

# COMMENTS TO LEGISLATURE

## on GAS CONTRACT and FISCAL INTEREST FINDINGS

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### Alaska Project Rank with Other Investment Opportunities

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# Methodology

- This analysis uses information from PFC's database of modeled projects with these criteria:
  - **Capex of at least \$ 1 billion**
  - **Production Start in 2006 or later**
    - **To make a level comparison, since projects starting prior to 2006 would have been advantaged by high prices of the last few years.**
  - Projects were split by type (Oil vs Gas)
  - Projects were split by country (OECD vs non-OECD)
- Analysis done in nominal dollar terms
- Financial metrics developed by PFC using Econ One assigned price decks at 2.5% inflation
- Projects are currently underway

# Composition of PFC Database Used in Analysis

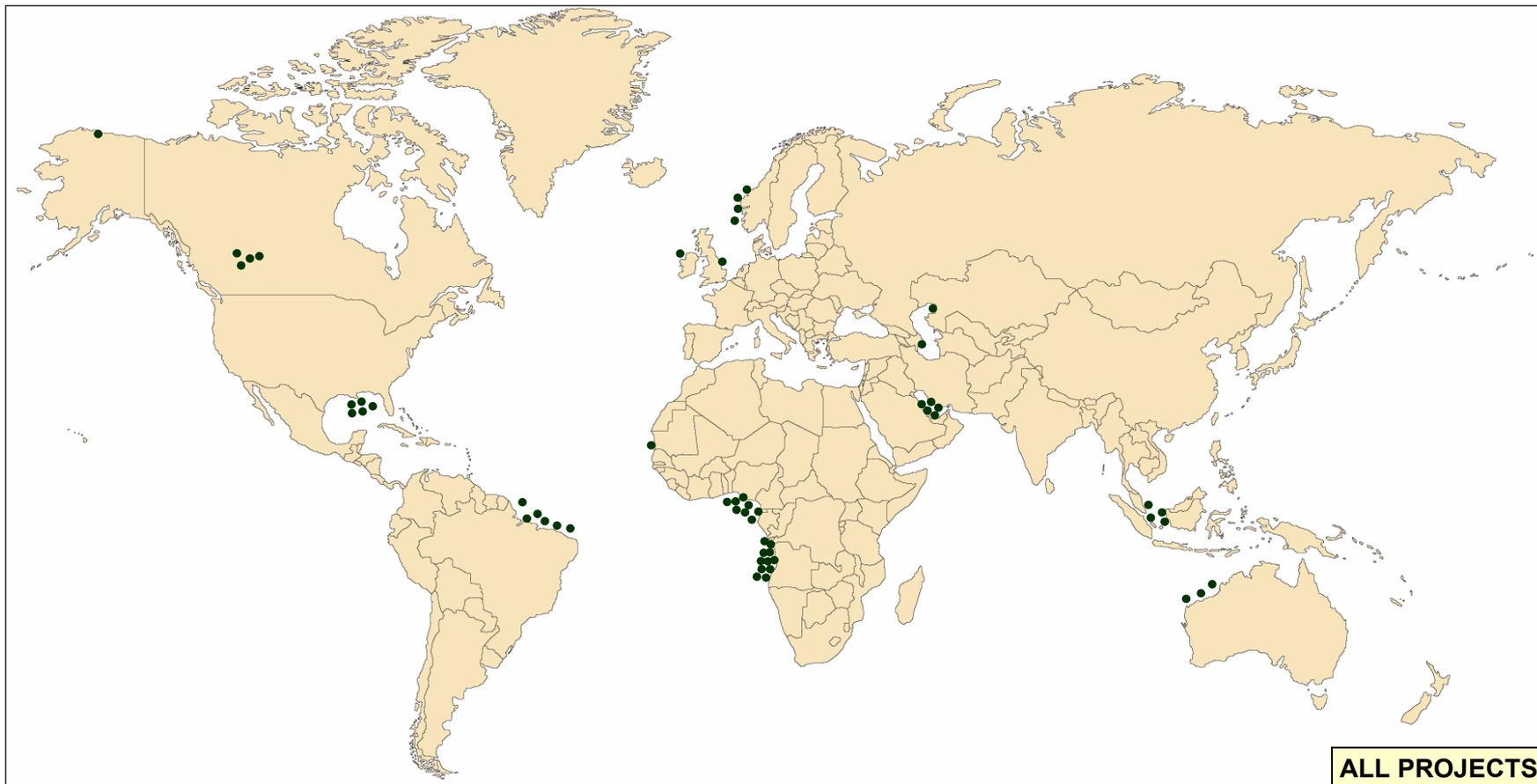
## Projects Over \$1 Billion in CAPEX with Production Starting after 2005

	<b>Total</b>	<b>of which OECD</b>	<b>of which Non-OECD</b>
<b>Total</b>	<b>55</b> <b>(Sponsors are in 32)</b>	<b>18</b> <b>(10)</b>	<b>37</b> <b>(22)</b>
<b>of which Oil</b>	<b>36</b> <b>(21)</b>	<b>10</b> <b>(6)</b>	<b>26</b> <b>(15)</b>
<b>of which Gas</b>	<b>19</b> <b>(11)</b>	<b>8</b> <b>(4)</b>	<b>11</b> <b>(7)</b>

## Some Issues with the PFC Analysis

- **Earlier work presented by P. Van Meurs in May 2006 using the same PFC database was done in real terms but discounted at 10%. This is equivalent to NPV 13.5 not NPV10 at 2.5% inflation. (This biases results against the Alaska gasline project since the comparisons were against NPV10 done in current dollars. This effect is not contained in Econ One's work.)**
- **For gas projects in the PFC database, transportation and regasification capital is excluded. (This biases the comparison of IRRs against the Alaska gasline project, which has pipeline capital in it.)**

# Location of PFC Projects



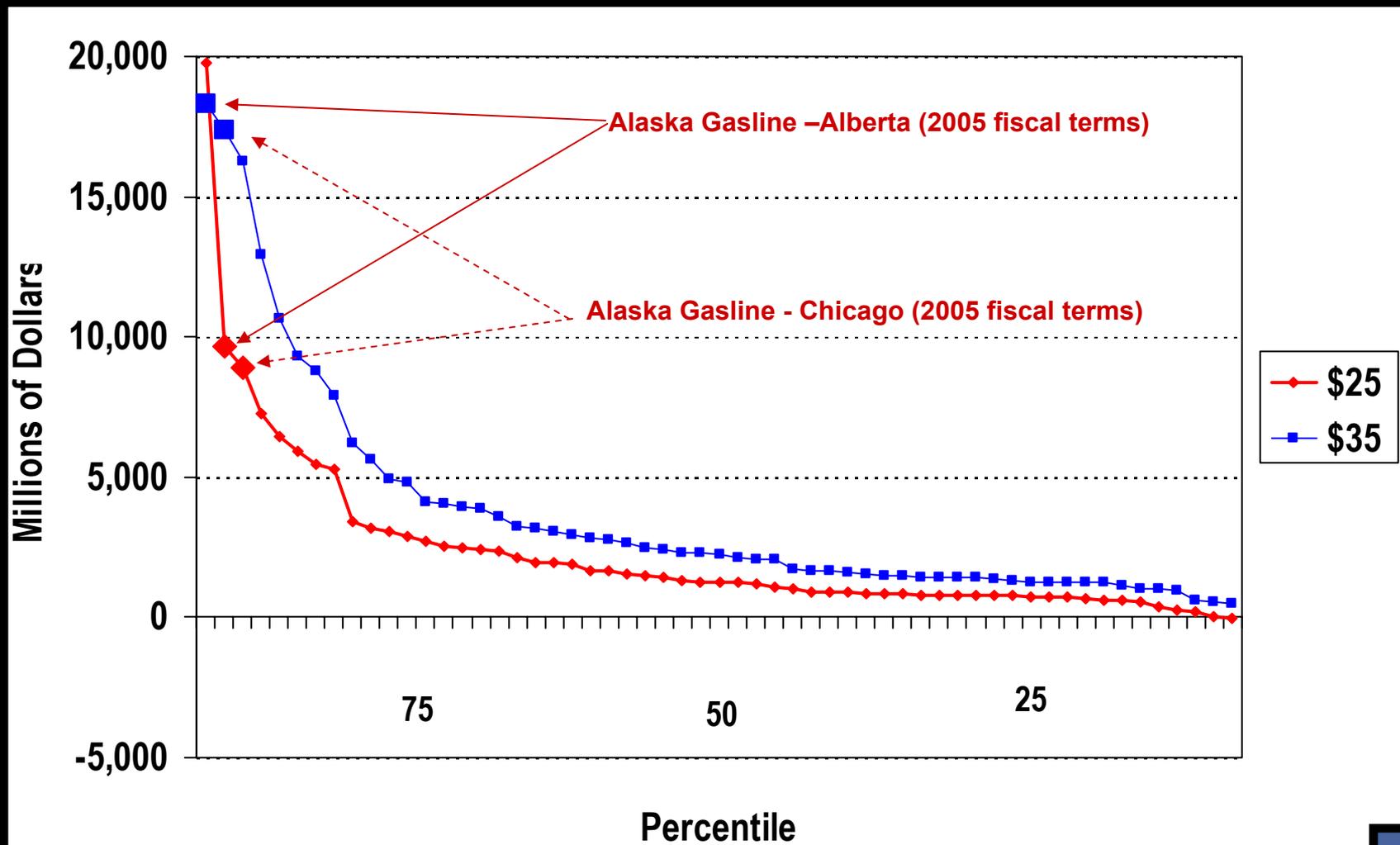
# Location of PFC Projects – by CAPEX



# Project Comparison

## Producer Net Cash Flow (NPV10)

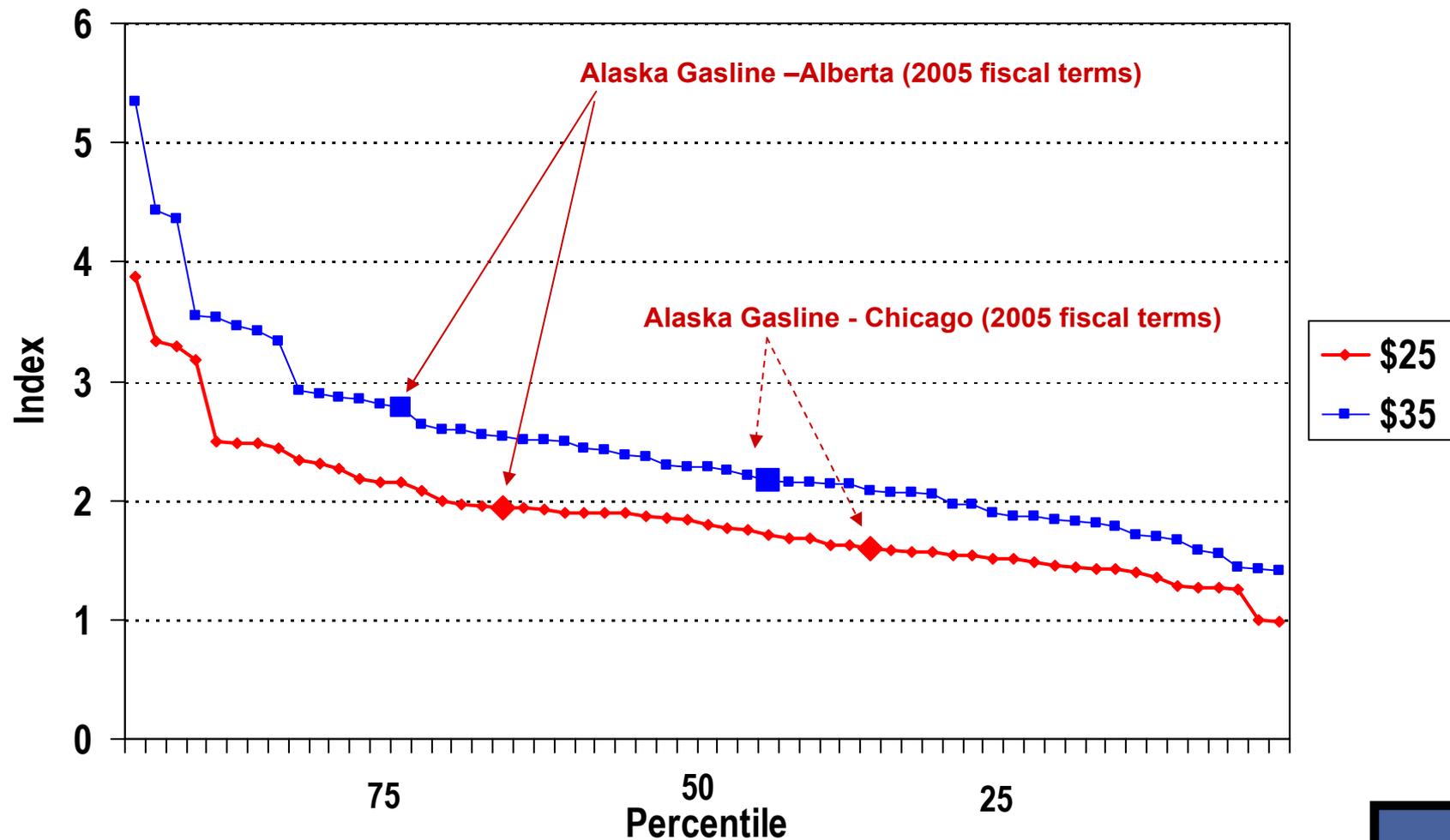
(\$35 and \$25 oil and 6-1 oil/gas price ratio)



# Project Comparison

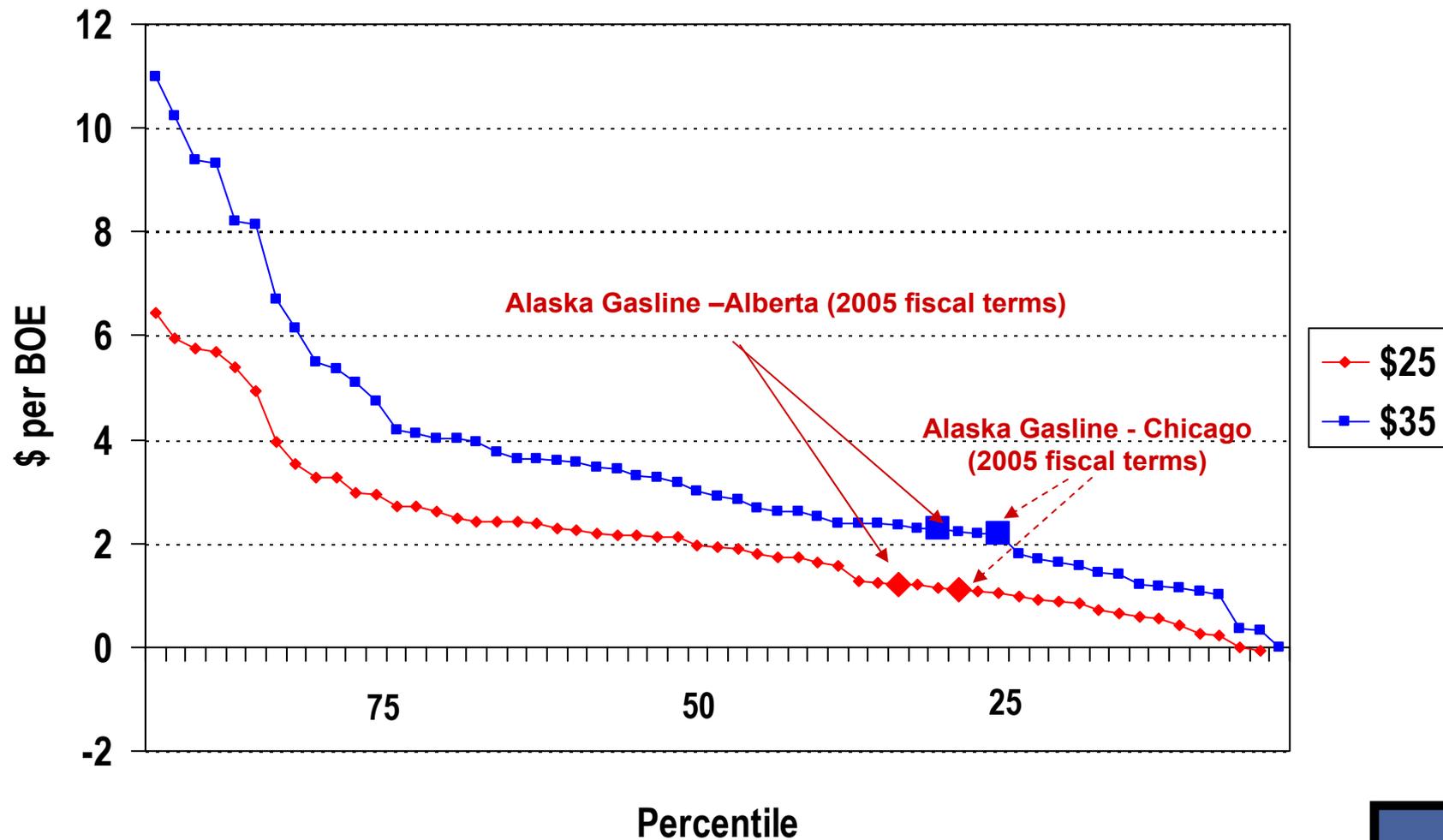
## Profitability Index (PIR10)

(\$35 and \$25 oil and 6-1 oil/gas price ratio)



# Project Comparison

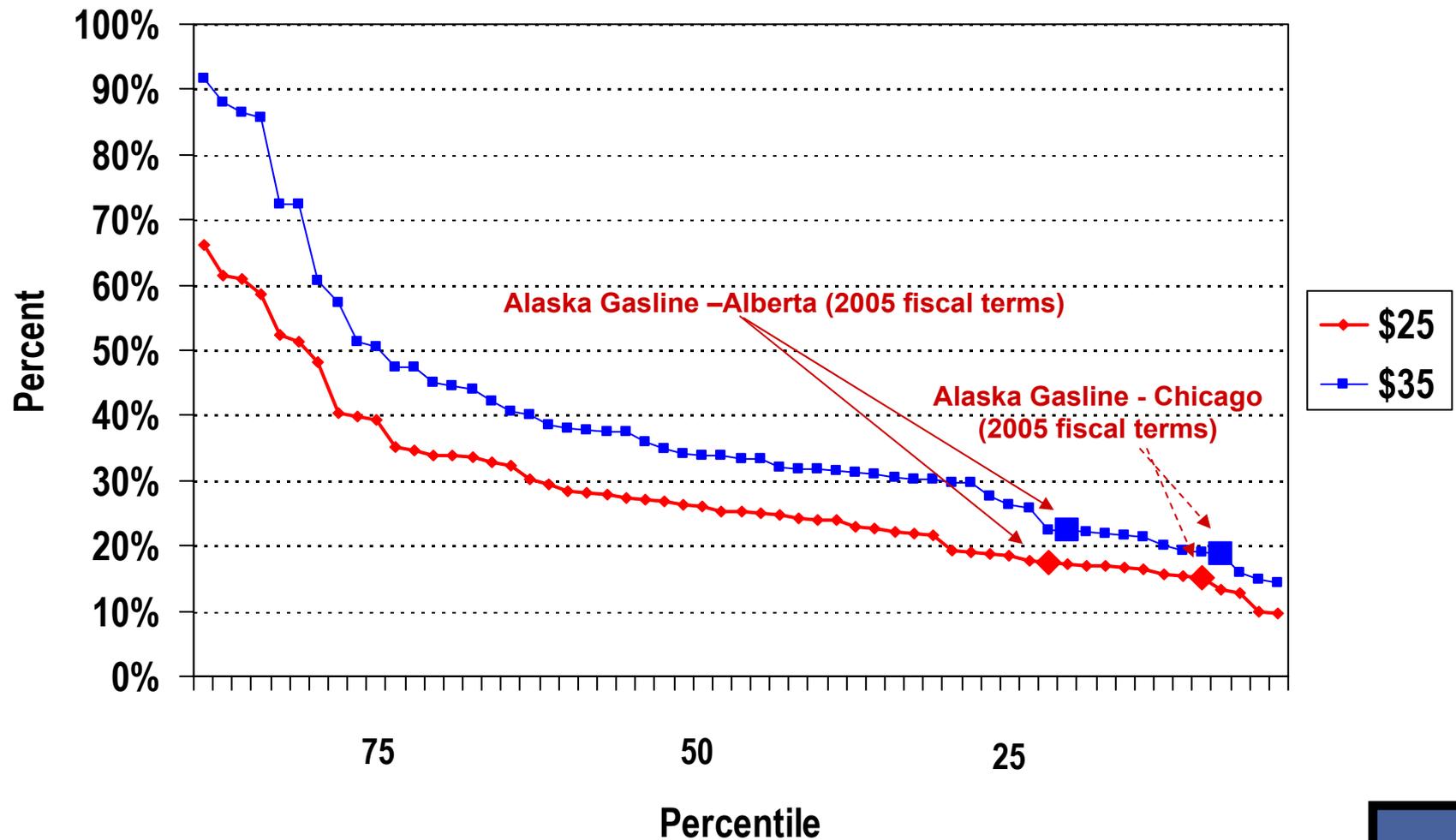
NPV10 per BOE(\$35 and \$25 oil and 6-1 oil/gas price ratio)



# Project Comparison

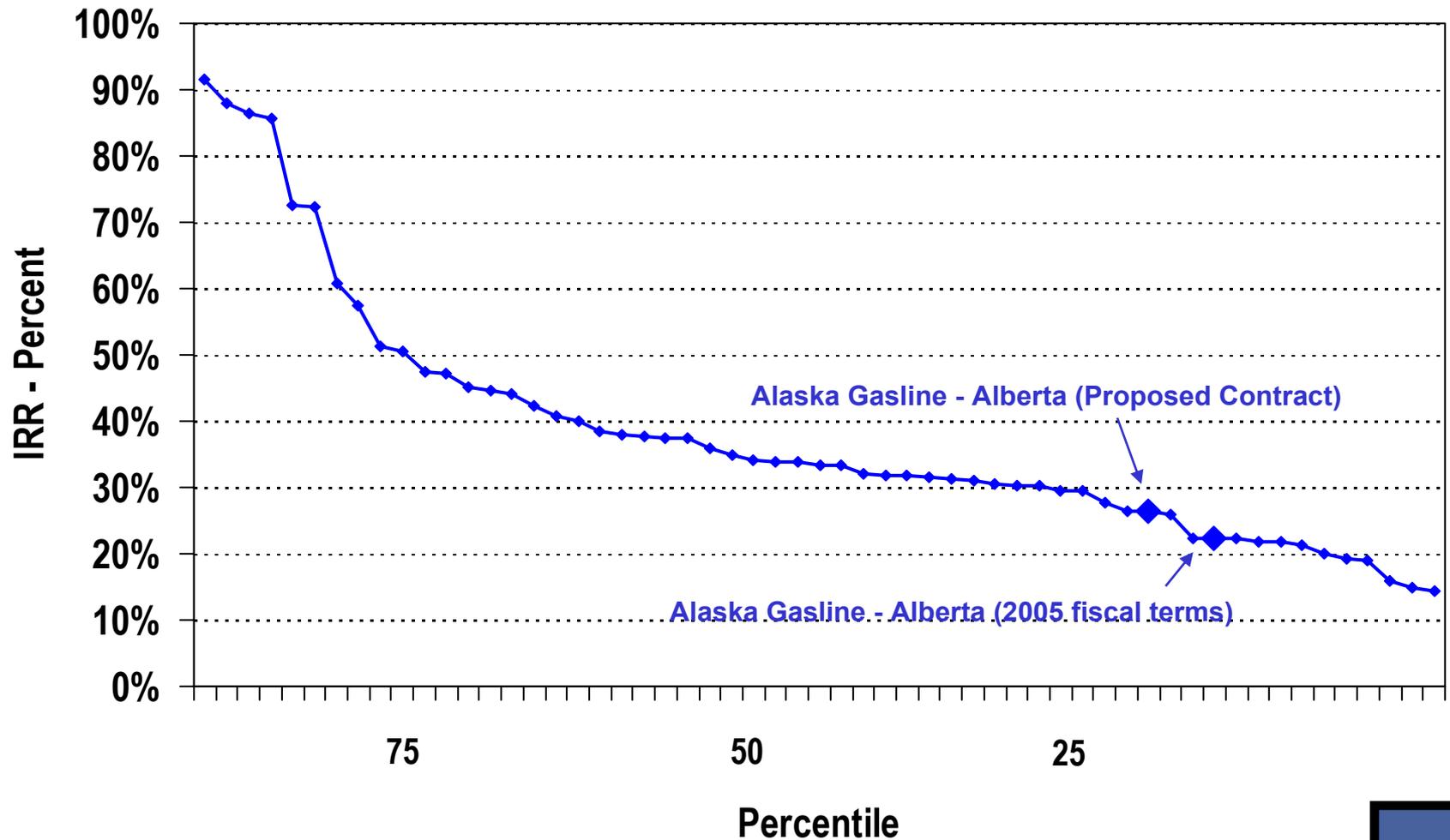
## Internal Rate of Return (IRR)

(\$35 and \$25 oil and 6-1 oil/gas price ratio)



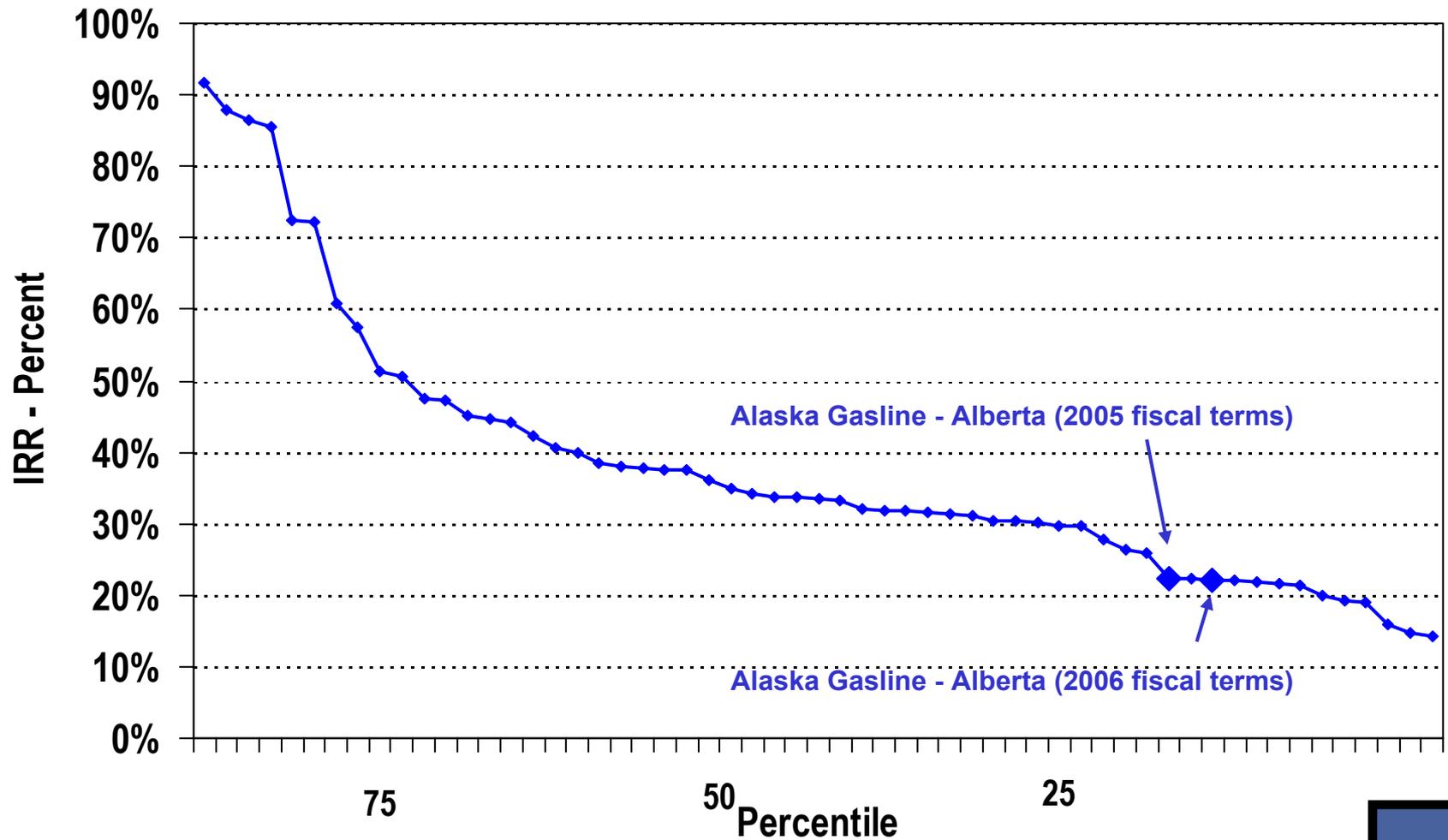
# Effect of Proposed Contract on IRR

(\$35 oil and 6-1 oil/gas price ratio)



# Effect of Fiscal Terms on IRR

(\$35 oil and 6-1 oil/gas price ratio)



# Ranking of Alaska Gasline by Size Class

## Gasline (Alberta) Ranking (\$35 oil and 6-1 oil/gas price ratio)

	Fiscal Terms	NPV10	PIR10	NPV10 per BOE	IRR
All Projects (including Alaska) (56)	2005 (ELF)	1/56	14/56	40/56	45/56
	2006 (PPT)	1/56	32/56	43/56	47/56
	Proposed Contract	1/56	8/56	35/56	43/56
Projects over \$3.5 Billion in CAPEX (16)	2005 (ELF)	1/16	5/16	8/16	11/16
	2006 (PPT)	1/16	5/16	9/16	12/16
	Proposed Contract	1/16	5/16	6/16	10/16

# Project Ranking Summary

## Ranking of Existing Projects (\$35 Oil and 6-1 Oil/Gas Price Ratio)

Category	Alaska Gasline Alberta 2005 Fiscal Terms	25%-tile	50%-tile (Median)	75%-tile	Ranking Quartile
<b>Description</b>					
Reserves (mmboe)	8,089	423	792	1852	4 <sup>th</sup> 3 <sup>rd</sup> 2 <sup>nd</sup> 1 <sup>st</sup>
CAPEX (\$mm)	28,123	1753	2806	3846	4 <sup>th</sup> 3 <sup>rd</sup> 2 <sup>nd</sup> 1 <sup>st</sup>
<b>Financial Metrics</b>					
NPV10 (\$M)	18,333	1404	2250	3865	4 <sup>th</sup> 3 <sup>rd</sup> 2 <sup>nd</sup> 1 <sup>st</sup>
NPV10/BOE	2.27	2.20	3.16	4.11	4 <sup>th</sup> 3 <sup>rd</sup> 2 <sup>nd</sup> 1 <sup>st</sup>
PIR10	2.78	1.90	2.28	2.63	4 <sup>th</sup> 3 <sup>rd</sup> 2 <sup>nd</sup> 1 <sup>st</sup>
IRR (%)	22.3	29.6	33.8	44.6	4 <sup>th</sup> 3 <sup>rd</sup> 2 <sup>nd</sup> 1 <sup>st</sup>

Source: PFC Energy and Econ One

# Project Ranking Summary

## Ranking of Existing Projects (\$25 Oil and 6-1 Oil/Gas Price Ratio)

Category	Alaska Gasline Alberta 2005 Fiscal Terms	25%-tile	50%-tile (Median)	75%-tile	Ranking Quartile
<b>Description</b>					
Reserves (mmboe)	8,089	423	792	1852	4 <sup>th</sup> 3 <sup>rd</sup> 2 <sup>nd</sup> 1 <sup>st</sup>
CAPEX (\$mm)	28,123	1753	2806	3846	4 <sup>th</sup> 3 <sup>rd</sup> 2 <sup>nd</sup> 1 <sup>st</sup>
<b>Financial Metrics</b>					
NPV10 (\$M)	9,667	435	1233	1635	4 <sup>th</sup> 3 <sup>rd</sup> 2 <sup>nd</sup> 1 <sup>st</sup>
NPV10/BOE	1.20	1.03	1.47	2.70	4 <sup>th</sup> 3 <sup>rd</sup> 2 <sup>nd</sup> 1 <sup>st</sup>
PIR10	1.94	1.51	1.83	2.16	4 <sup>th</sup> 3 <sup>rd</sup> 2 <sup>nd</sup> 1 <sup>st</sup>
IRR (%)	17.4	18.7	25.2	33.8	4 <sup>th</sup> 3 <sup>rd</sup> 2 <sup>nd</sup> 1 <sup>st</sup>

Source: PFC Energy and Econ One

# Political Risk

- It is important to compare IRRs in relation to their risk-adjusted cost of capital.

## IRR

(\$35 Oil and 6-1 Oil/Gas Price Ratio)

Project	IRR	Discount Rate?
Alaska Gasline (Alberta route)	22.3	10.0
Kashagan (Kazakhstan)	47.3	?
Shah Deniz (Azerbaijan)	21.7	?

# Incorrect Ranking by IRR

- **Ranking projects on the basis of IRR in a capital constrained situation will often lead to suboptimal portfolio of projects**
- **This can be demonstrated in the PFC database**
- **Eliminated the top six projects and assumed a capital budget**
- **Ranked projects by PIR (preferred method) and by IRR (non-preferred method)**
  - **Used two examples for total capital available.**
- **The portfolio ranked by PIR provided higher NPV, monetized more Reserves, and used Less Capital**

# Illustration of Incorrect Ranking by IRR

## Projects Chosen from PFC List Excluding Largest Six

Project	Portfolio Sorted by PIR10					
	Capex	Capex NPV10	BOE	NPV10	PIR10	IRR
Gorgon	4,572	3,174	2,699	10,659	4.36	40.7%
Qatargas III	3,742	2,665	2,821	6,212	3.33	31.5%
Agbami	4,258	2,741	999	4,105	2.50	37.5%
<i>Total</i>	<i>12,572</i>	<i>8,580</i>	<i>6,519</i>	<i>20,977</i>		
	Portfolio Sorted by IRR					
Dalia	3,846	3,115	999	3,584	2.15	42.3%
Gorgon	4,572	3,174	2,699	10,659	4.36	40.7%
Agbami	4,258	2,741	999	4,105	2.50	37.5%
<i>Total</i>	<i>12,676</i>	<i>9,030</i>	<i>4,697</i>	<i>18,348</i>		

# Illustration of Incorrect Ranking by IRR

## Projects Chosen from PFC List Excluding Largest Six

Project	Portfolio Sorted by PIR10					
	Capex	Capex NPV10	BOE	NPV10	PIR10	IRR
Gorgon	4,572	3,174	2,699	10,659	4.36	40.7%
Qatargas III	3,742	2,665	2,821	6,212	3.33	31.5%
Agbami	4,258	2,741	999	4,105	2.50	37.5%
Ormen Lange	6,695	5,500	2,300	7,886	2.43	30.3%
<i>Total</i>	<i>19,267</i>	<i>14,080</i>	<i>8,819</i>	<i>28,863</i>		
	Portfolio Sorted by IRR					
Dalia	3,846	3,115	999	3,584	2.15	42.3%
Gorgon	4,572	3,174	2,699	10,659	4.36	40.7%
Agbami	4,258	2,741	999	4,105	2.50	37.5%
Greater Plutonia	4,318	3,025	1,195	3,189	2.05	31.8%
Qatargas III	3,742	2,665	2,821	6,212	3.33	31.5%
<i>Total</i>	<i>20,737</i>	<i>14,720</i>	<i>8,713</i>	<i>27,749</i>		

# Conclusions

Among the projects in the PFC dataset used:

- Alaska Gasline is **LARGEST** project in terms of CAPEX and Reserves added
- Gasline has **BEST** financial performance (NPV10) at “best estimate” prices and assumptions under 2005 fiscal terms
  - Gasline does **NOT** fall out of top quartile under lower price scenarios
- Gasline has PIR (“biggest bang for buck”) in top half of projects
- Gasline NPV10 per BOE is in third quartile under most price cases
- Gasline has low IRR, but as shown earlier, IRR is **NOT USEFUL** for comparison between projects that do not include all the capital, are of different scale, or of different risk. (All three conditions hold.)