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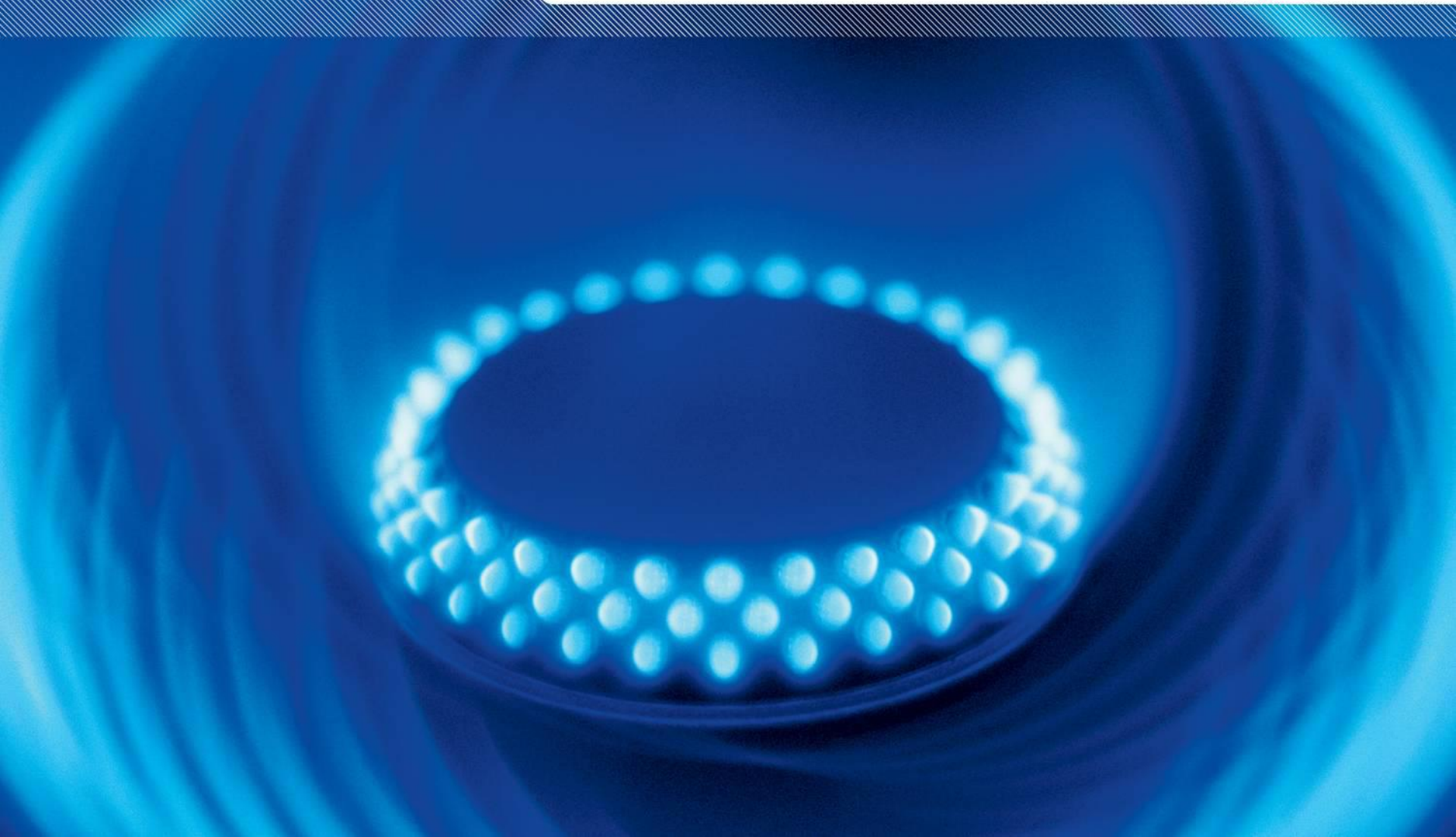
NW Natural's 2014 IRP (UG-131473)

Washington Utilities and Transportation Commission

December 11th, 2014



Agenda

1. Introduction
2. Principal Conclusions
3. Gas Requirements
4. Existing Resource Changes
5. Supply Side Resource Options
6. Modeling Results
7. Risk Analysis
8. Specific Infrastructure projects
9. Questions

Forward-looking Statements

- This presentation contains forward-looking statements. Forward-looking statements include statements concerning plans, objectives, goals, strategies, future events, forecasts, and other statements that are other than statements of historical facts. NW Natural's expectations, beliefs, forecasts, and projections are expressed in good faith and are believed to have a reasonable basis. However, each such forward-looking statement involves uncertainties that could cause the actual results to differ materially from those projected in such forward-looking statements.

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Period of Industry Transformation

Shale gas

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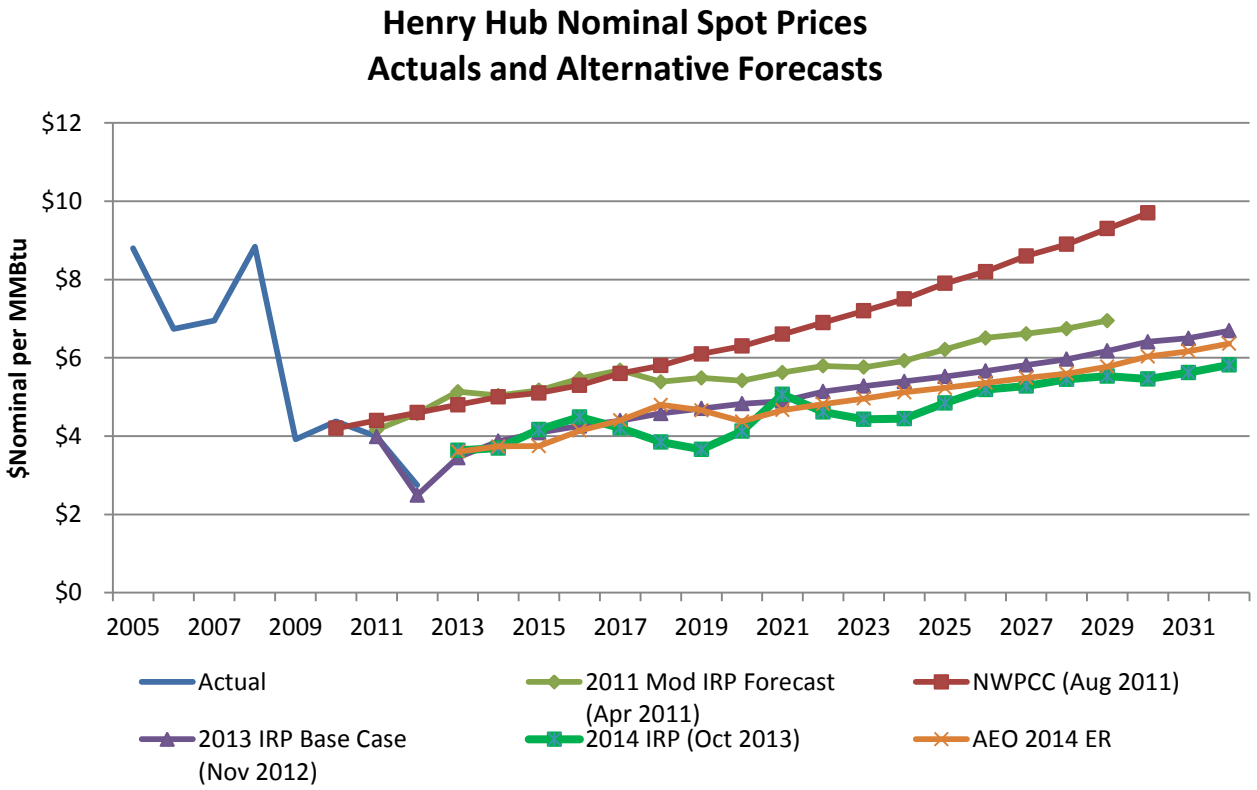
Lower prices

↓

Demand response

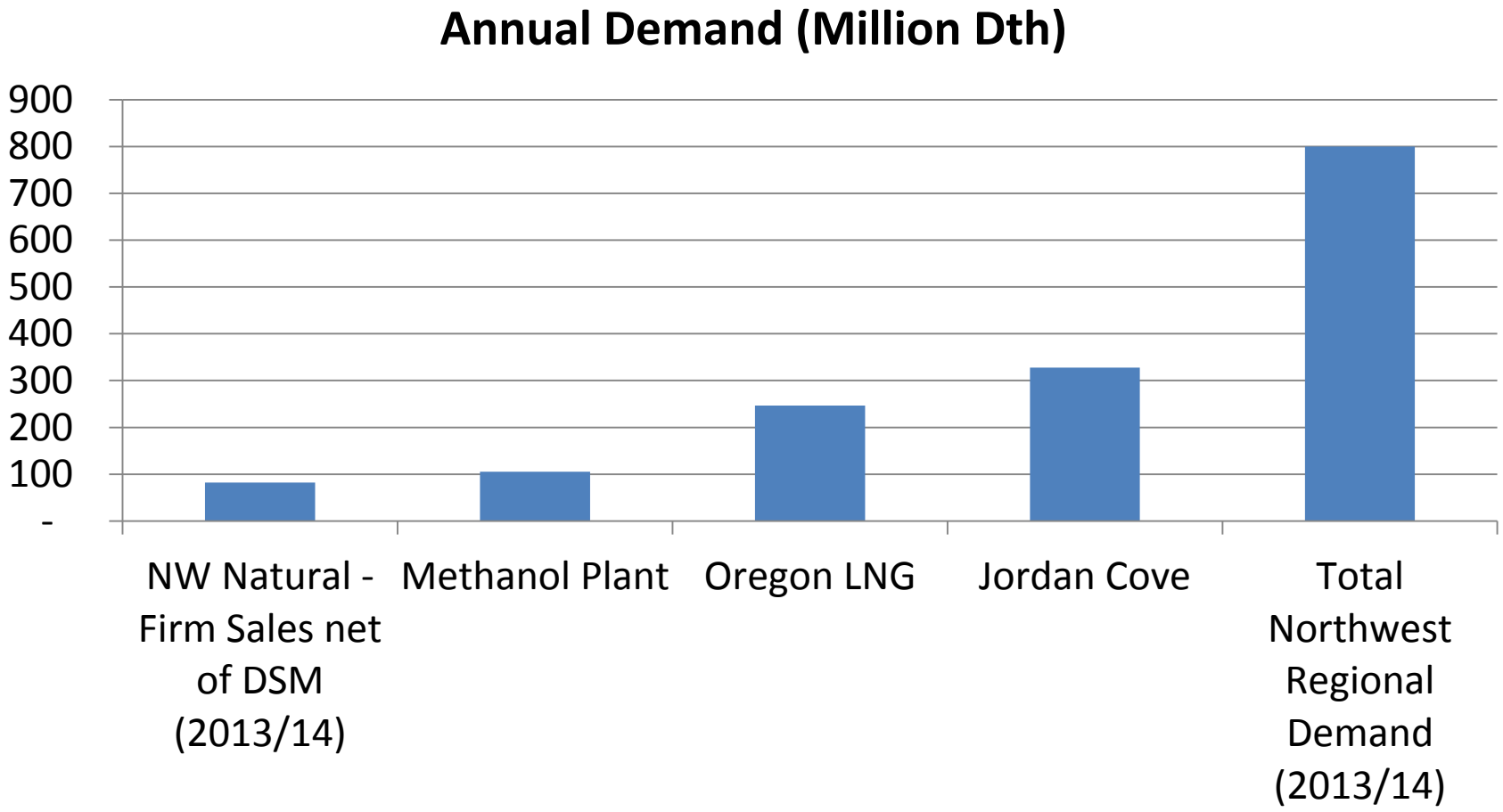


Additional Changes Affecting NW Natural

- ❑ Economy and housing market
- ❑ Emerging new markets
  - e.g. Transportation
- ❑ Energy-efficiency cost-effectiveness
- ❑ Existing resource reliability reevaluation
  - e.g. Plymouth LNG
- ❑ Uncertain GHG regulation
- ❑ Re-kindled pipeline options

The Company has put an increased emphasis on this IRP in addressing these issues – created a new team , more granular modeling , more in-depth risk analysis and increased stakeholder engagement and transparency.

Regional Pipeline Infrastructure: Implications of Potential Major New Loads



A New Approach to Resource Planning in this IRP

Adaptive Planning

- A resource plan that adapts as each particular regional scenario unfolds.
  - Not just a single preferred base case path for 20 years.

Key Scenario Variable

- Which, if any, regional pipeline project proceeds within the next few years. NW Natural does not control this decision.

Key Resource Optionality

- Mist Recall and further North Mist expansion. NW Natural can control this decision and, importantly, flex the timing.

Resource Portfolio Diversity

- From either of the two pipeline options selected, depending on the scenario.
- From North Mist.

Principal Conclusions

Principal Conclusions

1. Additional resources are needed due to load growth, removal of existing resources from the stack, less cost effective DSM, and improved modeling

2. Large degree of uncertainty as to which long-term resources will be available
   - NW Natural does not control the large regional pipeline options

3. Best approach is to use Mist Recall, preserve optionality associated with both Cross-Cascades and Pacific Connector pipelines, and analyze the value of creating optionality with North Mist

4. Infrastructure investments are required: (A) Newport LNG refurbishment; (B) Clark County distribution system; (C) the South Salem Feeder.

5. High level of uncertainty highlights need to manage the risks facing customers; (A) the risk of assuming 100% reliability of all resources in firm resource stack; and (B) gas price volatility and the upside risk of natural gas prices over the planning horizon.

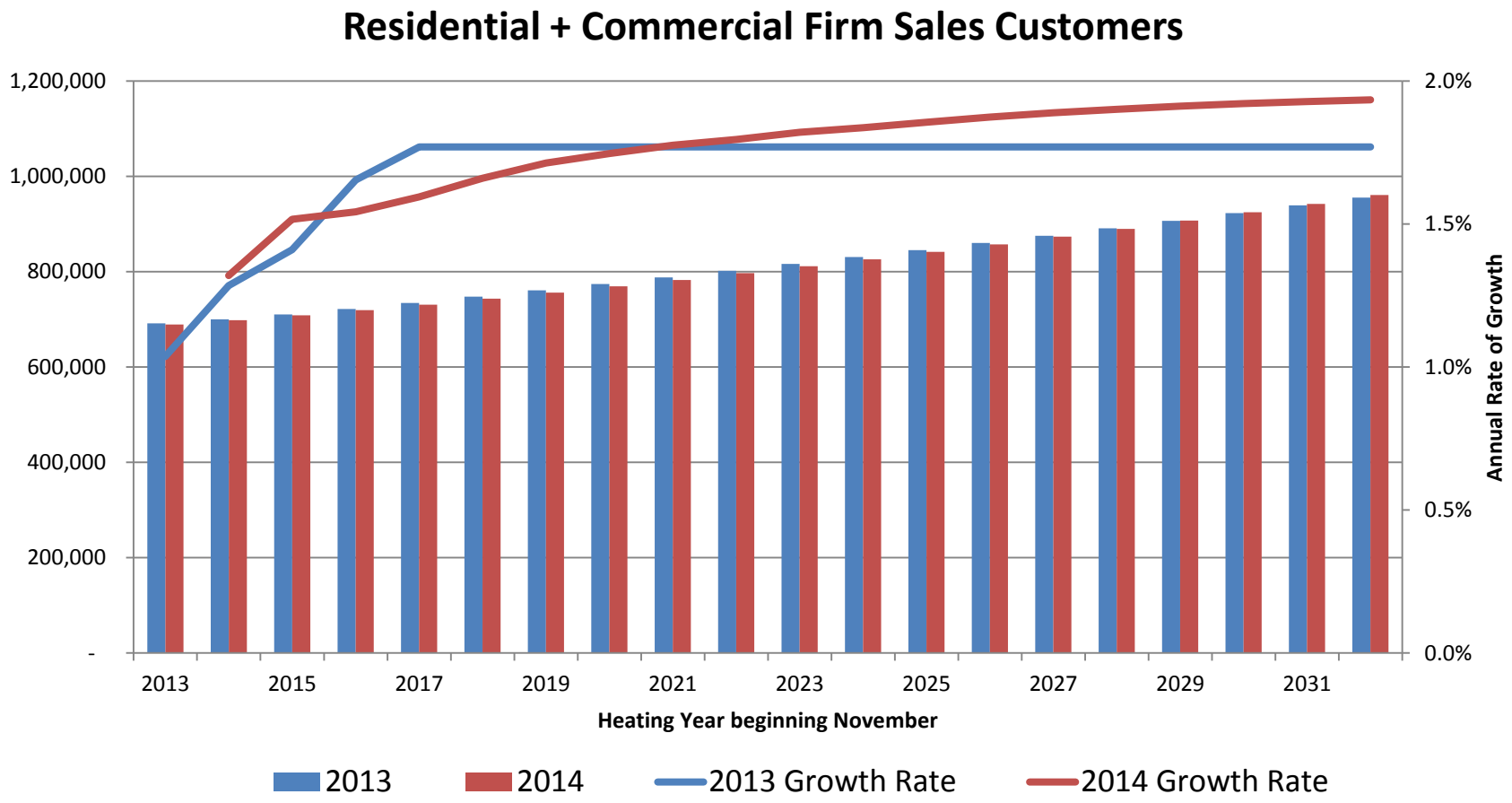
6. Initial Carbon Dioxide Emissions analysis shows even a relatively high tax is unlikely to impact resource choices or this IRP's action plan

Gas Requirements

Design Weather

- Peak day is coldest day in 30 years
  - Feb 3, 1989: system average of 53 heating degree day (equivalent to 12° F)
  - Peak day of system-weighted 53 HDD used for at least a decade, including in 2013 IRP
- Design weather selected from 30 years of weather history
  - 2013 IRP design weather developed from 20 years
- Heating season design weather is 3rd coldest in 30 years (1992/93)
  - 2013 IRP based on 4th coldest in 20 years (2000/01)
  - Three subsequent winters have been colder than 2000/01: 2007/08, 2008/09, 2011/12
  - More HDD in the winter provides more rigorous test of storage resources
- Design weather has 7-day cold event superimposed
  - Based on historical week: January 31 – February 6, 1989
  - 2013 IRP used a 3-day cold event: February 2 – February 4, 1989

Customer Forecast Comparison – 2014 IRP versus 2013 IRP



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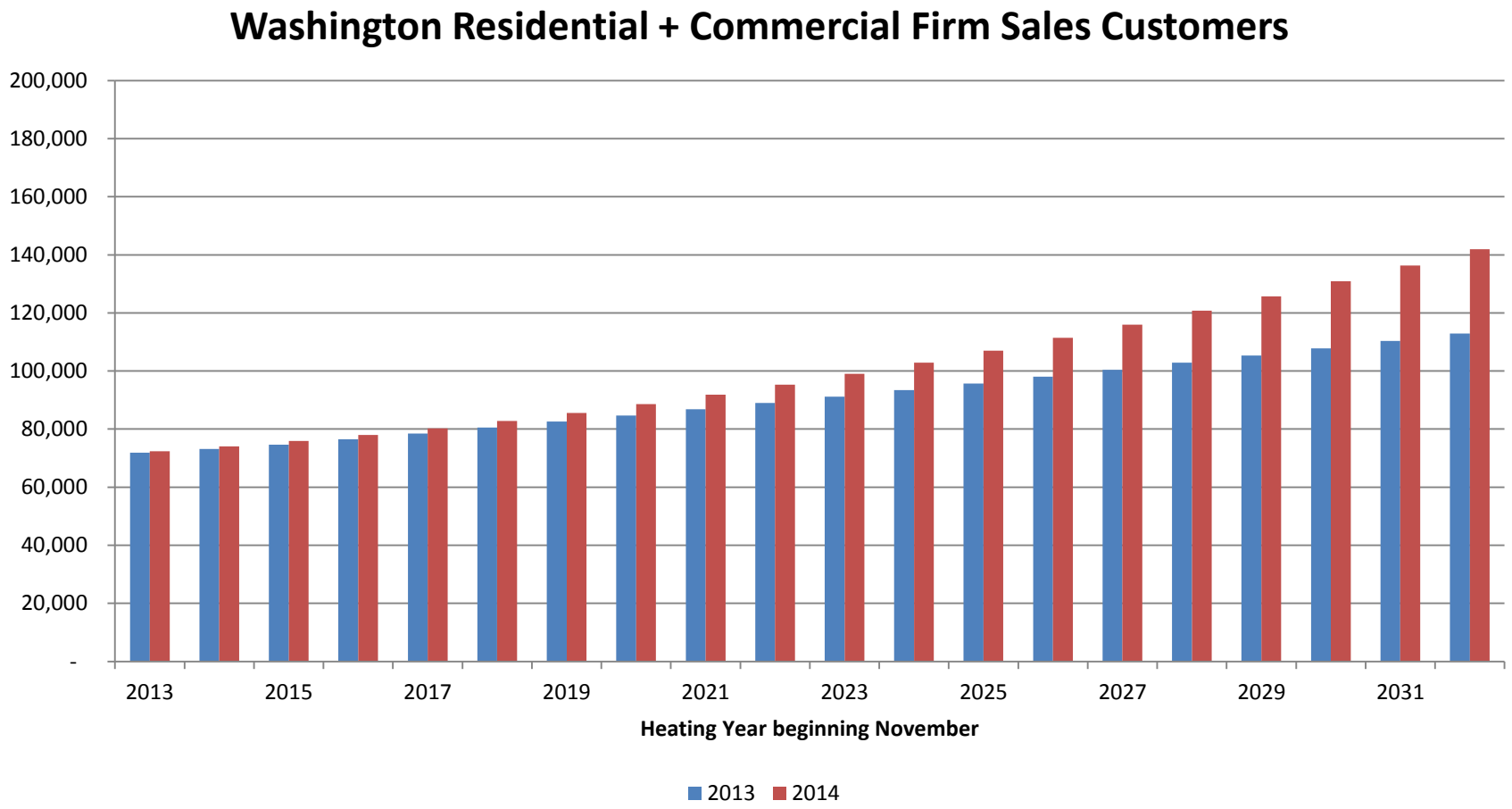
Washington Customer Forecast Comparison – 2014 IRP versus 2013 IRP



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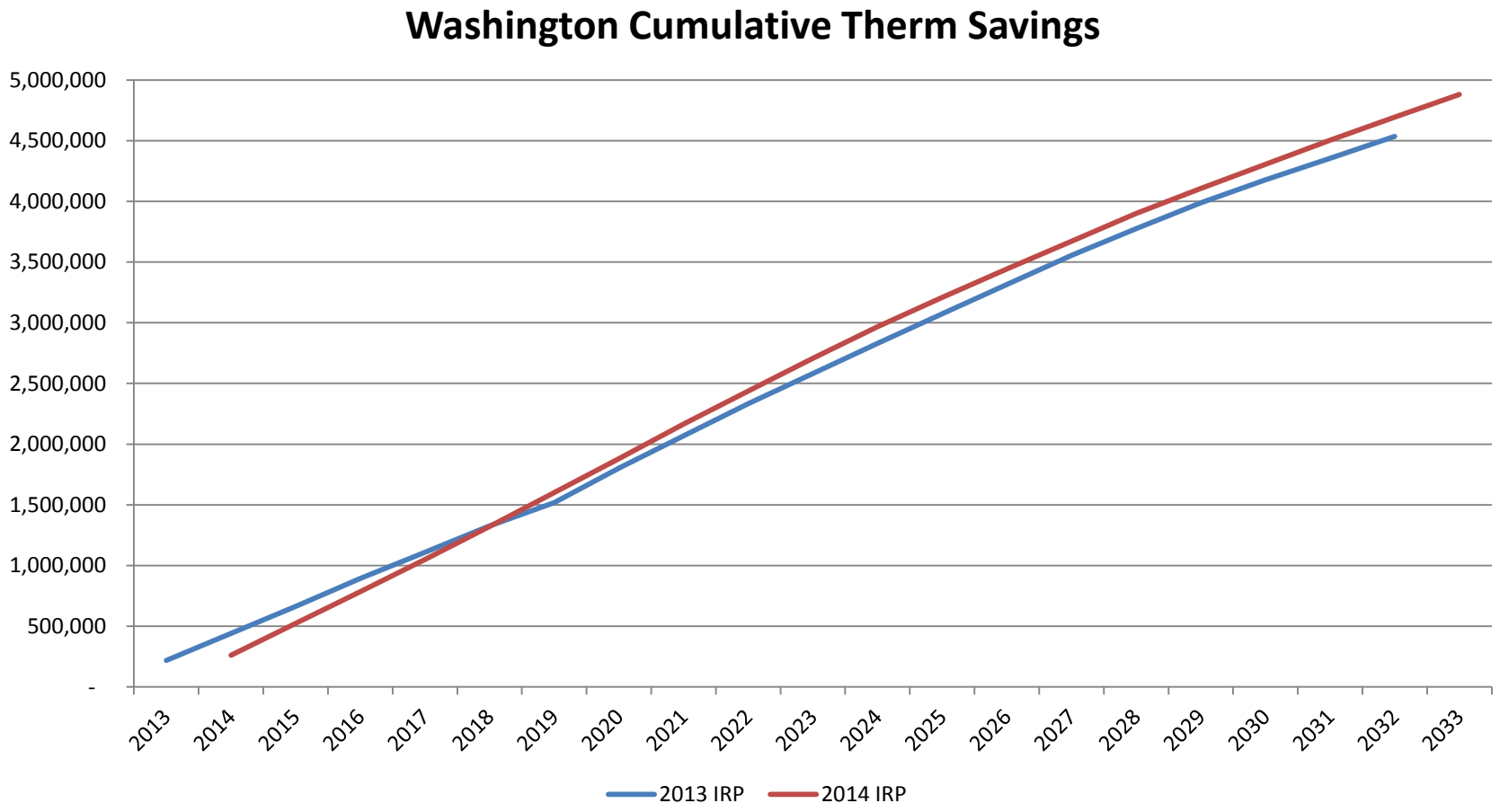
Washington Demand-side Management*



* Forecasts provided by ETO

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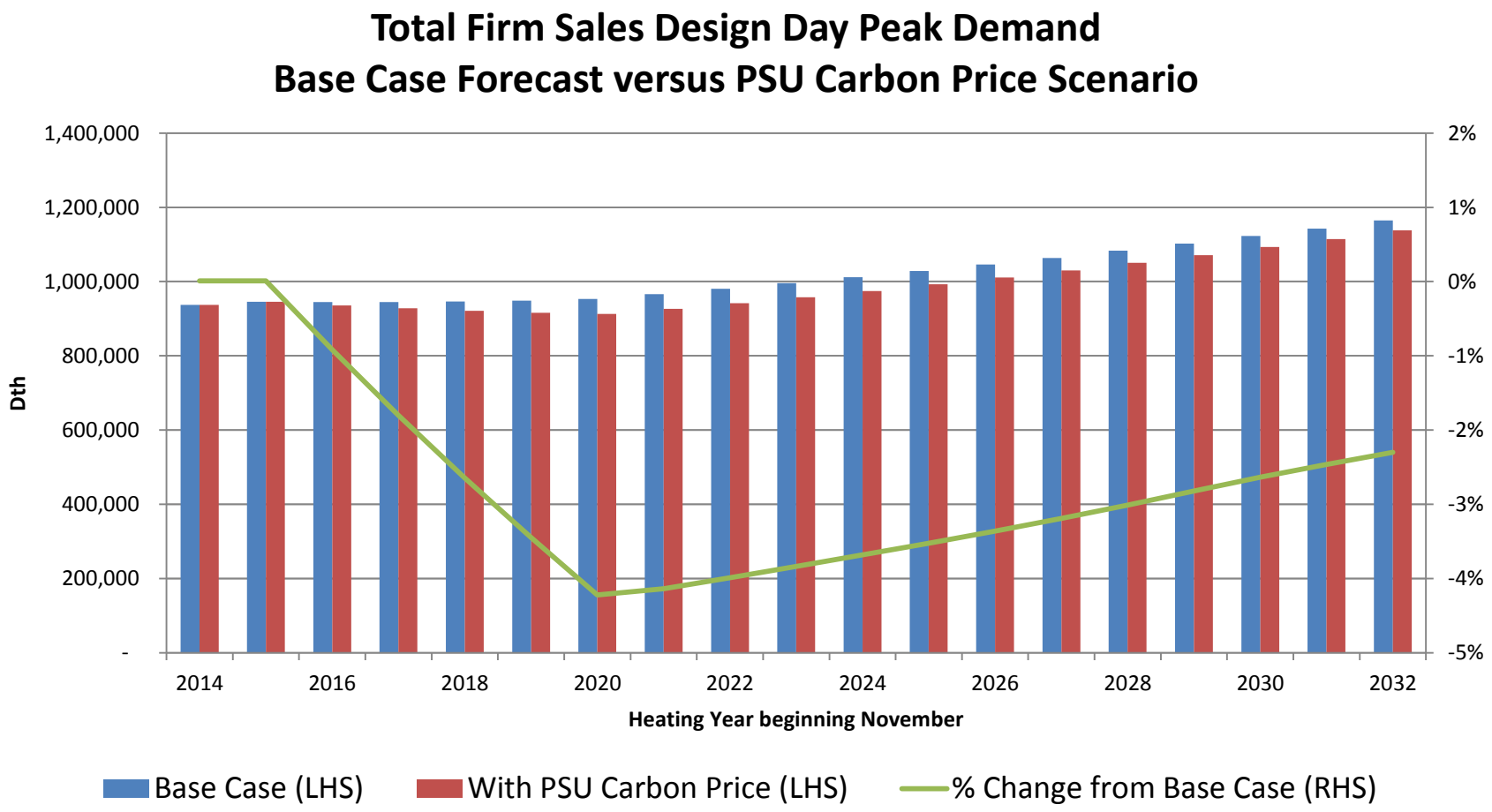
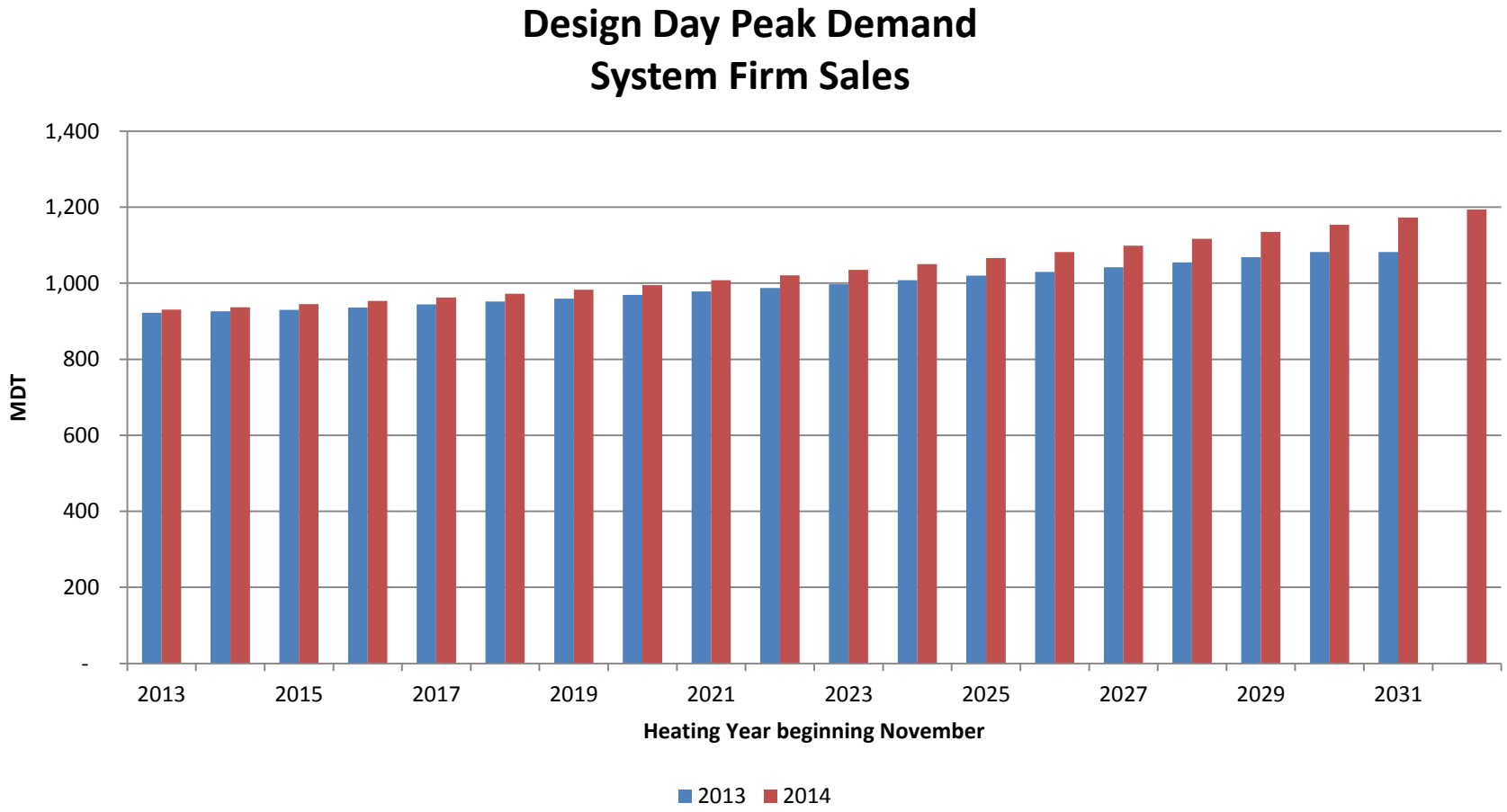
Impact of "High" Carbon Tax Scenario



Design Day Peak Demand Net of DSM - 2014 IRP versus 2013 IRP



Existing Resources and Recent Changes

Background Info That Didn't Use to Matter

- 1970s and 1980s:
  - NW Natural relied on Plymouth LNG and Jackson Prairie (JP) underground storage as part of its firm resource stack
  - Services offered by Northwest Pipeline (NWP) under Rate Schedules LS-1 and SGS-1
  - Storage facility and NWP transportation services were bundled together

- 1989-1993:
  - Deregulation resulted in unbundling of services provided by NWP
  - LS and SGS recast to only represent service at the storage facility itself
  - Compromise reached on allocation of pipeline costs, creation of TF-2 service
  - TF-2 service from JP was Firm, but TF-2 from Plymouth was "Secondary" Firm

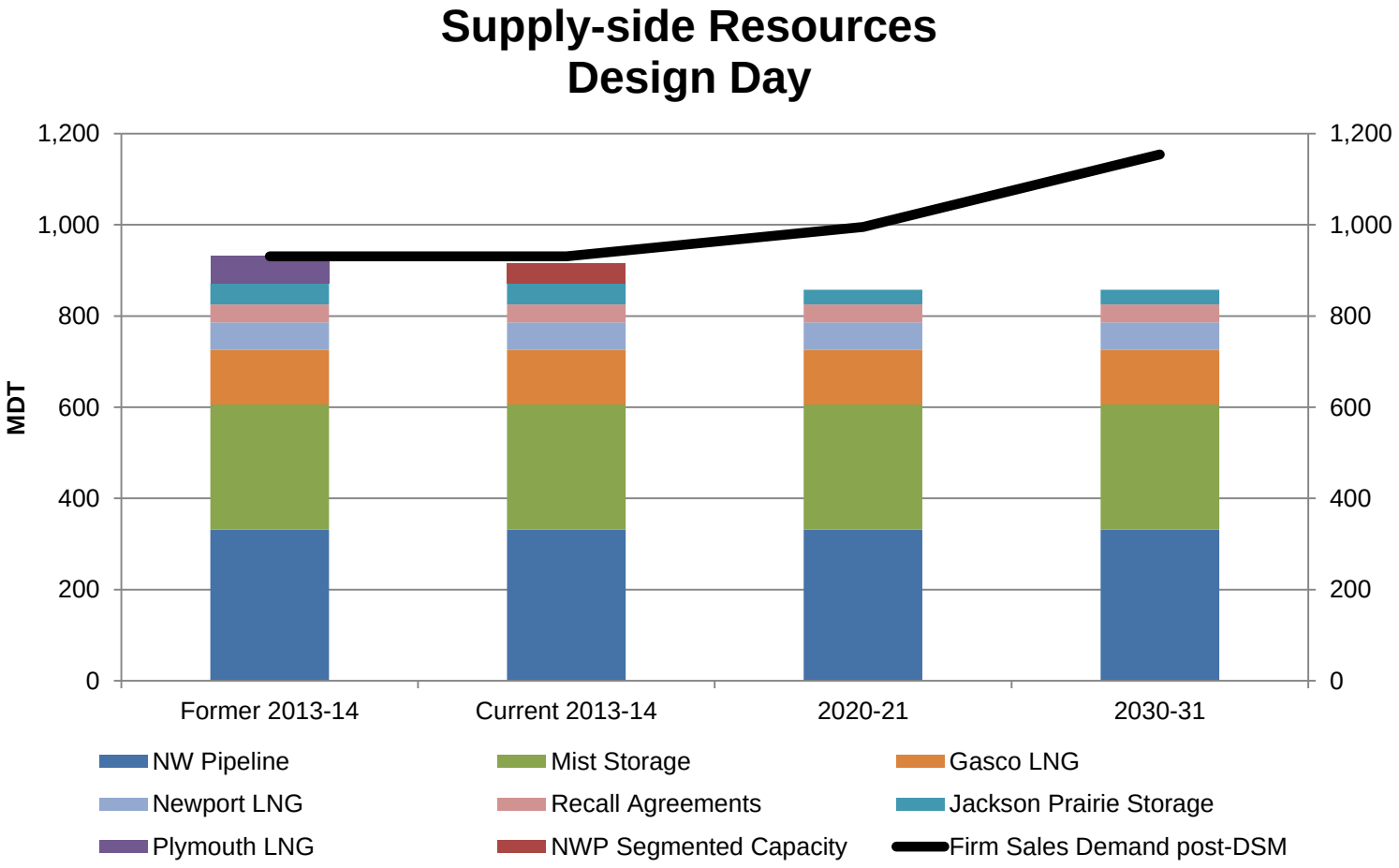
- 1990s:
  - JP facility was expanded and NW Natural subscribed to additional SGS service
  - Associated new TF-2 service was provided but as "Subordinate" Firm

How Firm is Firm?

NWP informed NW Natural that Plymouth Secondary Firm (TF-2) service would be curtailed during a December 2013 cold weather event that lasted several days.

- Per NWP, curtailment due to lack of available pipeline capacity through the Gorge.
- Was this an isolated or Force Majeure type occurrence?
  - NWP analyzed Plymouth TF-2 service to NW Natural after the December curtailment and indicated that it would be reliable in 12 out of 14 years.
- Is NW Natural unique?
  - All TF-2 from Plymouth is secondary firm, but moving gas east-to-west through the Gorge is the critical constraint.
  - PSE also has removed Plymouth as a firm resource in its IRP.
- Similar implications for JP Subordinate Service?
  - Yes, though JP subordinate TF-2 service has yet to be curtailed.

Supply Resources – if we do nothing



Supply-side Resource Options

What are the options for additional resources?*

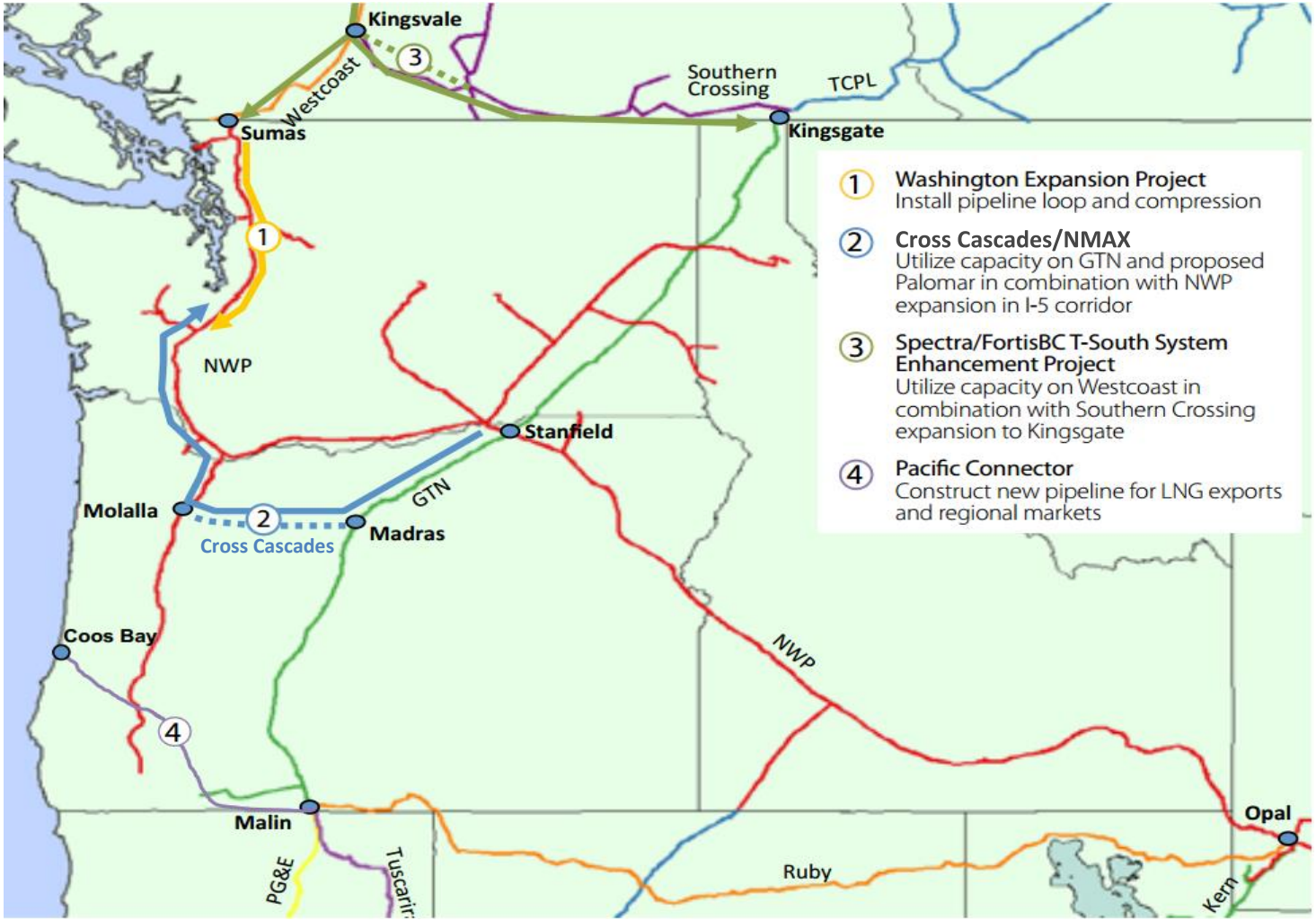
DSM/Other	Storage	Interstate Pipeline Capacity

•100% acquisition of cost effective DSM
 	
•Industrial Recall Agreements
	• **Underground**
	  • Mist Recall
	  • Mist Expansion (North Mist)
	  • Additional Jackson Prairie
	• **LNG**
	  • Additional Newport compression (Christenson Compressor)
	  • New LNG Facility
	  • Satellite LNG/CNG
		• Cross Cascades
		• Washington Expansion
		• Pacific Connector
		• Sumas expansion – Regional
		• Sumas Expansion - Local

**Not an exhaustive list.*

Resources in red not controlled by NW Natural.

Potential and Plausible Interstate Supply-side Resources



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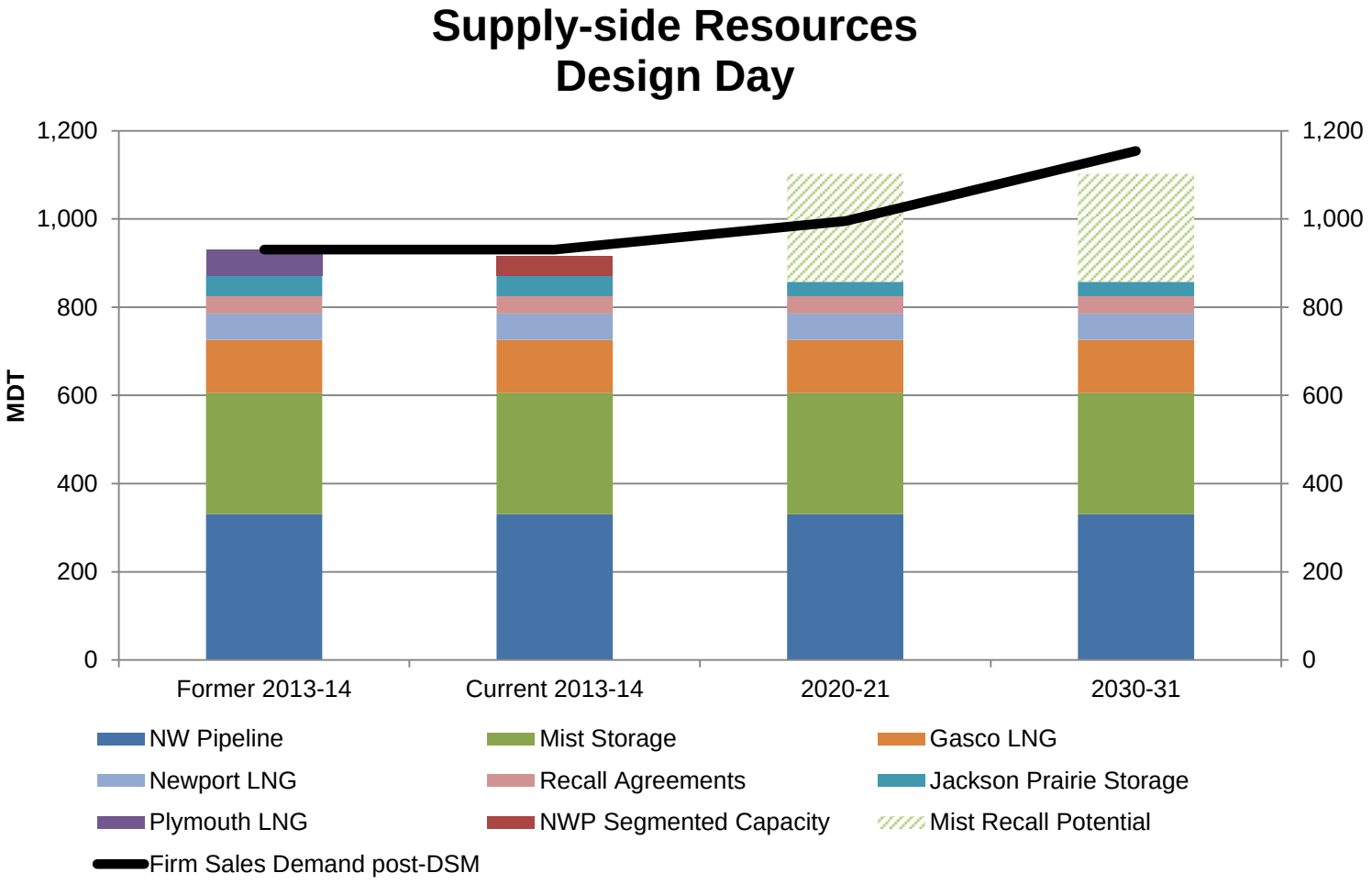
Supply Resources – with maximum Mist Recall



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Modeling Results

What are the possible futures?

No LNG exports – Neither Jordan Cove nor Oregon LNG export facilities are built.

- *No regional pipeline projects*
  - Neither CC nor SE(R) are built.
- *All regional pipeline options are available*
  - CC and/or SE(R) is built to support growing regional demand.
- *Only Sumas Expansion (Regional Project) is built*
  - Only SE(R) is built to support growing regional demand.

LNG Exports – Either Jordan Cove or Oregon LNG export facility is built.

- *Oregon LNG is built*
  - WEX is built to support LNG exports
- *Jordan Cove is built*
  - Pacific Connector is built to support LNG exports.

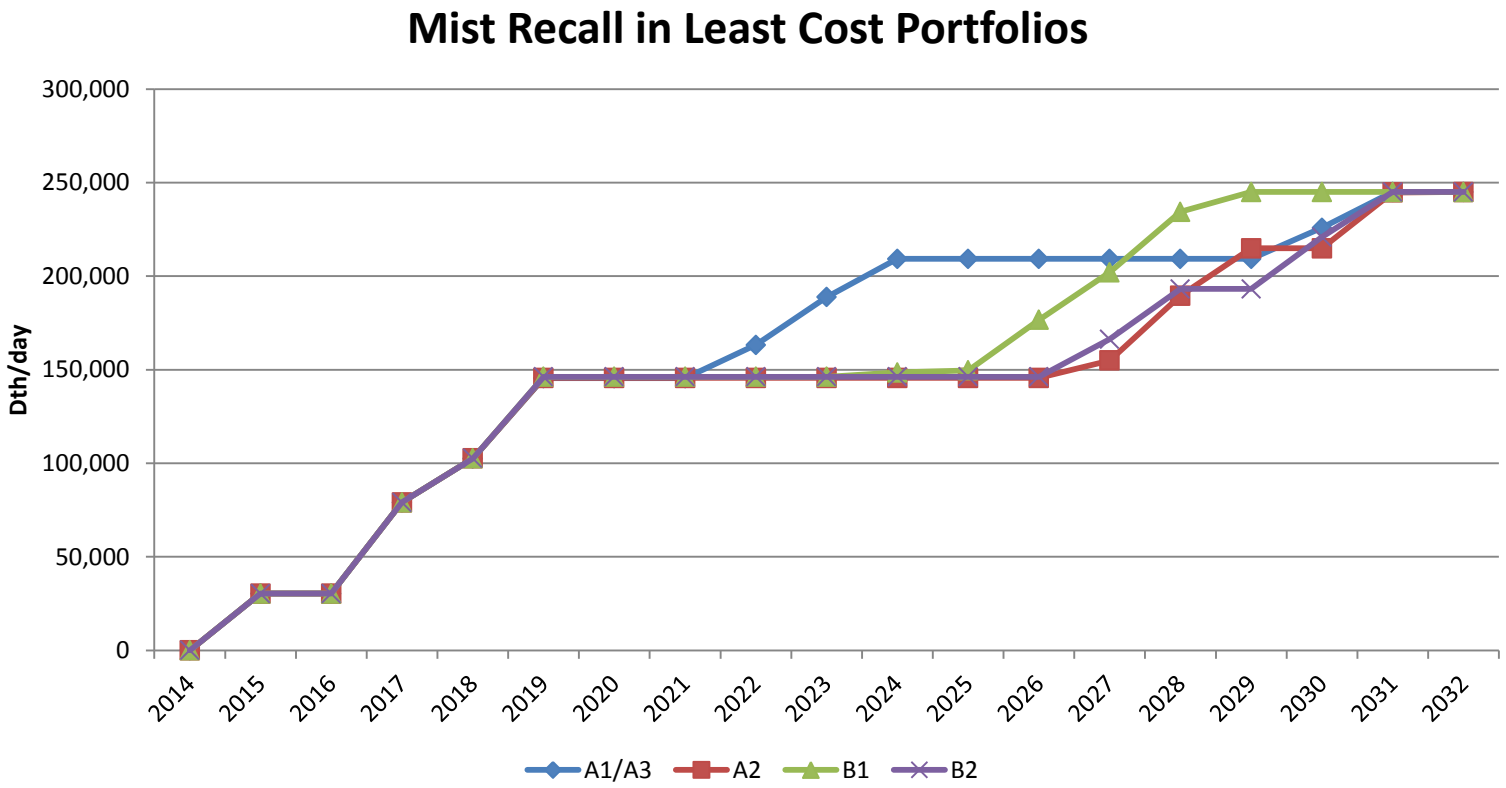
Supply Side Resources Always Selected

- Mist Recall
  - Beginning in 2015
  - All portfolios have same amounts of Mist Recall for the next 5 years
- North Mist
  - Additional storage capacity selected in every portfolio
  - Timing and size depends on availability of pipeline resources
- Christenson Compressor
  - Selected in all portfolios in 2025
  - Additional peak supply needed in Salem/Albany

Summary of Supply-side Resources Selected by Future

Future/Scenario		Resources Chosen for Least Cost Portfolio	Total NPVRR ($Billion)
		Supply Resources	
No LNG Exports	No Regional Project	North Mist Expansion (2020) Sumas Expansion (Local) (2025)	$6.663
	All Regional Pipeline Options	Cross-Cascades (2020) North Mist Expansion (2030)	$6.607
	No Cross-Cascades Option	North Mist Expansion (2020) Sumas Expansion (Local) (2025)	$6.663
LNG Exports	Oregon LNG	Cross-Cascades (2020) North Mist Expansion (2030)	$6.636
	Jordan Cove	Pacific Connector (2020) North Mist Expansion (2030)	$6.709

Mist Recall



- A1: No LNG Exports – No Regional Project
- A2: No LNG Exports – All Options Available
- A3: No LNG Exports – No CC Option
- B1: LNG Exports – Oregon LNG
- B2: LNG Exports – Jordan Cove

North Mist Expansion

- Oregon Rate Schedules 90/91 approved October 14, 2014

- Analysis for 2014 IRP performed in Summer 2014 indicates a North Mist expansion is a cost-effective supply-side resource based in part on estimated investment costs of a ***pipeline shared with PGE***
  - Selected as cost-effective resource in either 2020 or 2030, depending on scenario
  - Estimated North Mist investment cost with non-shared pipeline greater than with shared
  - North Mist storage facilities proposed to be used by Core are not shared with PGE

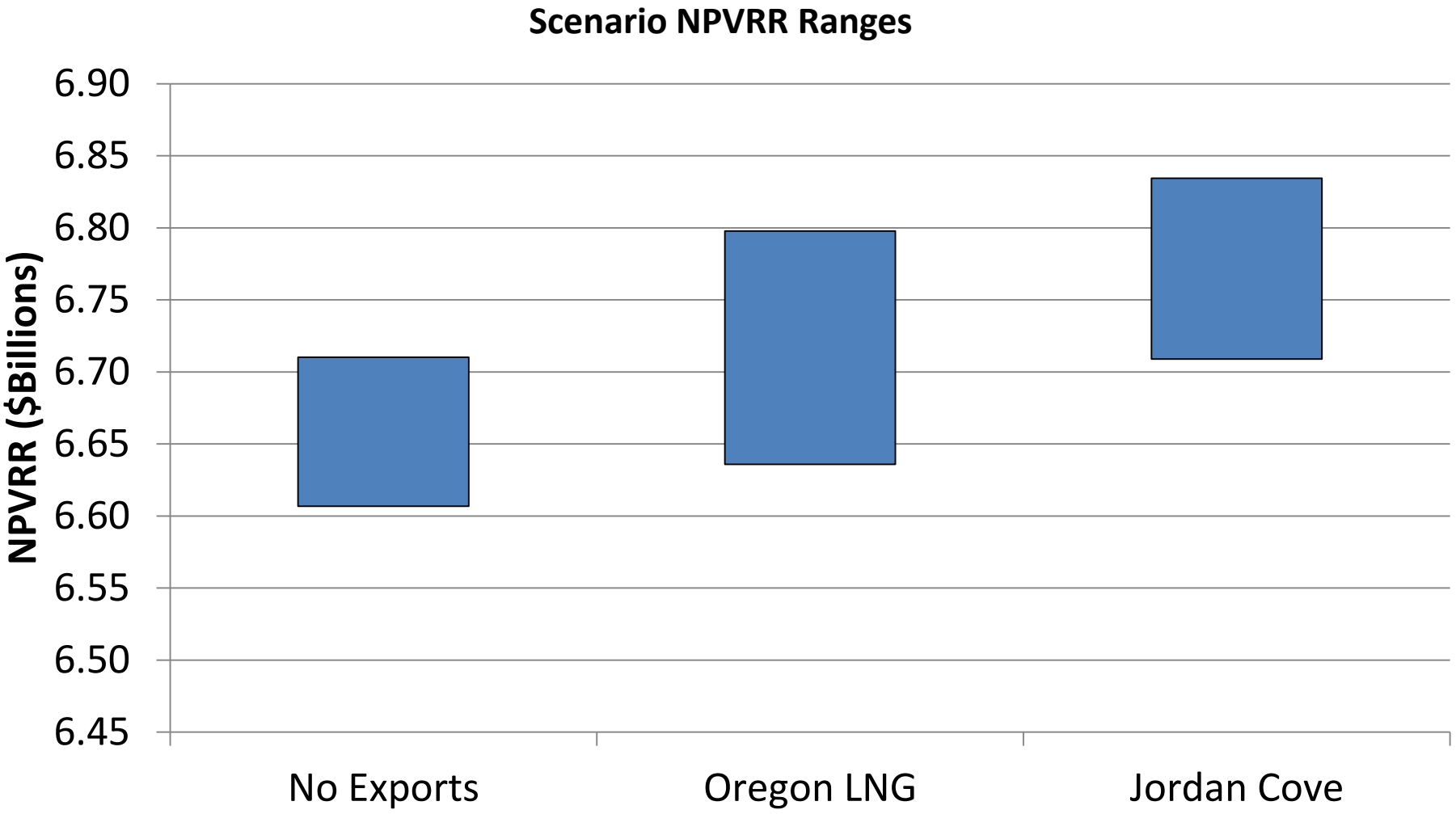
- Action Plan includes completing a North Mist analysis by May 2015
  - Refine cost estimates
  - Estimate value of optionality created by upsizing pipeline used in near-term by RS 90 customers
  - Determine impact on NW Natural's Hinshaw exemption from FERC regulation

Risk Analysis

Risks Evaluated

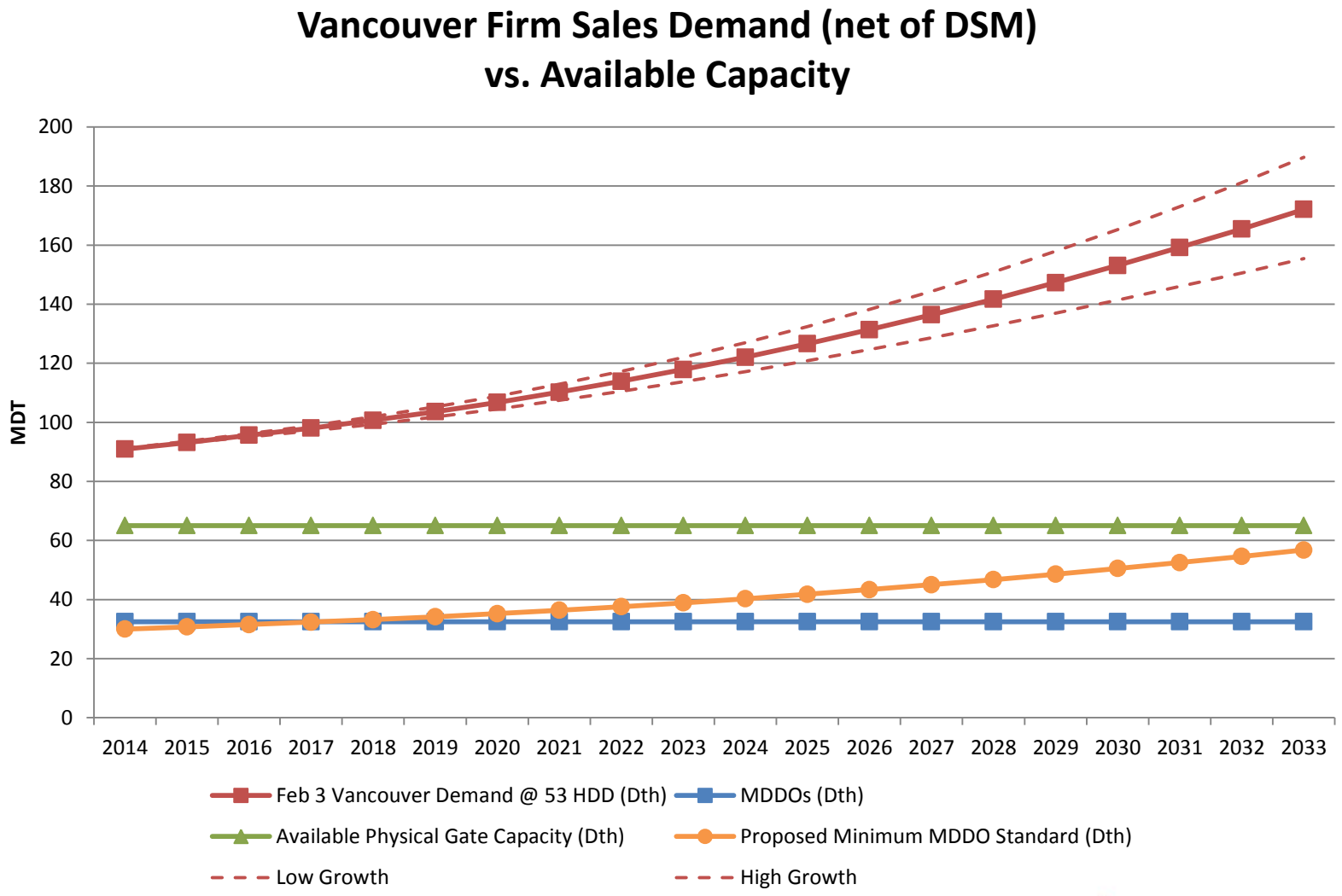
- Price Risk
- Construction Cost Risk
- Reliability Risk
- Load Risk
- Carbon Regulation Risk

Price Risk of Supply Basin Differentials



Action Plan Infrastructure Projects

Base Case Resource Deficiency



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MDDOs

- Maximum Daily Delivery Obligations
  - Represents NWP's contractual obligation to NW Natural at each gate station (in Dth/day)
  - We can pay NWP to expand gate stations,, but we only receive MDDOs when we subscribe to additional NWP firm pipeline capacity
  - Mist Recall allows us to avoid subscribing to additional NWP capacity, but as load grows, we need to expand gate stations not directly serviced from Mist
  - There is a gap between the physical capacity of certain gate stations and their MDDOs, with gates in Clark County being the best examples
  - These gaps are expected to grow since Mist Recall is a main component of our future resource additions

- Is this an issue?
  - Didn't use to think so, but as fallout from Plymouth, we are re-examining any part of the upstream pipeline delivery system that is less than rock-solid firm service

Clark County Distribution System Projects

Near- to mid-term projects oriented towards attaining current infrastructure requirements:

Year	Project	Estimated Cost ($Million)
2014	NE 119th Street: NE 111th to NE 72nd Avenue	$5.4
2015	Camas: NW Pacific Rim Blvd. to Sierra Dr.	$4.6
2015	Washougal Extension: 20th to 39th Street	$4.5
2017	NE 119th Street to Salmon Creek Road	$6.1
2017	Vancouver Core: E. Access Rd. to Reserve	$4.3

Newport LNG Refurbishment: Result of Analysis and Role/Status of Facility

- Refurbishing is least cost alternative
  - SENDOUT® optimization modeling selected refurbishment over alternatives
- Represents 60,000 Dth/day delivery capacity in resource stack
  - Approximately 10% of current firm storage delivery capability
- Older facility
  - Over 36 years old (commissioned in 1977)
  - Facility and major process components designed for nominal 30-year life
  - Engaged consulting firm to identify needs to extend useful life ≈ 25 years
    - Consulting firm identified multiple needs
- WUTC's Safety staff aware of refurbishment project

Questions?