Residential Dual-Fuel HVAC – Regional Opportunities

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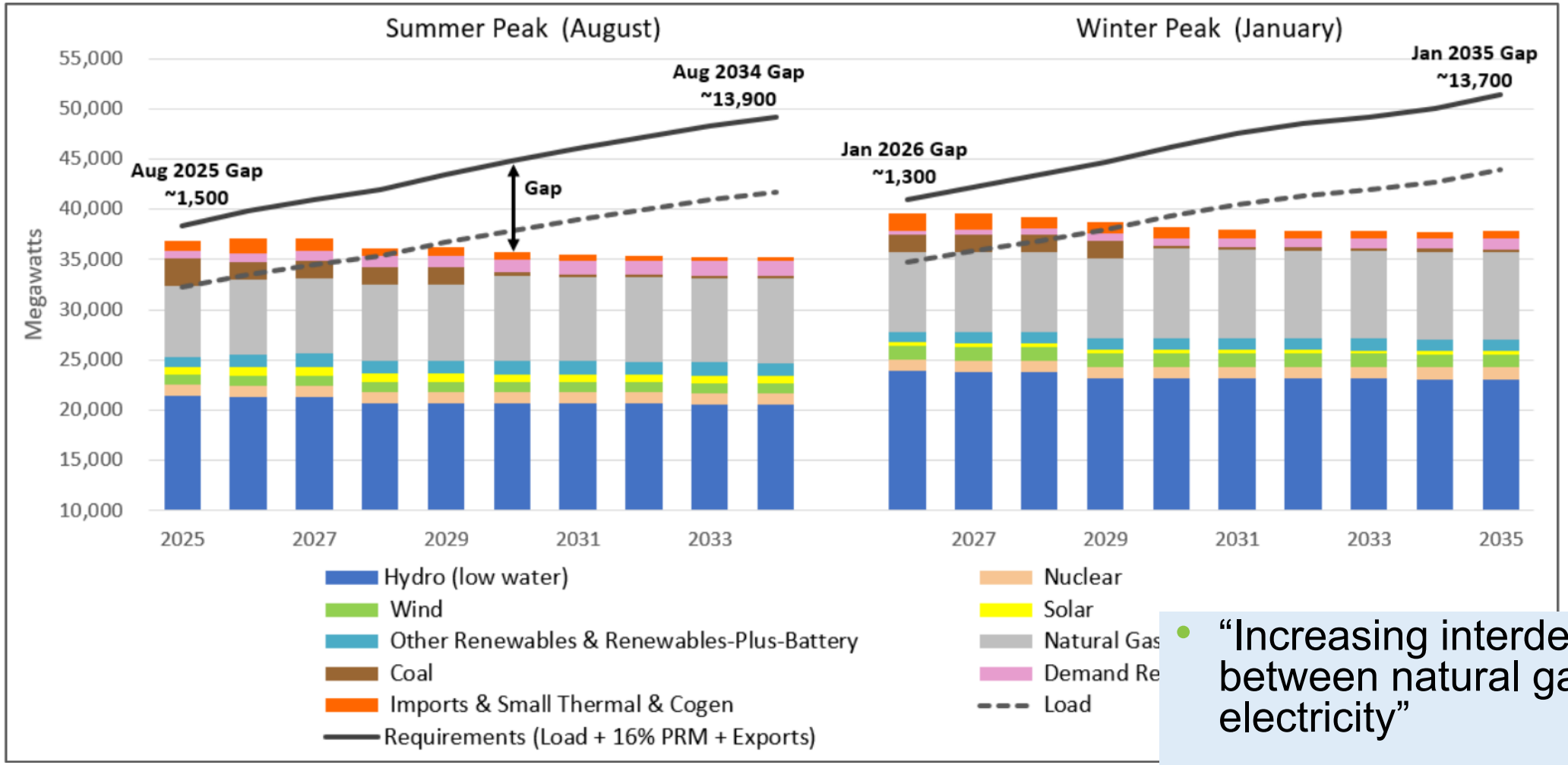
Agenda

- Regional benefits from dual-fuel technologies
- NEEA's regional role and pilot overview
- Utility perspective and value
- Next steps/ Q&A
- White paper

Why Dual-Fuel Technologies?

- Interconnectedness of gas and electric system
- Alignment with varying state policy goals
- Growing interest in dual fuel systems from contractors and customers

PNUCC Regional Forecast Shows Widening Gap between Resources and Loads



- "Increasing interdependence between natural gas and electricity"
- "Energy efficiency and demand response growing"

[2025-PNUCC-Northwest-Regional-Forecast-final.pdf]

Challenge: 100,000 new heat pumps, many with electric resistance back up

- Current sales >100k units/year and growing
- Could result in up to ~1 GW increased critical peak load on the grid

Opportunity: Dual-fuel systems

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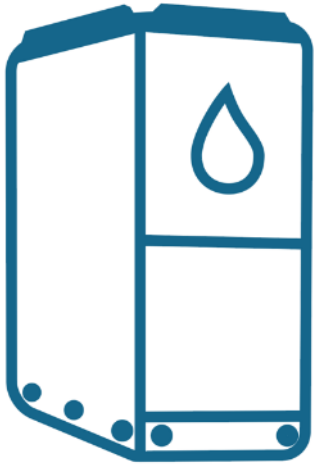
Dual-Fuel Opportunity Summary (Draft estimates):

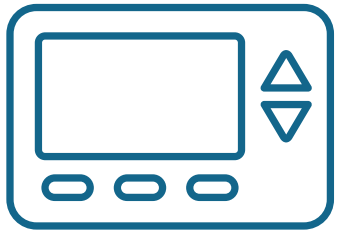
SCENARIO	CRITICAL PEAK LOAD	NON-CRITICAL DISPATCHABLE LOAD	DIRECT CARBON EMISSION REDUCTIONS*
100% Dual-Fuel (DF)	0	2.8 GW	4,350,000 Tons/yr
80% DF, 20% electric	2 GW	2.25 GW	5,200,000 Tons/yr
50% DF, 50% electric	5.2 GW	1.4 GW	6,550,000 Tons/yr
30% DF, 70% electric	7.3 GW	.85 GW	7,400,000 Tons/yr
100% electric	10.4 GW	0	8,700,000 Tons/yr

*NOTE: Direct combustion CO2 emissions reduction over a baseline condition of a gas furnace w/AC; **does not include marginal electric generation emissions**.

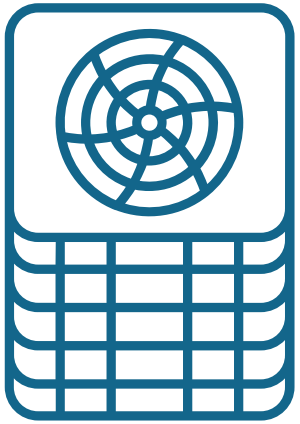
Technology Overview - Current



Gas furnace



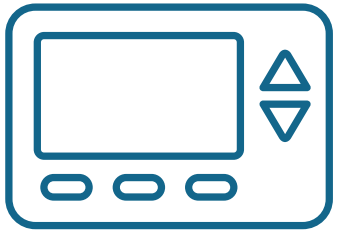
Thermostat (with fixed switchover temperature)



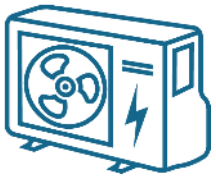
Air Conditioning (or Heat Pump) Unit

Technology Overview – Advanced Options

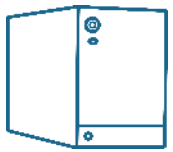
Gas Furnace



Thermostat (with variable switchover temperature)



Air source heat pump



Hydronic Air Handler

Integrated or standalone controls (with variable switchover temperature)

Tankless gas water heater

Dual Fuel - System Benefits

- Gas efficiency
- Resource adequacy
- Grid resilience
- Demand management
- Reduced emissions

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Dual Fuel - Consumer Benefits

- Reduced costs
- Increased comfort
- Resilience

The alliance

NEEA's role

Convene and Collaborate

Regional forum of gas and electric utilities creates opportunities for innovation

Technology scanning

Identified promising dual-fuel technology, initial vetting

Market engagement

Collaborated with NW and Canadian utilities to learn more, visited technology developer

Vision and pilot

Recognized opportunity for the future, renewed previous dialogue, developed advanced technology pilot demonstration

Future

Validate potential, explore Market Transformation program opportunities, expand to commercial technology

Dual Fuel Residential Pilot

Electric Utility Perspective

Matt Babbitts | Clean Energy Program Manager

Clark Public Utilities

Clark Public Utilities

- Founded in 1938, Clark Public Utilities is the sole electricity provider for Clark County, WA
- Serving 200,000+ residential customers and nearly 40,000 commercial and industrial customers
- Average load of ~550 aMW
  - Winter Peak: ~1,100 MW
  - Summer Peak: ~1,050 MW
- Increased coordination and discussions with NW Natural who provides natural gas service in Clark County, WA
  - **Dual Fuel HVAC Pilot**
  - Geothermal Energy Networks
  - Seasonal Demand Response Partnership

Dual Fuel Pilot Overview

- **Equipment**: Hydronic Gas Furnace paired with Gas Tankless Water Heater | Electric Air Source Heat Pump | Remote Communications
- **Participants**: Residential Sector | Existing Gas and Electric Service
- **Potential**: Decarbonization | Energy Efficiency | Capacity

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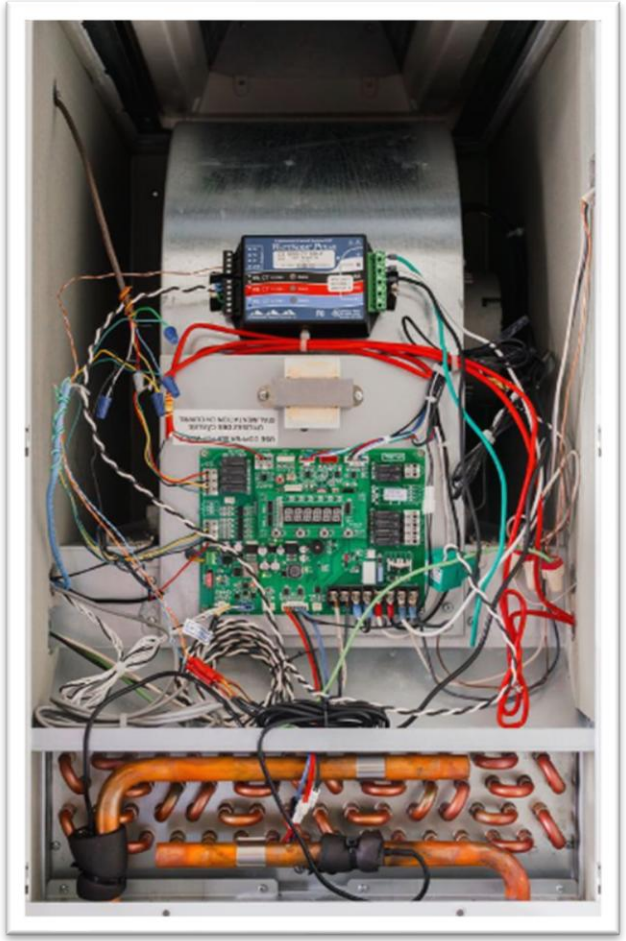
Dual Fuel Pilot Overview

- **“Smart” Controller**:
  - Thermostat agnostic, reducing consumer confusion and hassle
  - Can be used with existing and/or new equipment, addressing cost, compatibility and functionality barriers
  - Allows for simultaneous use of both gas and electric equipment, maximizing value and ensuring consumer comfort
- **Flexible configuration:**
  - Many equipment/controller combinations allow for installation in wide array of homes

Dual Fuel Pilot Overview

- 13 dual fuel systems installed in Clark County
  - Electric Provider: Clark Public Utilities
  - Natural Gas Provider: NW Natural
- Monitor and report on performance, market readiness, comfort, and satisfaction
- Estimate energy reduction compared to a conventional dual fuel system using utility bill and meter data, as well as engineering calculations
- Test system's ability to modulate between electric and gas heating modes in response to signals sent through web-connected controller
- Identify opportunities and barriers for scaling adoption

Installed Systems



Images Credit: NEEA

Gas & Electric Coordination

Washington's decarbonization goals and policies are driving electrification efforts across the state and requiring electric utilities to develop strategies for serving the load growth

- Leveraging natural gas as a *bridge* to a decarbonized future offers value for our consumers and electric and gas utilities
- The dual-fuel project and concept offer an opportunity to drastically reduce site emissions, and increase electricity sales while not compounding the already challenging to serve winter peak demand
- Customer impacts are positive
  - No behavior changes required
  - Substantial energy efficiency benefits (*both gas and electric*)
  - No negative comfort impacts

Image Credit: NREL

Scenario Testing

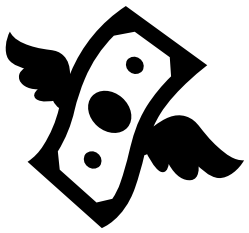
Proving the concept and identifying value streams

- Winter Peak Events
- Wholesale Electricity Price Excursion Events
- Greenhouse Gas Reduction Events
- Seasonal Hydro Events

Valuing Capacity

How can the electric utility compensate the gas utility for the capacity dual fuel HVAC systems provide?

Dual fuel HVAC systems are not traditional demand response, but… they walk and talk like a DR program!



Clark Public Utilities Industrial DR Program:

- ✓ Capacity: 50% discount on monthly demand charge for nominated load ($4.51/kW)
- ✓ Energy: No discount

Scaled Example:

- ✓ 10,000 Dual Fuel Systems
- ✓ Heat Pump Avg. 4kW
- ✓ 10,000 * 4kW * $4.51 = **$180,400**
- ✓ 6 program months = **~$1.1M**

Key Takeaways

The dual-fuel concept provides value to both the electric and natural gas utilities, while advancing decarbonization policies and goals:

- Capacity providing resource (electric sector)
- Capacity revenue stream (natural gas sector)
- Deep residential sector emissions reduction (policy sector)
  - *Emissions reduction opportunity only exists when the service area has existing retail gas service*

Thank you!

Matt Babbitts
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Clark Public Utilities

Gas Utility Perspective on Dual Fuel and the NEEA Pilot Project

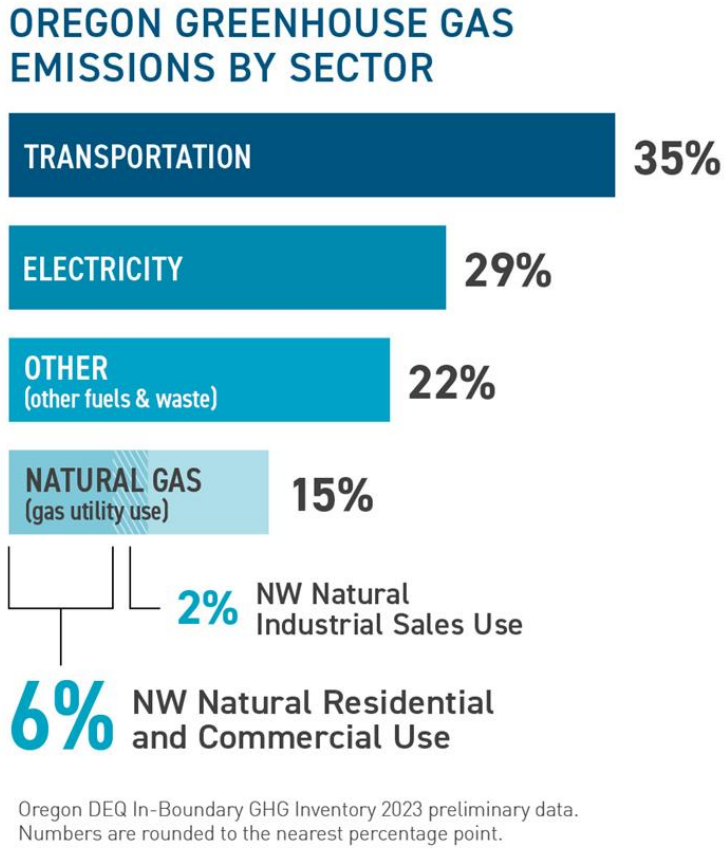
Kellye Dundon

NW Natural®

Our Interest in Dual Fuel

NW Natural®

- Balancing of energy system strengths
  - Valuation of the gas system for addressing resource adequacy and peak demand issues
- Utilization of existing infrastructure
- Emissions reductions/ carbon compliance
- Flexibility provided by the technology tested in this pilot
- Enabling policy and funding structures



Benefits of this Pilot

NW Natural®

- Evaluating the actual technology in our region
- Learning about customer experience
- Testing our operating scenarios and control functions
- Evaluating capacity payment structures
- Evaluate emissions savings
- Leverage lessons learned for enabling policy development or agreements (Hydro-Québec and Énergir example)

Hydro-Québec and Énergir Example

NW Natural®

- Quebec assessed the best way to lower emissions with their energy system that is heavily reliant on hydro power (99.6% of the electric supply)
- Dual fuel systems were better than straight electrification
- In July 2021, Hydro-Québec and Énergir signed a dual energy agreement for 2022–2045
- The agreement converts gas heating residential systems to dual fuel systems where gas furnaces will cover peak and the rest of the operating time will be electric
- Hydro-Québec estimates $1.682 billion in savings from this dual fuel plan compared to full electrification
- Énergir is receiving a GHG Compensation for lost revenues and serves as a capacity payment ($403 million by 2030)

Gas and Electric Utility Coordination

NW Natural®

- Potential for future technology pilots with other electric utilities in our service territory:
  - Dual fuel air source heat pump/ furnace combinations
  - Dual fuel ground source heat pump/ furnace combinations
  - Thermal energy networks
- Collaboration on constructive policy and incentives

Next steps

NW Natural®

Explore enabling policy and rate making structures → Look for additional pilot projects and partners → Continue to track technology improvements

Clark Public Utilities

Analyze scenario testing results → Develop capacity compensation model → Explore scaled opportunities

neea

Complete initial pilot, explore additional opportunities → Integrate findings into regional MT program(s) → Encourage broader dialogue to remove market barriers

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Questions?

Dual Fuel White Paper

- Dual-fuel residential HVAC systems can be a flexible and resilient solution.
- Advanced controls can be integrated into dual-fuel systems to develop a cost-effective foundation for future technological advancement.
- Successful control strategies realize the maximum potential of dual-fuel systems.
- Market research findings explain how existing consumer and contractor behaviors present barriers and opportunities to accelerate market adoption.

Thank You!

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FORTIS BC™

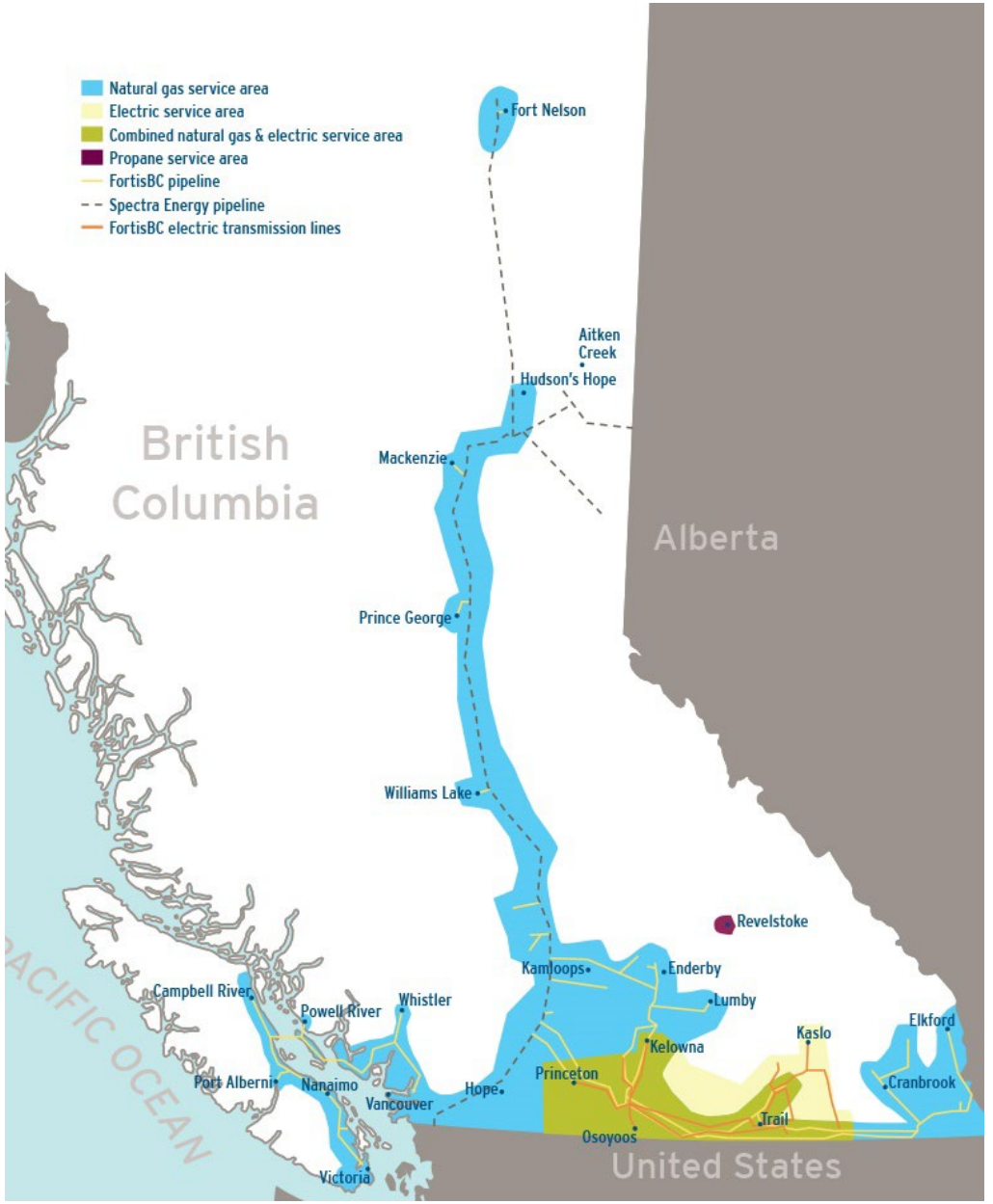
Integrated Gas & Electric Heating

Colin Norman
Senior Manager, Planning & Portfolio Strategy

June 4, 2026

About FortisBC

- FortisBC is the largest energy provider in the province of BC
- Combined, we serve nearly **1.3 million customers**, providing:
  - 1.1 million gas customers
  - 180,000 electric customers (including direct and indirect)
- We serve **135 communities** across BC and 58 Indigenous communities across 150 traditional territories
- We directly **employ 2,700** British Columbians

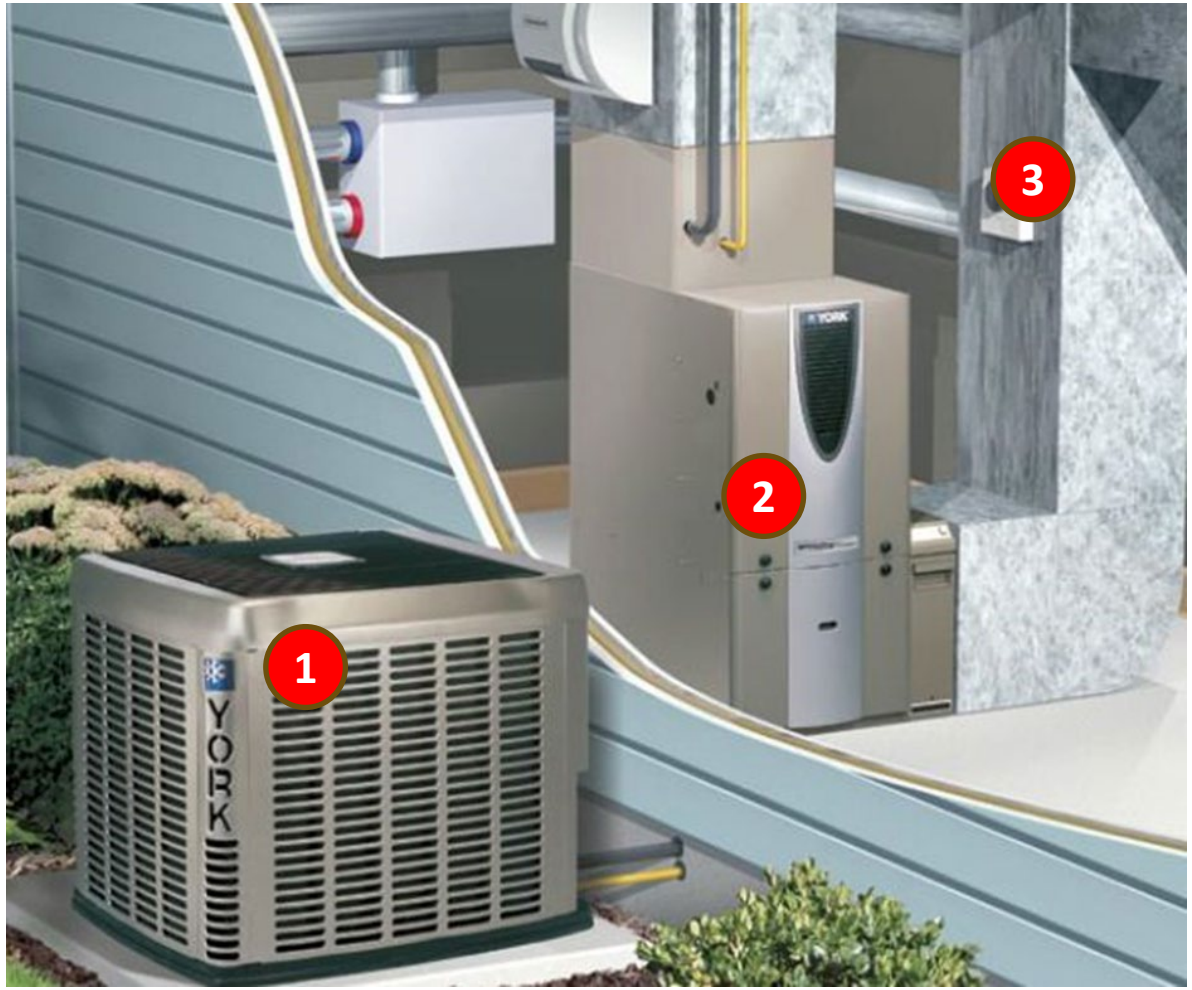


FORTIS BC™

Dual Fuel Systems: A Reliability and Resilience Solution

Comprised of three components:

1. Electric Heat Pump
2. High efficiency gas furnace, and
3. Common controls
   - Combined efficiency exceeding 150%
   - Optimizes use of gas and electric system, overall reduction in GHG emissions
   - Avoids peak demand on the electric system during colder periods



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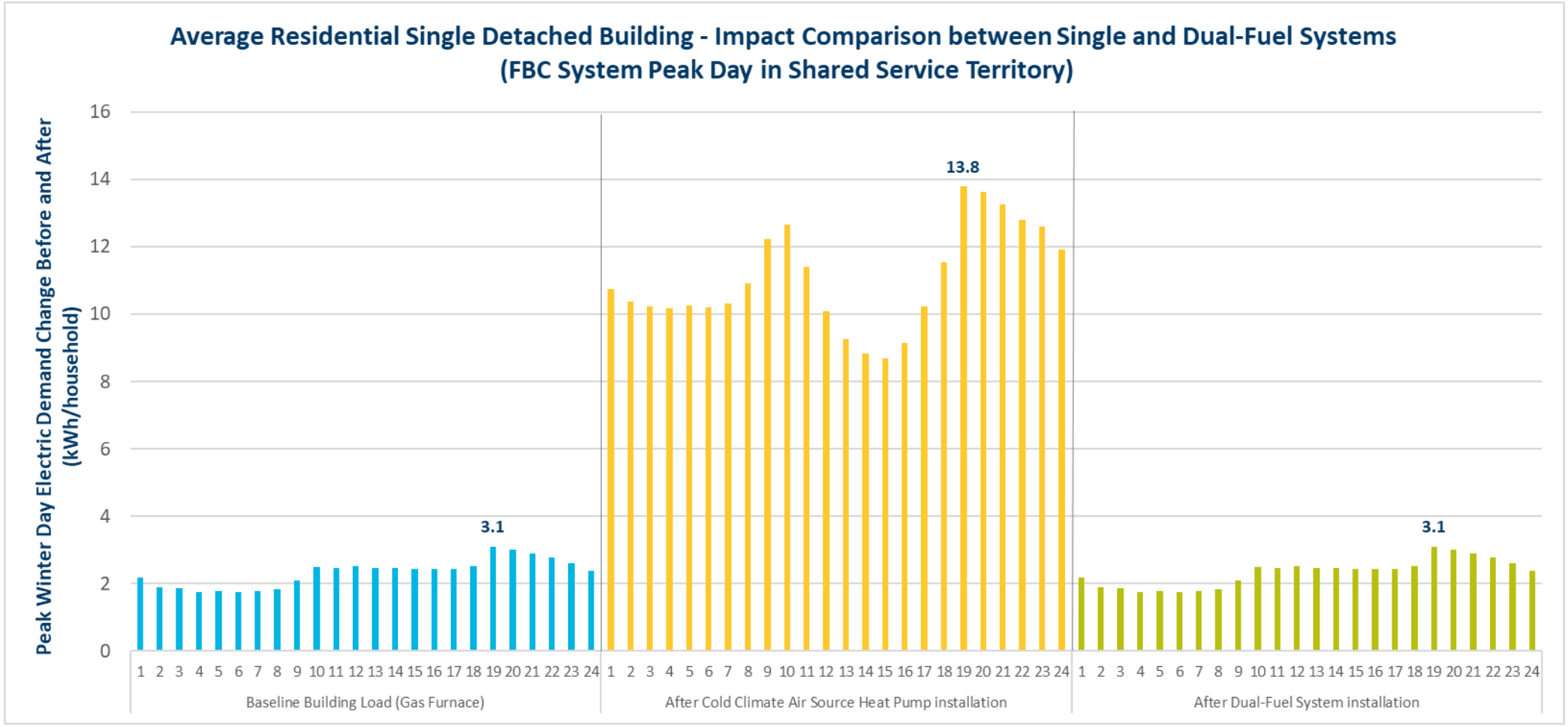
Benefits of Dual Fuel Systems on Peak Day

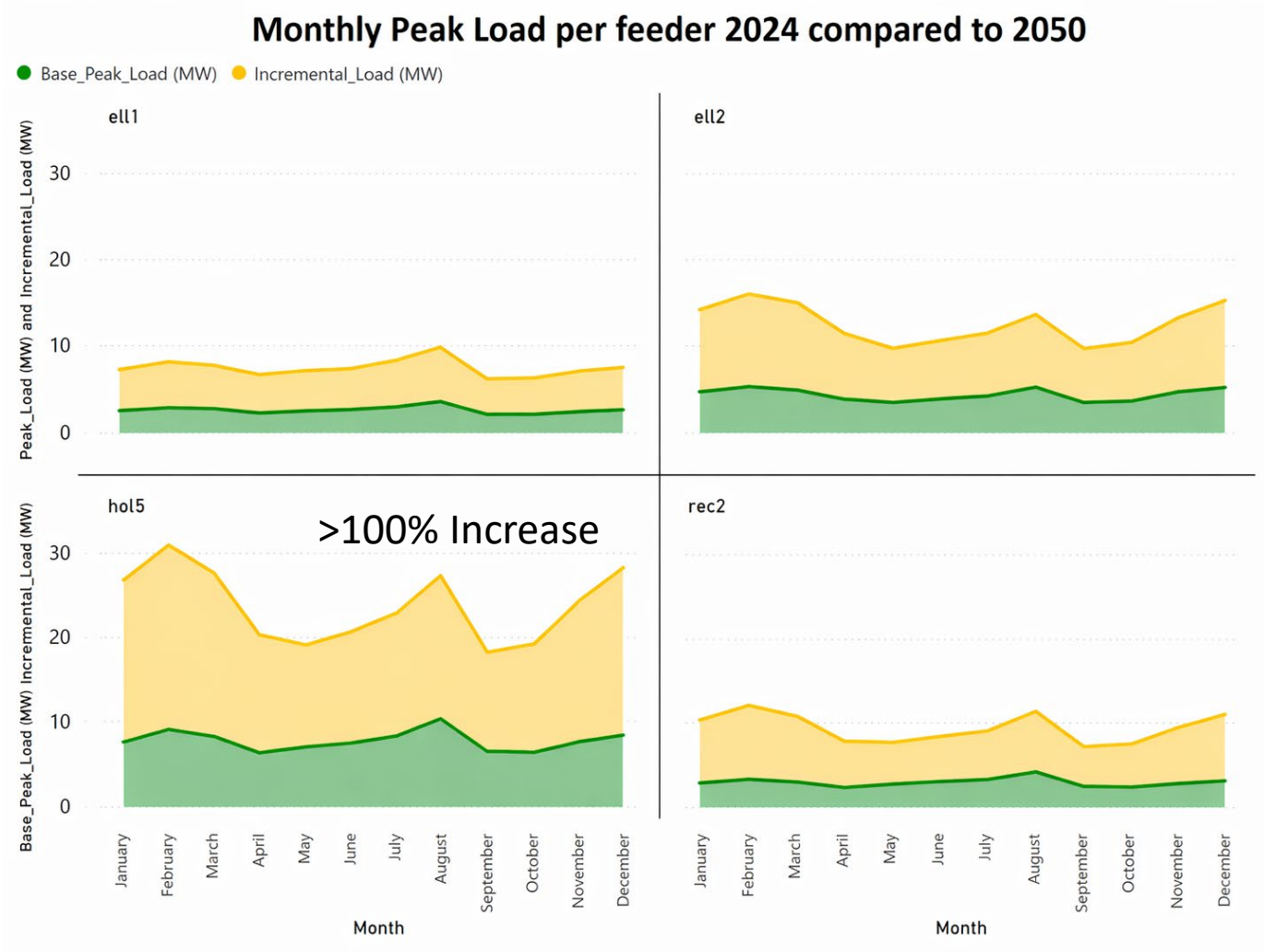


- If all 44,000 single detached homes in FortisBC's shared service territory became dual-fuel instead of switching to electric heating, **this would avoid close to 500 MW of peak electric demand growth**

FORTIS BC™

Dual Fuel Deferring Electric Infrastructure Costs

- FortisBC completed preliminary analysis on how dual-fuel heating or fuel switching could impact electric feeders
- The analysis showed that **dual fuel heating** benefits the electric utility in **delaying and deferring electric infrastructure**
- **Different Electric Feeders:** Ellison Substation #1 and #2, Hollywood #5, Recreation #2
- **Shape Year:** Design Conditions
- **Region:** FBC North Okanagan
- **Customers:** Existing Residential only



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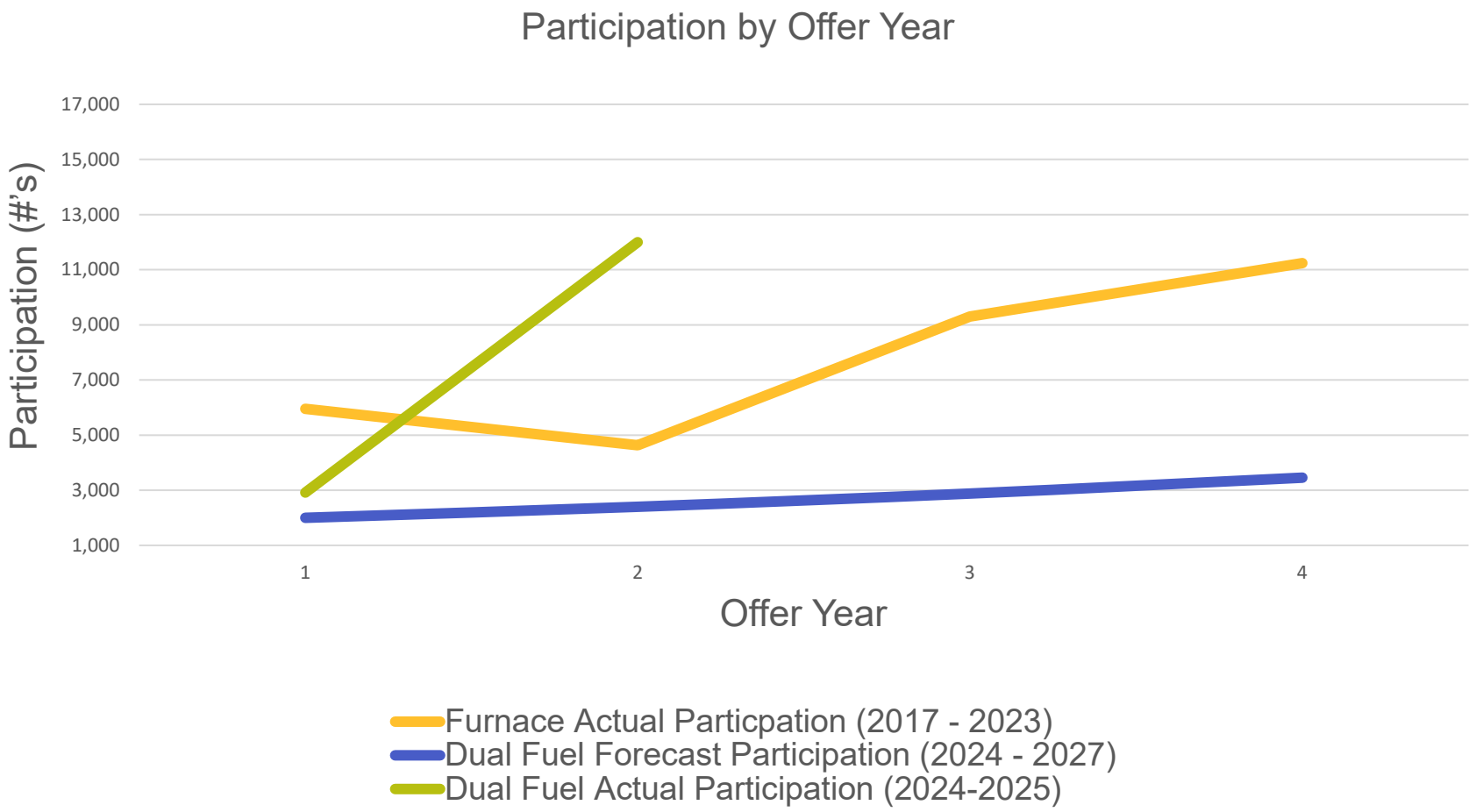
Dual Fuel Forecasts & Market Behavior

- 2024 – 2027 DSM Plan forecasts considered historical furnace offer participation.
- Anticipated that barriers to adoption for dual fuel would result in slower participation growth in the initial program years than the furnace offer.
- Actual market response was strong from customers and industry. Participation growth was rapid.



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Key Dual-Fuel Takeaways

1. **Uses Strengths of Both Systems**: Gas demand is higher and more variable than electric demand (worse load factor), uses existing gas infrastructure in winter, increases electric load in shoulder season

2. **Avoids Electric Peak and System Increases:** Dual-Fuel heating systems in the BC Interior use gas below 2°C (35.6°F), so defers electric system build out to meet increased peak demand

3. **Reduces Gas Consumption and GHG Emissions:** Dual-Fuel heating systems compared to a gas furnace baseline can reduce demand and emissions

4. **Creates an Opportunity for a Benefit Sharing Mechanism:** Dual-Fuel systems offer benefits to electric customers by avoiding marginal electric costs, which are not currently captured within an incentive mechanism that is provided solely from a gas utility

FORTIS BC™