

# NATURAL GAS PRICES IN THE PACIFIC NORTHWEST

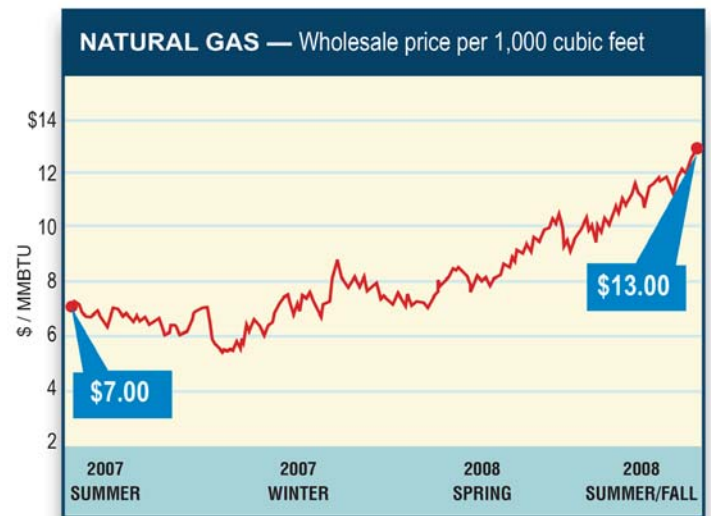
## IN THIS ISSUE

- Why prices are at current levels
- What the industry is doing to manage prices
- How public policies affect prices/initiatives

**E**nergy prices in the Pacific Northwest remain among the lowest in North America. Nevertheless, they have risen dramatically over the last few years, largely tracking price increases across North America. As wholesale electricity and crude oil prices scaled new heights, the average natural gas price has almost tripled since 2003. Average wholesale prices in 2003 were \$4.88 Mcf, compared to summer prices in 2008 hovering around \$13<sup>1</sup> per Mcf.<sup>2</sup> In addition, wholesale prices continue to fluctuate, making natural gas among the most volatile of traded commodities. Higher prices for natural gas and gas price volatility are expected to continue.

A complex interplay of factors contribute to energy price volatility – some natural (such as weather-related events), some man-made, some regional and some global.

But this does not mean energy prices are beyond our influence. By examining and understanding these variables and working together to craft effective energy policies, the region's energy industry, consumers and policy makers can help to mitigate future increases.



Source: PSE EnergyWise July-Aug 08

This White Paper explores the key factors influencing natural gas prices in the Pacific Northwest, what the natural gas industry is already doing to manage price risks for customers and lastly, how public policy changes – or lack of them – could affect future prices.

1. Source: Energy Information Administration (EIA), U.S. Department of Energy.

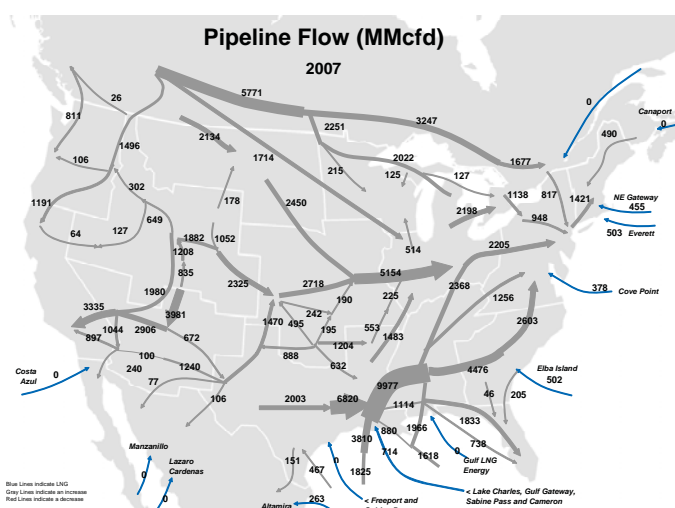
2. Mcf = Thousand cubic feet, the typical unit by which natural gas is bought and sold.

# NATURAL GAS PRICES IN THE PACIFIC NORTHWEST

## WHY ARE REGIONAL NATURAL GAS PRICES AT CURRENT LEVELS?

The sustained higher prices we have experienced in recent years are a result of fundamental market dynamics: growth in demand for natural gas is outpacing production capabilities. While there are sufficient supplies of natural gas in North America and across the globe to serve growing demand for decades to come, efforts to extract new sources of gas and bring it to growing markets like the Pacific Northwest have lagged. Meanwhile, existing North American resources are “maturing,” and producing less gas.

The region’s proximity to prolific natural gas production areas in Canada and the U.S. Rockies – one of the reasons for lower regional gas prices in the past – is still an advantage for Northwest consumers, but that benefit has lessened in recent years. Just a few years ago, the Northwest was one of only a few destinations for the gas produced in those regions. New pipelines have been built in recent years resulting in greater integration of these supply resources to other North American market regions, particularly the Midwest and Southwest. Consequently, Northwest markets now face increased competition for these supplies and are subject to price shocks that occur in other market regions such as the U.S. Northeast and Southwest. Likewise, the greater North American market is facing increased competition for natural gas in the global market. While the continent currently produces nearly all the gas it consumes (97 percent in 2007), it will increasingly depend upon



Recently enhanced connections between production areas in Canada and the U.S. Rockies to population centers in the U.S. Midwest and Northeast have diminished the price advantage enjoyed by Northwest consumers.

## THE GROWING IMPORTANCE OF LNG IMPORTS

As the price of North American produced natural gas has increased, imported liquefied natural gas (LNG) has become an increasingly viable – and vital – option for the continent’s future supply.

Due to technological improvements, streamlined production, and decreasing transportation costs, the cost of LNG imports is now more competitive, spurring interest in expanding or building new LNG import terminals throughout North America. In the U.S. alone, four existing terminals are being expanded, the first new terminal in twenty years began service in March 2005, and more than 40 new terminals have been proposed to regulators, including five in Oregon and two in British Columbia.

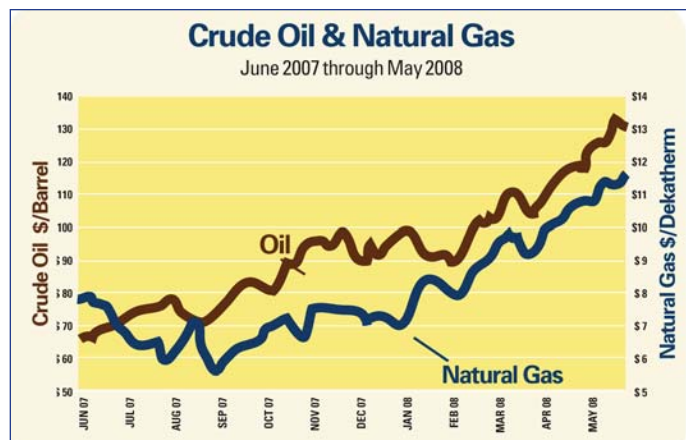
However, more LNG imports are neither imminent nor assured. Each facility must go through rigorous financing (private) and permitting (public) processes and then can take years to build. Infrastructure expansions necessary to support import terminals (e.g., pipelines) have similar hurdles and timelines.

Yet the EIA projects LNG imports must increase enough to serve more than 15% percent of U.S. natural gas demand by 2030 if projected demand is to be served. Consequently, public policies to expedite terminal and infrastructure construction, and education campaigns to ease environmental concerns, are crucial to our energy future.

imported liquefied natural gas (LNG) to satisfy expected demand – competing with other consuming nations for those supplies. Also affecting natural gas prices in the near term are historically high prices for crude oil. The linkages between the fuels are complex but undeniable. For instance, large industrial consumers, including some electrical generation facilities, can burn either fuel and make the most economic choice based on the price of the fuel and such factors as emissions, maintenance costs, etc. So, although natural gas prices have increased in recent years, demand for it remains strong because oil prices have increased as well. Recently, as crude oil prices have spiked, prices for the two fuels have tracked particularly closely<sup>4</sup>, indicating continuing demand for natural gas despite higher prices.

4. Source: EIA, Annual Natural Gas & Crude Oil Prices, as of Dec. 31, 2004. Correlation is represented by a number between 0.0 & 1.0 with 1.0 representing a perfect or one-to-one correlation.

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The correlation between natural gas and crude oil prices has been very close in recent years largely due to the ability of some large industrial customers, including electrical generation facilities, to switch fuels. (Source: Avista Connections July 2008)

## WHAT IS THE NATURAL GAS INDUSTRY DOING TO MANAGE PRICES?

Natural gas bills are made up of two parts: the cost of the natural gas commodity and the cost to deliver the gas to the consumer. Local gas companies are highly regulated and are allowed to earn a profit only on the service of delivering natural gas to consumers. They are not allowed to profit from the sale of the natural gas itself. Therefore, the consumer pays only what the local gas company paid for the natural gas commodity without markup. Each year, gas companies file some form of Purchased Gas Adjustments (PGAs) with their respective regulators passing on to customers increases or decreases in gas supply costs.

Electricity and natural gas prices are also closely linked because a sizable portion of our electricity needs - even in the Pacific Northwest - are generated using natural gas. Over the long run all energy prices move together as the different forms of energy can be substituted for one another in many applications. Consequently, natural gas will remain competitive to other fuels (e.g. electricity, oil) over the long run.

*The natural gas industry uses all tools at its disposal to minimize costs & stabilize prices.*

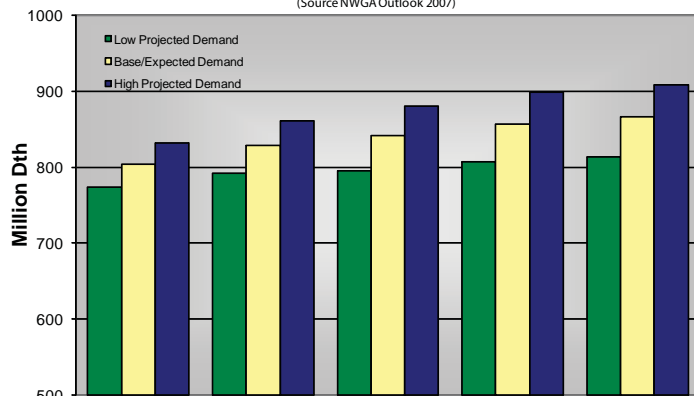
In recent years, Pacific Northwest utilities have had to pass through commodity cost increases that reflect the tightness of the overall gas market. 2007 was the last year that the natural gas commodity cost decreased, prompting local gas companies to file for rate reductions that resulted in lower gas bills for regional consumers.

With natural gas demand expected to increase across all market sectors – a cumulative 7.2 percent growth in the Pacific Northwest through 2012 – and no extensive new supply on the immediate horizon, pressures on prices will continue in the near term.

Because they want to keep their existing customers and earn new ones, NWGA member companies work hard to obtain least-cost gas supplies and stabilize prices, notably through comprehensive resource planning efforts and a mix of short- and long-term contracts and price hedging programs.

## Annual Regional Demand Growth

(Source NWGA Outlook 2007)



Utilities' least-cost (or "integrated resource") planning efforts analyze the complex mix of factors affecting demand and how best to meet it well into the future. Some of the questions utilities seek to answer through this process includes: Do we have adequate supply and means of delivery to serve our customers for the next 20 years? Do we have alternatives in case of supply or delivery interruptions? Have we identified major issues that could limit or expand resource or infrastructure choices, including public policy trends, environmental sensitivities, or development of renewable or alternative resources? Have we anticipated how changing demographic, economic and/or marketplace conditions may affect demand or our ability to access supply?

Resulting from this intensive process is a definitive but flexible plan that identifies strategies for acquiring the most effective mix of resources to meet near-term demand as well as strategies to address uncertainties and barriers to acquiring a least-cost mix of resources in the longer term.

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## WHAT DRIVES NATURAL GAS PRICES

The balance between supply and demand determines prices both day-to-day and long term (Economics 101). When supplies are plentiful – as they were in the 1980s and 90s – prices are low. When supplies are tight relative to demand – as is true now and in recent years – prices increase and become more volatile. Some of the primary factors that influence the natural gas supply/demand balance – and therefore market prices include:

### SUPPLY

- ★ **Production.** Production is declining in many older basins while access to promising resource areas remains restricted.
- ★ **Storage levels.** High storage levels tend to dampen natural gas prices while perceived low storage levels can boost prices.
- ★ **Pipelines and infrastructure.** Although plenty of gas may exist to serve a need, physical constraints on the region's delivery system can create supply scarcity and boost prices. Interconnection with other consuming markets also influences prices.
- ★ **Weather.** Weather conditions can affect the ability to drill for, produce and gather both oil and natural gas supplies. For example, Hurricanes Ivan in 2004 and Katrina in 2005 affected production and transportation infrastructure in the Gulf coast. In northern production environments, the drilling season lasts as long as the ground remains frozen (though new technologies are helping to extend cold weather drilling seasons).


### DEMAND

- ★ **Weather.** Weather extremes boost demand putting upward pressure on short term gas prices. Also, anticipated or long-range forecasts of weather during any particular season can affect the price of natural gas as purchasers seek to ensure they have enough, but not too much, gas to meet their needs.
- ★ **Economy.** The relative health of regional, national and global economies influence prices by directly affecting demand and the balance between it and supply. If new sources of supply cannot keep pace with increasing demand from a prospering regional and national economy, for example, prices go up.
- ★ **Environment.** As society continues its move toward more environmentally acceptable fuels, natural gas is a preferred fuel because of environmental attributes like low emissions relative to other fuels.
- ★ **Crude oil prices.** The ability of some large energy consumers to switch between natural gas and crude oil derivatives means the price of oil can also influence natural gas prices.

- ★ **Electrical generation.** Responsible for more than half the region's expected growth in demand for natural gas over the next five years, gas-fired generation influences prices. For instance, summer generation loads increasingly compete for natural gas that was historically purchased for storage during the summer months to serve winter peak loads, driving up prices during the summer as well as other times of the year.
- ★ **Demand elasticity.** The measure of how much demand changes in response to a price change, demand elasticity plays a role in both short- and long-term price trends. In the short-term, for example, price-sensitive industrial and electric generation customers may choose to curtail production or switch to an alternative fuel when natural gas prices are high – reducing their demand for natural gas significantly. In the long-term, homeowners and businesses may be encouraged by higher prices to install higher efficiency equipment and otherwise reduce usage.

### GLOBALIZATION

- ★ **Currency Exchange Rates.** Over half of the oil and 15% of the natural gas supplies used in this country are purchased from foreign sources. Fluctuations in the value of the U.S. dollar versus other currencies like Canadian dollar and the European euro can and do drive domestic costs up or down accordingly.
- ★ **Competition for Supply.** LNG imports may be bound to long-term supply contracts, but they increasingly will be sold into a "spot market" where cargoes will move to those purchasers offering the highest prices. This means the U.S. will have to compete on price with Asian and European markets or else watch LNG cargoes get diverted to foreign ports.
- ★ **International political environment.** Similar to the current scenario with oil, as North America increases its use of natural gas produced in other parts of the world, the price of that gas will be affected by the political stability or volatility of producing nations.


While some of these factors cannot directly be addressed through policy changes, several can – chief among them, expanding natural gas production and delivery infrastructure to keep pace with growing demand as well as continuing to promote energy efficiency improvements and increased conservation. 

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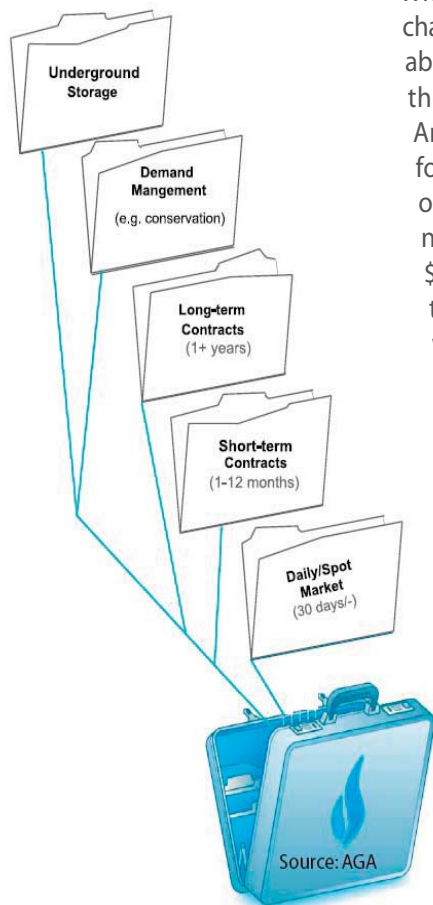
Strategies may involve demand-side activities such as promoting energy-efficiency, or supply-side actions like contracting for additional pipeline and storage capacity or investing in the development of new supply resources. This is where public policies and the regulatory environment come heavily into play – either expediting the process or posing serious hurdles that can skew the demand/supply balance.

*A HEDGE is an offsetting position designed to protect against risk: in this case, fluctuations in gas prices. A typical hedge involves locking in a certain price for future natural gas supplies through financial institutions or with actual gas producers. These are often referred to as “financial derivatives” such as futures, options or swaps.*

Generally, natural gas utilities, marketers and direct purchasers (large industrial customers) find the most cost-effective mix of resources is one involving both short- (one year or less) and long-term contracts, and the use of hedging transactions. More than two-thirds of U.S. natural gas utilities now use long-term contracts and hedging tools to stabilize customer costs, according to the American Gas Association (AGA).

While there is roughly an equal chance that a hedge price will be above or below current prices, the tradeoff is price stability. And this paid off handsomely for customers during the winter of 2004-05 when wholesale natural gas prices averaged \$3.17 (per million Btus) higher than they were the previous winter, but most utilities were paying less through contracts and hedges. Long-term contracts and hedging activity are becoming more prevalent as regulators and utilities seek to reduce the risk of price volatility on behalf of natural gas consumers. 

*Utilities have a portfolio of ways to manage natural gas price volatility and use an appropriate mix as needed.*



## WHAT CAN BE DONE NOW TO MITIGATE FUTURE PRICES?

It is clear the Pacific Northwest and North American continent are at a critical crossroads regarding natural gas supply. Continued strong growth in natural gas demand, particularly for electricity generation, and limited growth in supply over the next few years indicate customers will continue to pay the price, literally, for this demand/supply squeeze.

While past public policy has encouraged demand but not supply, new policies must reverse this trend, and quickly, to help moderate prices. Fortunately, the U.S. Congress and some Canadian provinces are already moving in the right direction.

The Energy Policy Act of 2005 lays out a blueprint for the supply, delivery and efficient use of natural gas and other forms of energy – directly benefiting homeowners and commercial consumers who have been hammered with rising energy prices since 2000. The Act encourages more natural gas production in the U.S., increasing imports of LNG, and promoting research on promising new sources of natural gas, such as coal-bed methane and methane hydrates. It encourages expansion of natural gas pipelines and the construction of more underground natural gas storage facilities. And the Act promotes innovative technologies, such as natural gas fuel cells, to encourage more efficient use. By separate action earlier in the year, Congress also enacted provisions to expedite construction of the Alaska Gas Pipeline, which will connect readily available stores of natural gas to the consuming regions of North America.

In addition, British Columbia continues to implement aggressive strategies that are producing results. Royalty relief, road construction in remote areas and other incentives have spurred significant natural gas production gains in targeted areas.

But these policy changes cannot bring overnight resolution to the supply/demand imbalance. While demand can change quickly, it takes years for new natural gas production (and pipelines to deliver it) to reach the market. According to Dave Parker, President and CEO of the AGA, “If you design a new house today, it will not be built tomorrow. In the same vein, energy projects have long lead times before they yield results.”<sup>5</sup>

5. AGA Press Release, *Natural Gas Customers Will Benefit From Congressional Energy Bill*, July 27, 2005

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For example, the licensing and construction of new LNG import terminals is a three- to five-year effort. Likewise, changing consumer behavior – to adopt new technology or otherwise conserve energy – takes time to achieve.

Continued firm leadership is needed at every level of government to ensure fresh supplies of natural gas reach the market

– including conservation and efficiency, production from as-yet untapped land and water areas with huge amounts of proven reserves and construction of LNG import terminals – and to address public unease with such projects by focusing on the true environmental and economic impacts.

The time is now to unlock the resources at our fingertips and balance our energy future. 

## TALE OF TWO STUDIES: IMPACT OF PUBLIC POLICY ON NATURAL GAS PRICES

Two recent studies looked at the effects public policy choices (or lack of them) could have on future natural gas prices. An American Gas Foundation (AGF) study issued in February 2005 – Natural Gas Outlook to 2020 – analyzed future U.S. natural gas prices based on three alternative public policy scenarios: existing, expected and expanded.

The existing, or status quo, scenario assumed continuing restrictions on off-shore and Rocky Mountain drilling, no functional Alaskan pipeline and no new LNG terminals.

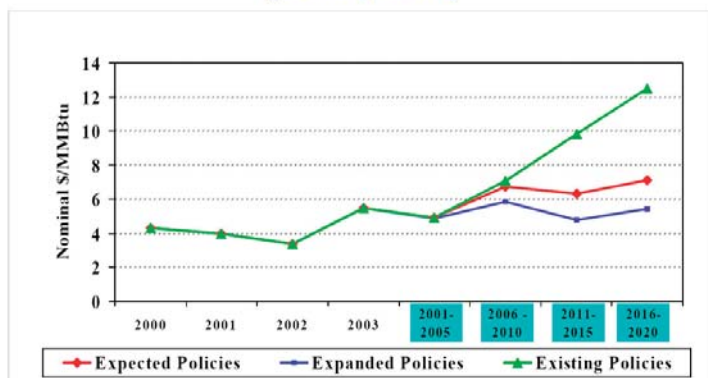
The expected scenario assumed a more diverse natural gas supply, with major contributions from Alaska (by 2014) and imported LNG, but continuing drilling restrictions. Finally, the expanded scenario assumed new supplies from Alaska and LNG and development of limited resources off the East Coast and Gulf of Mexico and in the Rockies.

The expanded policy scenario could save consumers more than \$500 billion over the expected scenario between 2005 and 2020, the study found. It notes, however, that both the expected and expanded scenarios require significant changes in public policy.

Similarly, in its 2003 Natural Gas Study, the National Petroleum Council (NPC) identified two policy scenarios: a “reactive path” and “balanced future.” The reactive (or minimal action) path assumed some action is taken to increase efficiency and conservation, enable the Alaskan gas pipeline, overcome siting opposition to LNG terminals, and allow increased drilling in the Rockies. Supply and demand would continue to be

tight, the NPC found, resulting in higher and more volatile prices. The NPC’s recommended balanced future scenario assumed more aggressive steps to maximize supply and infrastructure development and fuel-switching flexibility, resulting in lower price projections. Such actions could save energy consumers up to \$1 trillion in natural gas costs over the next two decades, the study found.

**Actual and Projected Natural Gas Prices (Henry Hub)**



Per an American Gas Foundation study, failure to change current U.S. energy policies would worsen supply constraints and push the 2020 nominal forecast price for natural gas to \$13.76 per million Btus, with an average price of \$9.43 over the study period. With some change in policy, average prices could remain in the \$5 to \$6 range, with a 2020 forecast price of \$8.15. Policies to encourage new supply could produce prices averaging \$5.50 over the entire study period, with a 2020 forecast price of \$5.47.

Located in Louisiana, Henry Hub is one of the most active natural gas trading points in North America. The Henry Hub price is commonly used as an index against which other trading point prices are compared.

This White Paper was published by the Northwest Gas Association (NWGA) to provide policy makers, opinion leaders and the media with accurate and timely information about the dynamics of natural gas commodity pricing in the Pacific Northwest. NWGA members include six natural gas utilities serving communities in Oregon, Washington, Idaho and British Columbia, and three interstate pipelines that move natural gas from supply basins into and through the region. NWGA members deliver or distribute all of the natural gas consumed in the Pacific Northwest. For more information contact us or visit our Web site.