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ARCTIC GAS SUPPLY, DEMAND AND PRICING CONSIDERATIONS

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Objective of the Presentation

Source: www.anwr.com

"Provide Purvin & Gertz' views with respect to project and market considerations related to Arctic gas"

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Source: http://www.gov.nt.ca

- Employee–owned consultant firm, founded in 1947
- Independent of any holding company,engineering firm, process licensor or any Arctic gas project developer or stakeholder
- Extensive experience on frontier, Arctic and other gas projects
- Therefore, in a position to provide unbiased, sound, and objective views and advice.

Drivers for Arctic Gas Development

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- Concerns over current and future gas supply with consequent increase in price
- Strong long-term gas demand outlook
- Drive to monetize stranded gas assets with impressive and economic potential
- Strong stakeholder support

PROJECT AND MARKET CONSIDERATIONS

Market Drivers

Source: www.anwr.com

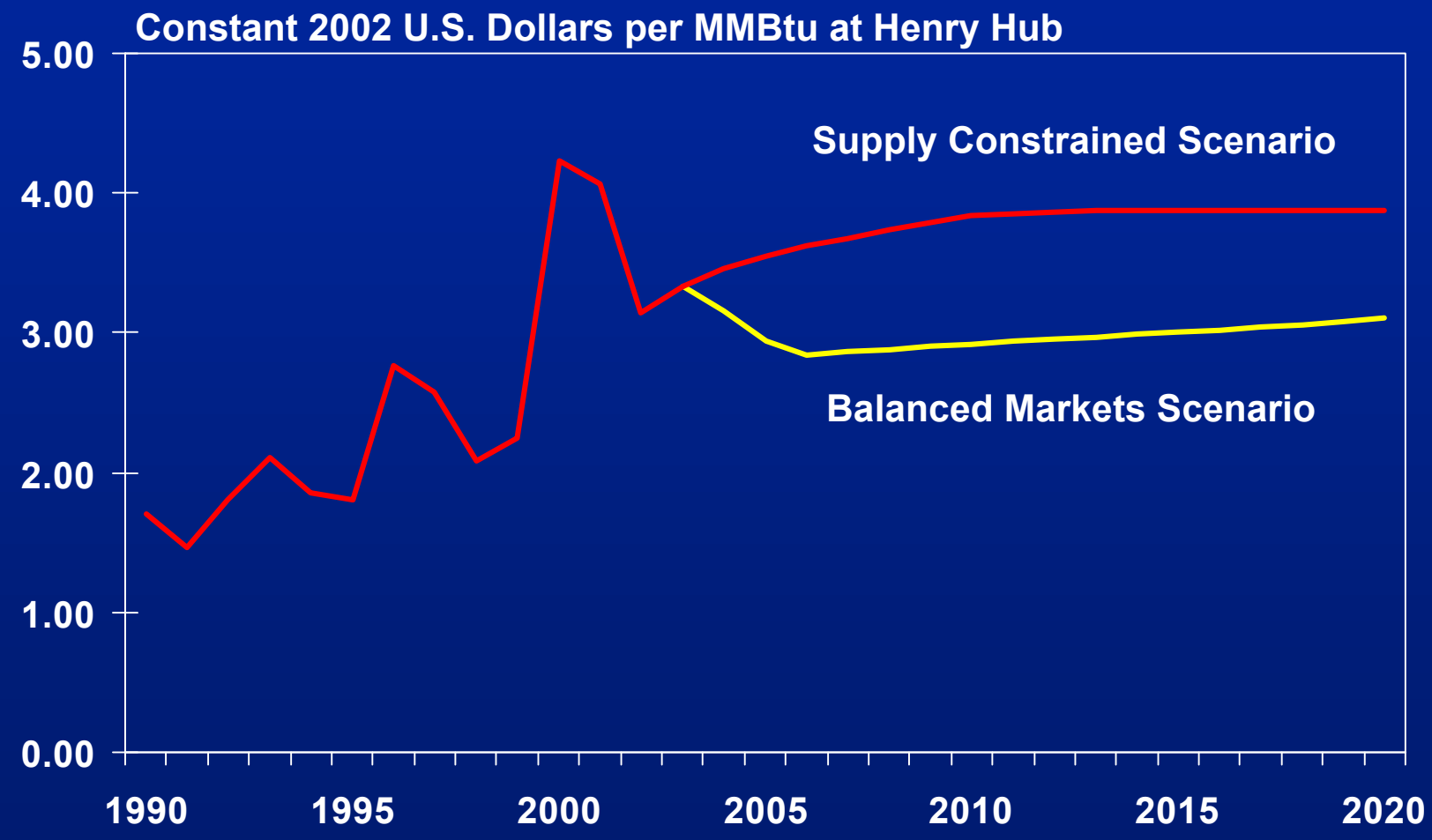
- Long term future U.S. gas Demand annual about 1.5% (economic growth, electricity sector, competitive pricing)
- Canada around 2% (ibid + energy intensive industrial growth in West)
- A large conventional resource base that can be developed but still need new incremental sources of supply

Why is Arctic Gas Next?

$US/MMBtu (Constant 2002 $) at a Henry Hub Price Equivalent

- **LNG (varies from <$3.00 to >$4.00):**
  - low/medium reserve uncertainty but high transportation costs
- **Mackenzie Delta gas (>$3.00):**
  - medium reserve uncertainty but high transportation costs
- **Alaska gas (>$3.00):**
  - low reserve uncertainty but high transportation costs
- **Other**
  - Scotian Slope and Grand Banks (expensive)
  - Offshore East Coast, CA, BC (out-of-bounds)
  - Mexico (constitution)
  - Hydrates (too speculative)
  - Arctic Islands (too far)
  - Canadian coalbed methane (interesting potential)

What Prices are Required?

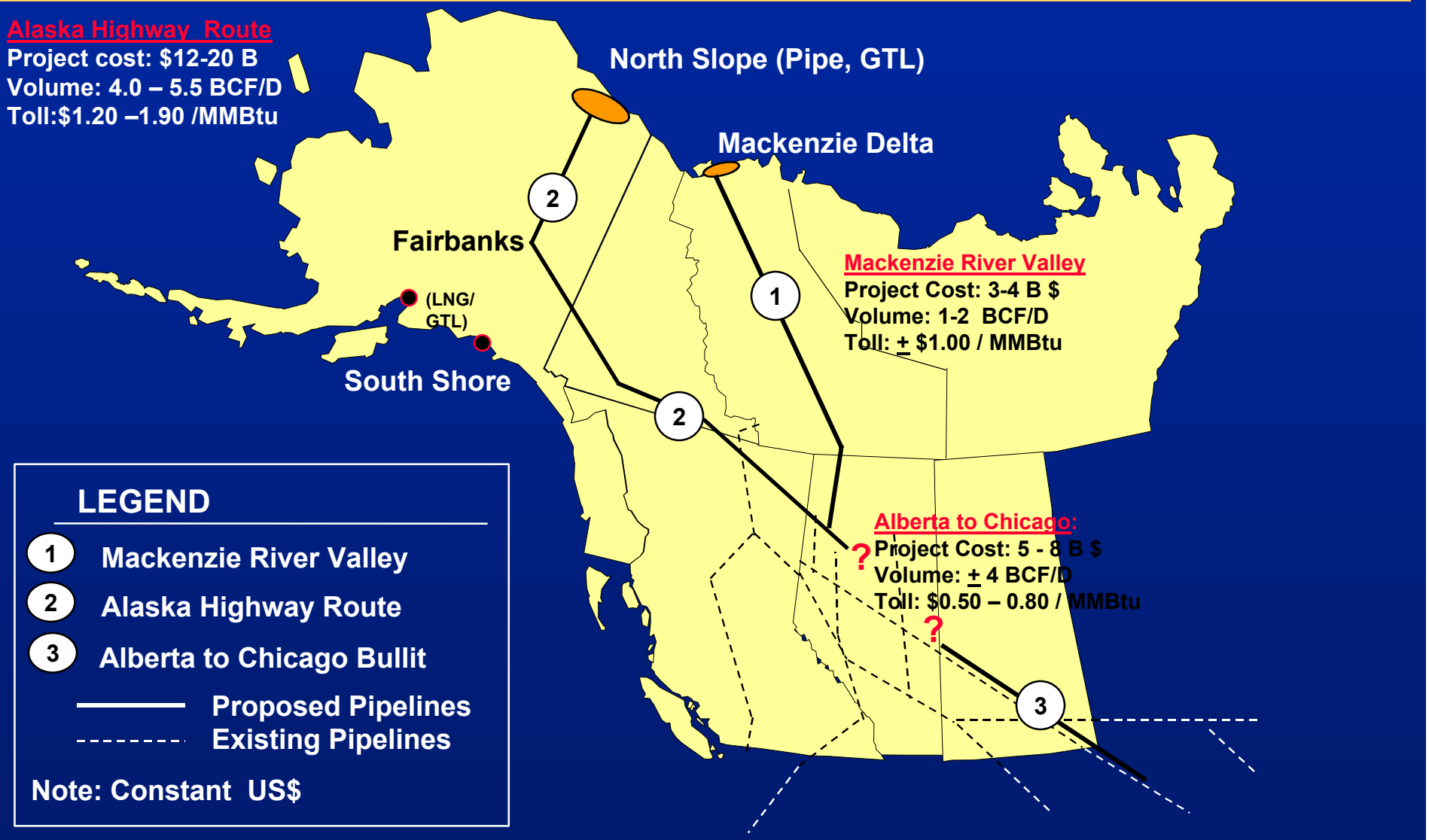


What are the Pipeline Projects?

Important Considerations:

- **Status**
- **Routing**
- **Volumes**
- **Timing**
- **Cost and Rates**

Arctic Gas Pipeline Routes



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A Specific Example of Purvin & Gertz Costing

- Basic Assumptions
- Determine Rate Base
- Determine Cost of Service
- Determine Unit Cost

Basic Assumptions

Transportation Cost of Service Model

Basic Assumptions

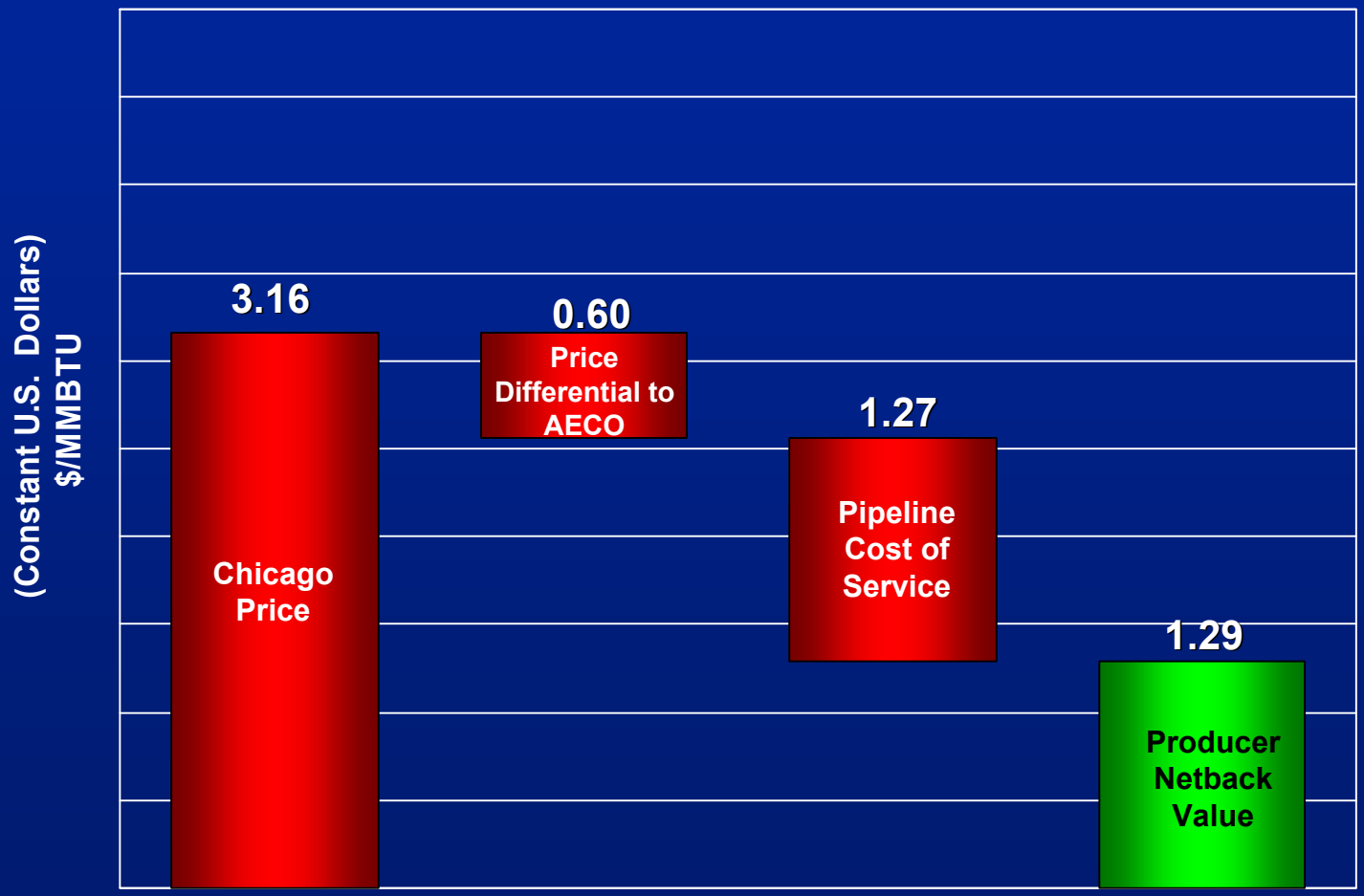
Location	Alaska	Canada
Debt/Equity Ratio	60/40	60/40
Cost of Debt, %	8	8
Equity Rate of Return, %	12.5	12.5
Inflation Rate, %/year	2	2
Federal Income Tax, %	35	28
State/Provincial Tax, %	9.4	15.25
Property Tax, %	2	2
Other Taxes, %	0.2	0.2
Depreciation Rate, %	5	5
Revenue Credits, %	0.1	0.1

Gas Pipeline Segment Project Cost Buildup

CAPEX	Base
Escalation	+ 4%
Project Development	+ 5%
Financing	+ 3%
IDC	+ 8%
WC	+ 1%
= Total Project Cost	

Netback Derivation for Gas Based on Chicago Price (Balanced Market Scenario)

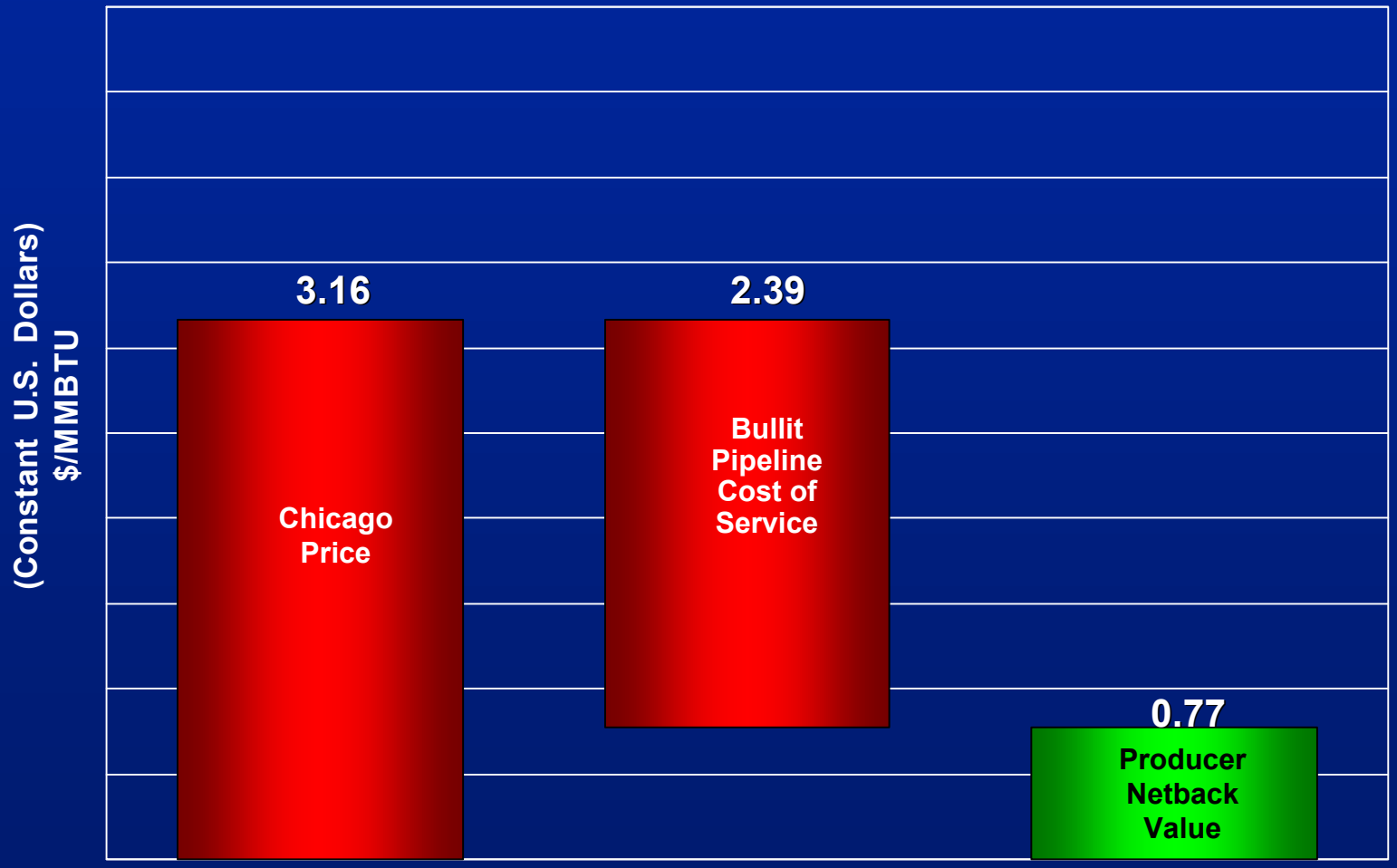
Case: Alaska Hwy 4.0 BCF/D to Alberta in 2011



Note: Alaska to Chicago unit cost = $1.87 /MMBtu

Netback Derivation for Gas Based on Chicago Price (Balanced Market Scenario)

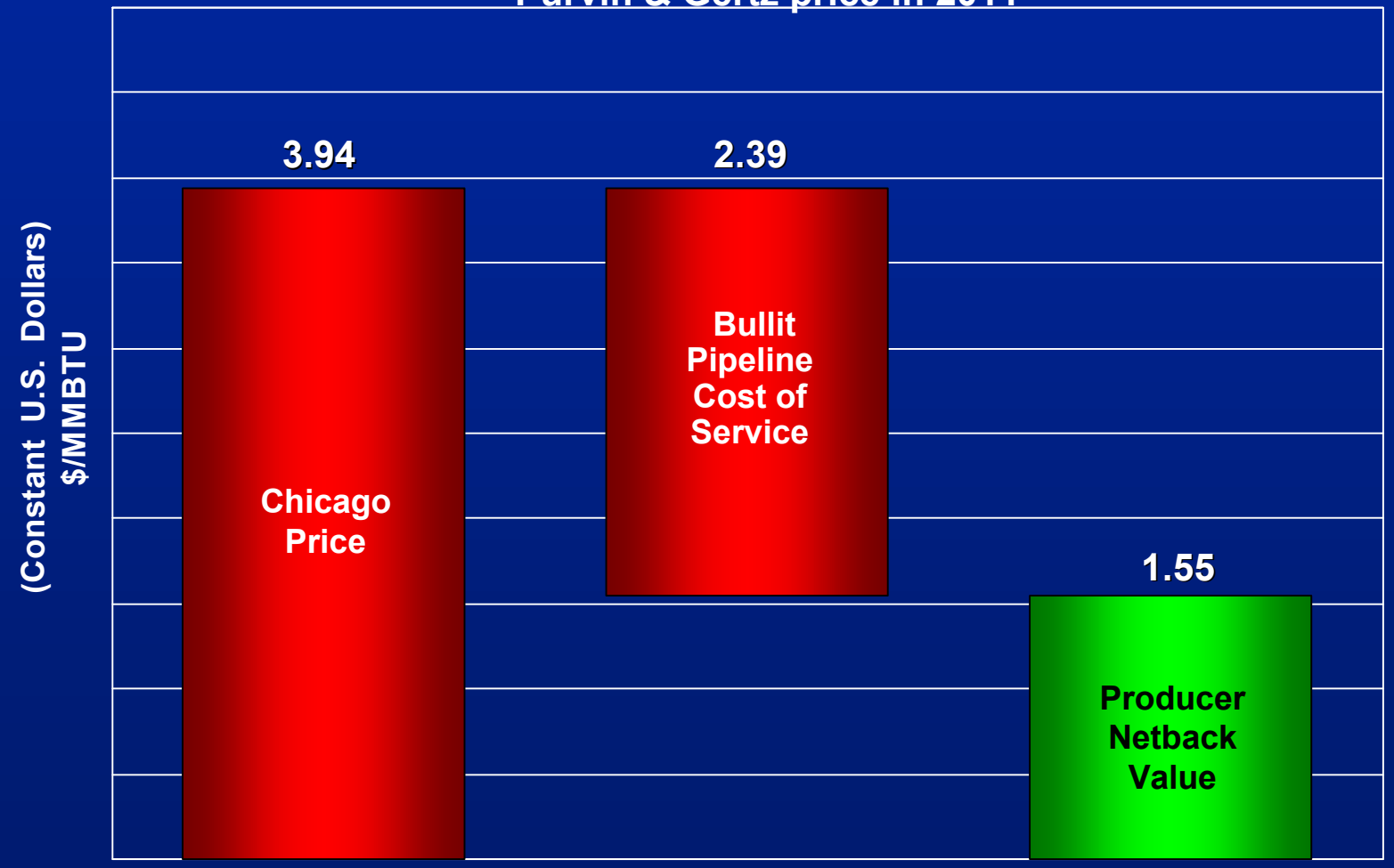
Case: One of the Alaskan producers' scenarios with Purvin & Gertz price in 2011



Note: The profitability of this case is insufficient if Purvin & Gertz' Balanced Markets Scenario price and the Alaska producers' tolling scenario are correct.

Netback Derivation for Gas Based on Chicago Price (Supply Constrained Scenario)

Case: One of the Alaskan producers' scenarios with Purvin & Gertz price in 2011



Note: The profitability of this case is sufficient if Purvin & Gertz' Supply Constrained Scenario price and the Alaska producers' tolling scenario are correct.

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What are the Risks?

- The greatest quantifiable risk elements to the economics of Arctic gas development are market price and project costs
- Lesser risk factors are return on equity, the cost of debt and the debt-equity ratio
- Other "qualitative" risks include politics (Alaska prefers the more costly pipeline route), regulatory and environmental processes (uncertainty, delays, costs), and social (extremely high expectations of benefits)

Current Challenges

Source: www.anwr.com

- Politics! Politics! Politics! Impact of government intervention?
- Local and native support still strong?
- Regulatory and environmental processes (Mackenzie vs. ANS)?
- Producer and financial community requirements for development?
- So it's not just economics and technology!

CONCLUSIONS

Conclusions

Source: www.anwr.com

- Strong gas demand outlook remains the fundamental driver for Arctic gas development
- Jockeying for advantage and an adversarial approach has delayed Arctic gas
- Even if there are no “slam dunks”, Purvin & Gertz is optimistic that challenges will be overcome and economic projects in both areas will be developed

“Purvin & Gertz is an independent, employee owned, international energy consulting firm providing sound and objective strategic, commercial, and technical advise to the energy sector.”

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