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**BLACK & VEATCH**



## **Presentation to the State of Alaska Legislature**

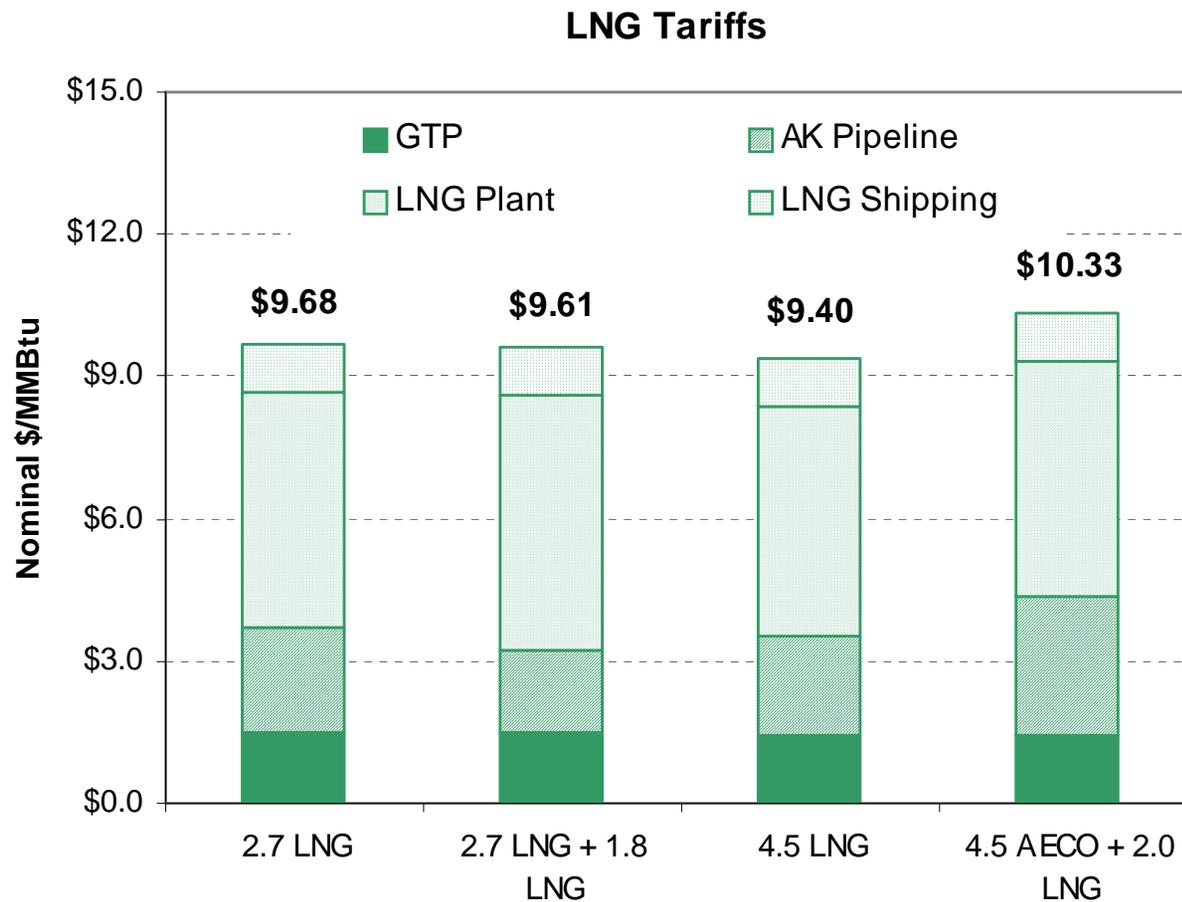
# **Liquid Natural Gas (LNG) NPV Analysis and Results**

**June 9, 2008**

## Key Conclusions

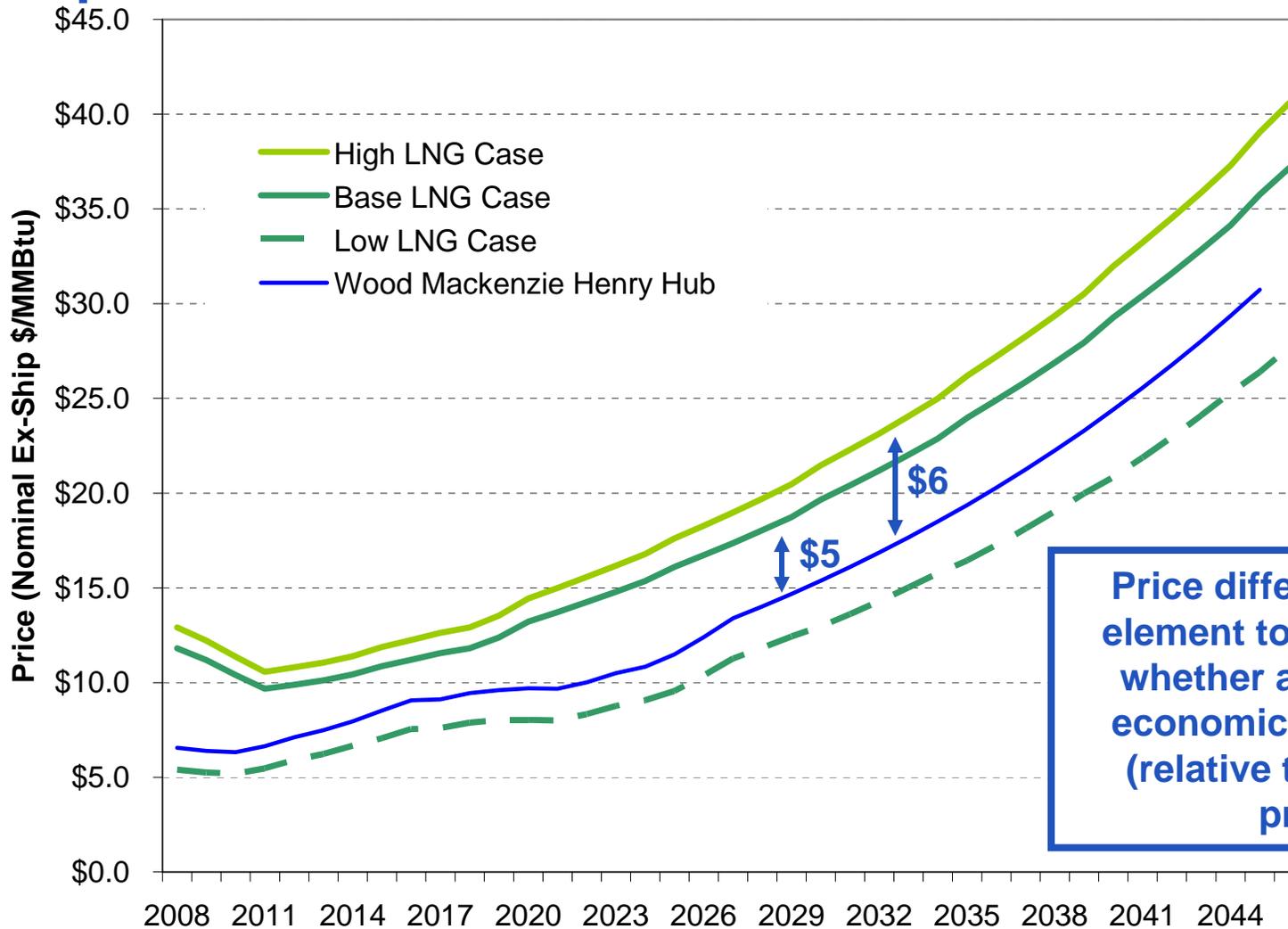
- LNG Projects Have Higher Capital Costs and Therefore Greater Risk than a Pipeline Project
- Similar to an Overland Project, Price Remains the Primary Risk to a LNG Project
- LNG Projects Have Positive NPVs with Base and High LNG Price Assumptions
- The 4.5 Bcf/d Proposal Base Case Project Produces a Higher NPV than a 4.5 Bcf/d LNG Project
- A Sustained High Oil to Gas Price Relationship is Required for an LNG Project to be Favorable when Compared to an Overland Route

# Expected LNG Tariffs for the LNG Project Configurations Considered



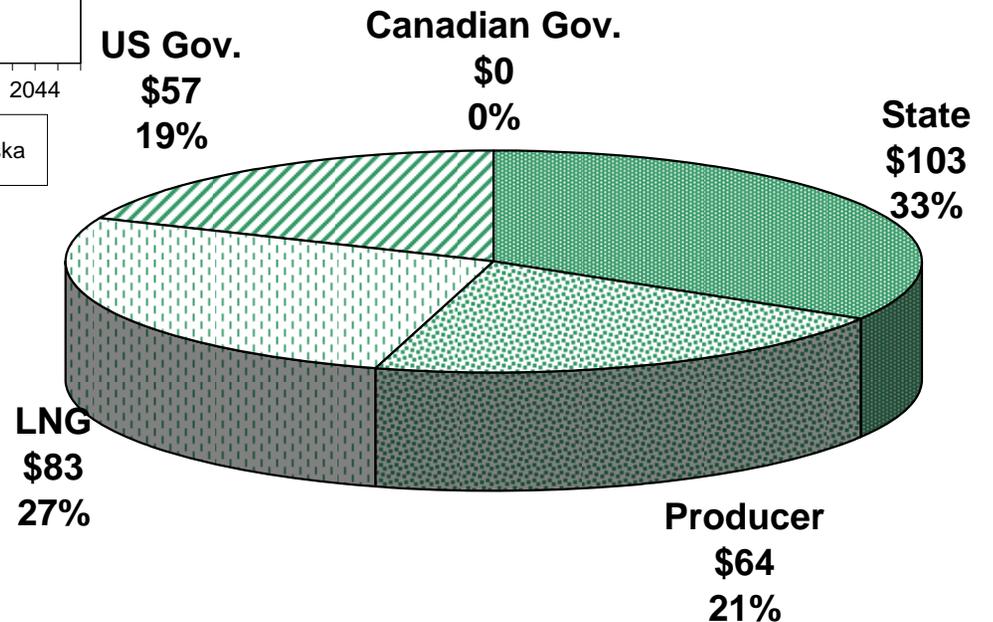
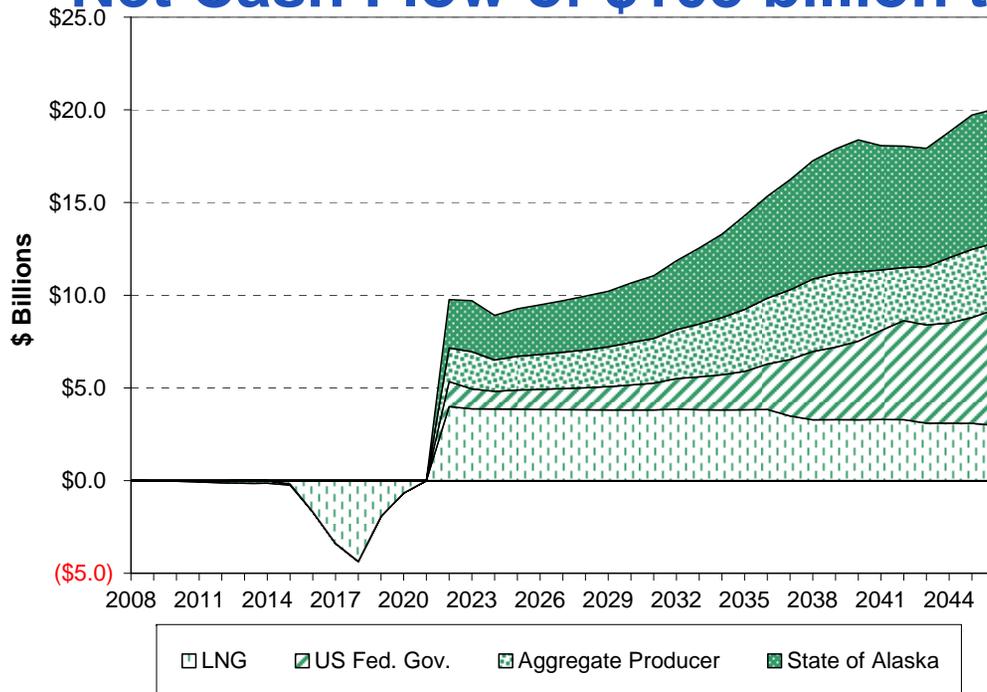
- Assumed same terms as TC proposal
- Differences to tariff are:
  - Higher capital
  - Higher fuel Losses
  - Higher O&M
  - Higher property taxes
  - Delayed start date
  - Higher debt cost
  - LNG shipping

# Applying the Gas Strategies Asian Price Formula Expectations

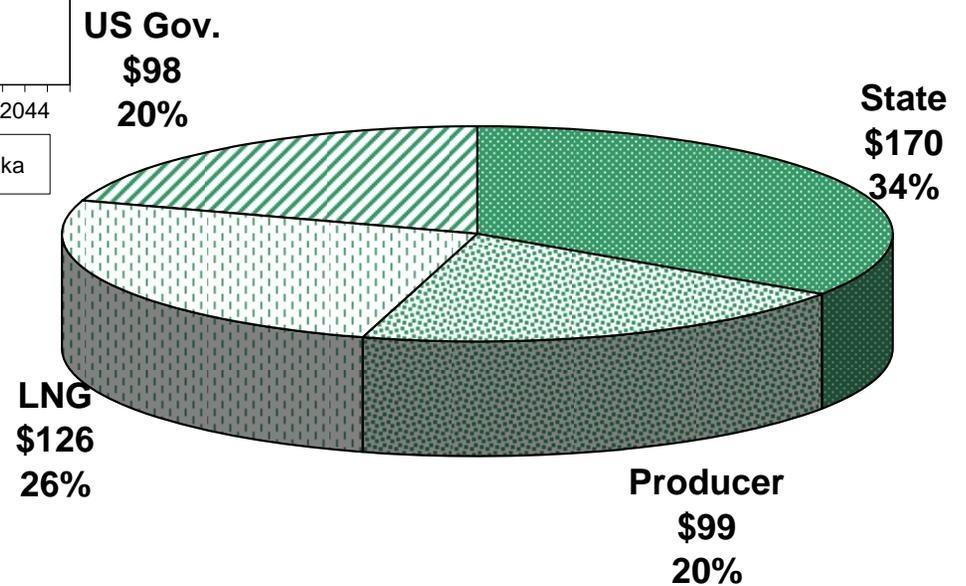
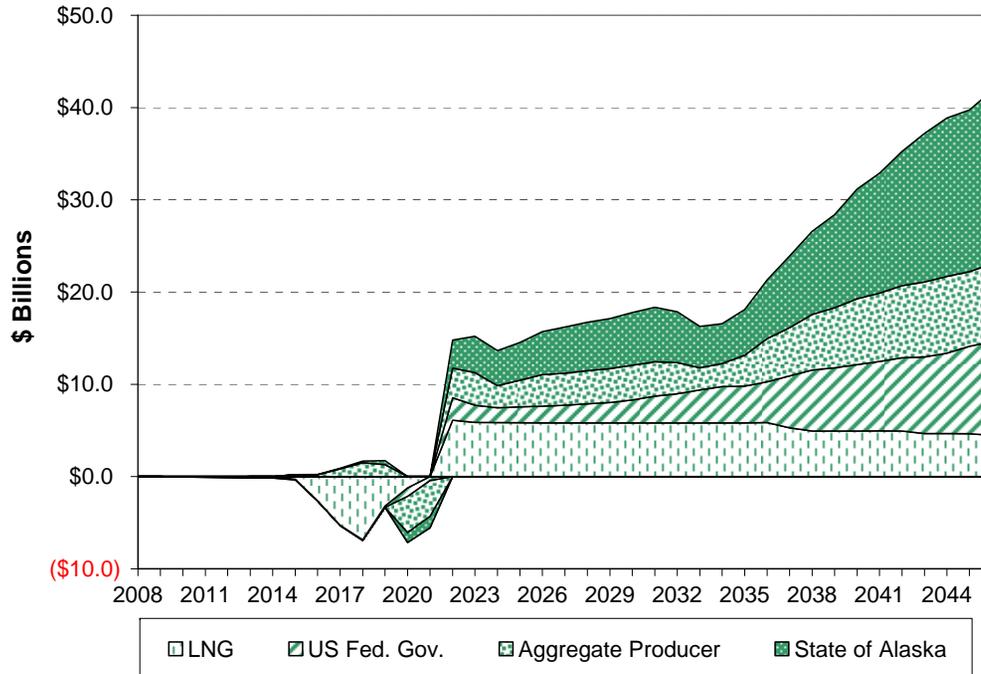


**Price differential is a key element to understanding whether an LNG project economics are favorable (relative to an overland project).**

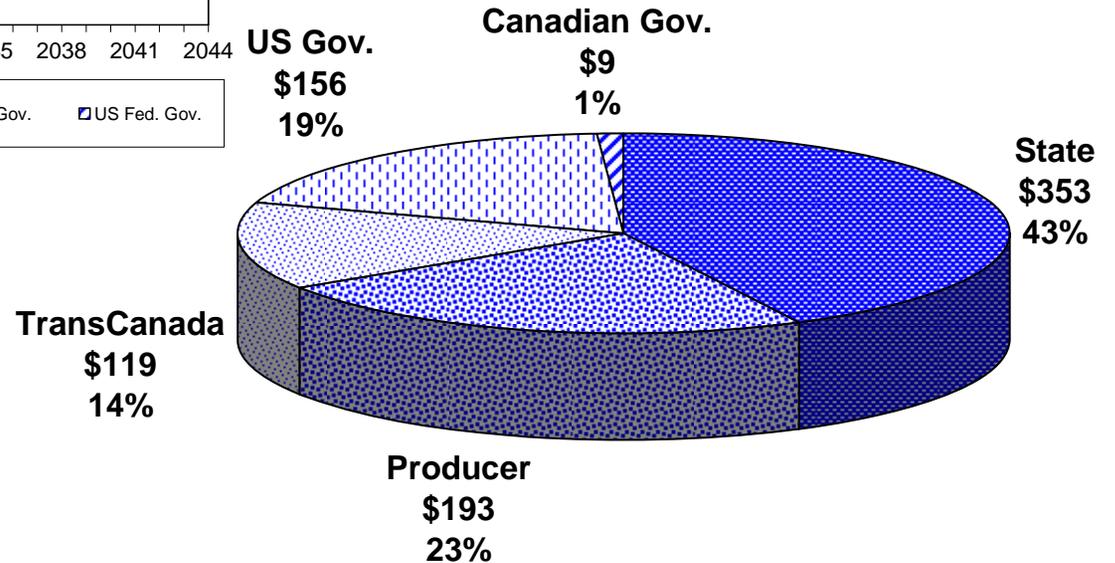
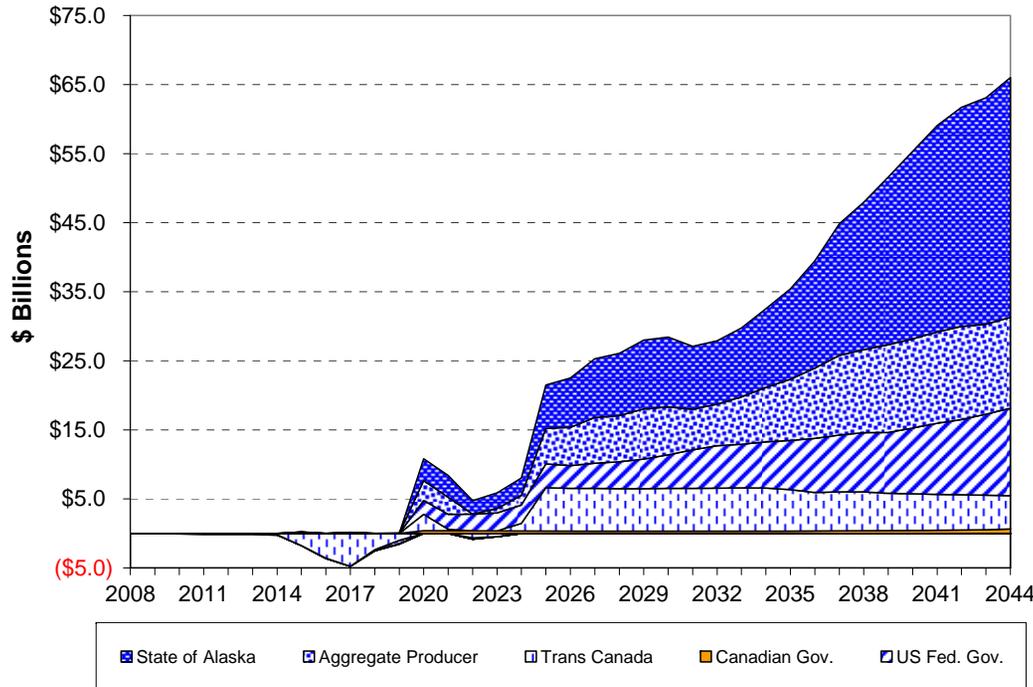
# Estimated Cash Flow for the 2.7 Bcf/d LNG Case: Positive Net Cash Flow of \$103 billion to the State



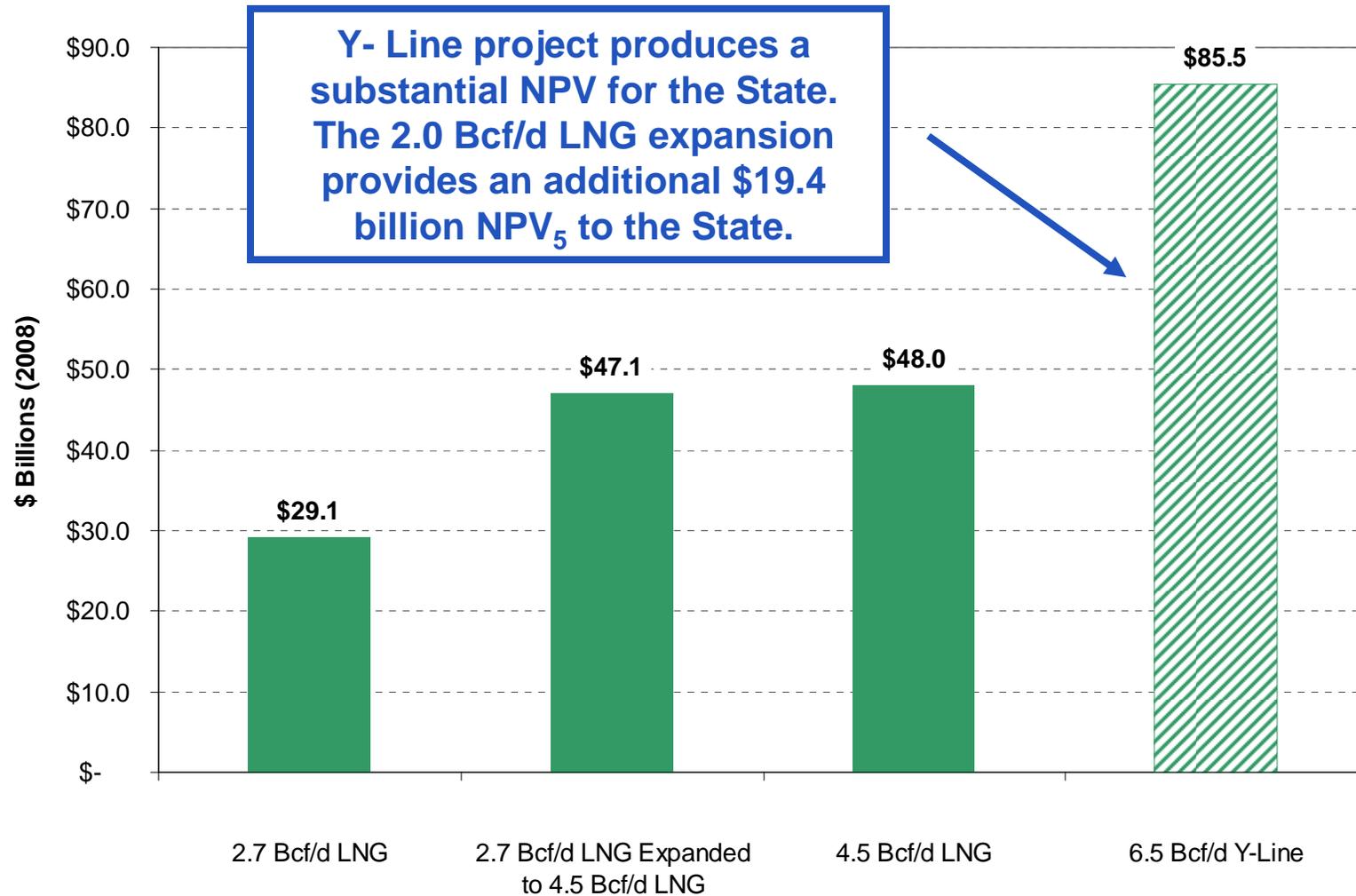
# Estimated Cash Flow for the 4.5 Bcf/d LNG Case: Positive Net Cash Flow of \$170 billion to the State



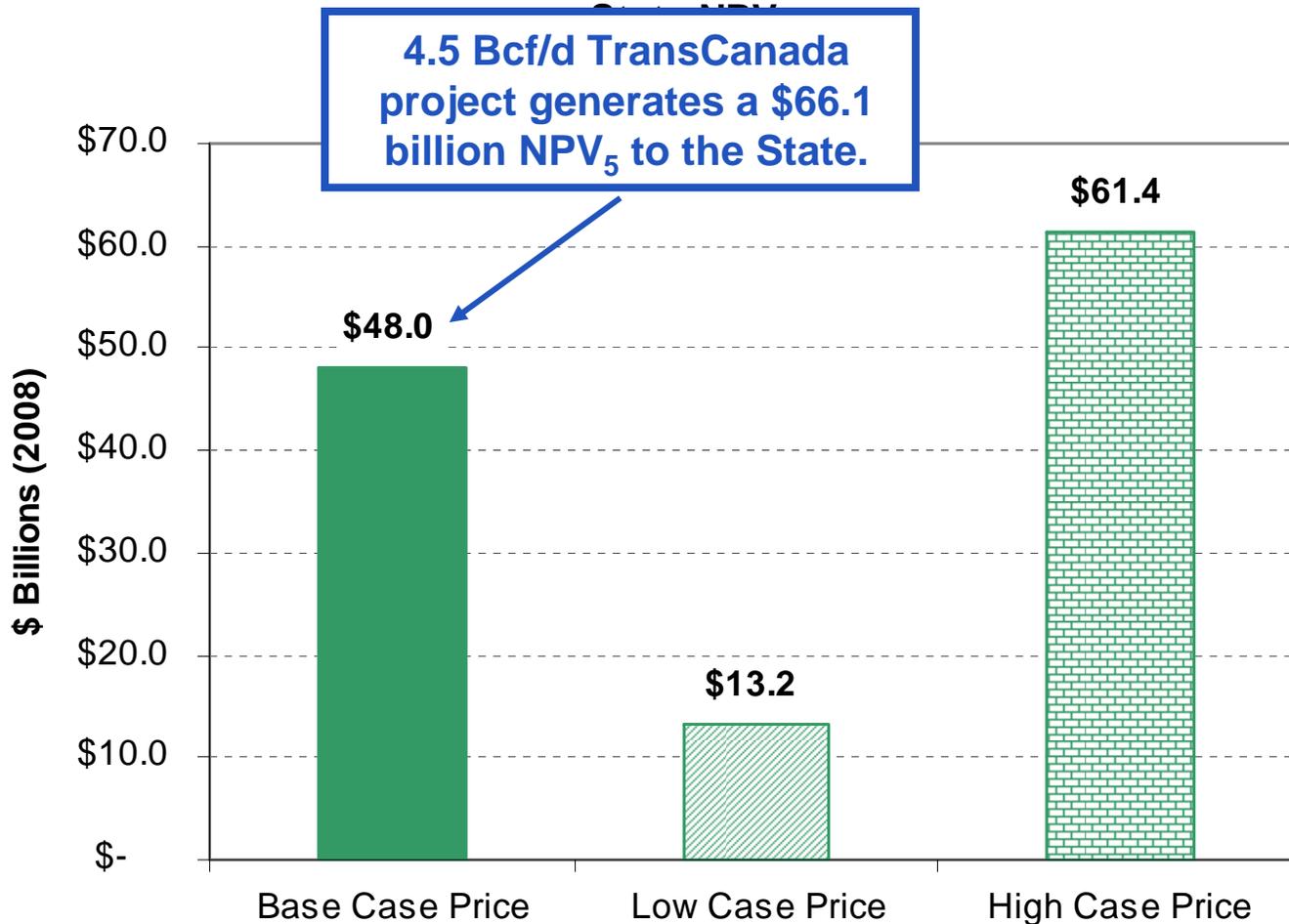
# Y-Line – Aggregate Project Cash Flow: Positive Net Cash Flow of \$353 billion to the State



# Estimated State NPV<sub>5</sub> is Substantially Positive for all LNG Project Configurations Considered

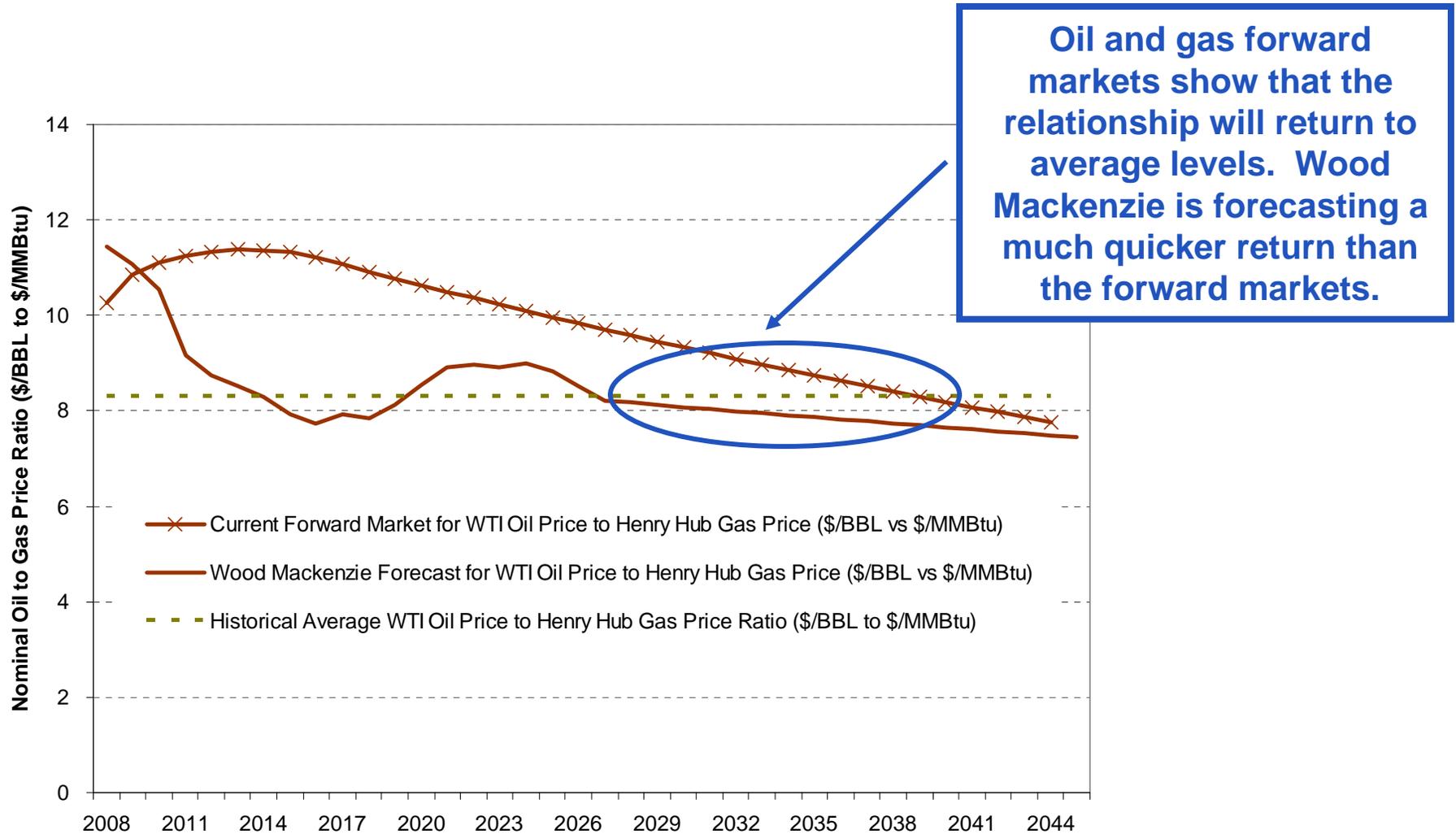


# LNG Price Scenario Impacts on the State NPV<sub>5</sub> for the 4.5 Bcf/d LNG Project



- Considered the alternative price scenarios impact on the producers
- Producer NPV<sub>15</sub>:
  - Base LNG Price - \$3.0 billion
  - High LNG Price - \$3.8 billion
  - Low LNG Price - <\$1.8> billion

# Current Market Relationship between Oil and Gas Prices is Substantially Higher than Historical Average



## Implications to LNG Project NPV from High Oil Prices

### Analysis Assumptions:

- Considered oil to gas price ratio assumptions of 8, 9, 10 and 11 to 1

### Analysis Results:

- High oil prices, relative to gas prices, must be maintained in order for LNG project NPV to be greater than an overland route
- Assumes that the Gas Strategy generated relationships do not change

#### Base Case LNG Price

- State: 10 to 1 or greater
- Producer: 11 (12) to 1 or greater

#### High Case LNG Price

- State: 9 to 1 or greater
- Producer: 10 or 11 to 1 or greater