



Got Gas?

How Fracking Restored the Inland Northwest Comparative Energy Advantage

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Randy Barcus
Avista Chief Economist, Financial Planning & Analysis

Topics

- Avista overview
- Markets and changing supply picture
- Electric markets and wind generation
- Transportation – natural gas and electric vehicles
- Inland Northwest Comparative Energy Advantage

Generation Capability and Service Territory



HYDROELECTRIC		GENERATION CAPABILITY (MW)
1	Noxon Rapids (Noxon, MT)	562.4
2	Cabinet Gorge (Clark Fork, ID)	254.6
3	Long Lake (Spokane, WA)	87.0
4	Little Falls (Spokane, WA)	34.6
5	Post Falls (Post Falls, ID)	18.0
6	Nine Mile (Spokane, WA)	17.6
7	Monroe Street (Spokane, WA)	15.0
8	Upper Falls (Spokane, WA)	10.2
Total Hydroelectric Capability		999.4

THERMAL		GENERATION CAPABILITY (MW)
9	Coyote Springs 2 (Boardman, OR)	278.3
10	Colstrip (Units 3 & 4) (Colstrip, MT)	222.0
11	Rathdrum Combustion Turbines (Rathdrum, ID)	149.0
12	Northeast Combustion Turbines (Spokane, WA)	61.2
13	Kettle Falls Biomass Plant (Kettle Falls, WA)	50.0
14	Boulder Park (Spokane, WA)	24.0
15	Kettle Falls Combustion Turbine (Kettle Falls, WA)	6.9
Total Thermal Capability		791.4

PURCHASED		GENERATION CAPABILITY (MW)
16	Lancaster (Rathdrum, ID) – Contract	275.0
Mid-Columbia Projects		180.0
17	Wells (Douglas PUD)	
18	Rocky Reach (Chelan PUD)	
19	Wanapum (Grant County PUD)	
20	Priest Rapids (Grant County PUD)	
21	Stateline Wind Farm (Touchet, WA)	35.0
Total Purchased Generation Capability		490.0

SERVICE TERRITORY

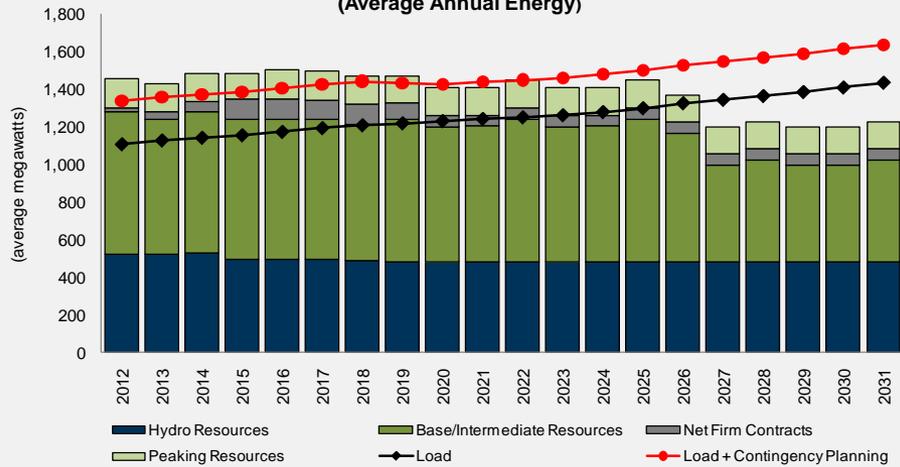
- Electric and Natural Gas
- Natural Gas

GENERATION SOURCES

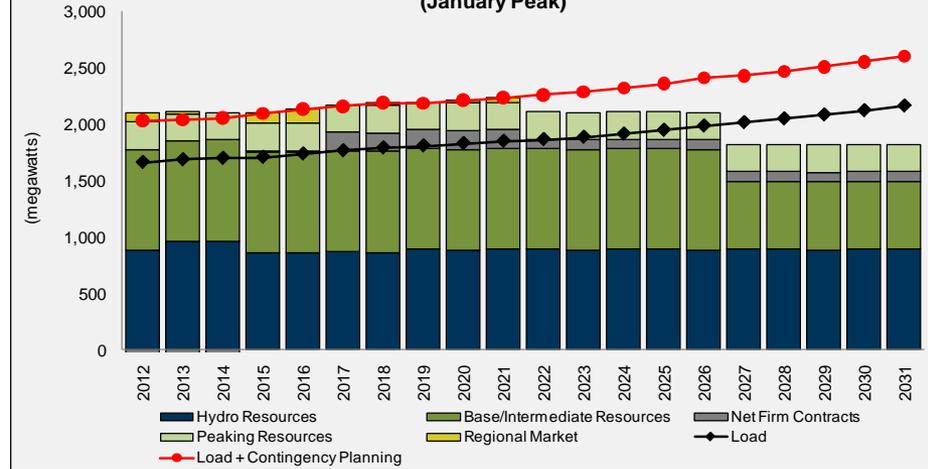
- Hydroelectric
- Thermal
- Wind

Loads & Resources Forecast

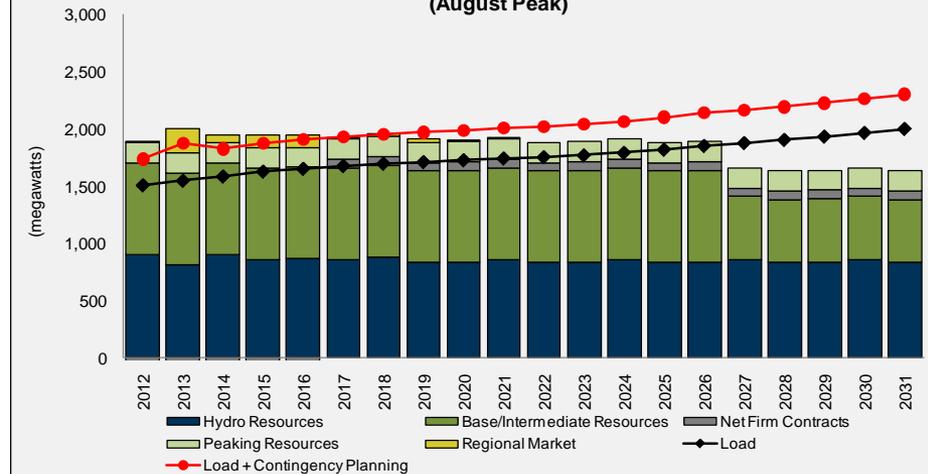
**Loads & Resources
(Average Annual Energy)**



**18-Hour Loads & Resources
(January Peak)**



**18-Hour Loads & Resources
(August Peak)**

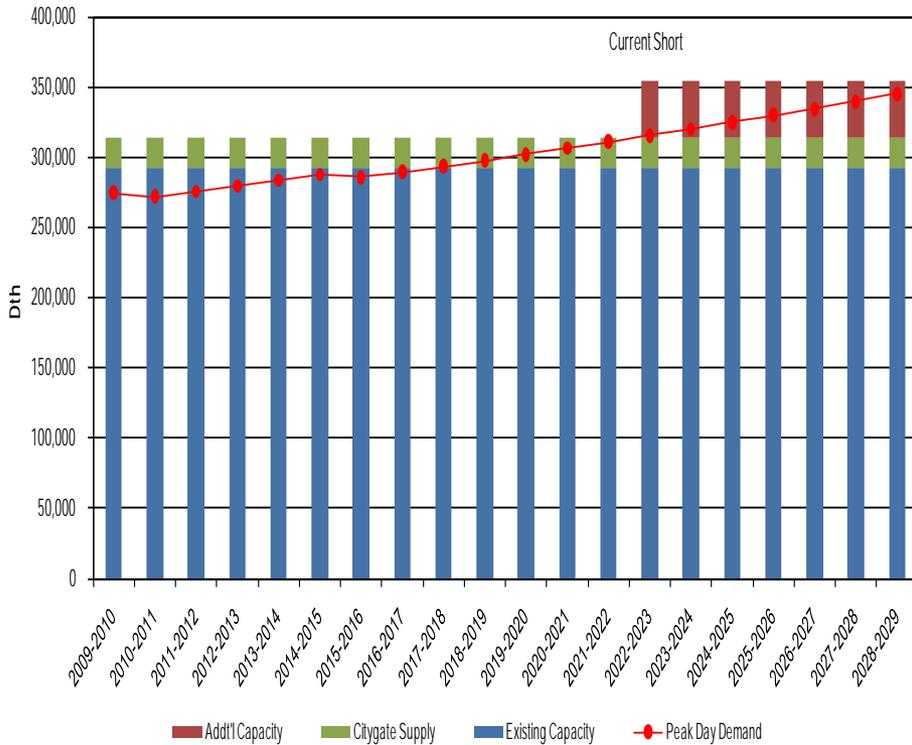


Long-term needs don't require major generation until 2019 except for renewable resource requirements

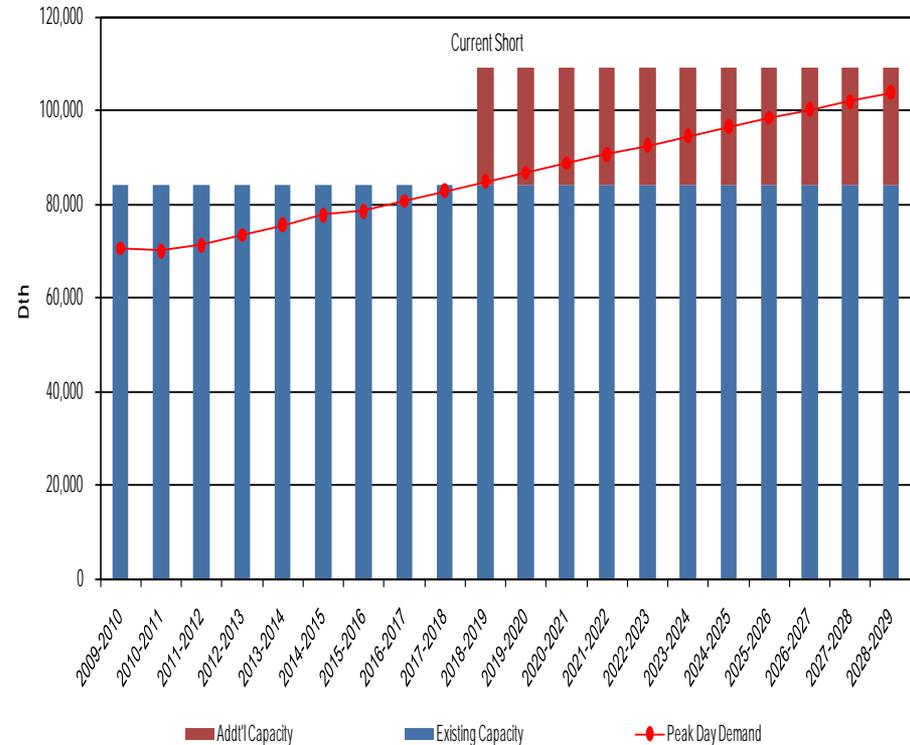
2009 Natural Gas IRP

No Additional Resources Required for Some Time

Expected Case - WA/ID Existing Resources vs. Peak Day Demand
(Net of DSM Savings) November to October

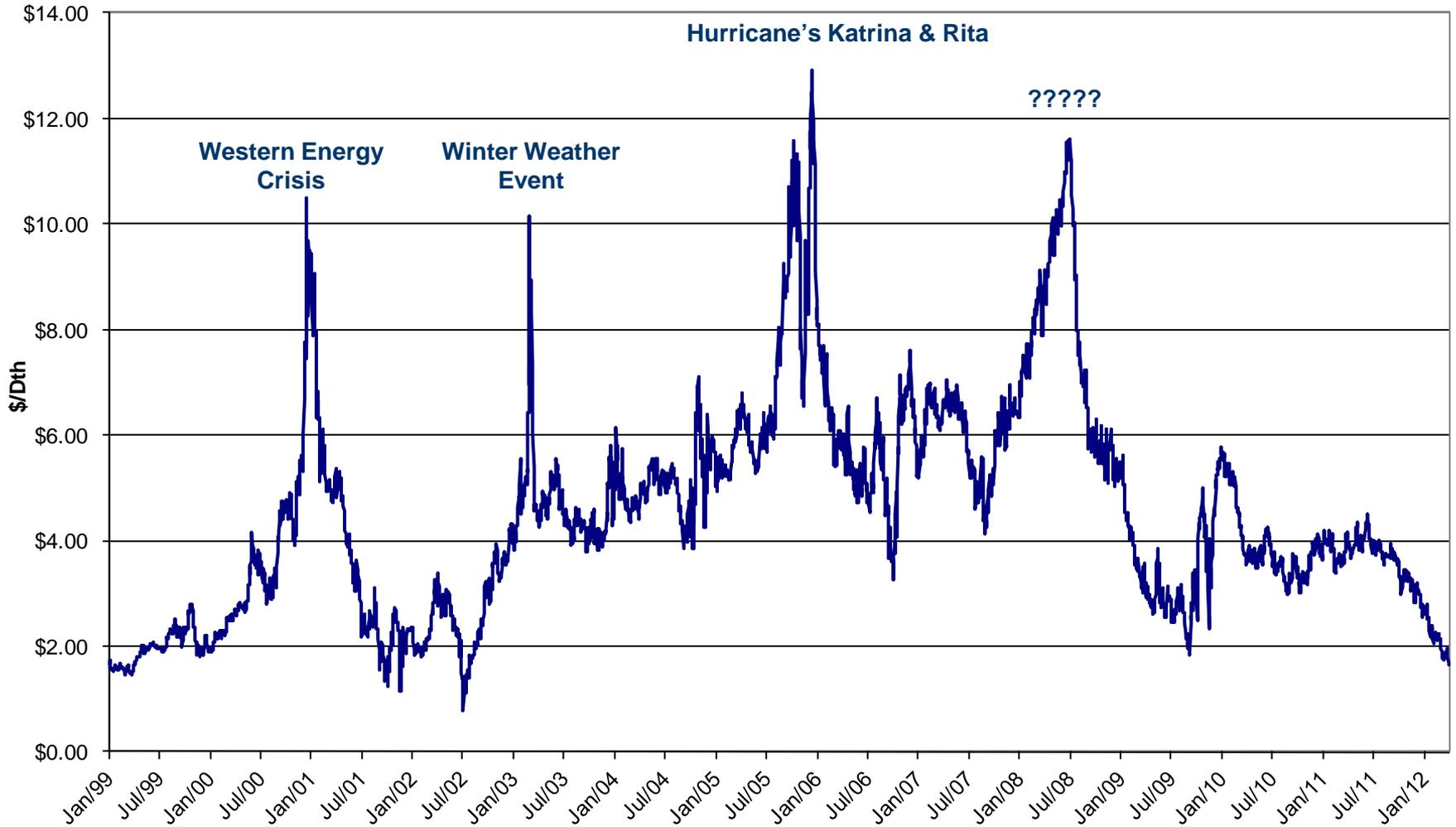


Expected Case - Medford/Roseburg Existing Resources vs. Peak Day Demand
(Net of DSM Savings) November to October



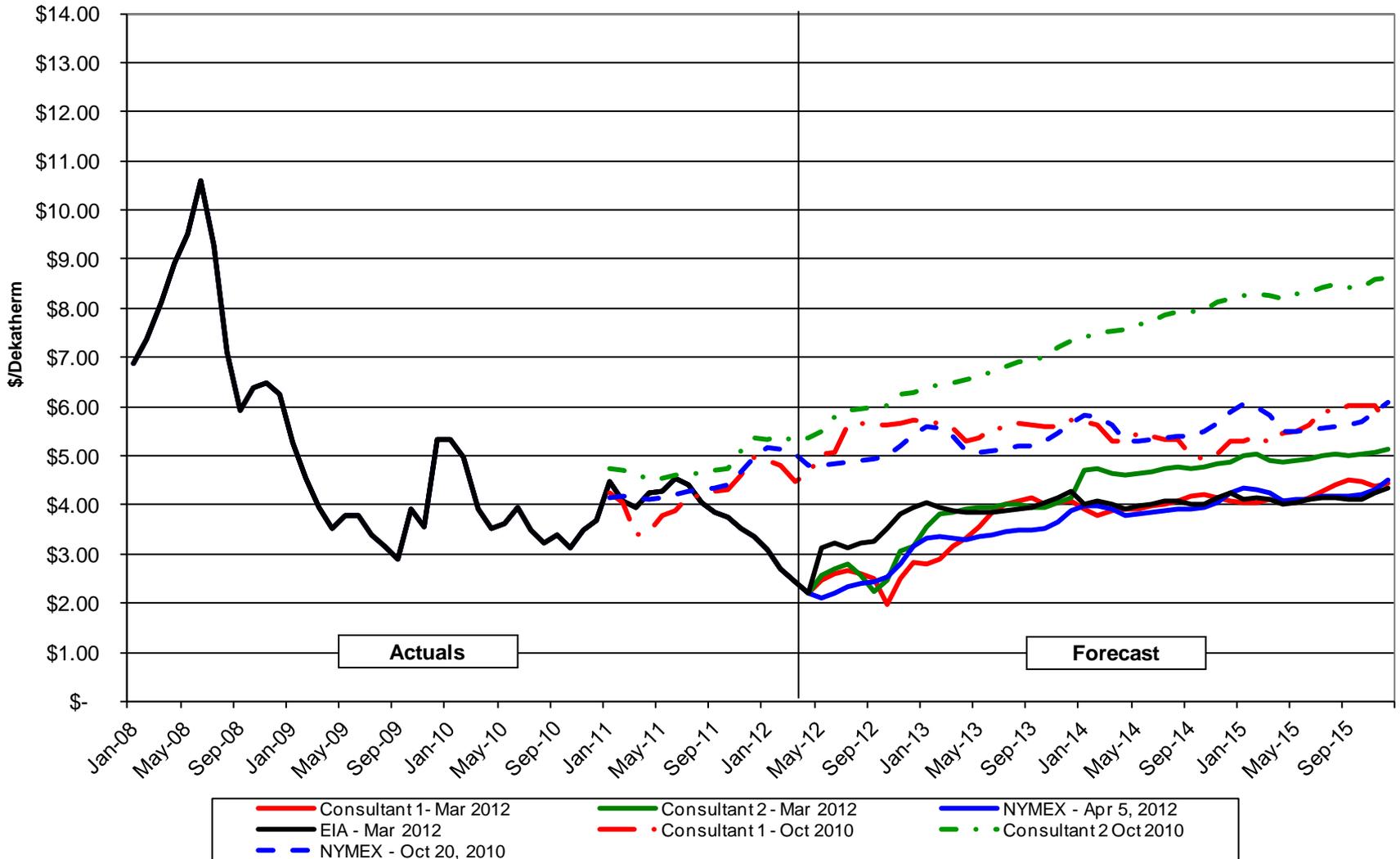
Energy Markets

Historic AECO Cash Prices 1999 through March 2012



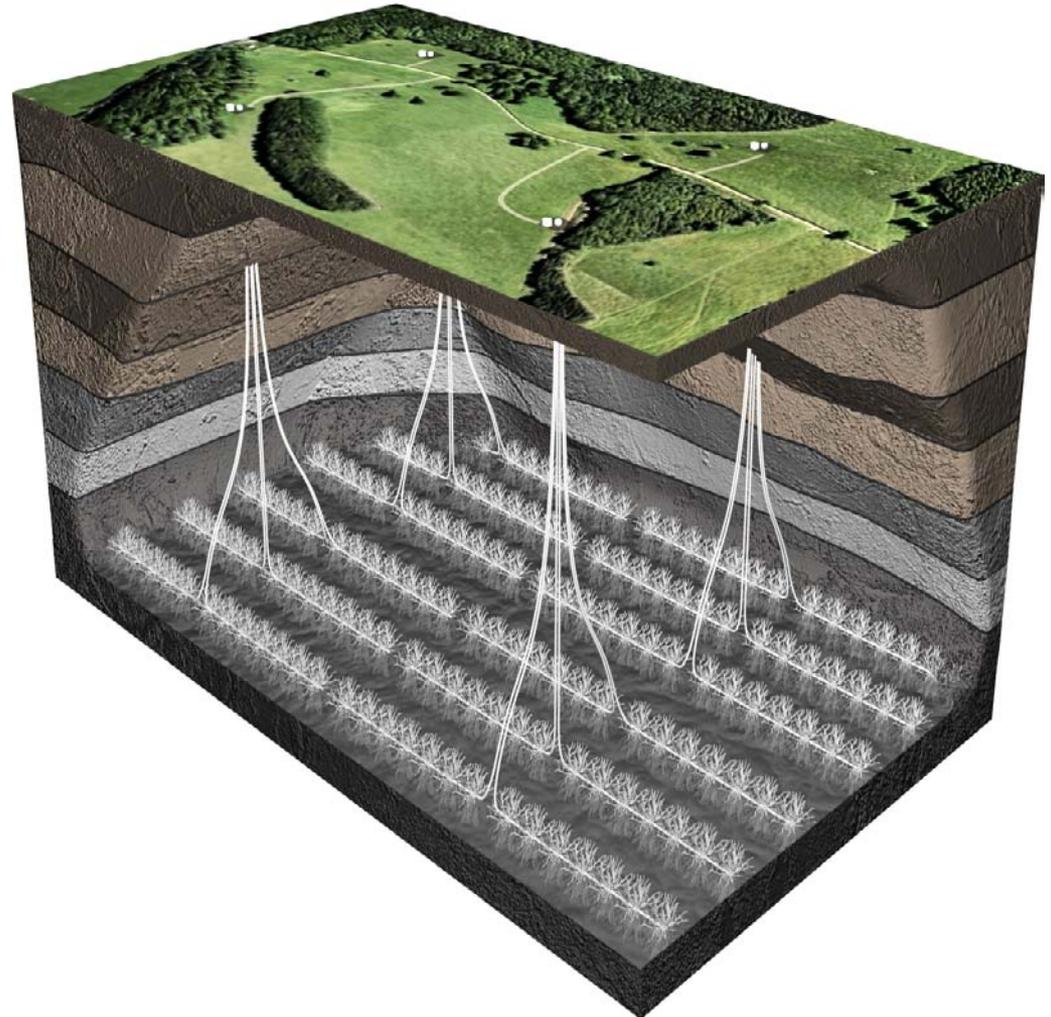
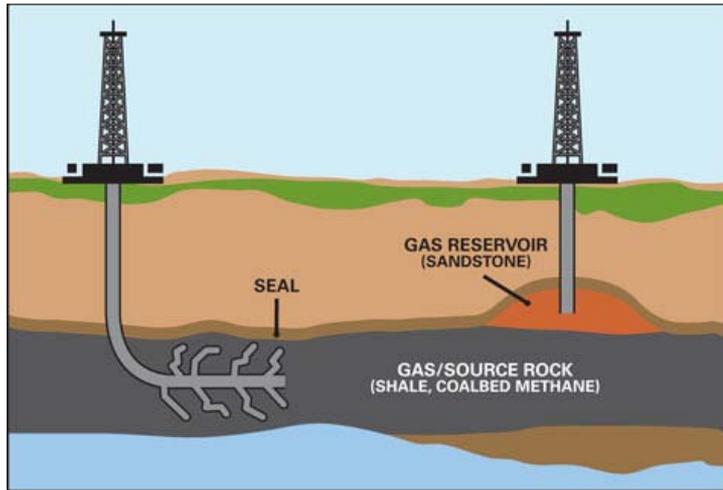
Fundamental Change to the Natural Gas Market

Fundamental Forecasts vs. Actual - March Update Henry Hub



Natural Gas Exploration

An Unconventional Turn



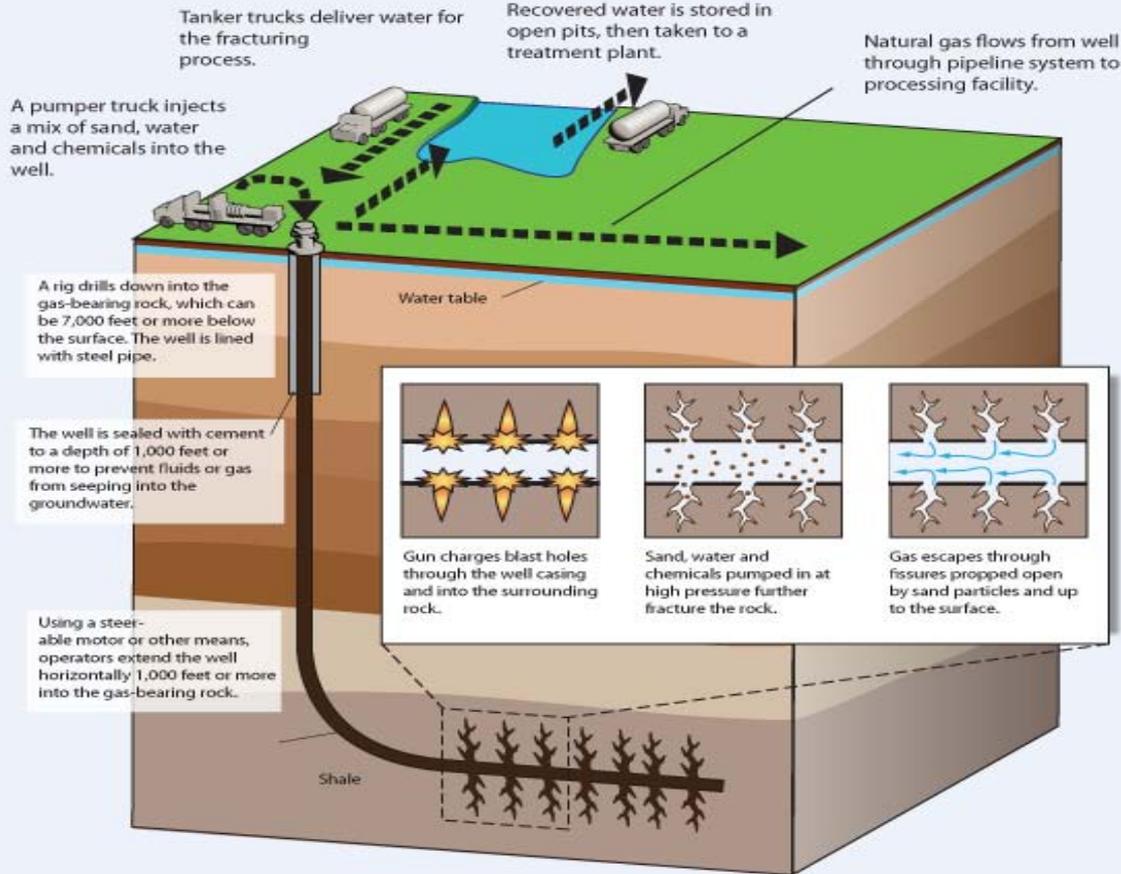
Conventional wells - vertical drilling into porous saturated sandstone pockets

Unconventional wells – horizontal drilling into vast rock formations

The Shale Drilling Process

Tapping the Gas

Horizontal drilling and hydraulic fracturing have made it feasible to extract huge amounts of natural gas trapped in shale formations. Here's how they work.



Sources: Chesapeake Energy; Al Granberg; WSJ research

Natural Gas: Productivity Has Improved

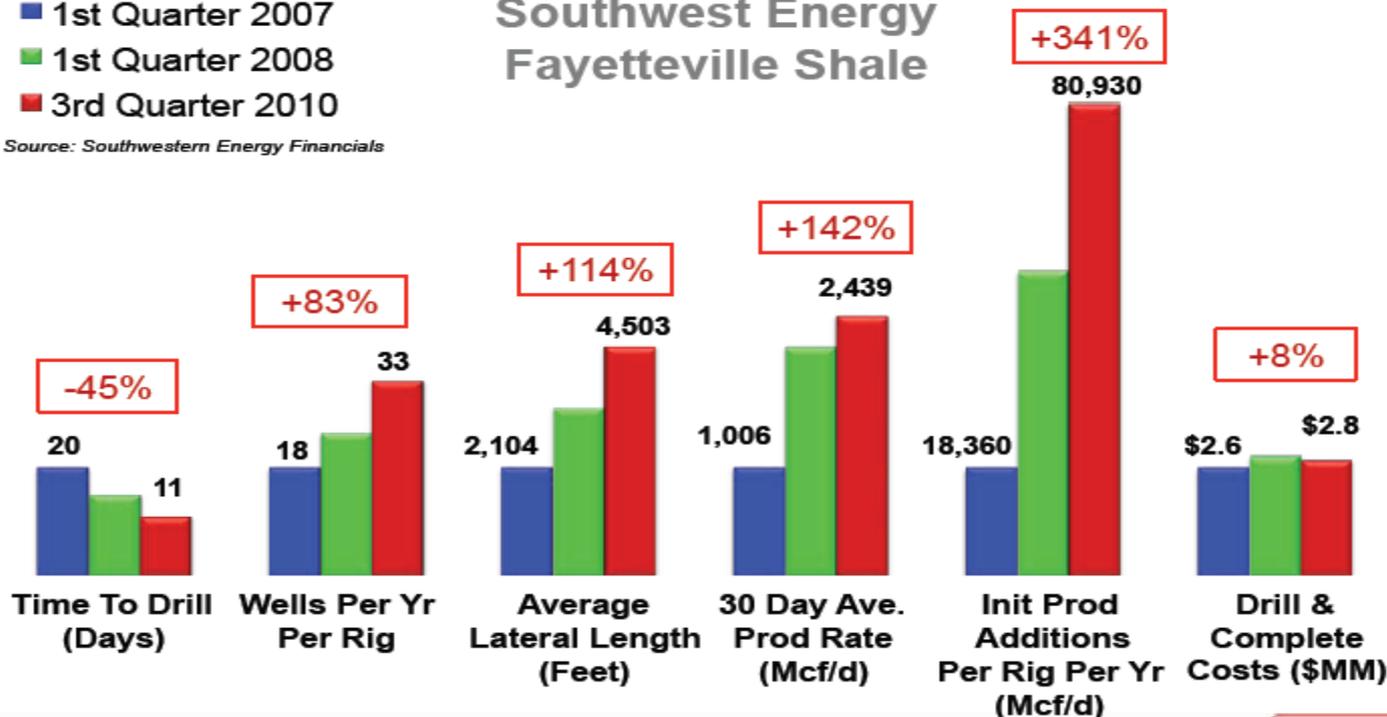


Drilling Rig Productivity Has Dramatically Improved

- 1st Quarter 2007
- 1st Quarter 2008
- 3rd Quarter 2010

Source: Southwestern Energy Financials

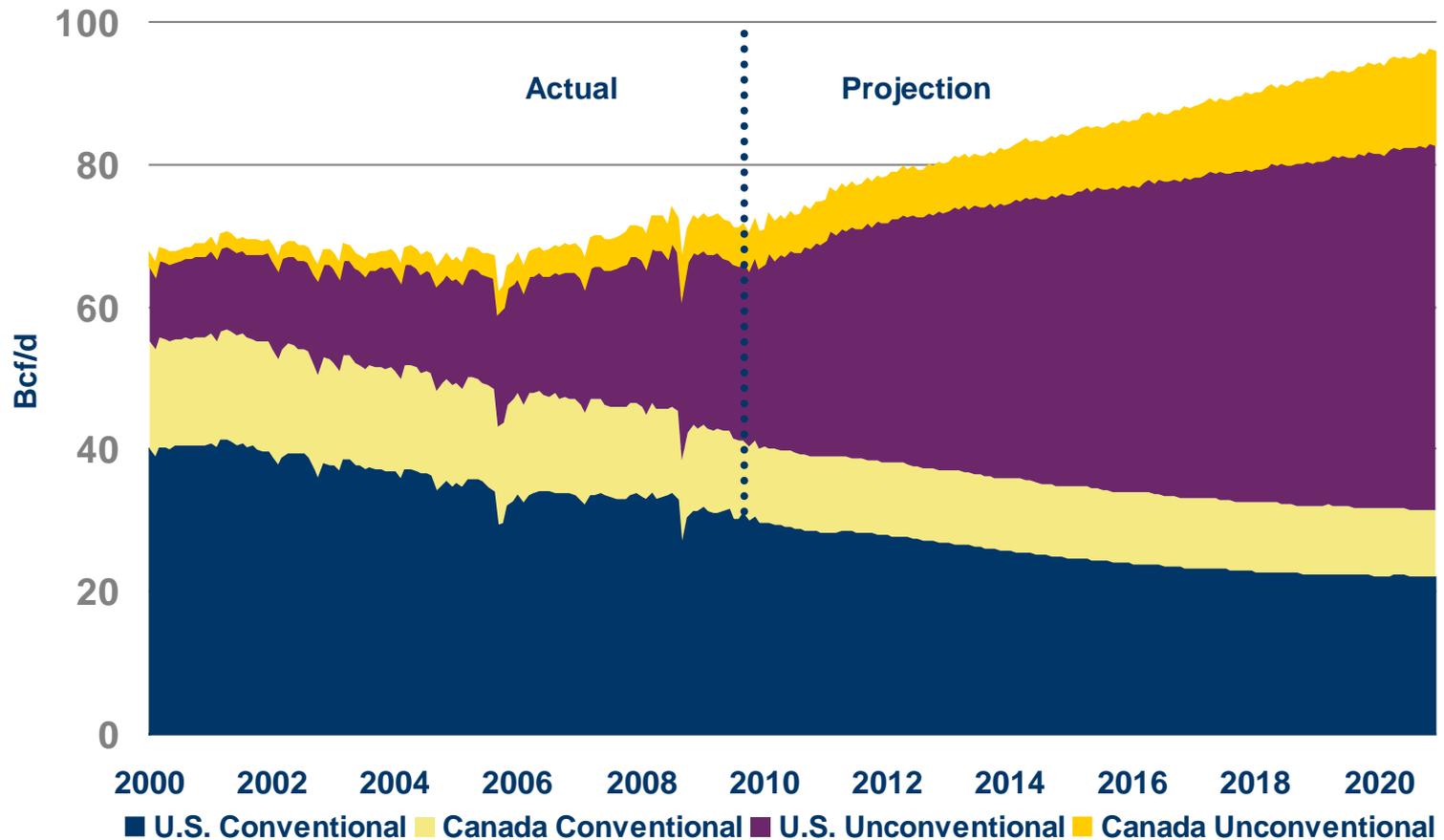
Southwest Energy Fayetteville Shale



BENTEKENERGY.COM

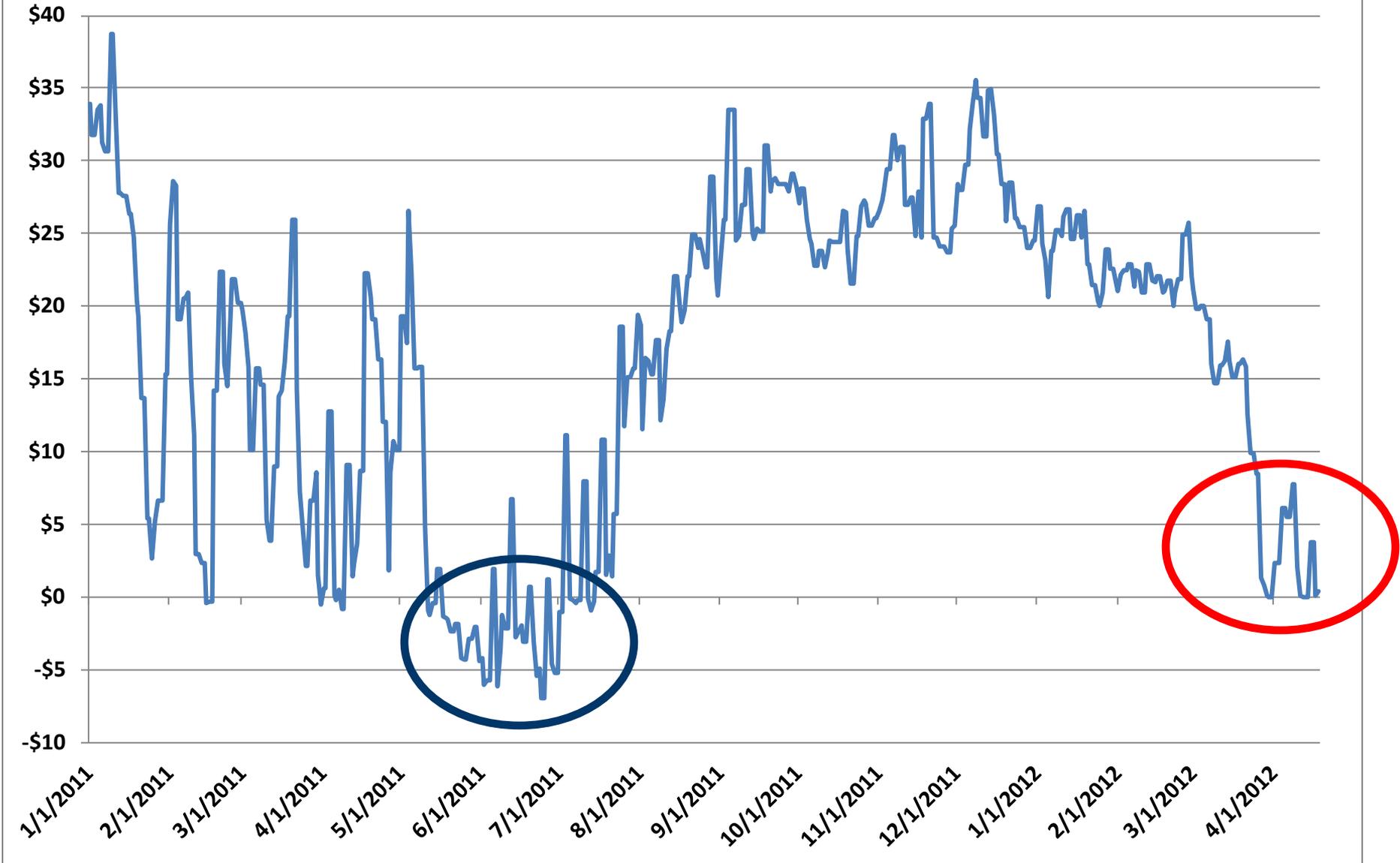
Slide 4

Forecasted North American Natural Gas Production

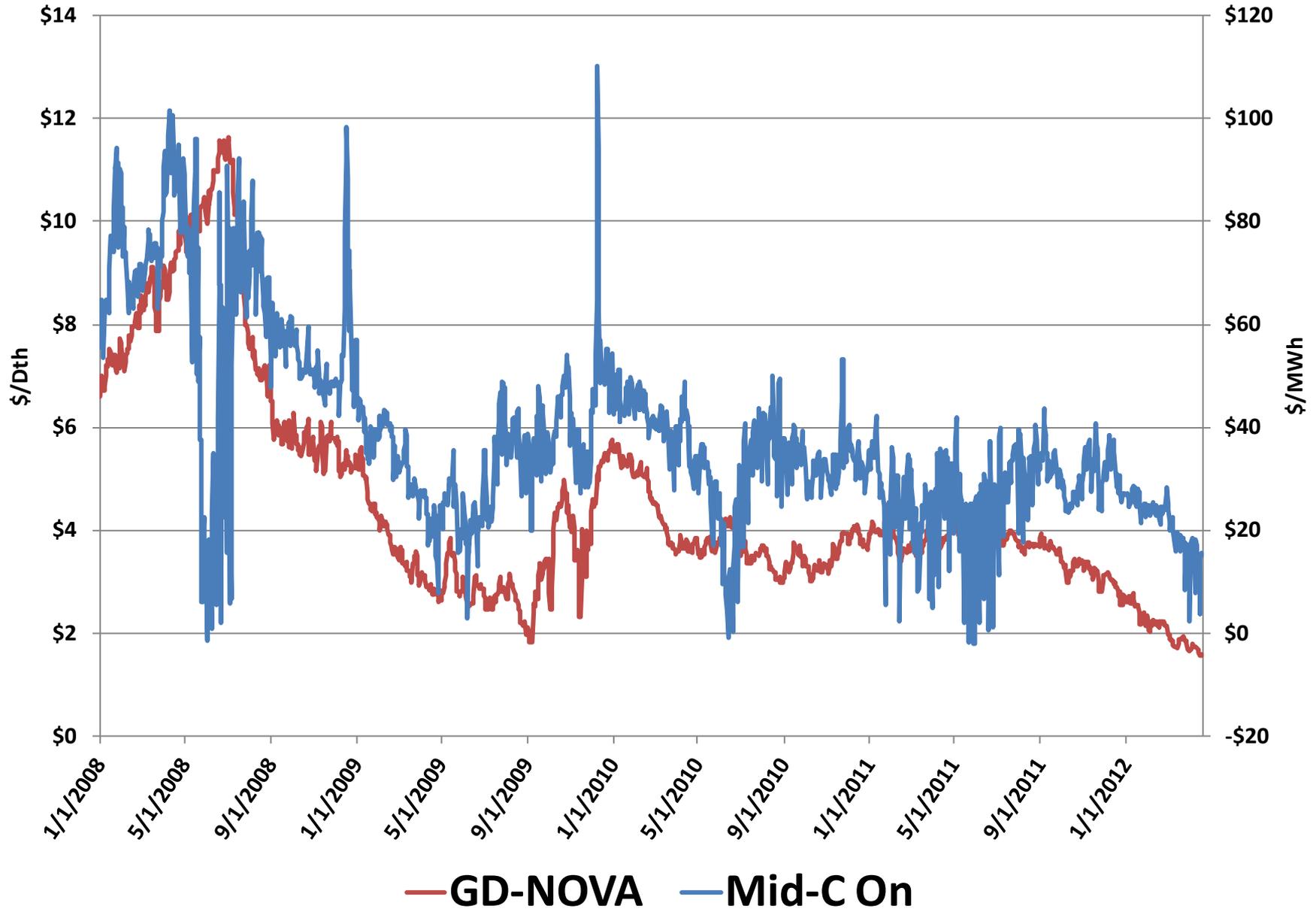


Source: EIA & NEB historic data; Encana forecasts

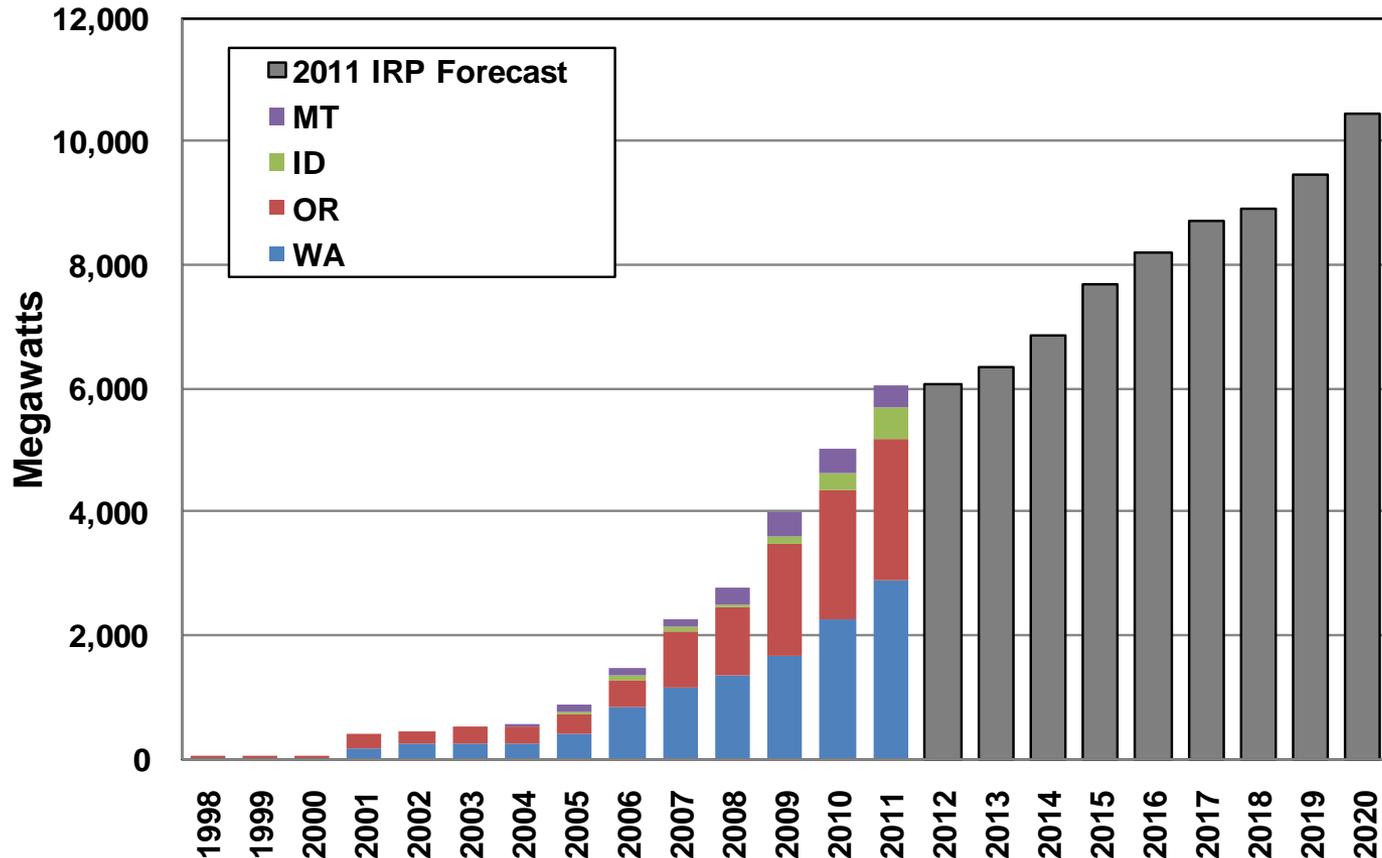
Mid-C Firm Off-Peak Prices (\$/MWh)



AECO Gas vs. Mid-C On-Peak Prices

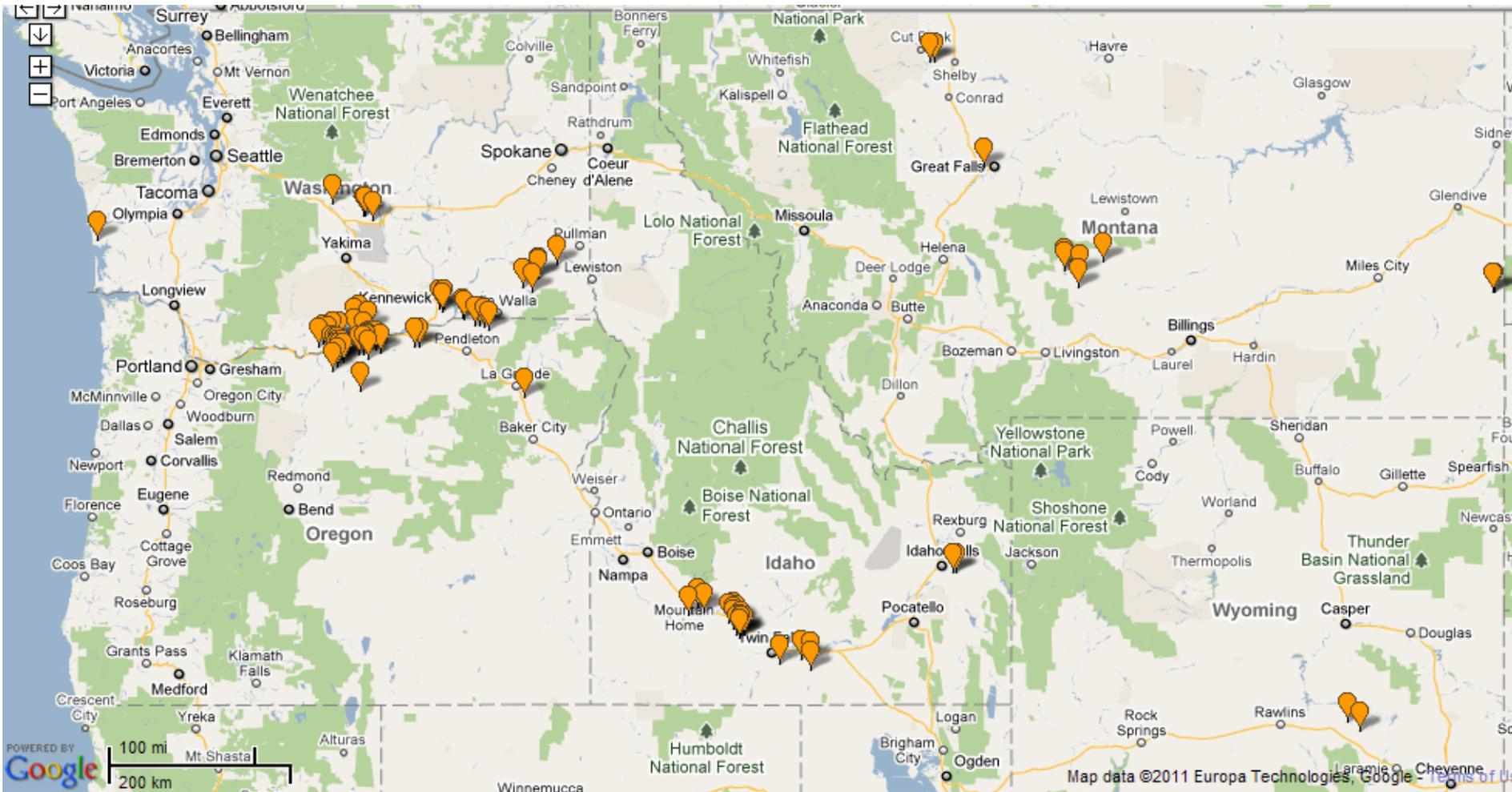


Northwest Wind Capacity Past and Future



Historical data provided by RNP website

Wind Fleet Locations



Source: RNP.org

Concerns

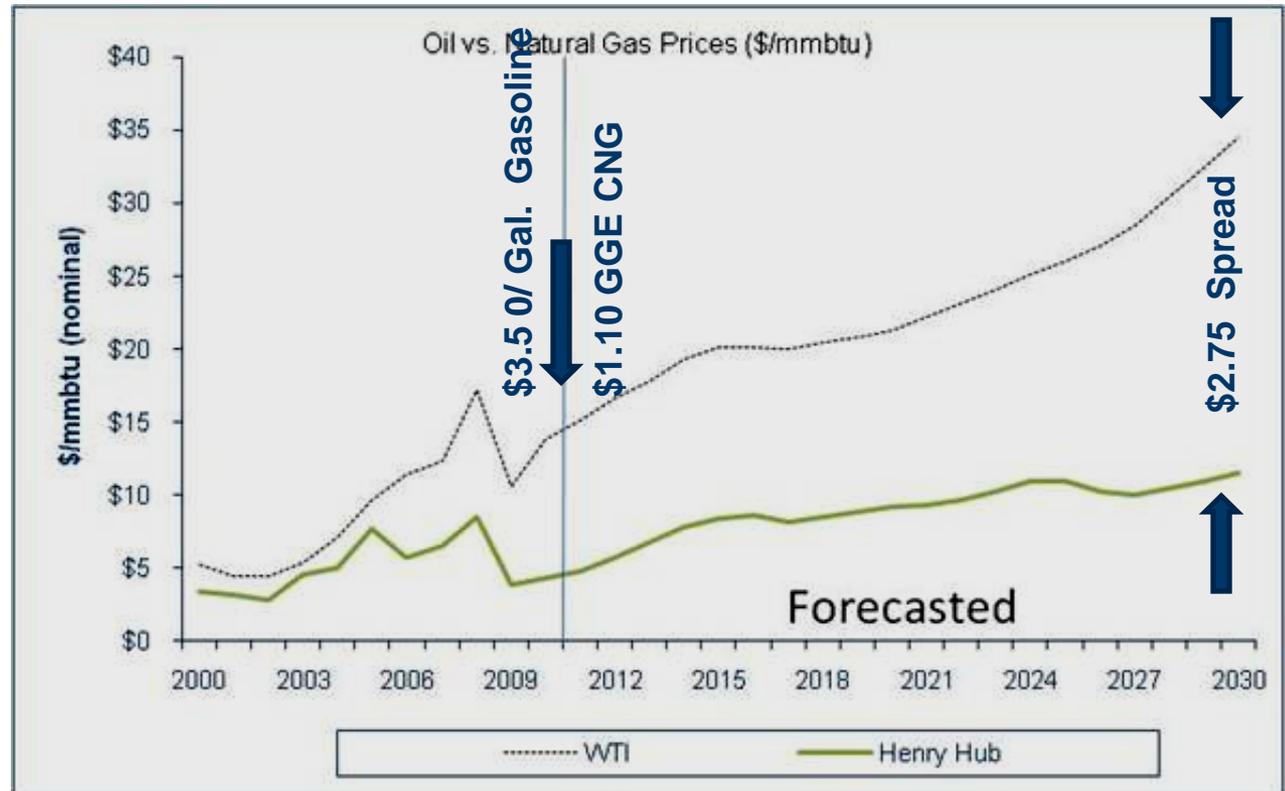
- How far will gas prices go down? Will the prices remain stable?
- Will the duration of the negative price excursions expand as the wind fleet grows?
- How will these issues affect long-term and short-term planning?

How will transportation choices affect the utility industry?

- Gasoline/Diesel
- Natural Gas
- All Electric
- Hybrid

Natural Gas and Petroleum Price Differential

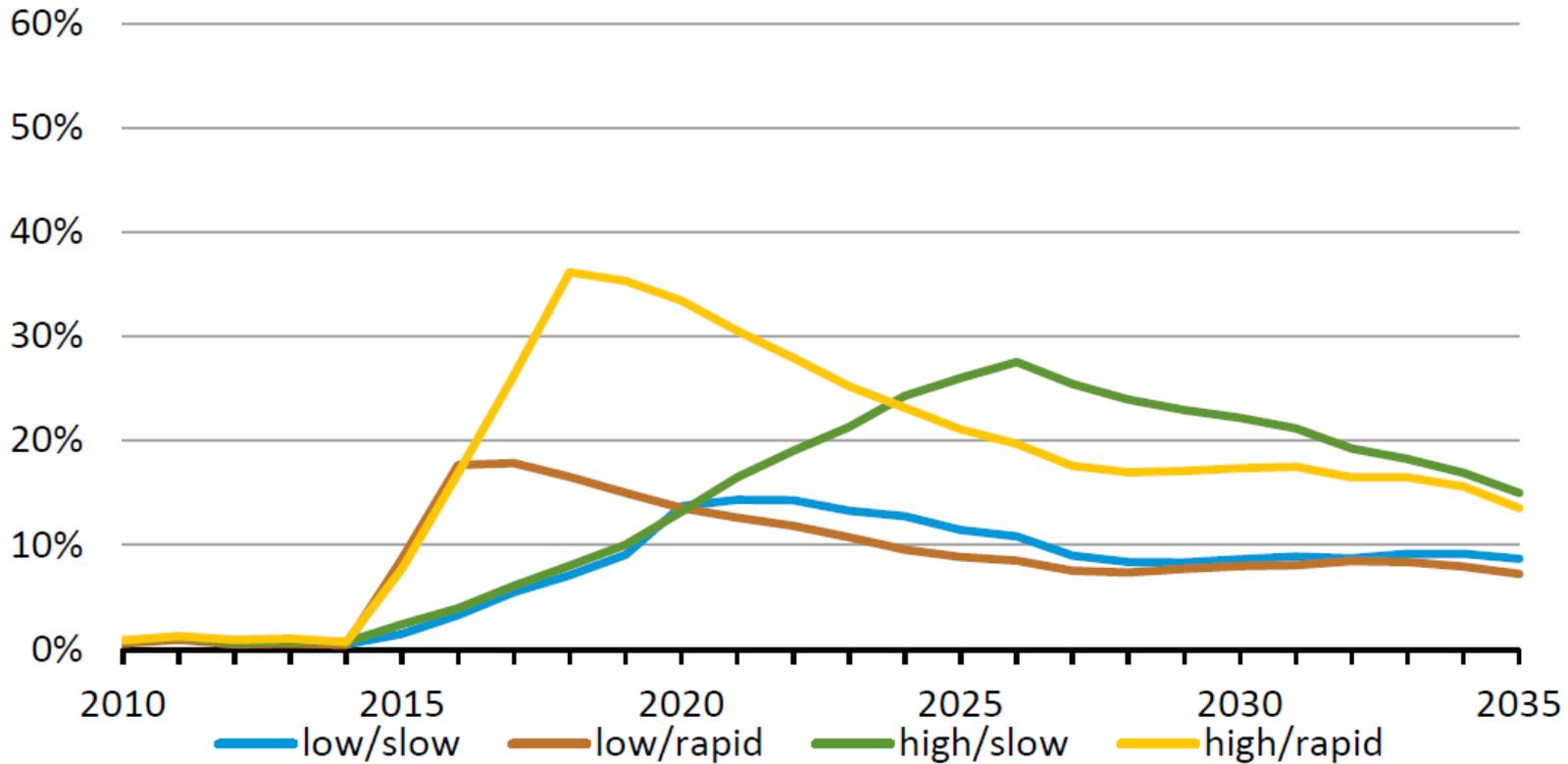
Separation needs to be at least \$1.40/gallon for large fleets to pencil out.



Source: U.S. Energy Information Administration (EIA), Dec 2010

Not Without Controversy

Figure 3. Natural gas wellhead price difference from AEO2011 Reference case with different additional export levels imposed



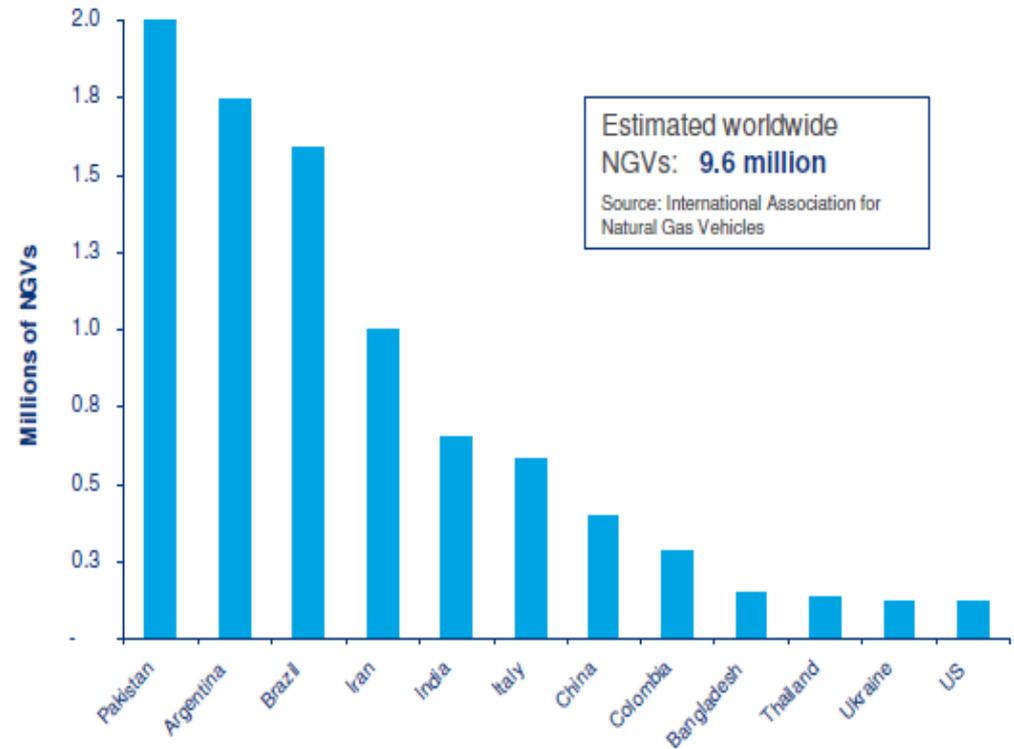
Source: U.S. Energy Information Administration, National Energy Modeling System

Global Penetration of Natural Gas Vehicles

The U.S. has less than 2% of global natural gas vehicles (NGV).

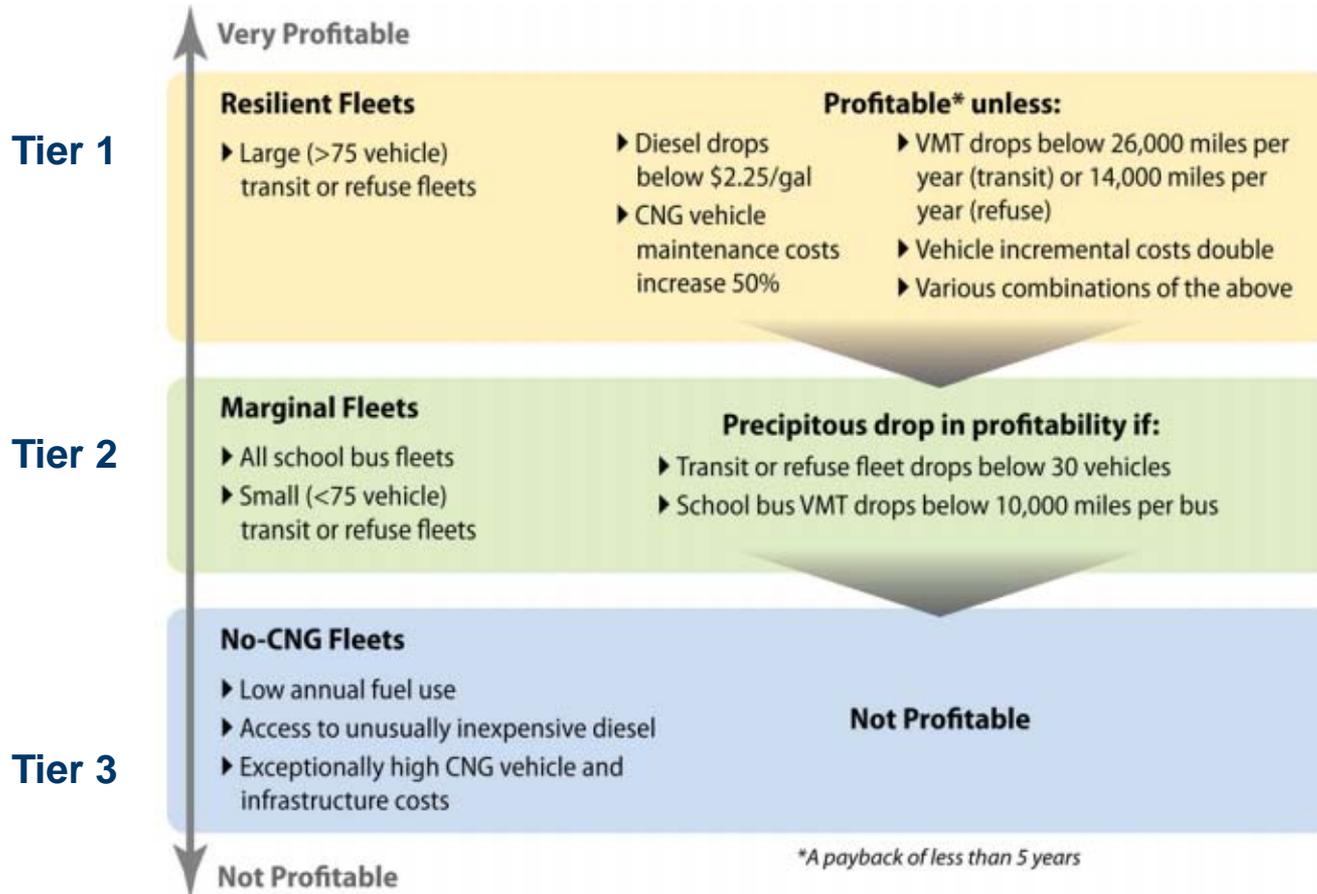
Countries with the highest NGV penetration rates generally have:

- Reasonably priced NGVs and/or efficient retrofit practices.
- Natural gas prices that are less than 50% of gasoline prices.
- Fueling infrastructure that is adequately dense yet disbursed to promote convenient availability.
- Favorable government policies or incentives.



Sources: Wood Mackenzie, IANGV

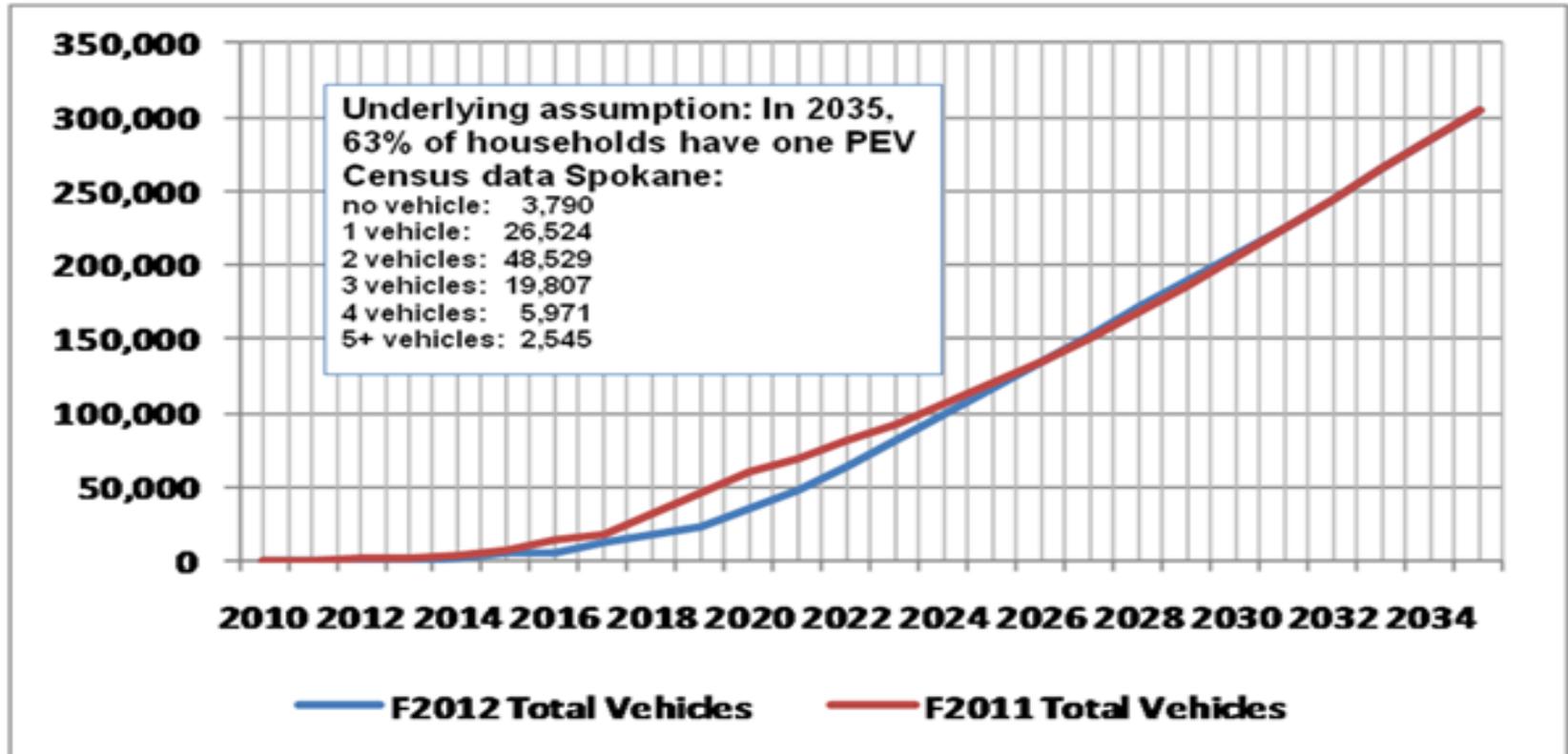
Market Applications



Source: NREL/TP-7A2-47919, June 2010

Electric Car & Plug In Hybrid Sales

Eastern Washington & North Idaho Service Area



Inland Northwest Comparative Energy Advantage

The Energy Situation in the Inland Northwest

- ❖ We have among the lowest electricity and natural gas retail rates in the country
- ❖ In most of the West, retail electricity prices are double the local price; in the case of California one-third to one-fourth
- ❖ We have a location advantage in natural gas markets because we are right in the middle of three suppliers of low cost gas
- ❖ Our renewable energy mandates are sensible at 25%, especially compared to California (33%)

Energy Retail Price Outlook in the Inland NW Electricity

- ❑ During the rest of this decade, our retail electricity prices are likely to increase 5% per year from a base of 8.5 cents per kWh
- ❑ Today in San Diego incremental retail electricity prices are about 30 cents per kWh and will increase 50% next year

Energy Retail Price Outlook in the Inland NW Natural Gas

- ❑ **Locally, natural gas retail prices will increase 1-2% per year because the cost-of-gas component will remain stable for the decade**
- ❑ **Projections of retail natural gas for the rest of the country are for moderate increases in the range of 5-10% per year from a higher base level**

Energy/Economy History

- In the 1960's and 1970's the Pacific Northwest and our Region enjoyed extraordinary low cost energy
- This in turn drew energy intensive industry to the area
- During the 1980's and 1990's some large blunders (largely nuclear on the electricity side) and strong demand (on the natural gas side) drove up energy costs rapidly
- The aluminum industry, mining and smelting and other natural resource industry exited during these decades

Energy/Economy Future

- Today, reasonable renewable energy targets and low natural gas prices for industry and electricity generation have dramatically shifted the balance of where onshore industry will relocate and offshore industry will return
- We have the land
- Labor will come to the jobs
- Capital is not going to be an obstacle
- Entrepreneurship seems to be everywhere
- And our energy will be dramatically lower cost
- Will we be ready for growth?

Questions