

# US Natural Gas Markets– The Future Will Be Full of Surprises

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## **Natural Gas Markets Forum**

**January 22, 2011**

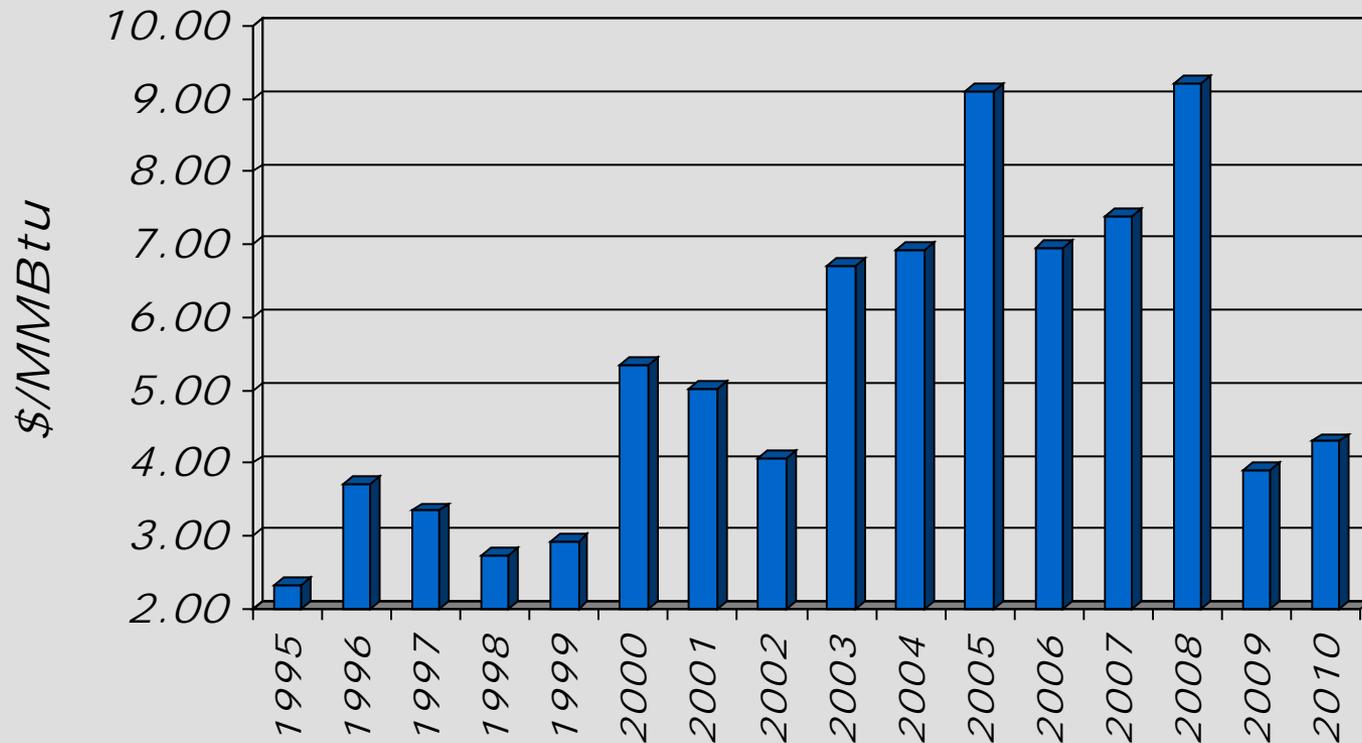
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Natural gas prices have gone through many **unanticipated** cycles.

*Henry Hub Prices*



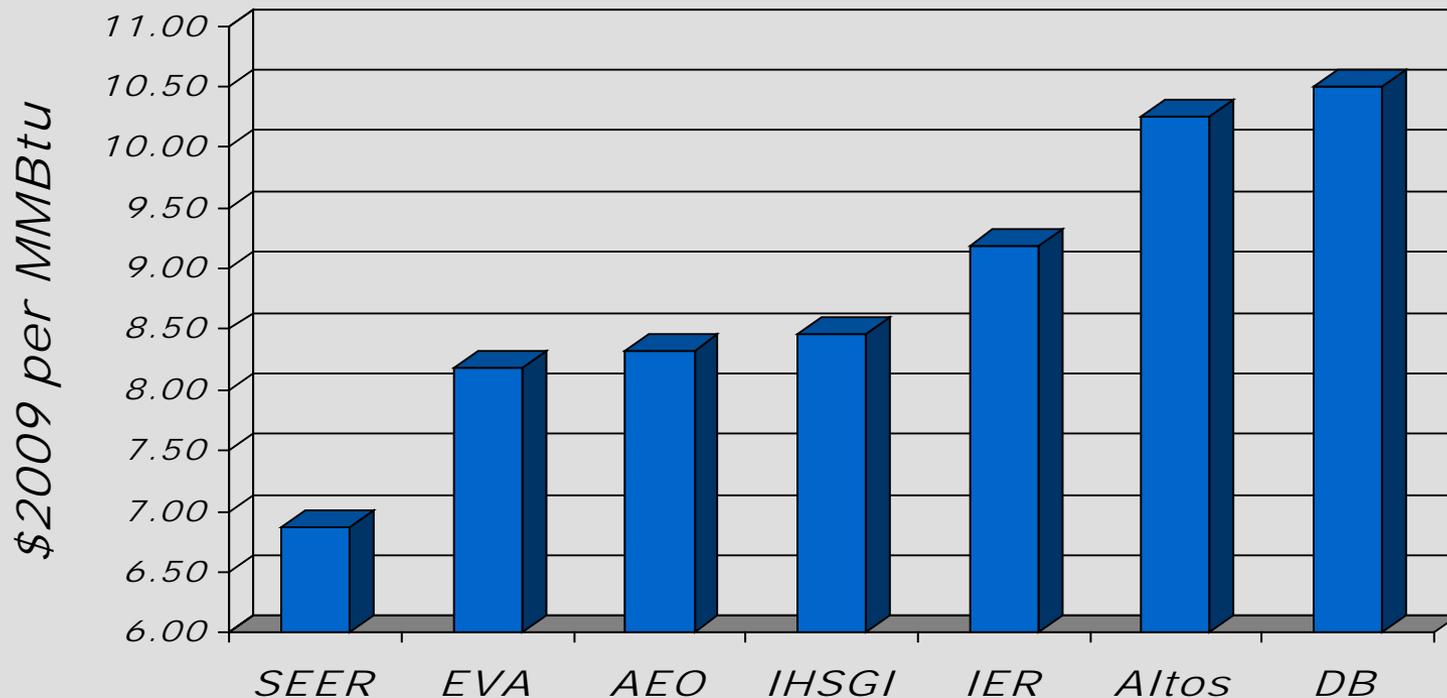
The 1990s were characterized by unjustified optimism.

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- **Excess reserves and productive capacity were developed in the early 1980's because of poor regulatory decisions.**
- **Production grew in the 1990's by using up these reserves and the excess productive capacity.**
- **In 1996 one of the largest energy consulting companies developed scenarios with high prices of \$3.00 per MMBtu in 2010, average prices of \$2.50 and low prices of \$1.50 per MMBtu. (Prices are nominal at Henry Hub.)**
- **Prices averaged \$6.53 per MMBtu from 2006 to 2010.**

In 2000, prices increased and production did not grow. In 2008, price forecasts were very high.

### 2025 Henry Hub Prices

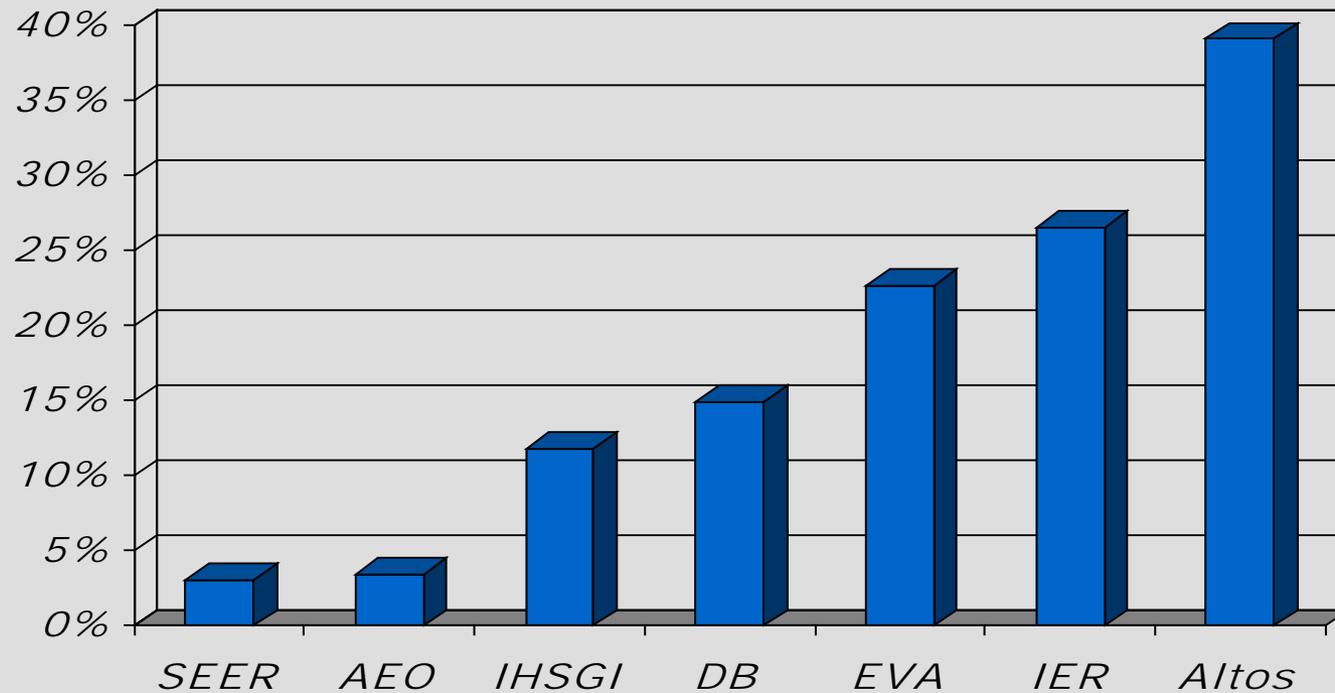


Note: The SEER and AEO projection above was without GHG. Some of the forecasts above assumed GHG.

In 2008, supply was expected to come from Alaska and LNG.

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*% of US Supply from LNG (2025)*



In 2009, a recession and the development of natural gas production from shale radically changed perceptions.

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- Now forecasts are for much lower prices and some companies have filed to export LNG.
- But, there many uncertainties both known and unknown.
- A few of the supply side uncertainties are the resource base, potential restrictions on access to reserves, technological change, taxes on production, increased water costs, and the EPA investigation of risks of fracturing to the water supply.
- On the consumption side limitations on greenhouse gas emissions (GHG), the oil-gas spread and other factors could stimulate much more consumption than anticipated and there are factors such as renewables that could lower consumption.

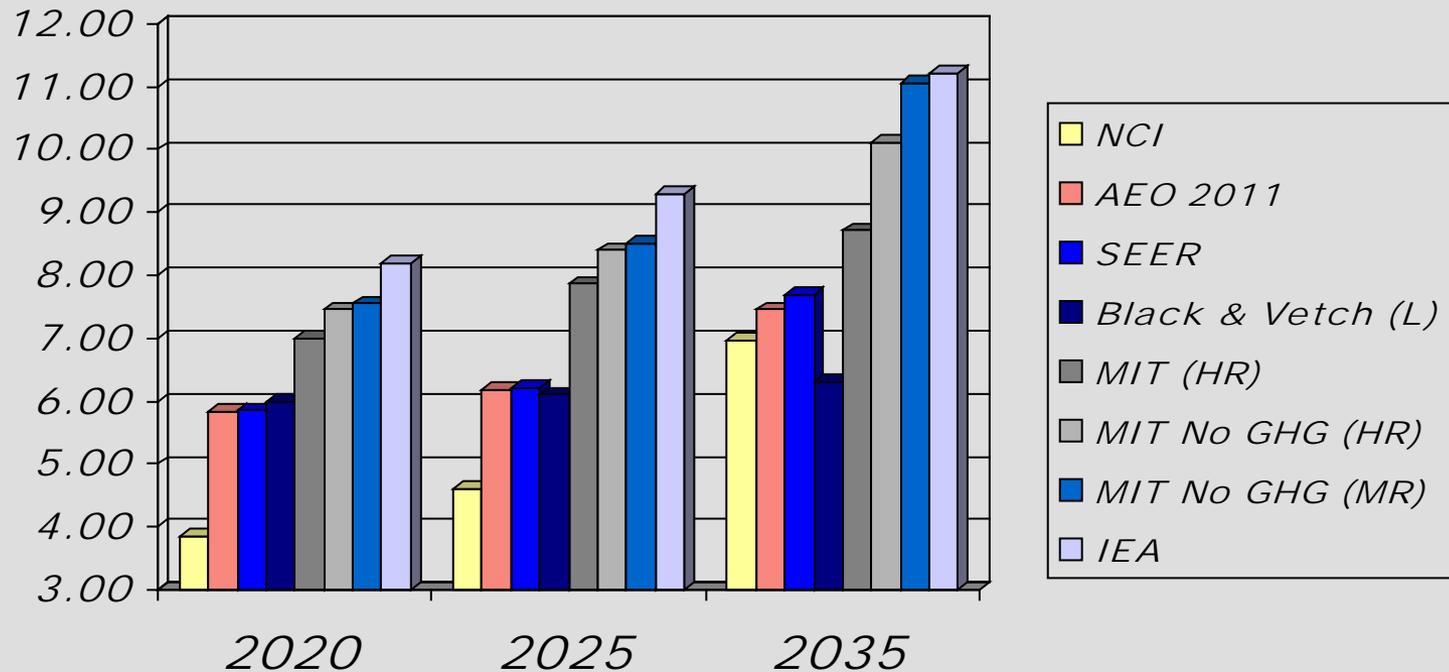
## Supply side uncertainties could result in lower or higher prices.

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- Land access restrictions could limit access to reserves. In New York there is a moratorium on horizontal drilling.
- Pennsylvania, the major source of Marcellus shale production, has been trying to pass a tax on natural gas production – this could add \$.25 per MMBtu.
- Water treatment could add \$.25 per MMBtu or more to the cost of production.
- Tighter standards by the EPA could add \$.25 per MMBtu or more to production cost.
- There are factors such as technology changes and the potential discovery of a major new play that could lower costs as well.

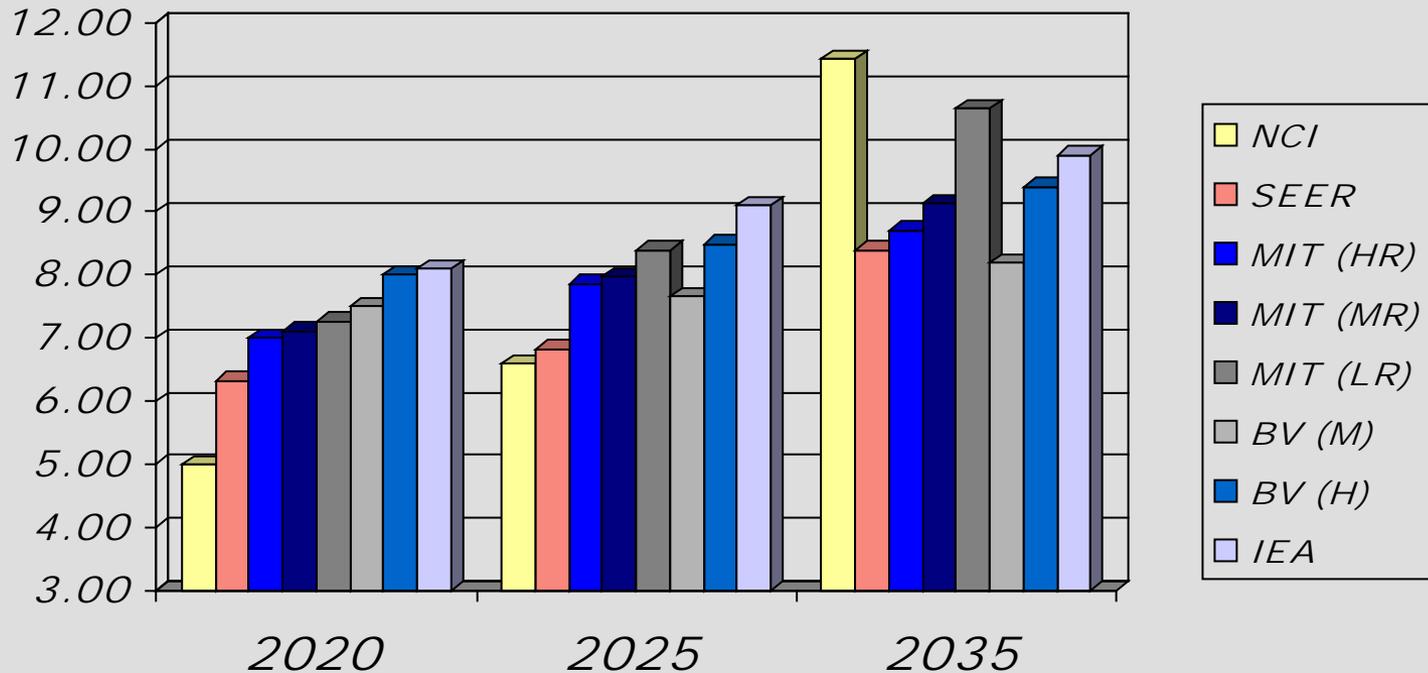
Even without green house gas emission limits, prices are expected increase from current levels.

### Henry Hub Prices \$2009/MMBtu



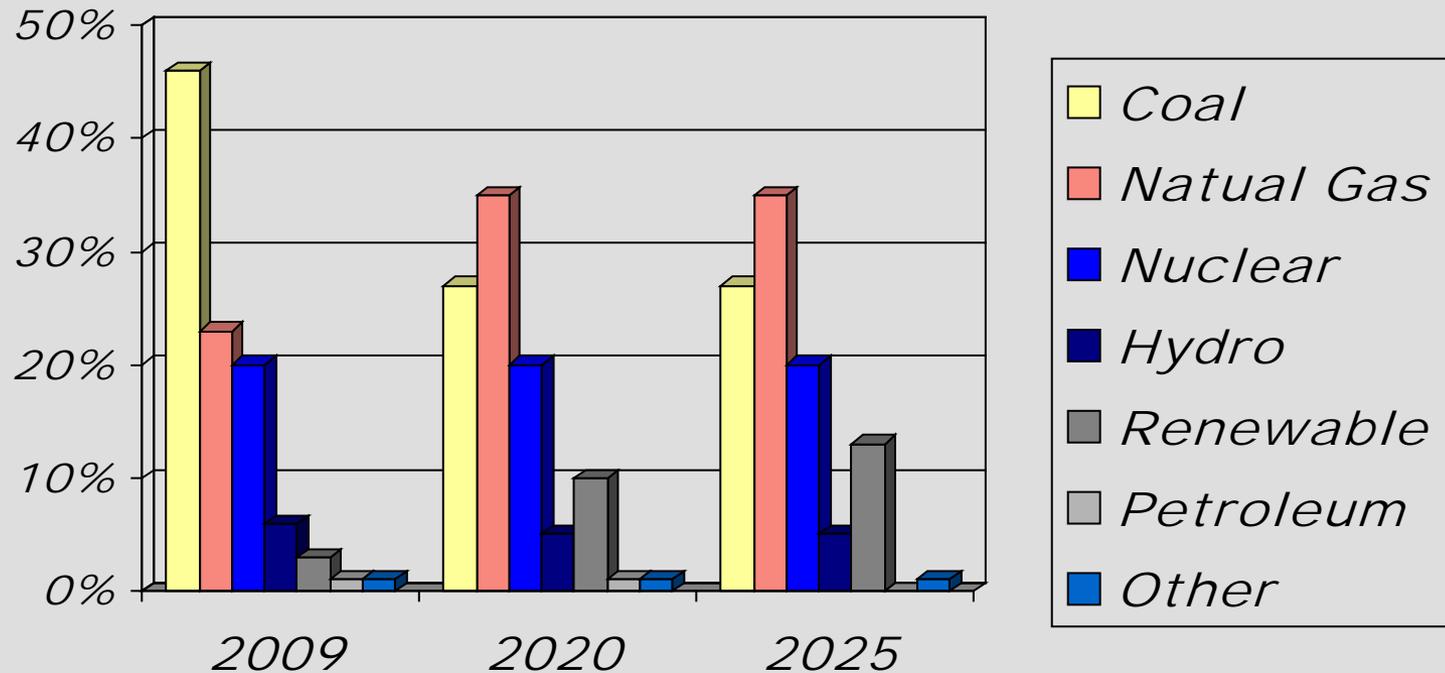
Forecasts with green house gas (GHG) emission limits are higher than those without.

*Henry Hub Prices \$2009/MMBtu*

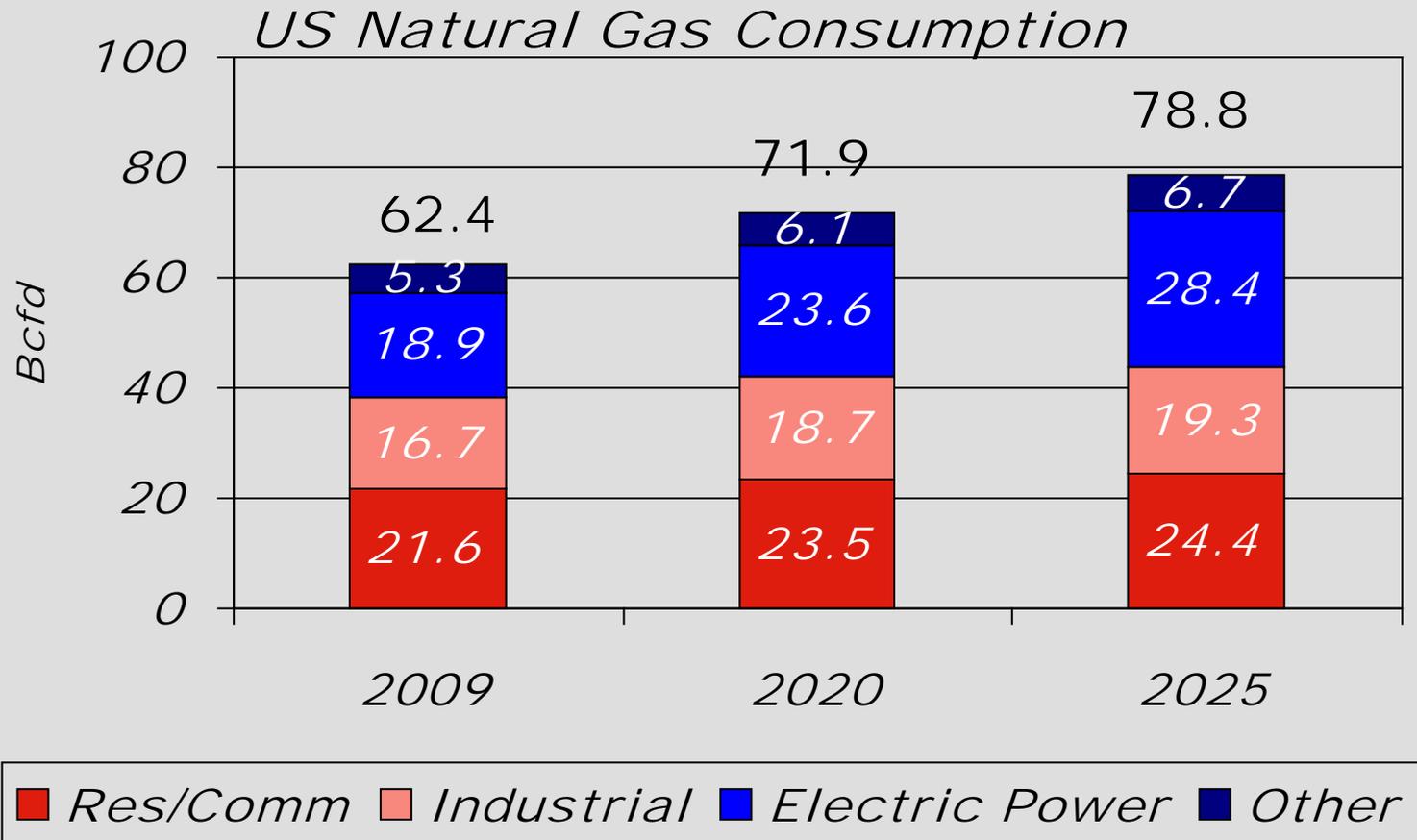


Natural gas use for power generation will be the major source of growth because of emissions and price.

### *US Share of Generation*



With GHG, natural gas consumption increases by 15.2% and 26.3% by 2020 and 2025 respectively.



# “The Future Ain’t What It Use to Be” – Yogi Berra

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- The outlook is for market growth and price increases.
- There are forces both known and unknown that could change the price outlook dramatically in either direction.
- Forecasts beyond a few years have very little reliability.
- Be prepared to take advantage of unexpected change.

# Abbreviations

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- **AEO**      **Annual Energy Outlook**
- **Altos**      **Altos**
- **BV (H)**      **Black & Vetch (H) - High Price, (M) Medium Price, (L) Low price**
- **DB**      **DeutschBank**
- **EVA**      **Energy Ventures Analysis**
- **IEA**      **International Energy Agency**
- **IER**      **Institute of Energy Economics, University of Stuttgart**
- **IHSGI**      **IHS Global Insight**
- **MIT**      **Massachusetts Institute of Technology - (HR) High Resource, (MR) Middle Resource, (LR) Low Resource**
- **NCI**      **Navigant**
- **SEER**      **Strategic Energy & Economic Research**