

# OTP/MDU Witness

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Summary:

OTP/MDU Exhibits

341 - 350

## *My Testimony is about Trade-offs*

What are the potential costs of future greenhouse gas regulation?



What are the cost and other risks of not using coal at Big Stone II?

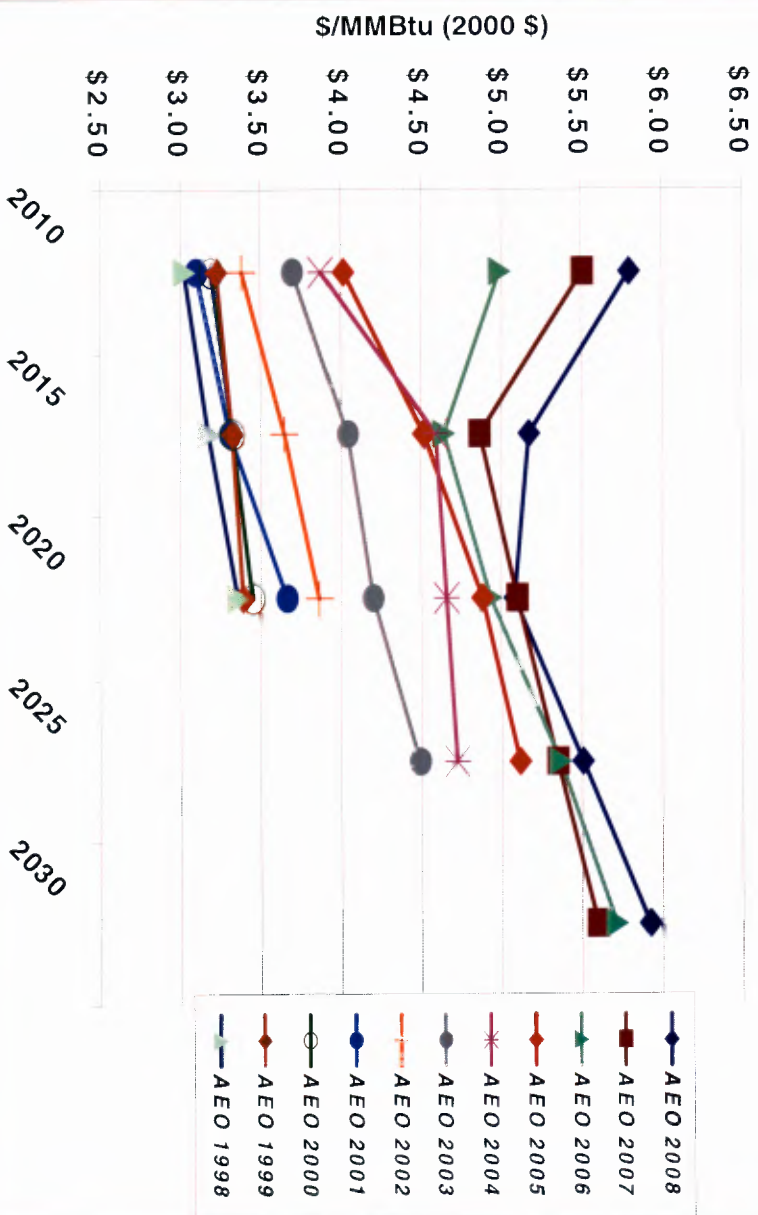
Alternatives to Big Stone II likely entail natural gas as a primary or backup fuel supply, or as power purchased from the pool.

- Risks of higher natural gas prices
- Greater price volatility
- Increased exposure to natural gas price spikes

# Natural gas price forecasts continue to spiral upward year-by-year

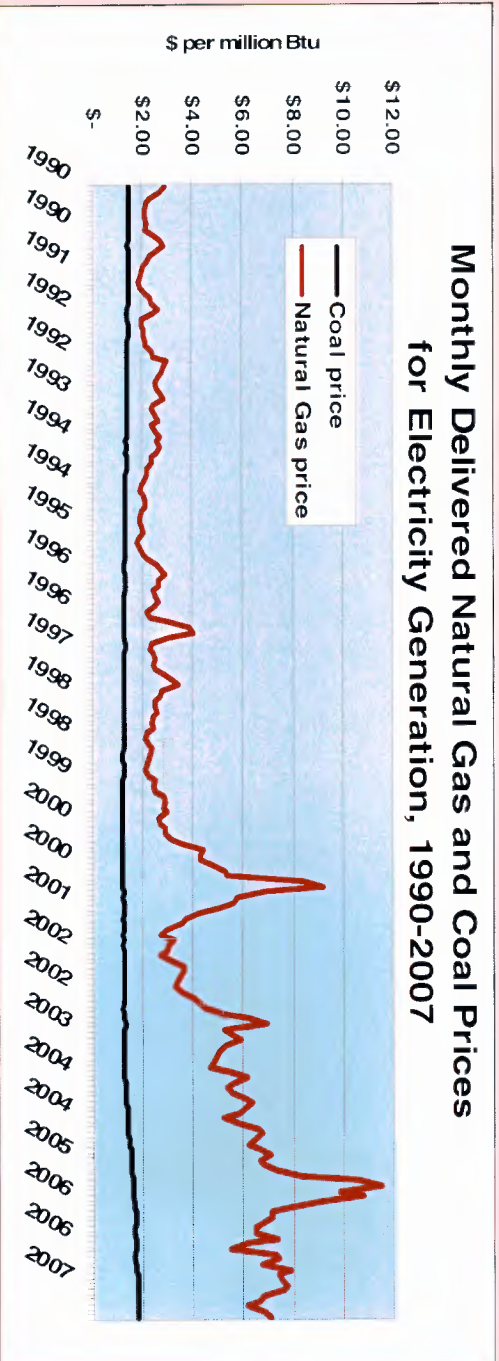
History of Natural Gas Price Forecasts

EIA's Natural Gas Price Forecasts  
Annual Energy Outlooks, 1998-2008



# Increasing volatility in natural gas prices

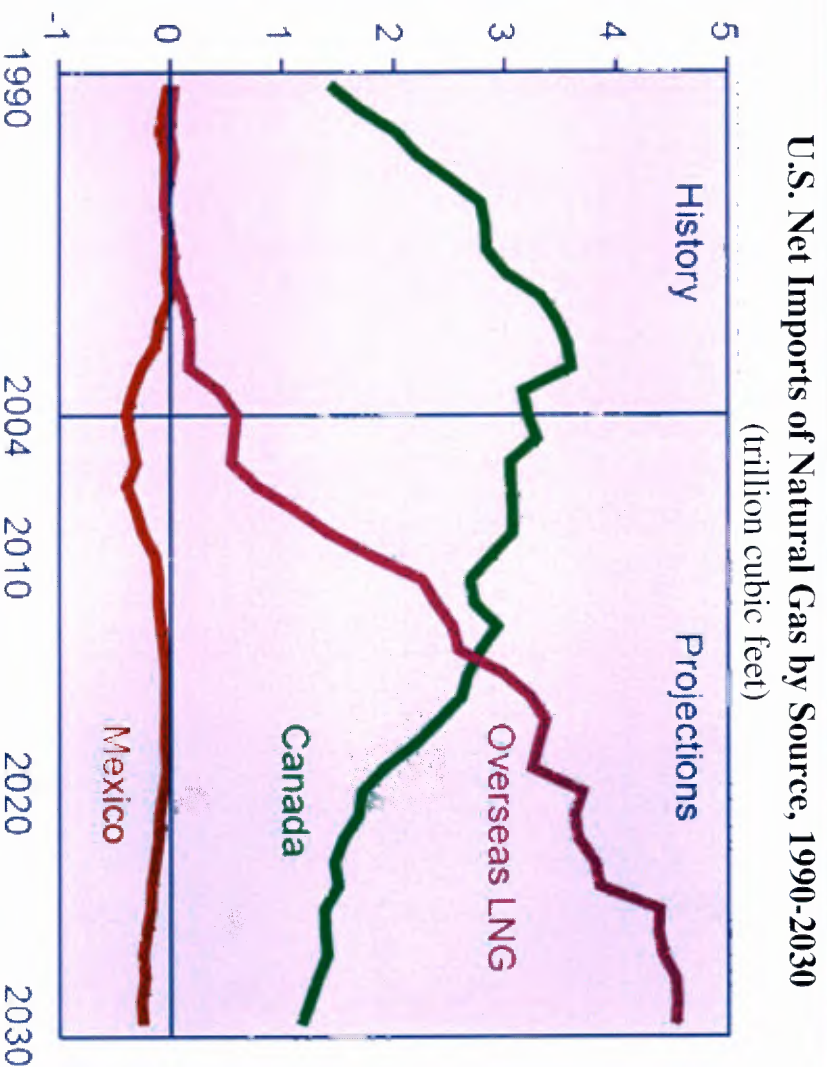
Monthly Delivered Natural Gas and Coal Prices for Electricity Generation, 1990-2007



Changes in Monthly Delivered Natural Gas and Coal Prices for Electricity Generation, 1990-2007



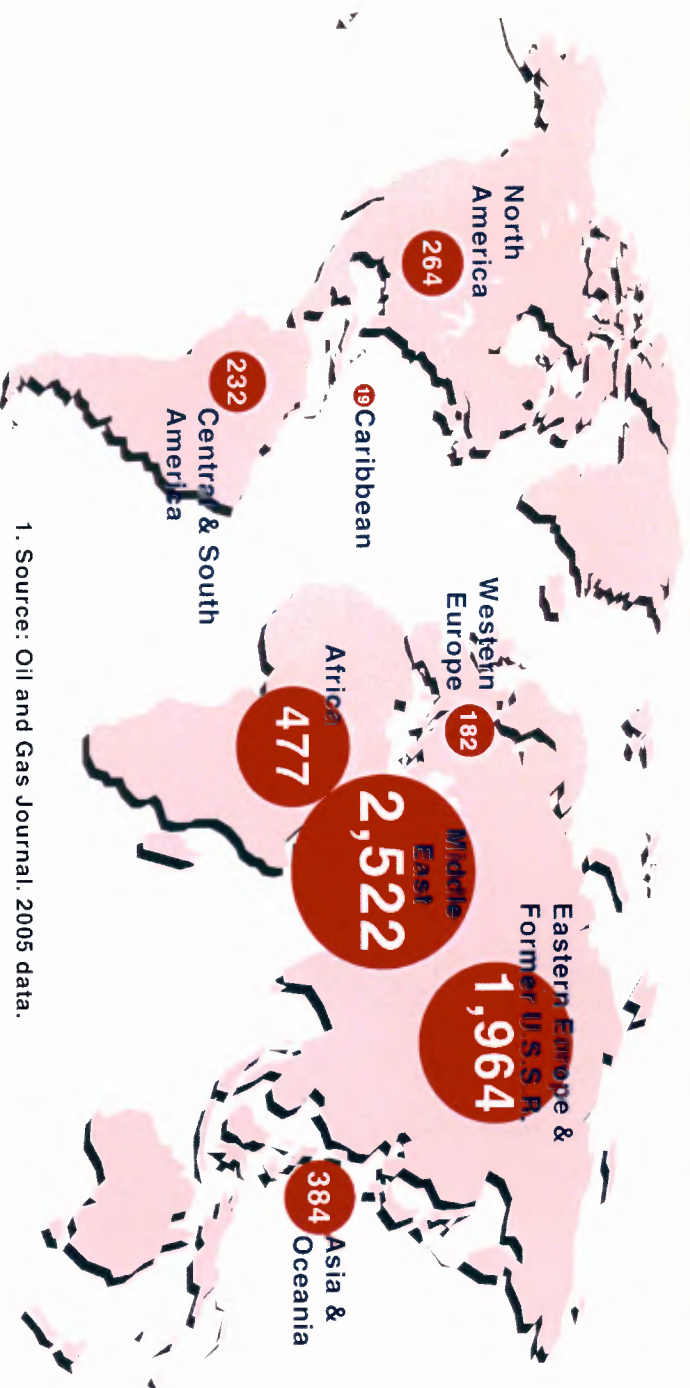
# Future Sources of natural gas for the U.S. will increasingly come from overseas LNG



Source: U.S. Department of Energy, Energy Information Administration, *International Energy Outlook 2007*, Report #DOE/EIA-0484(2007), May 2007, Figure 46. [http://www.eia.doe.gov/oiaf/ieo/figure\\_46.html](http://www.eia.doe.gov/oiaf/ieo/figure_46.html). Figure developed using historic data in *Annual Energy Review 2005* and forecasts in *Annual Energy Outlook 2007*.

# Future Sources of natural gas are an energy independence issue for the U.S.

Proven World Gas Reserves: 6,044 Trillion Cubic Feet



1. Source: Oil and Gas Journal. 2005 data.

Source: Adapted from Kevin R. Petak, Energy and Environmental Analysis, Inc., *Oil and Gas Prices: Will They Stay Linked?*, presented at 2006 EIA Energy Outlook and Modeling Conference, Washington DC, March 27, 2006, <http://www.eia.doe.gov/oiiaf/aeo/conf/pdf/petak.pdf>. Data source for chart is *Oil and Gas Journal*.

## ***High natural gas prices and price volatility pose risks for electricity generators and customers***

- For 500 MW of gas combined cycle:
  - 1¢ change in gas prices → \$280,000/year
  - \$1.00/MMBtu or more → tens of \$millions/year
- Additional considerations: North Dakota
  - ND counties to be served by Big Stone II have lower than average household income
  - ND households have higher than average consumption of gas and oil → doubly vulnerable to gas price volatility
  - Higher rates for customers → less household income for other purposes
  - Coal use at Big Stone II would moderate price spikes in household energy budgets