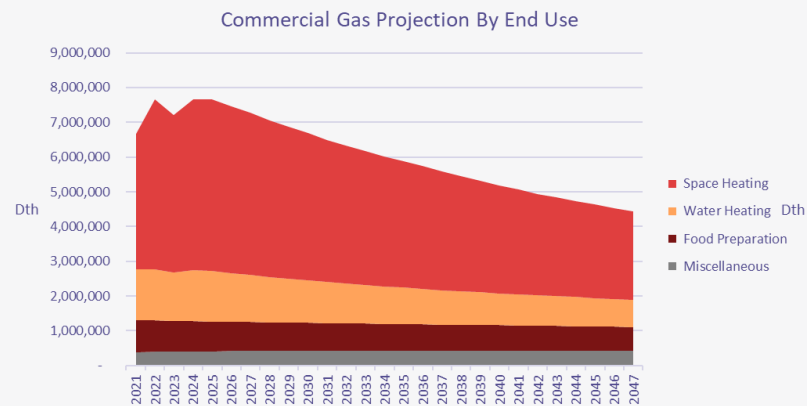
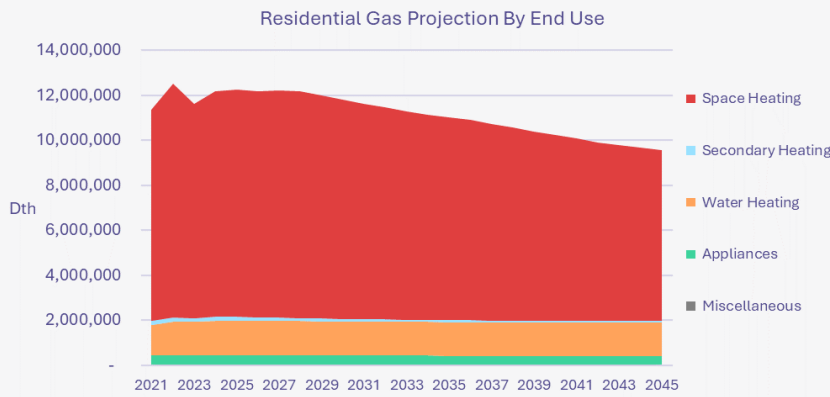


- A combination of electrification, building codes, and natural efficiency cause overall gas loads to decline by 7% across the forecast period
- Washington has a much stronger downward trend in isolation, offset by growth in Idaho (see next slides)
- Includes:
  - Projected heating degree days according to climate trends in Avista's territory
  - Market efficiency impacts (such as customers installing HE furnaces on their own), which are saving 42 million therms in the forecast period compared to minimum codes & standards

# Washington Sector-Level Forecasts



- WA Residential declines 15.8% as residential space heat electrifies (or converts to dual-fuel systems) either in natural equipment replacement cycles or to comply with state energy code
- Commercial declines for the same reason, however the decline is steeper as commercial space tends to turn over faster compared to residential spaces (and therefore is under pressure to become code compliant when new occupants move in)
- Industrial loads do not have the electrification opportunity that res and com space heating do and are minimally affected by the code requirements. Loads are generally flat.



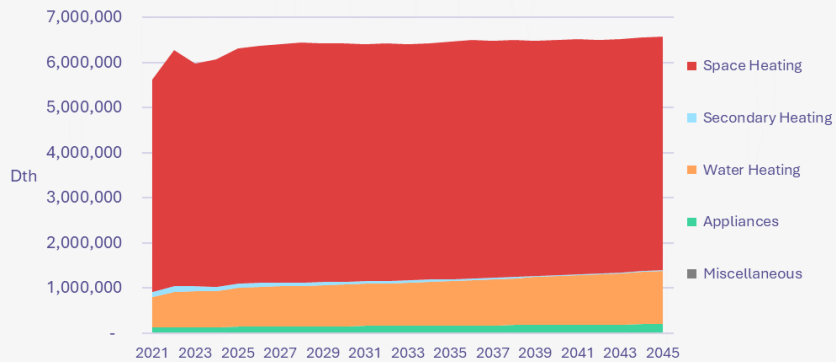


# Idaho Sector-Level Forecasts

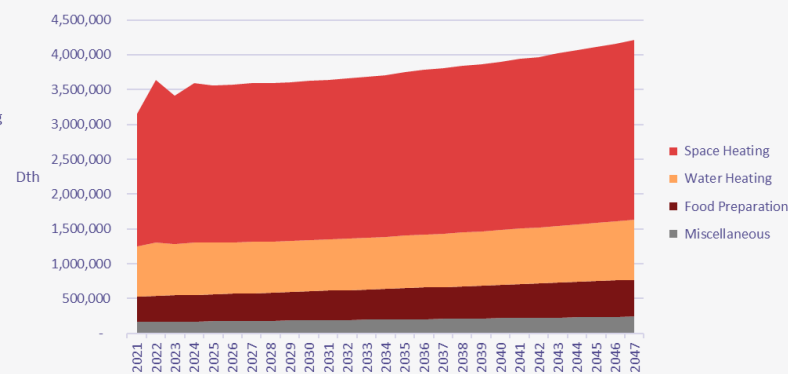


- ID gas loads do not have the same downward pressure as WA.
- While building shells improve in efficiency as older stock is renovated, customer growth continues to increase the use of natural gas in the forecast.

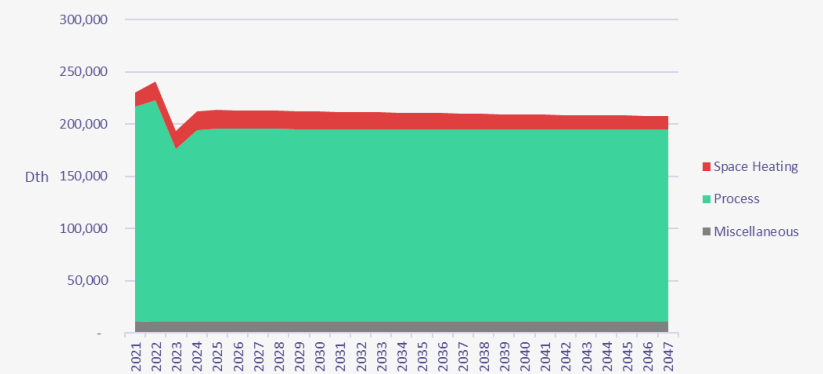
Residential Gas Projection By End Use



Commercial Gas Projection By End Use



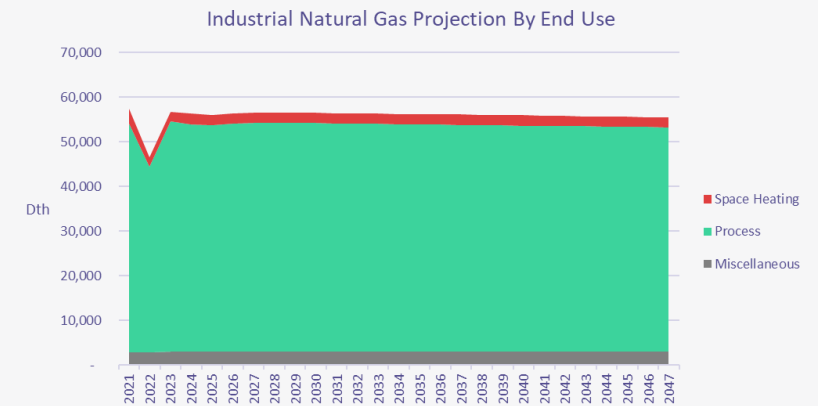
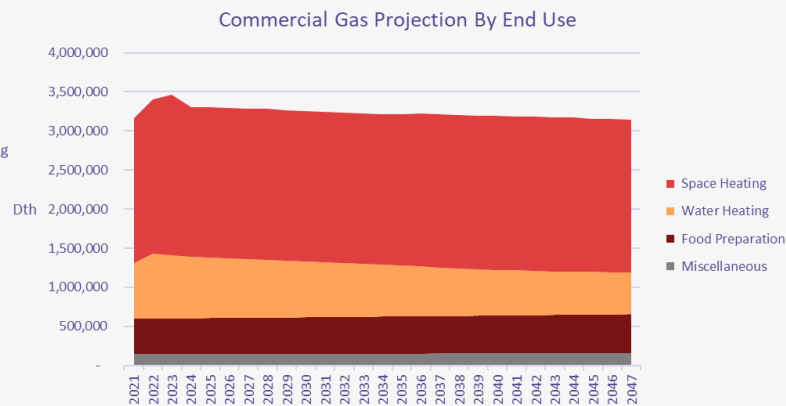
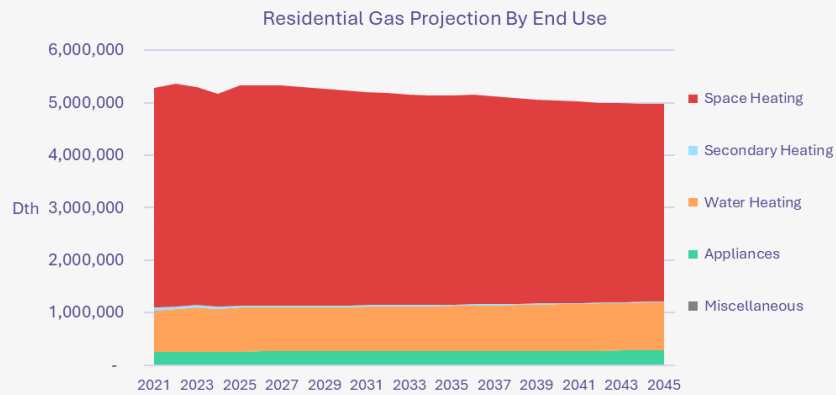
Industrial Natural Gas Projection By End Use



# Oregon Sector-Level Forecasts



- Oregon has relatively stable natural gas loads, as building stock improvements keep pace with modest customer growth and lead to reductions in overall gas use

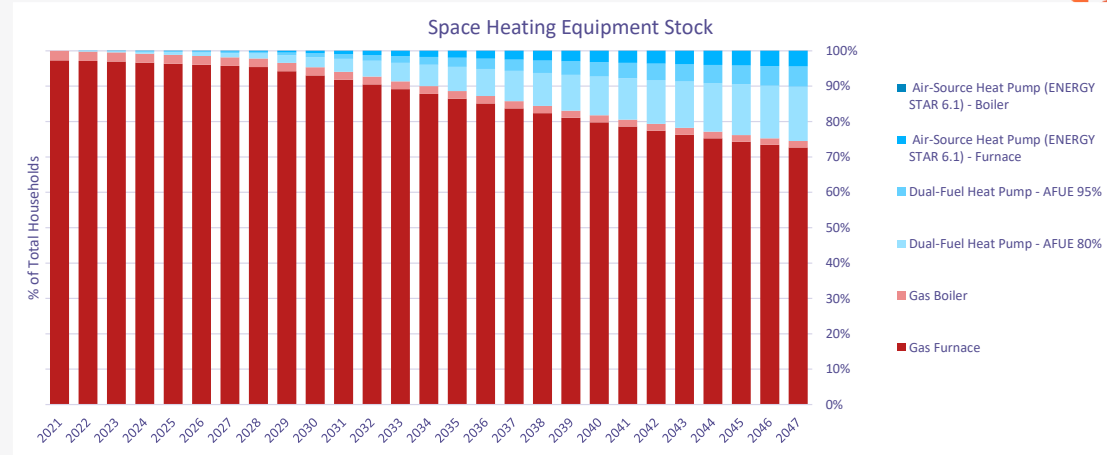


# Electrification Decision Modeling

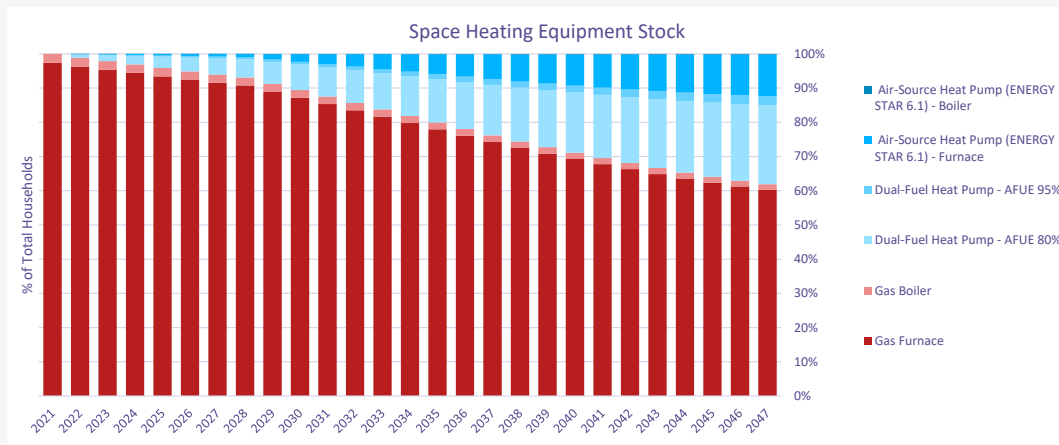


- Gas customers were modeled the same way as the electric market, with the option to replace existing gas space or water heating equipment with electric alternatives, using purchase decision logic copied from the US DOE's National Energy Modeling System.
- Conversion costs include the possibility of a panel upgrade and associated labor. The model compares the lifetime cost of ownership including up front costs and associated lifetime fuel costs.
- As data on customer electrification is not readily available\*, electrification purchases were seeded with a value ¼ that of dual-fuel heat pump installations, which do have documented market shares for WA and ID.

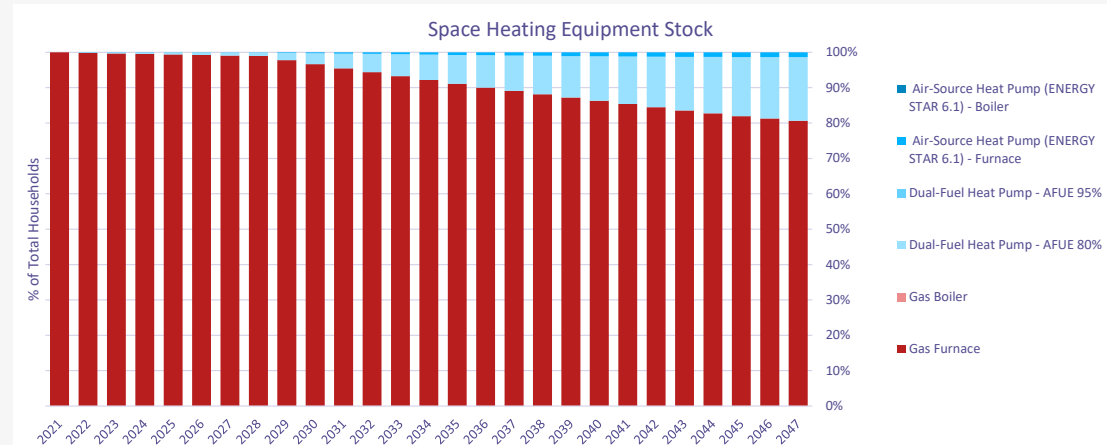
## Washington Residential Gas Heating Market Transformation



## Oregon Residential Gas Heating Market Transformation



## Idaho Residential Gas Heating Market Transformation



# Thank You.

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