Natural Gas Market Outlook

WA Citizens Committee on Pipeline Safety
March 13, 2014
NWGA Members:

Avista Corporation
Cascade Natural Gas Co.
FortisBC Energy
Intermountain Gas Co.
NW Natural
Puget Sound Energy
Kinder Morgan Ruby Pipeline
Spectra Energy Transmission
TransCanada GTN System
Williams NW Pipeline
Conventional vs. Horizontal Drilling
Gas From Shale Has Profound Impact

Source: Energy Information Administration (EIA), dated May 9, 2011
Total Resource Estimates

Increase

<table>
<thead>
<tr>
<th>Year</th>
<th>Traditional</th>
<th>Coalbed</th>
<th>Shale</th>
</tr>
</thead>
<tbody>
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<td>2012</td>
<td>1,153</td>
<td>1,153</td>
<td>2,384</td>
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</tbody>
</table>

Shale resource not assessed separately
Shale Dominates North American Production

Source: Navigant Consulting, Fall 2012 Gas Market Outlook
Price Not Quantity is the Issue

North America Gas Supply Cost Curve

Source: 2011 MIT Study on the Future of Natural Gas, Figure 2.10
How Much Is 900 Tcf?

North America Supply and Demand

Cumulative Gas Consumption, Tcf

Source: US Energy Information Administration, Canada National Energy Board
“The Learning Curve” (source: EIA Annual Energy Outlook)
Price Forecasts

Recent Gas Demand

PNW Gas Deliveries (source: US EIA, StatCan)

- Residential
- Commercial
- Industrial
- Generation

* 2014 Outlook Year 1 Forecast
2014 Outlook Forecast

- Residential
- Commercial
- Industrial
- Power Generation

Million Dth/year

2013/14
2014/15
2015/16
2016/17
2017/18
2018/19
2019/20
2020/21
2021/22
2022/23

NWGA
NORTHWEST GAS ASSOCIATION
Replace Existing Resources
Support Renewable Resources

BPA Balancing Authority Area Load & Total Wind Generation
Jan. 5-25, 2009
Natural Gas Use Is Versatile

Plastics
Panty hose
Paints
Photographic film
Beer
Safety glass laminate
Adhesives
Solvents
Carpeting
Insulation
Refrigerants
Windshield washer fluid
Particle board
Pigments and dyes

Frozen french fries
Pool liners
Food Packaging
Metals and recycling
Glass and recycling
Bricks
Lumber
Paper
Cardboard
Fertilizer
Antifreeze
Medicines
Aircraft parts
Chewing gum
US Natural Gas and Crude Oil Prices

Source: EIA Monthly Spot Prices through October, 2013
Natural Gas Transportation
Accelerated Demand Scenarios

- Annual Demand - Expected Case
- Accelerated Industrial
- Accelerated Generation

Million Decatherms

2013/14 to 2022/23
Capacity

Projects

- Southern Crossing Expansion
- Palomar
- Sunstone
- Blue Bridge (N-MAX)
- Ruby
- Pacific Connector
- Pacific Trail
- Oregon LNG
- Washington Expansion

LNG Terminals

- Kitimat LNG
- Bradwood Landing LNG
- Oregon LNG
- Jordan Cove LNG

Storage Facilities

- Mist
- Jackson Prairie
Questions

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