The Imperatives of Arctic Natural Gas Development

By
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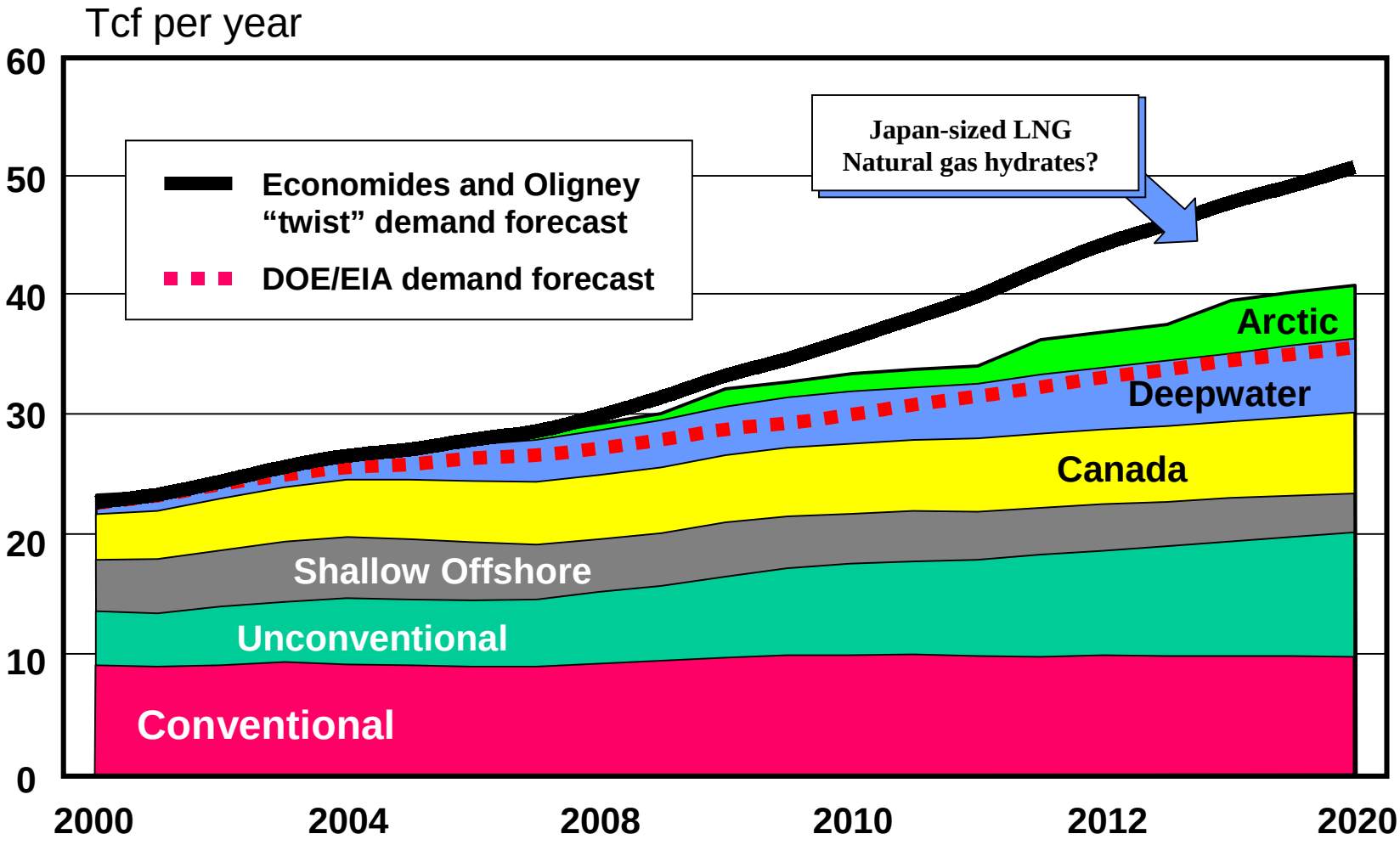
James Longbottom, University of Houston

November 2001

Primary Messages

1. The United States must pursue 12 Bcfd of natural gas production from the Arctic, not 4 or 6 Bcfd—America needs the gas!
2. Oil or natural gas supply disruptions—whether geopolitical or infrastructure related—quickly destroy 10 million U.S. jobs.
3. The $3.00 per Mscf price floor for natural gas necessary to support Arctic pipeline development will emerge in the next 24 months.
4. Risk and uncertainty are the greatest roadblocks to Arctic pipeline construction, not the much-debated standard financial variables.
5. Staged pipeline construction is the obvious mechanism to materially reduce costs, risk and uncertainty.
6. Under almost any political, financial or price scenario, a natural gas pipeline down the Mackenzie corridor will be developed first.

U.S. Natural Gas Demand and Supply Sources



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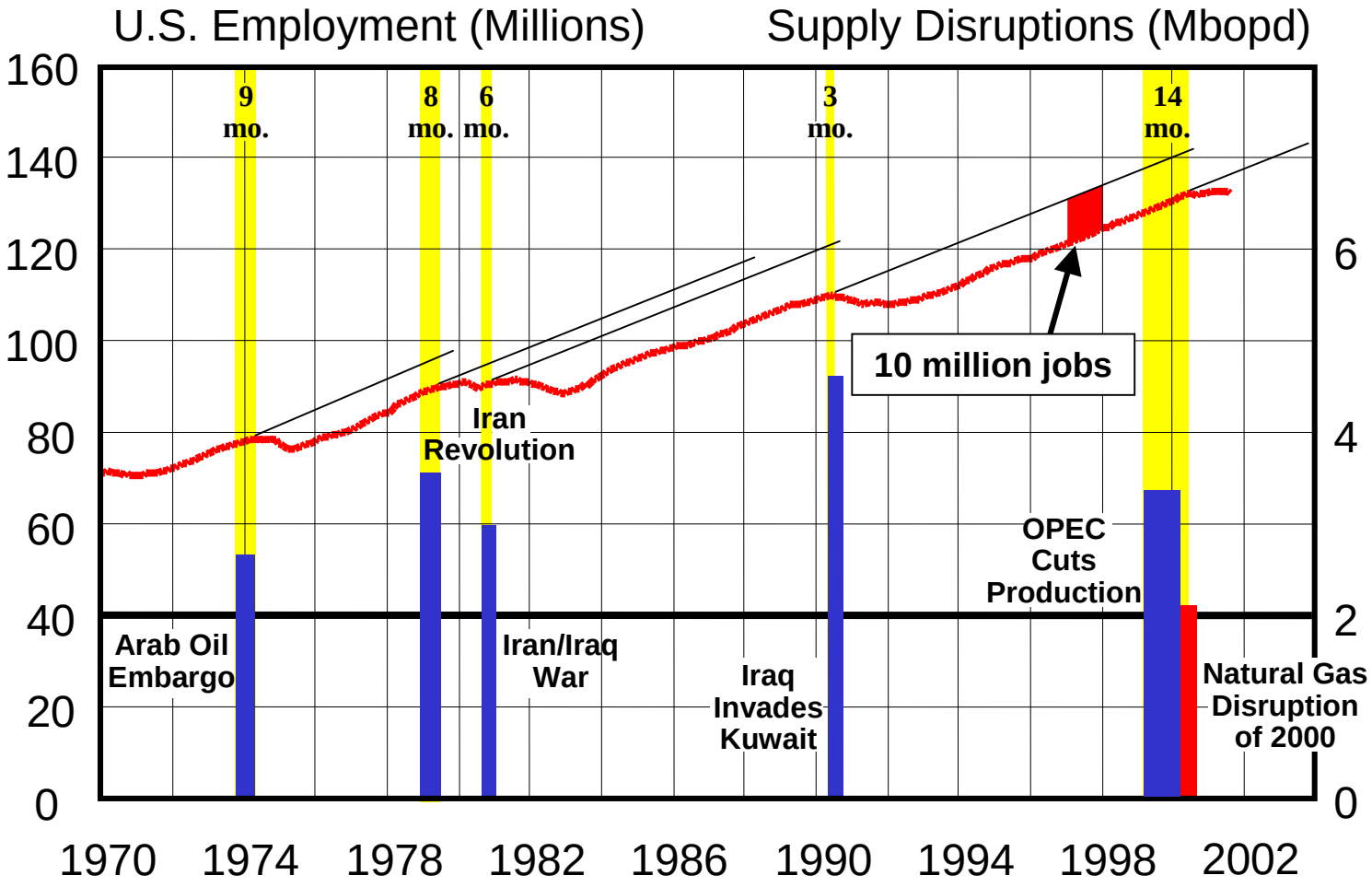
U.S. Employment and Major Energy Supply Disruptions in OPEC Era



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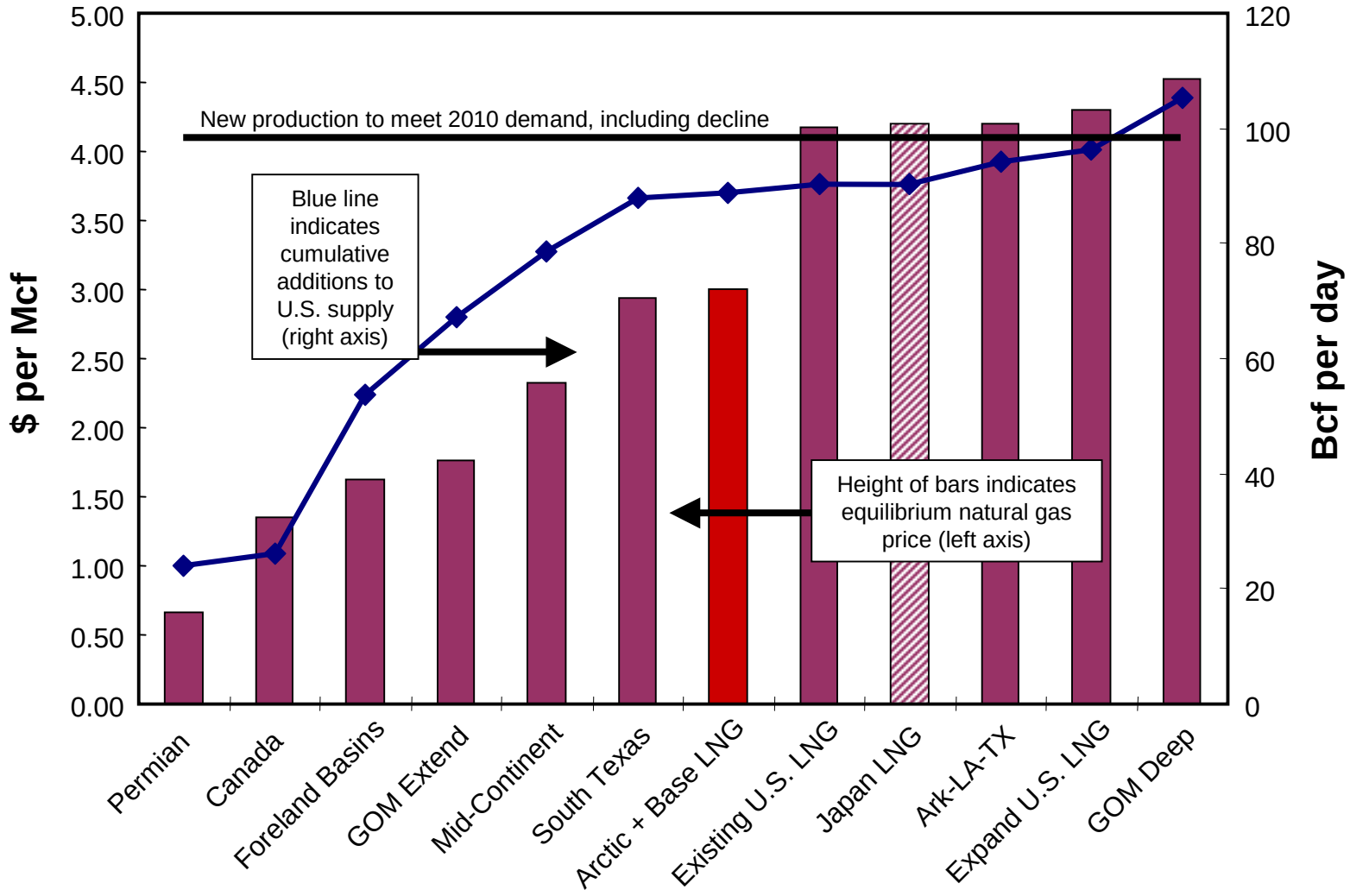
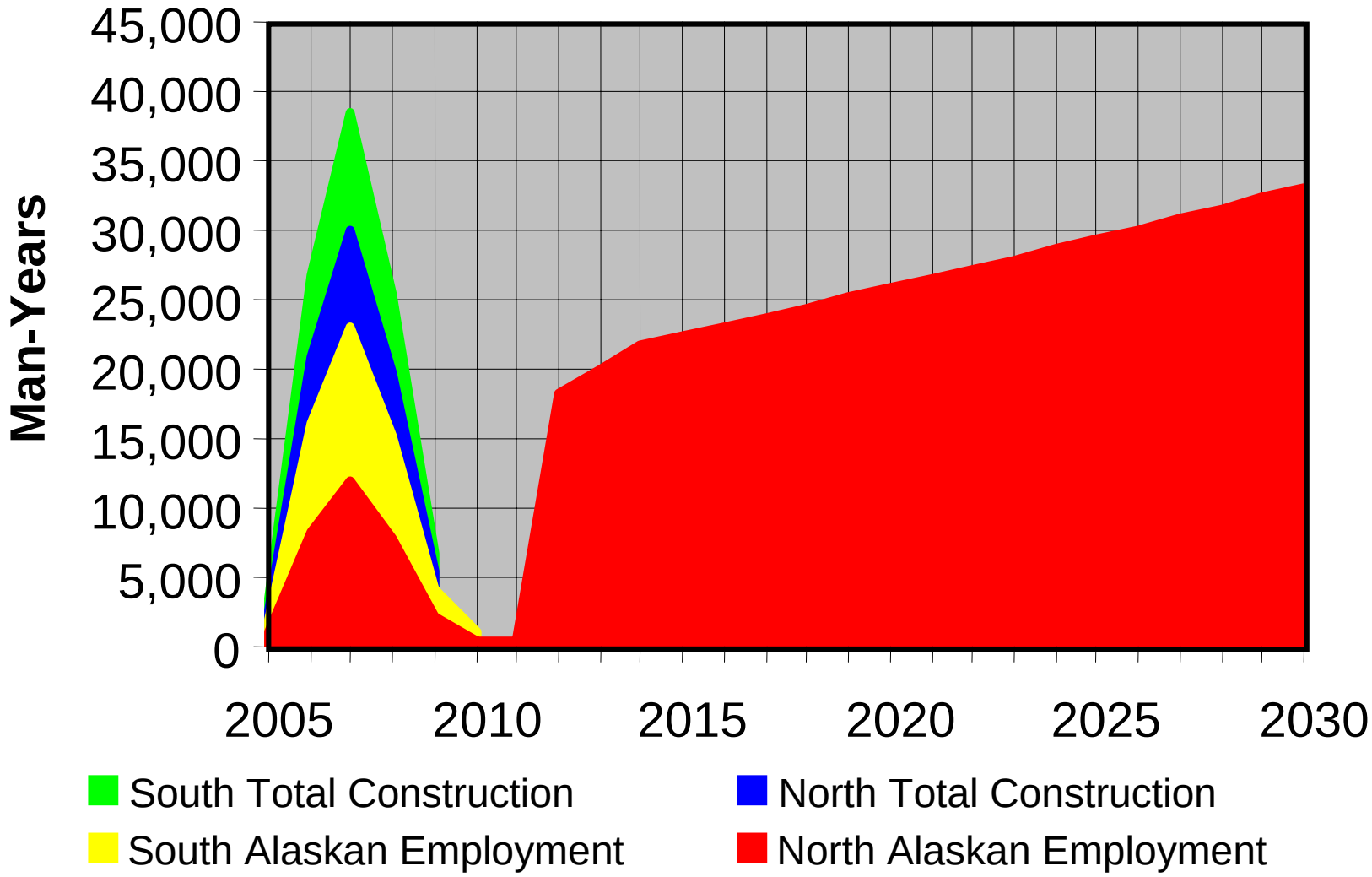
Forecast U.S. Natural Gas Supply and Prices—Moderate Demand and Mild Decline Rate



Message to Alaskans

1. Near-term stable jobs involving Alaskan gas should focus on Kenai development rather than a North Slope gas pipeline.
2. Any pipeline route from the North Slope will be 60 percent or more in Canada:
   - Routing decisions based on Alaska construction jobs do not serve your long-term financial interests.
   - Canada will ultimately have the final say on routing decisions.
3. Support the lowest-cost, highest-netback pipeline solution:
   - Generates the greatest corporate revenues and State income.
   - Translates to permanent jobs and a strong Alaska economy.
   - Prevents job leakage to out-of-state commuters.
4. False environmental claims made today may be your undoing later when ANGTS route is dead and you change your vote to "Over-the-top"—be careful!

Which Route Creates Most Permanent Jobs for Alaskans?



Escopeta Oil & Gas and B.B.I., Inc.
Announce Exploration Results in Cook Inlet Basin, Alaska
Estimated 12 Tcf of Recoverable Natural Gas Reserves Located

FOR IMMEDIATE RELEASE
September 26, 2001

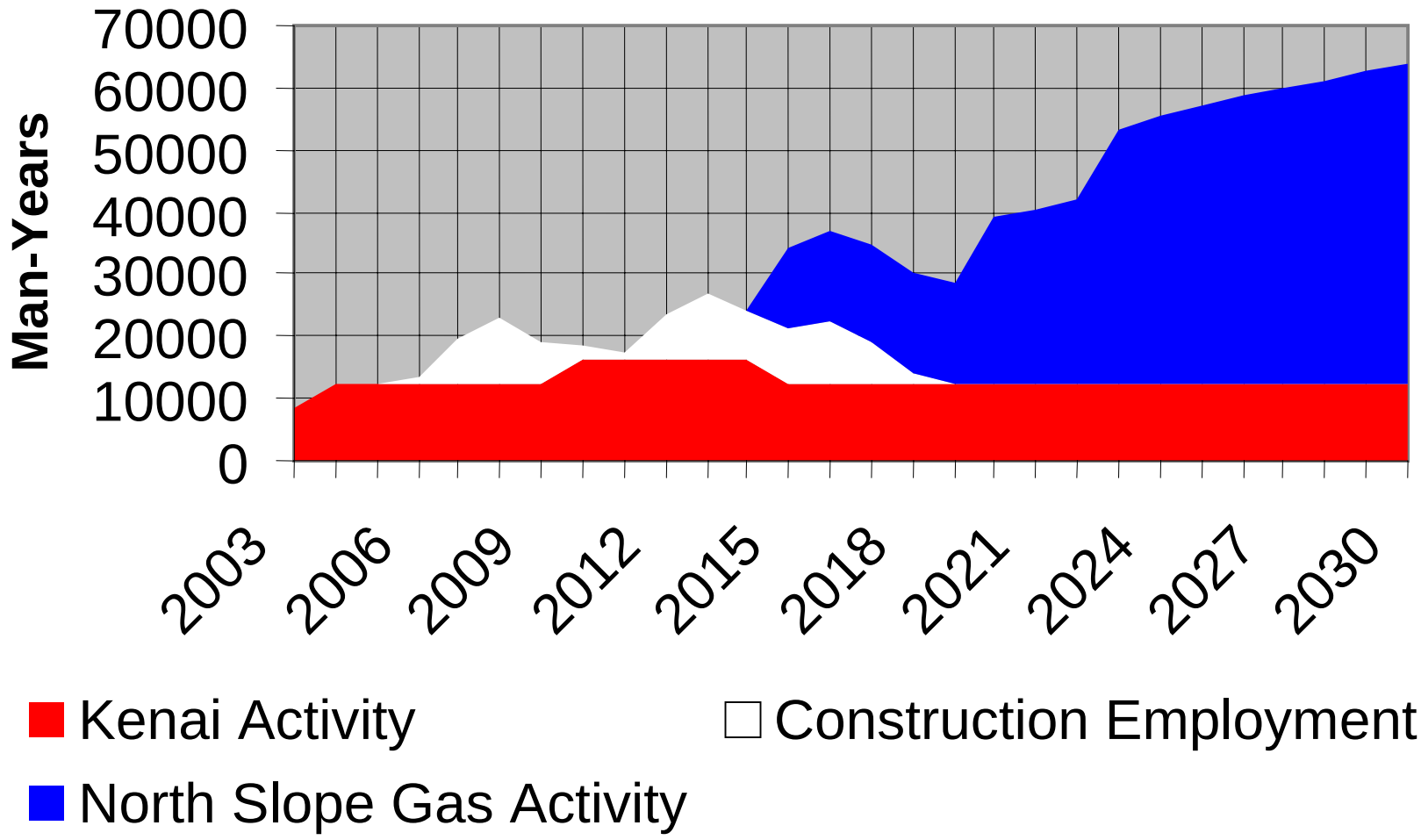
Contact: Mr. Danny Davis
(713) 623-2219

Houston, TX – Escopeta Oil & Gas and BBI, Inc. of Houston, Texas, today announced new seismic reprocessing results that show estimated recoverable reserves of 12 trillion cubic feet (Tcf) of natural gas near the East Forelands area of Alaska's Cook Inlet Basin, at depths of 18,000 to 21,000 ft. Known producing horizons in the same structural trend would likely recover 1.35 billion barrels of oil and an additional 6.1 Tcf of gas.

The reprocessed seismic data reveal the presence of a significant complex fault system on the east flank of the Middle Ground Shoal Field (200 million barrels reserves), forming an immense trapping mechanism, possibly the largest untested structural fault block in the Cook Inlet Basin. Geophysical and geological mapping reflect approximately 9000 feet of vertical closure against this fault system representing approximately 69,000 acres of structural closure. The depth of the main targets suggests accumulations of thermogenic gas.

(cont.)

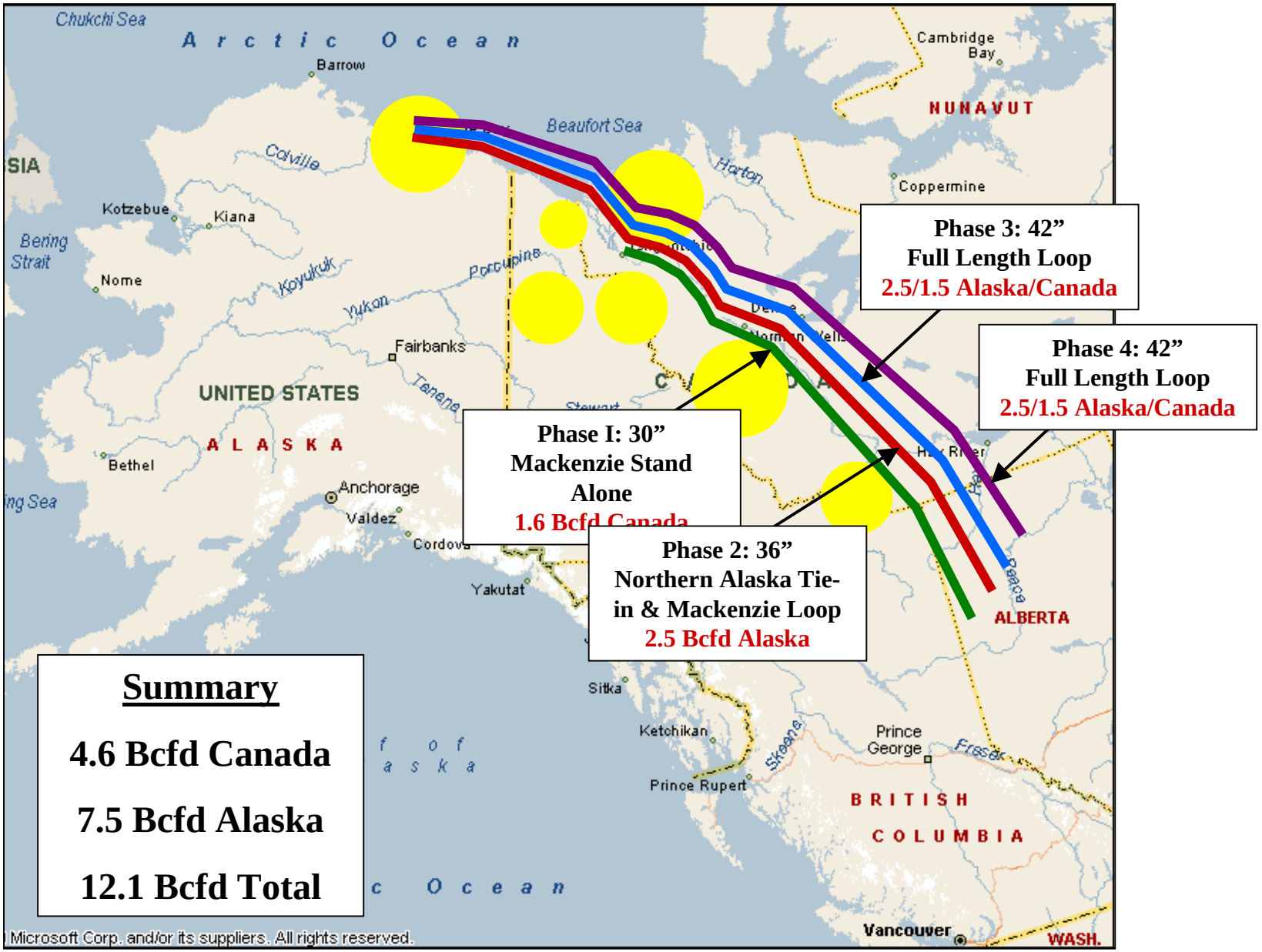
Alaska Gas Employment Impact, including Kenai



Message to Canadians

1. Canada has the lead in Arctic pipeline development—get busy before you lose it!
   - Natural gas in the North, takeaway capacity in the South.
   - No need for international agreement before proceeding.
   - Environmental/regulatory framework in place.
2. Mackenzie Valley will develop as pipeline "corridor":
   - Historical and modern imperative of market forces.
   - Construction of first segment reduces risk of corridor route for future expansion and (ult.) connection to Alaska.
3. Impact on Canadian employment will be huge:
   - Construction peak employment in 2013 is 23,161 man-years
   - Gas industry job impact by 2020 is 39,694 permanent jobs
4. Employ ARC strategy:
   - Best financial parameters.
   - Sensitive to Aboriginal needs.

Multiple Pipeline Stages Used to Access Arctic Gas



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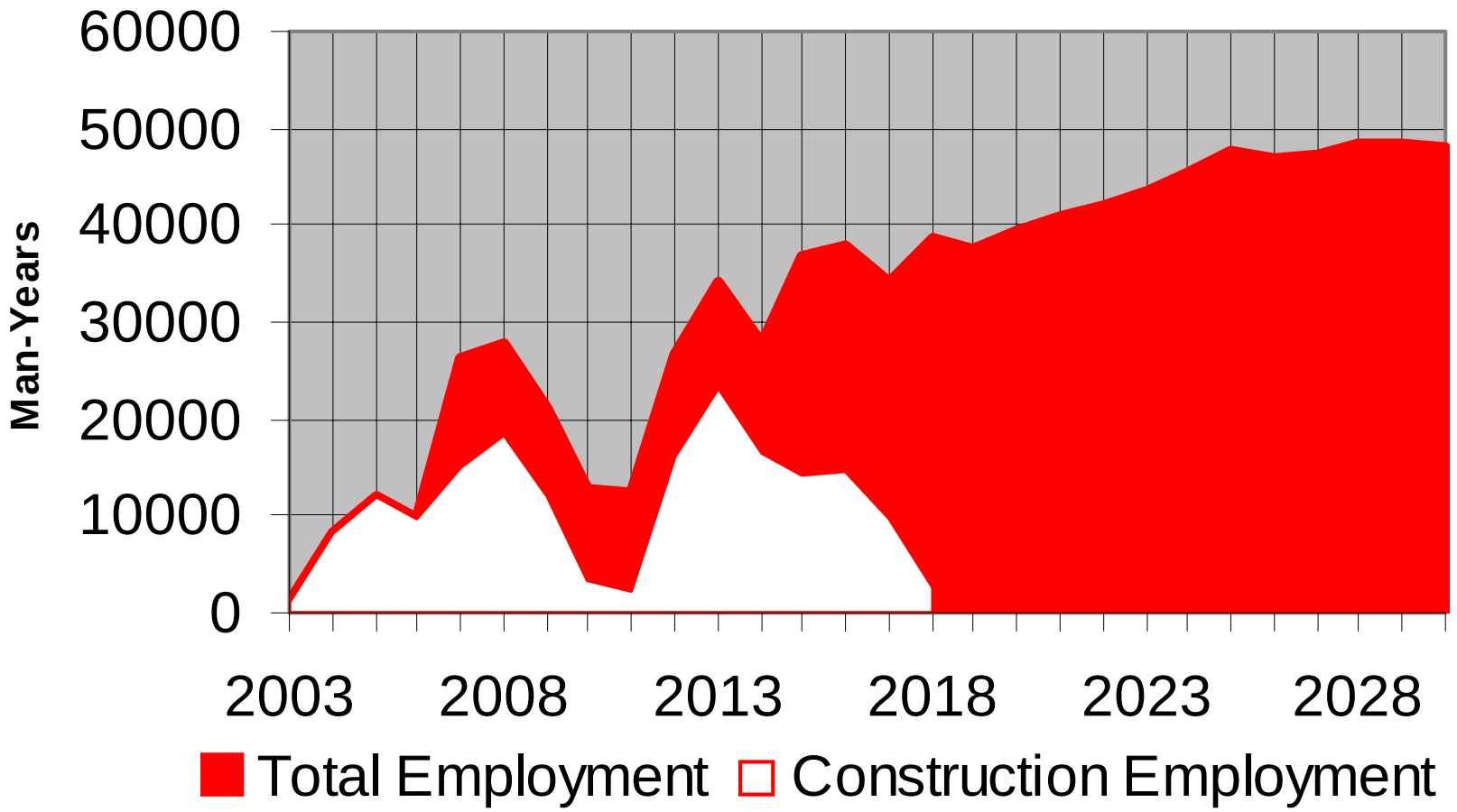
Model Results of Recommended Capacity Additions

	Mackenzie Only	Northern Tie-in + Loop	Full Length Loop	Full Length Loop
Capital Cost (Billion USD)	$3.353	$6.128	$8.326	$8.572
Length (miles)	1040	1700	1700	1700
Alaska Capacity (Bcf/d)	0	2.5	2.5	2.5
Canada Capacity (Bcf/d)	1.6	0	1.5	1.5
Size (inches)	30	36	42	42
Tariff Prudhoe to L48 ($/Mcf)	NA	$1.83	$2.22	$2.27
Tariff Mackenzie to L48 ($/Mcf)	$0.96	NA	$1.45	$1.50
Assumed Gas Price ($/Mcf)	$2.63	$2.71	$2.85	$2.93
Netback to Producers ($/Mcf)	$1.07	$0.88	$0.63	$0.66
Recommended On-line Date	2007	2010	2015	2018
Cumulative Capacity (Bcf/d)	1.6	4.1	8.1	12.1

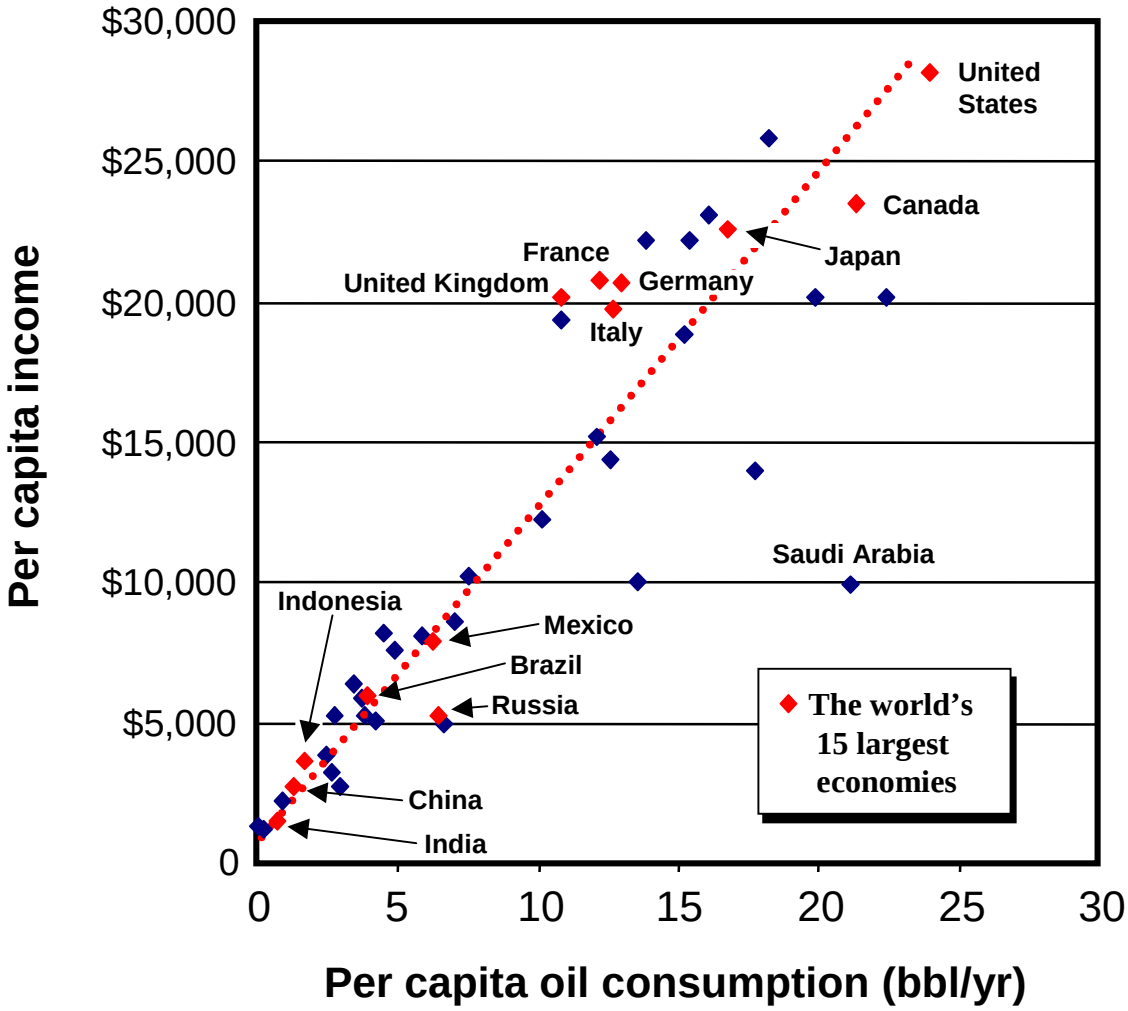
Canadian Gas Employment Impact



Study

- Emerging U.S. natural gas economy and price environment
- U.S. employment impact
- Alaska dynamics
- A new economic model for development of Arctic natural gas infrastructure
  - Alaska Gas Employment Impact
  - Canada Gas Employment Impact
- Kenai development
- Environmental Impact and Aboriginal Issues
- Conclusions and Recommendations
- Reference List

Energy Consumption as an Indicator of the Wealth of Nations



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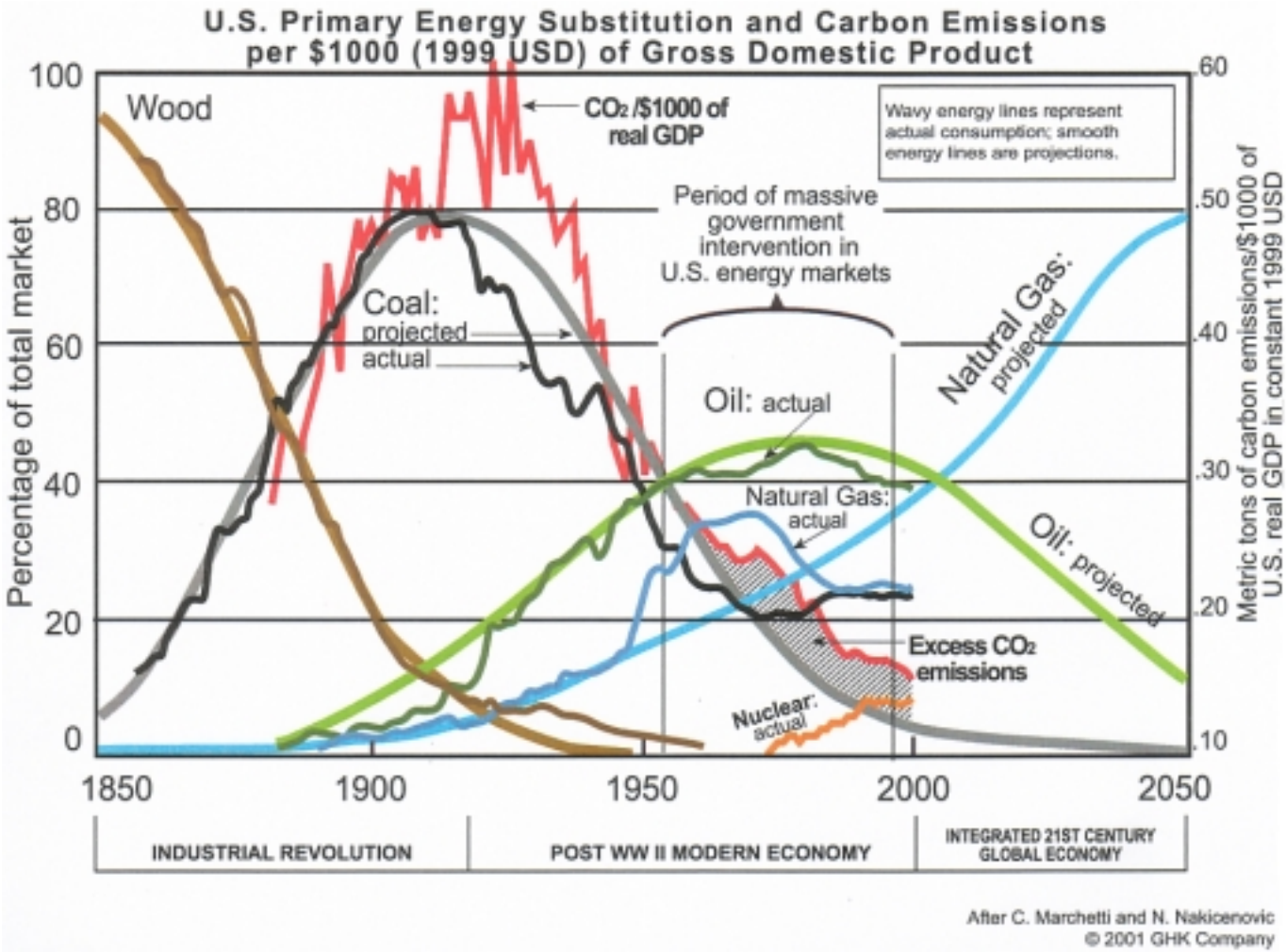
Historical Imperative for Natural Gas (from Hefner)



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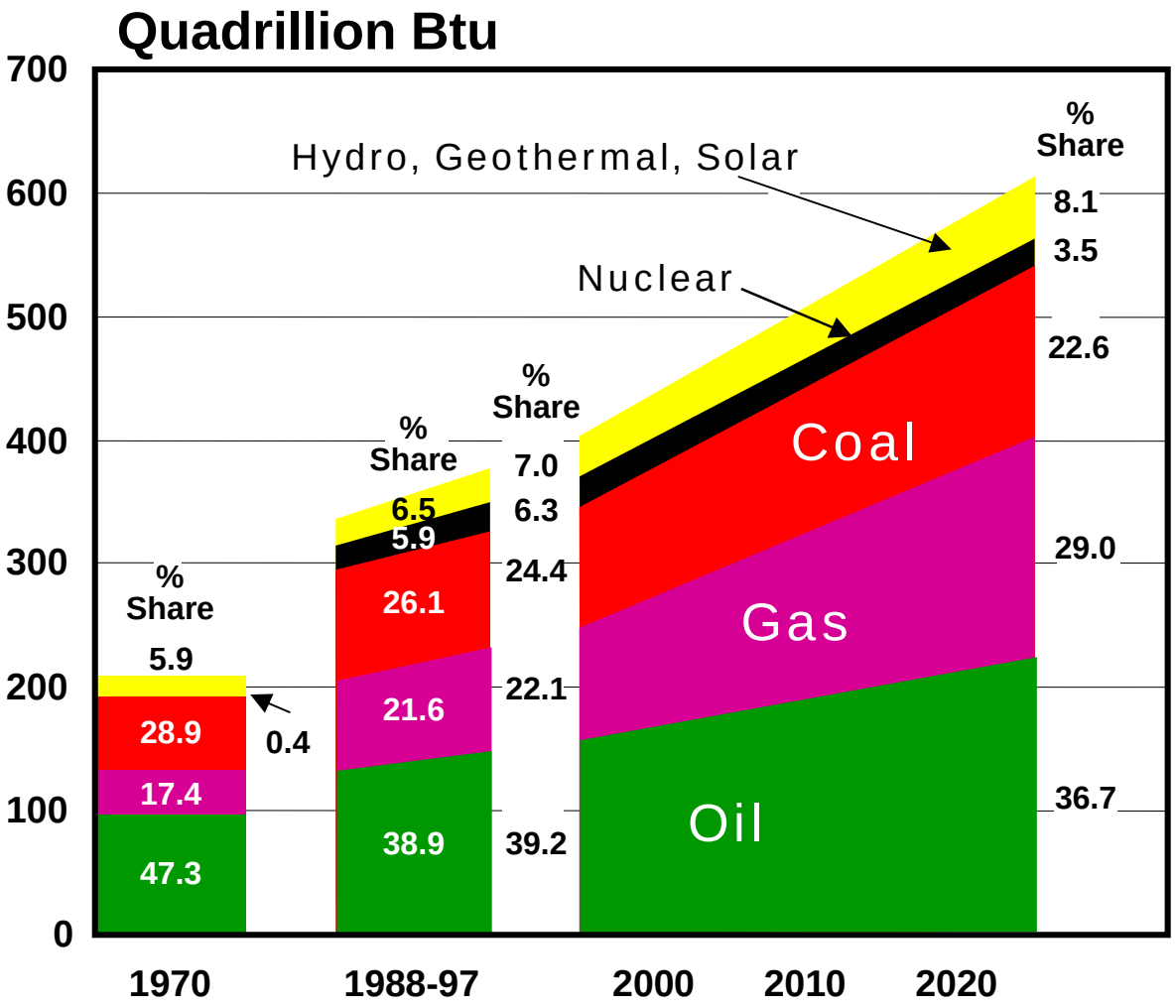
Worldwide energy mix forecast (from EIA/DOE)



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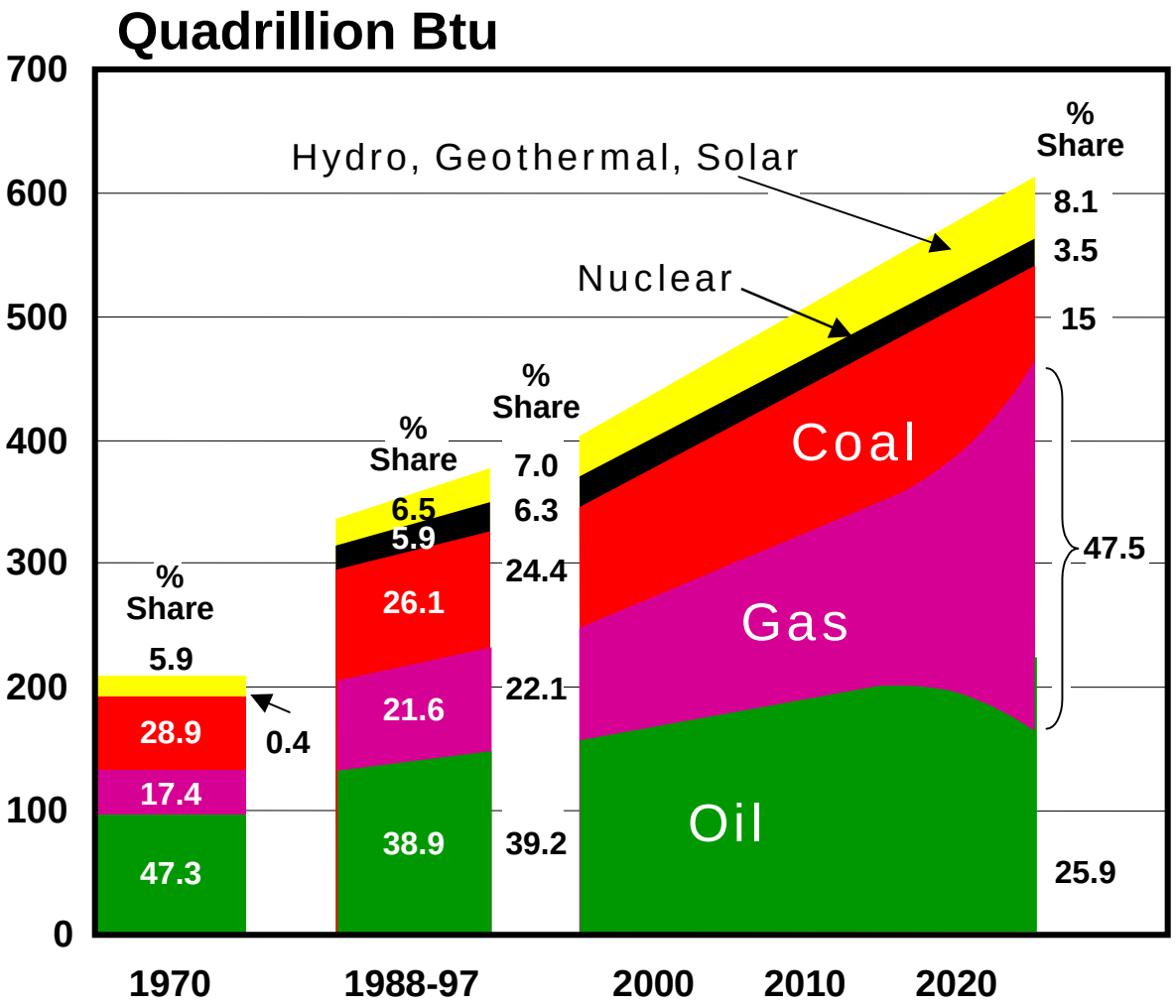
Worldwide energy mix "twist" forecast (Economides and Oligney)



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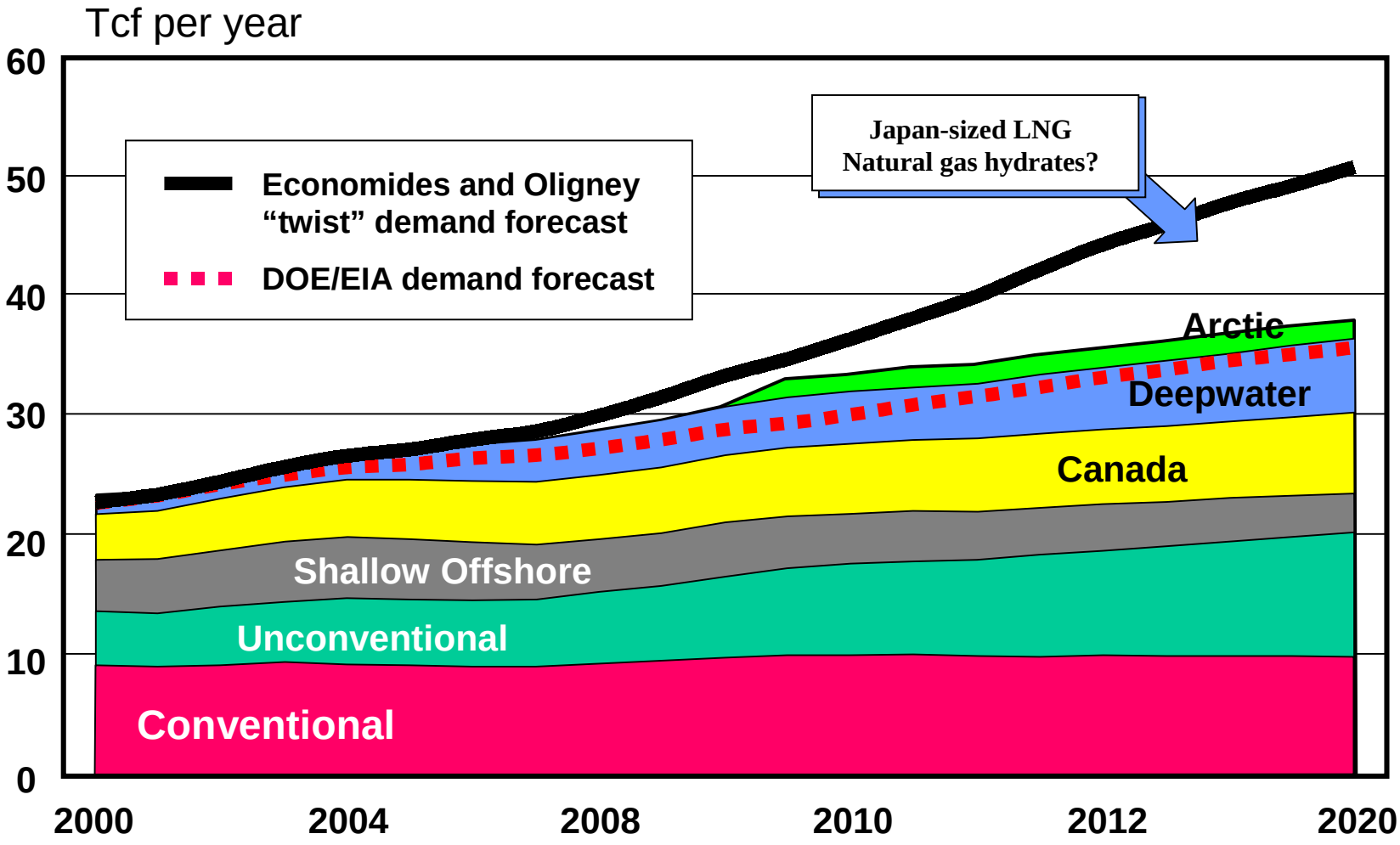
Various forecasts of U.S. natural gas consumption

	1999	2000	2003	2008	2010	2015	
NPC/DOE	21.5 **59**	22.1	Tcf **Bcfd**		27.7	30.6 **82**	"Low"
CERA	21.5 **59**				30.0 **82**		"Mid"
Bernard		21.9 **60**		30.0 **82**			
El Paso		21.9 **60**	"plus 25 Bs"		31.0 **85**		
Duke	21.5 **59**	"200,000 megawatts of new generation over the next 12 years"			32.0 **88**		
Economides/ Oligney		21.9 **60**	26.5 **72.5**		32.9 **90**		"High"
Simmons		21.9 **60**			40.0 **146**		

U.S. Natural Gas Demand and Supply Sources



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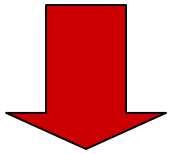
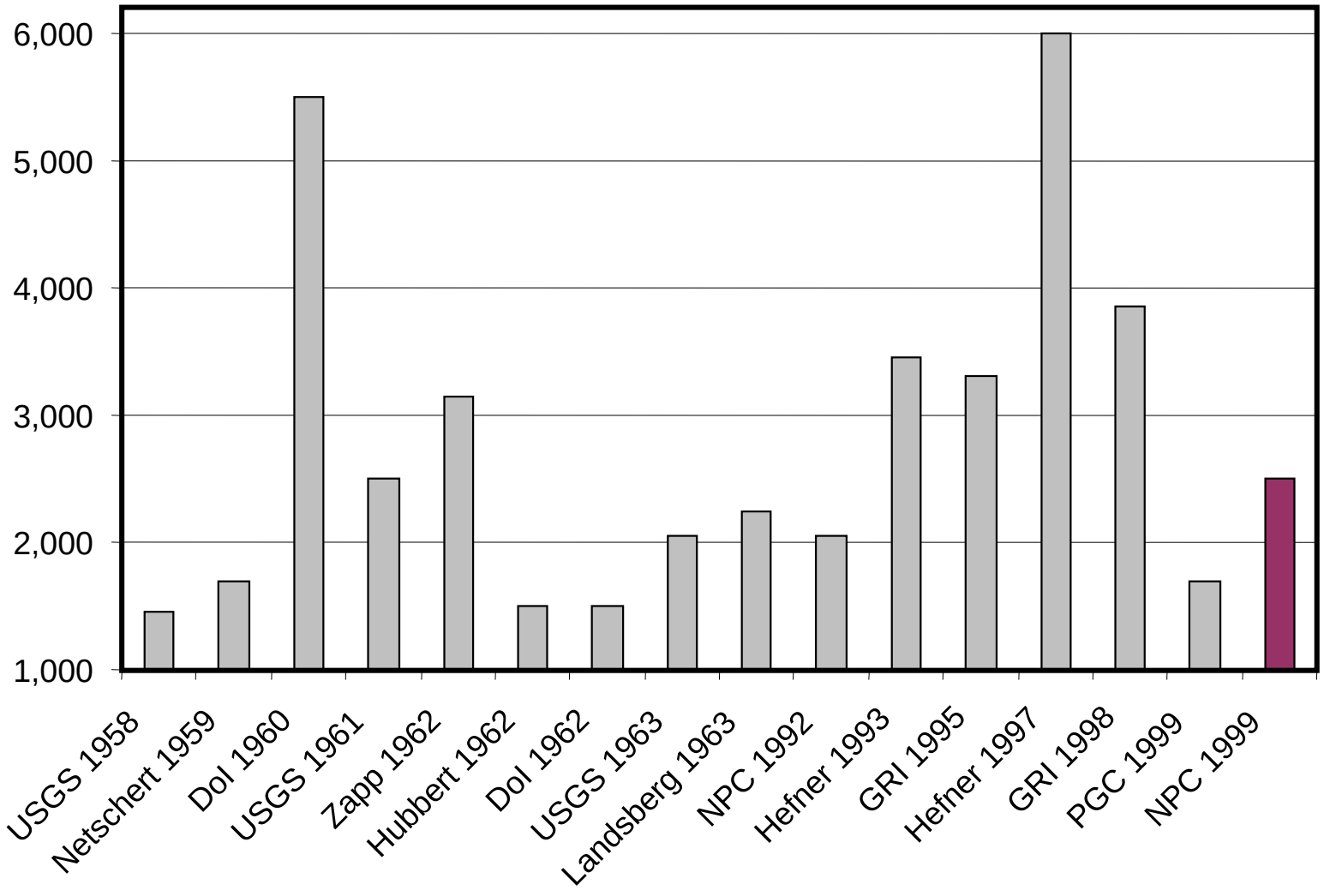
Supply and demand analysis

- Potential Gas Reserves
- Proved Gas Reserves
- Gas Deliverability
- Activation Index

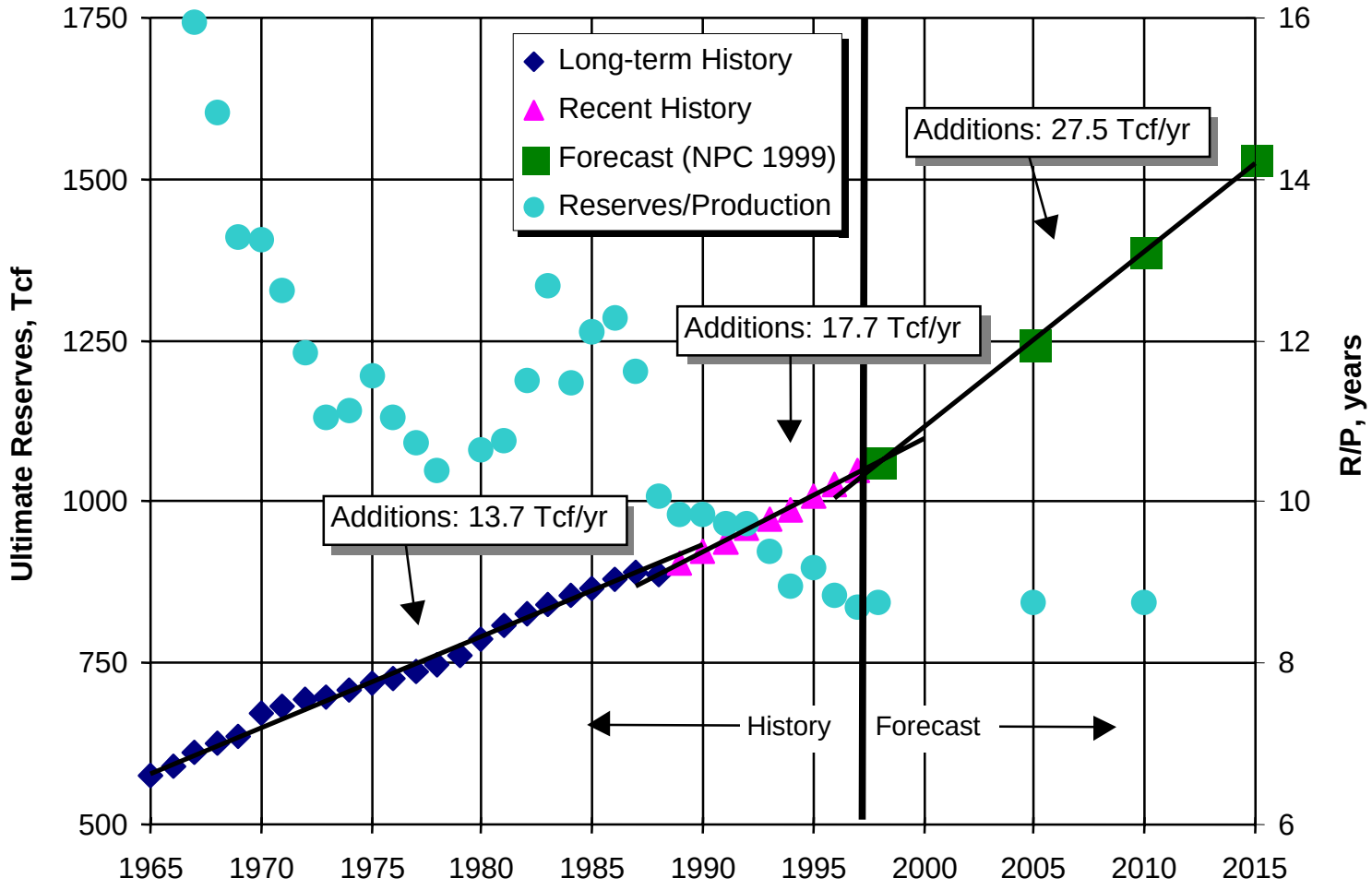


- Gas Price, $/Mscf

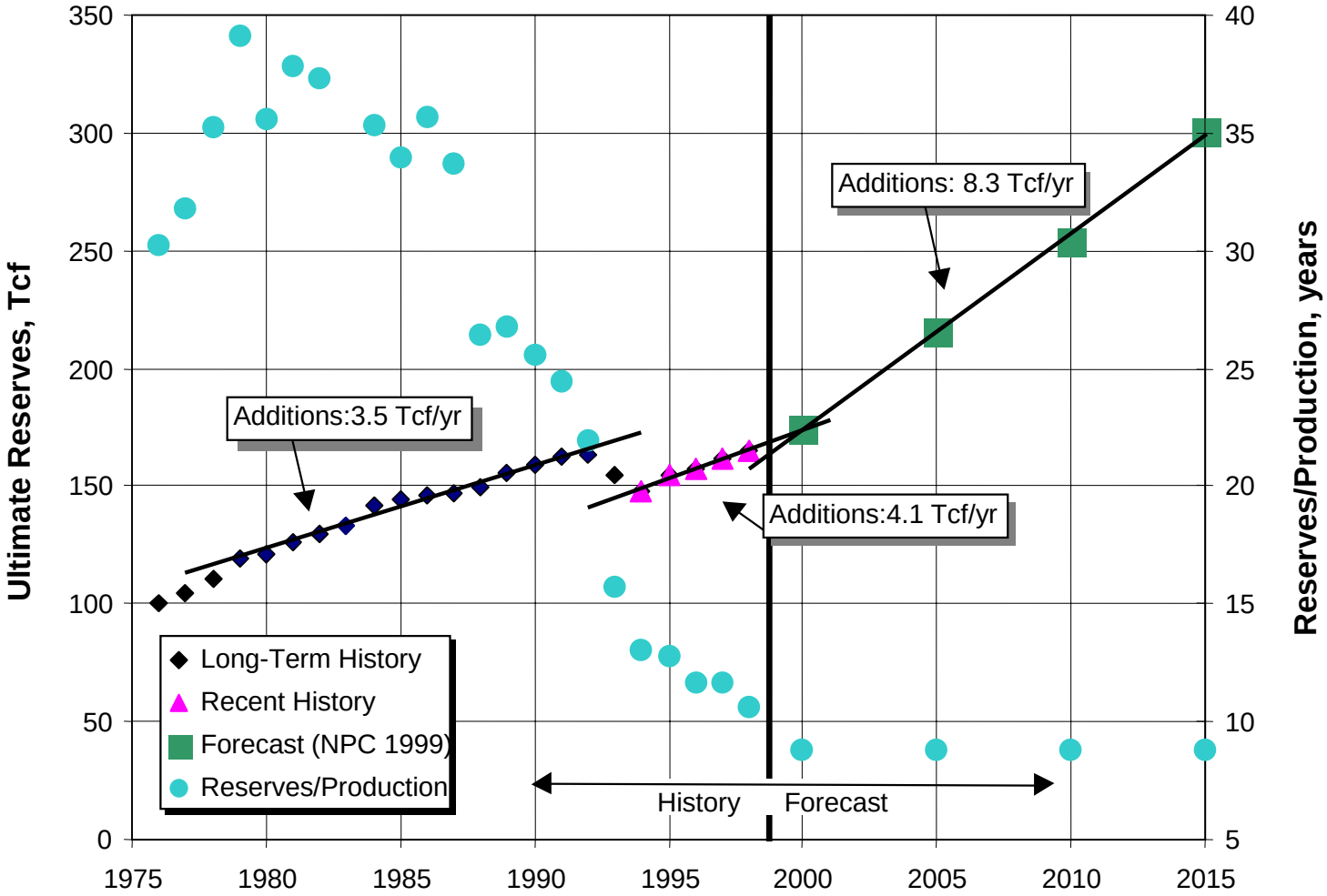
Potential Ultimate U.S. Gas Reserves, Tcf



Ultimate Proved U.S. Gas Reserves



Ultimate Proved Canadian Gas Reserves



Determination of Activation Index for Select Areas

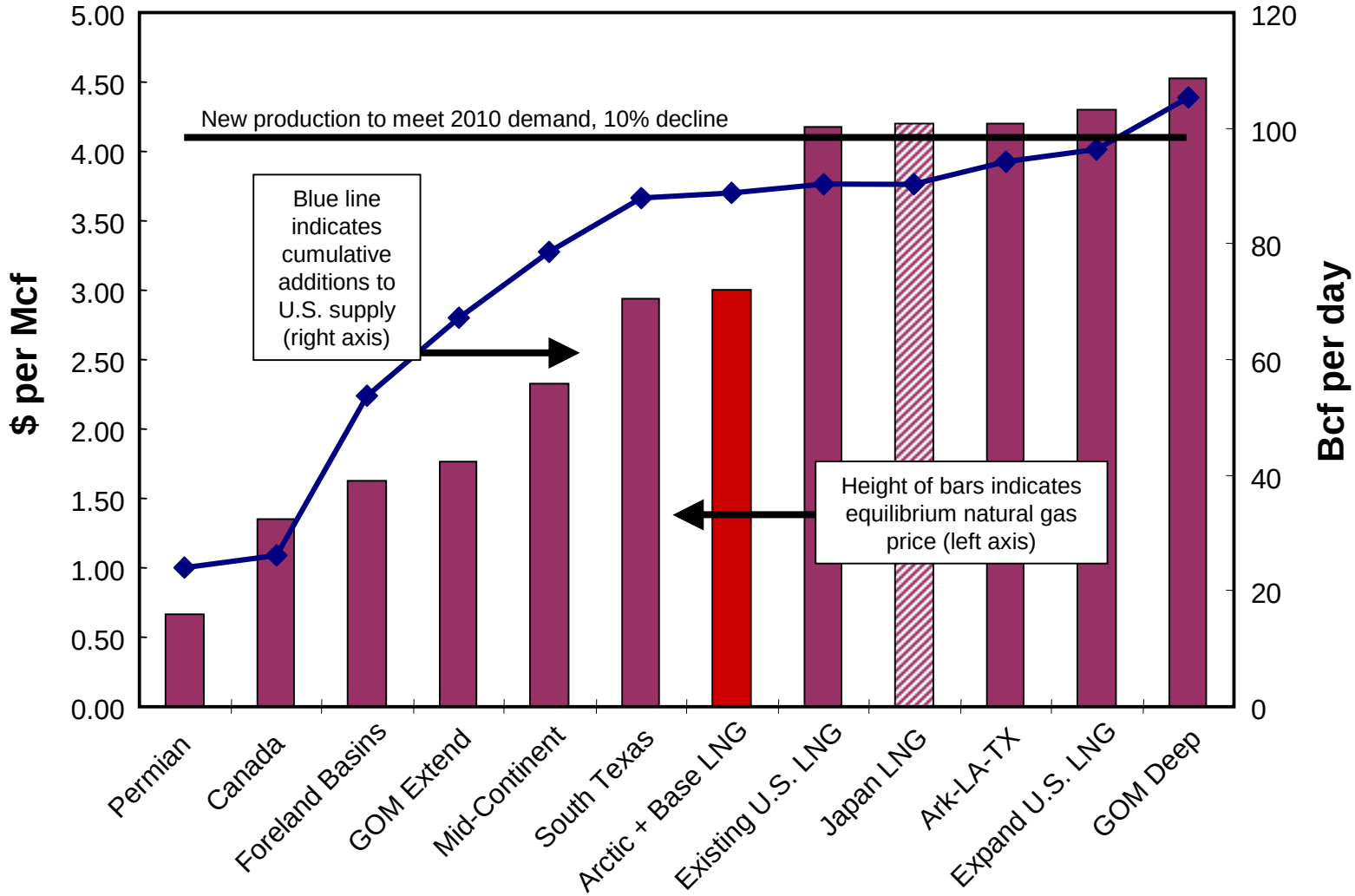
Play 1	Ave. Depth ft[26] 2	1995 Avg. Cost k$[26] 3	Cost Escalation %[28] 4	Est. Tie-in Cost k$ 5	1st 12 mo. Production Mcf/D[27] 6	Activate Index k$/McfD 7
Anadarko - Watonga-Chicksha	11,450	676	24	20	464	1.85
Arkoma - Choctaw Thrust	14,545	2382	24	20	2438	1.22
Arkoma – Jackfork	9136	1237	24	20	1362	1.14
Cotton Valley Reef	15,975	3687	24	20	1813	2.53
Deep Austin Chalk	16,645	3591	24	20	1621	2.76
Wilcox - Lobo trend	9900	523	24	20	844	0.79
GOM Deep Water	15,150	14,350	48	100	7832	2.72
GOM Extended Reach	15,600	3175	48	100	4526	1.06
Green River - Moxa Arch	12,272	488	24	30	830	0.77
Green River - Wamsutter	10,144	394	24	30	432	1.20
Val Verde - Strawn & Penn	11,907	1202	24	20	3812	0.40

Weighted Average Activation Index by NPC Region

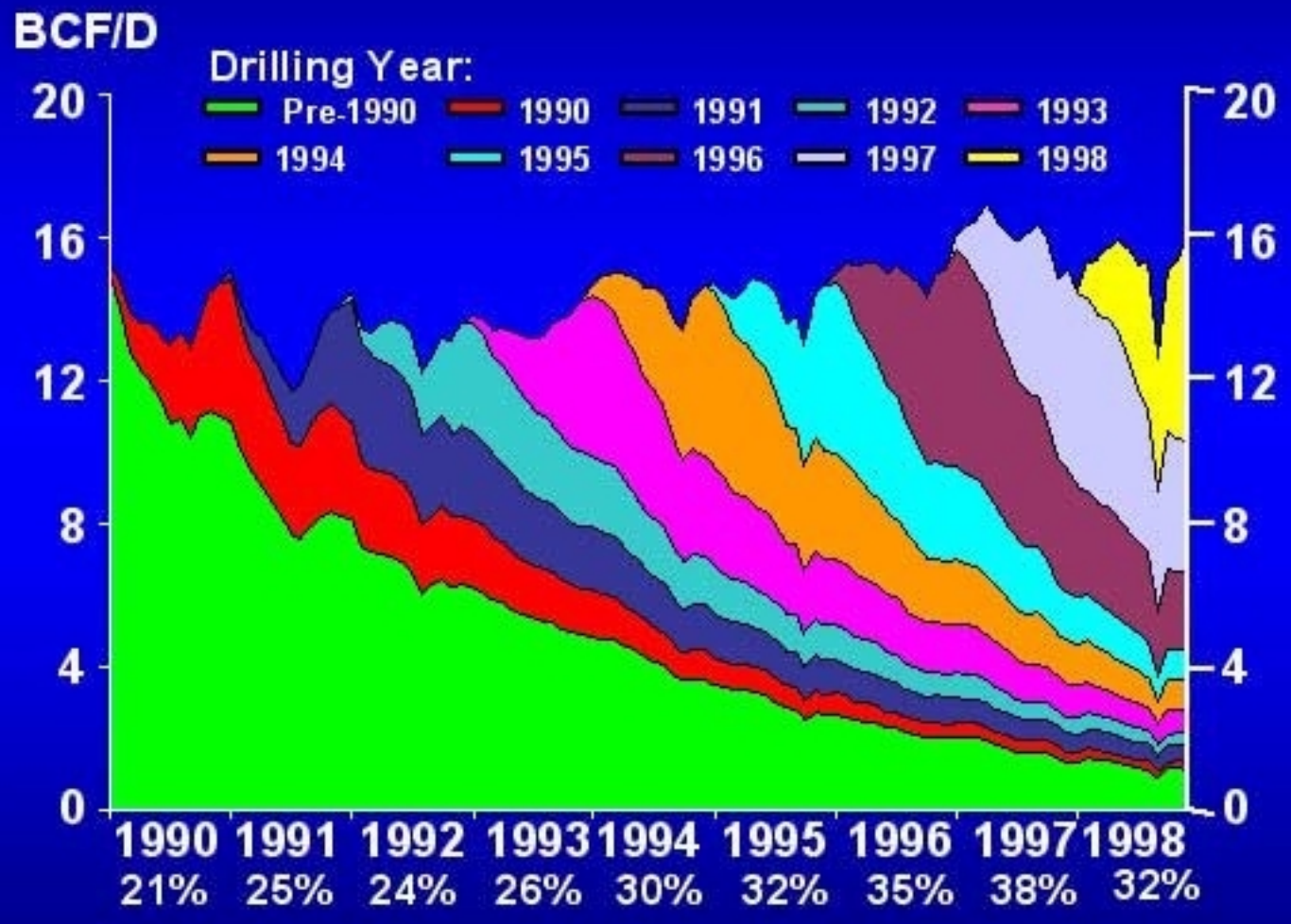
Area	Area Avg. Active Index k$/McfD	Reserves + Potential Tcf	Contribution to Harmonic Mean AI %
Mid-Continent	1.40	119	11.7
Ark-LA-TX	2.53	72	3.9
South Texas	1.78	121	9.4
GOM Deep Water	2.72	181	9.2
GOM Extended Reach	1.06	105	13.6
Foreland Basins	0.98	199	27.8
Permian	0.40	70	24.4
Weighted Harmonic Mean Activation Index	**1.195**	**867**	**Total Reserves + Potential**

$$\overline{AI} = \frac{\sum_i \left(Reserves + Potential\right)_i}{\sum_i \left(\frac{Reserves + Potential}{Activation\ Index}\right)_i}$$

Forecast U.S. Natural Gas Supply and Prices—Moderate Demand and Mild Decline Rate

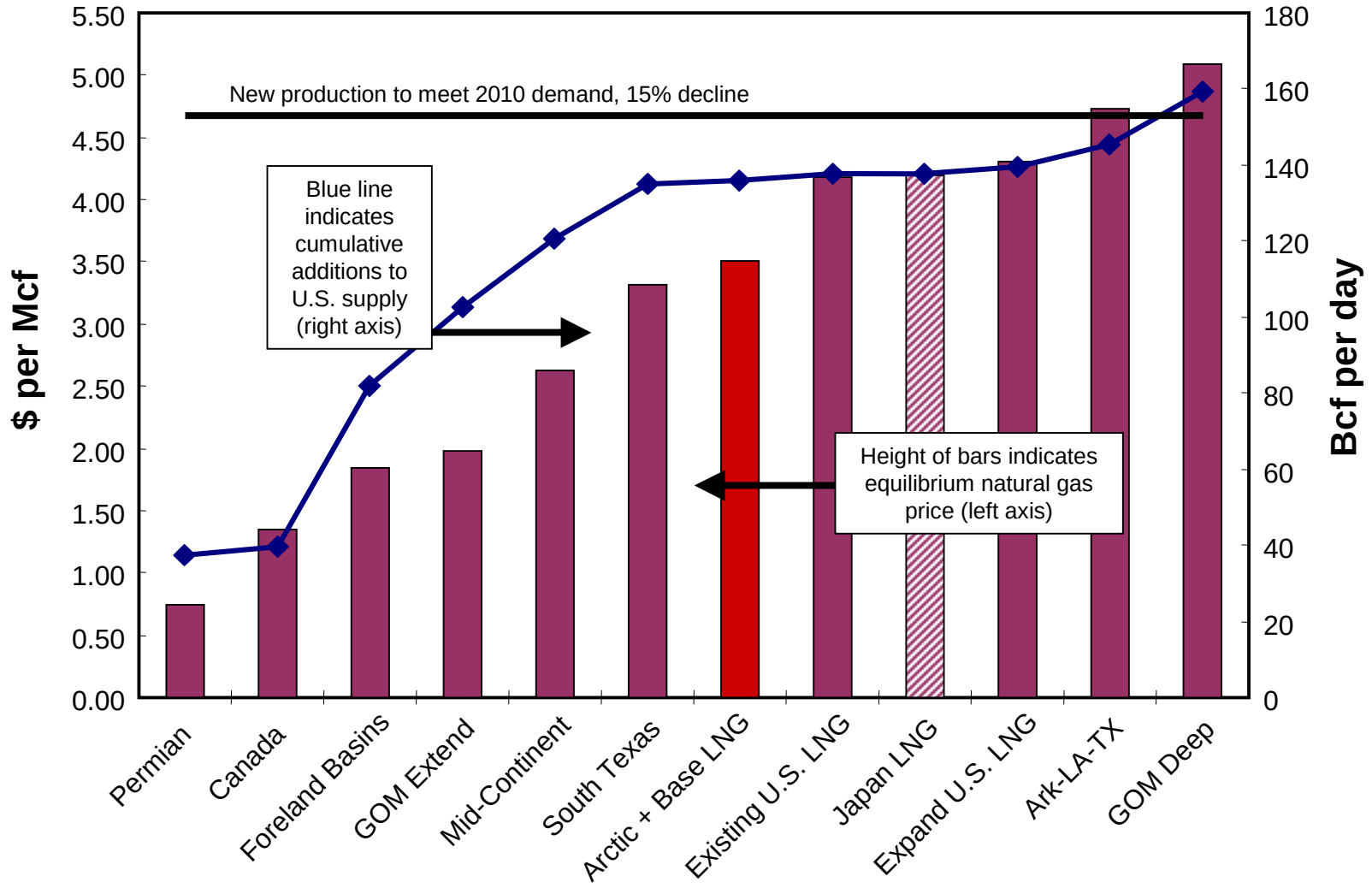


GOM GAS DECLINE RATE IS ACCELERATING



Source: EOG Resources 7/00.

Forecast U.S. Natural Gas Supply and Prices—High Demand and Accelerated Decline Rate



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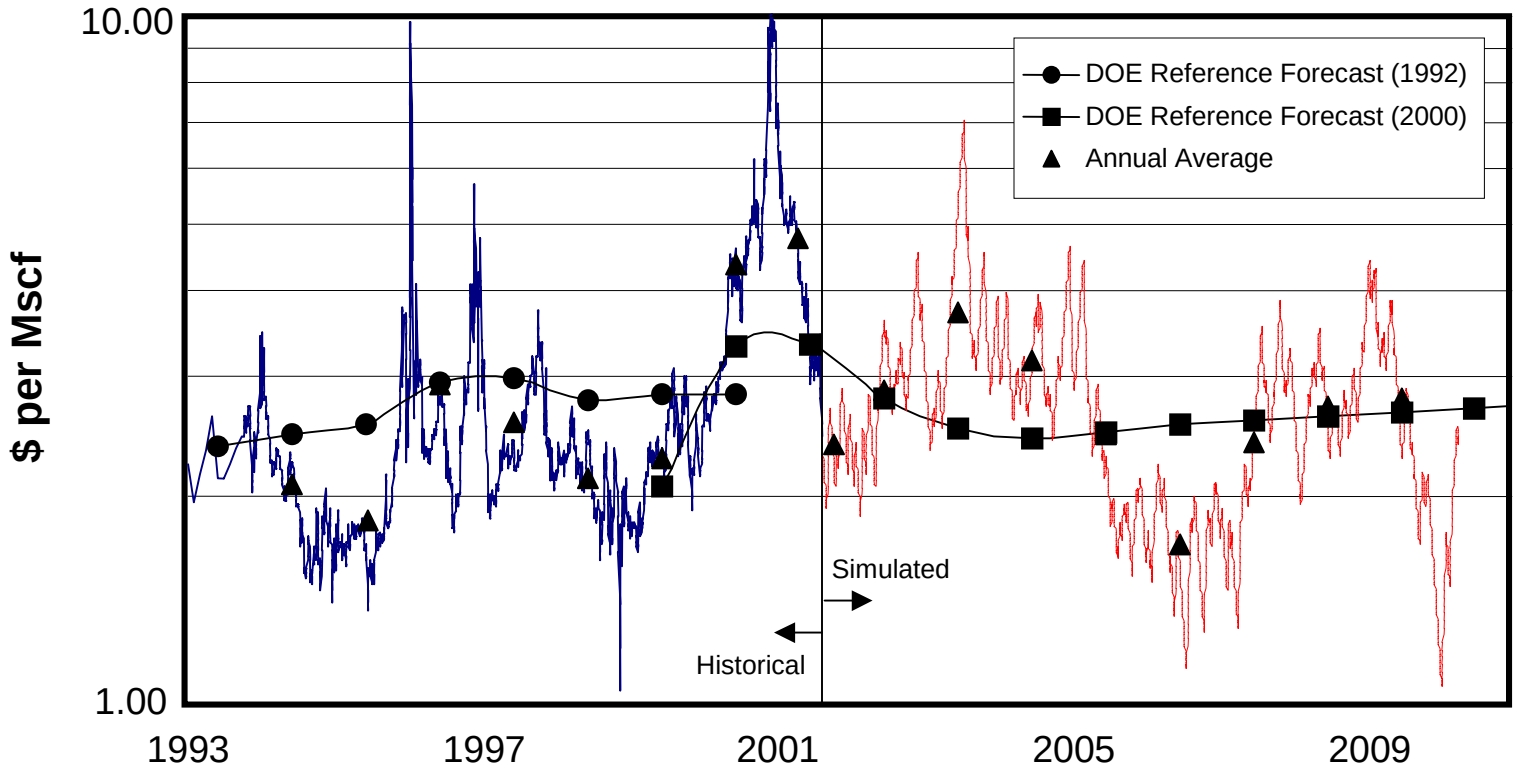
Cash Natural Gas Price

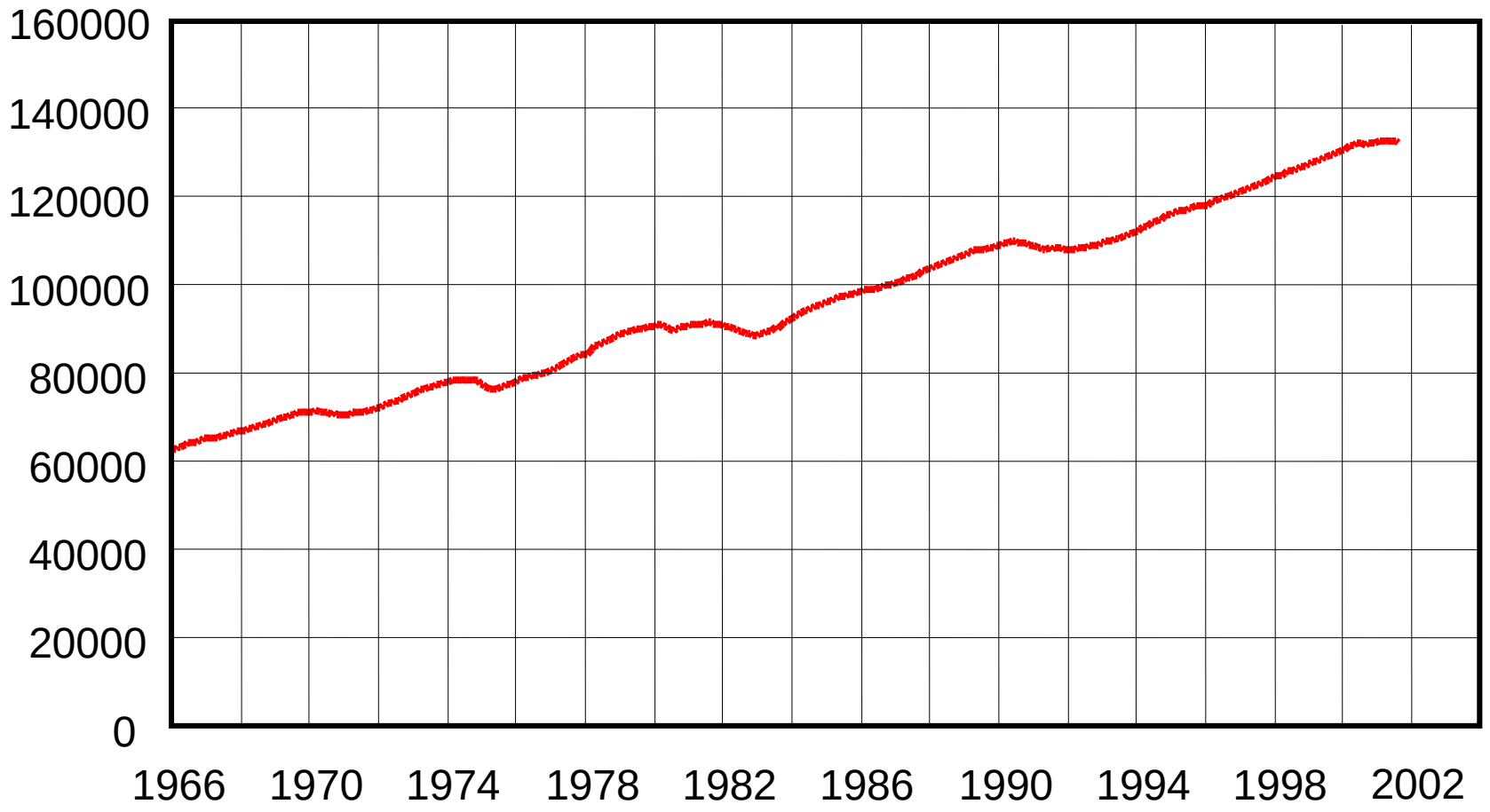
(1999 dollars)



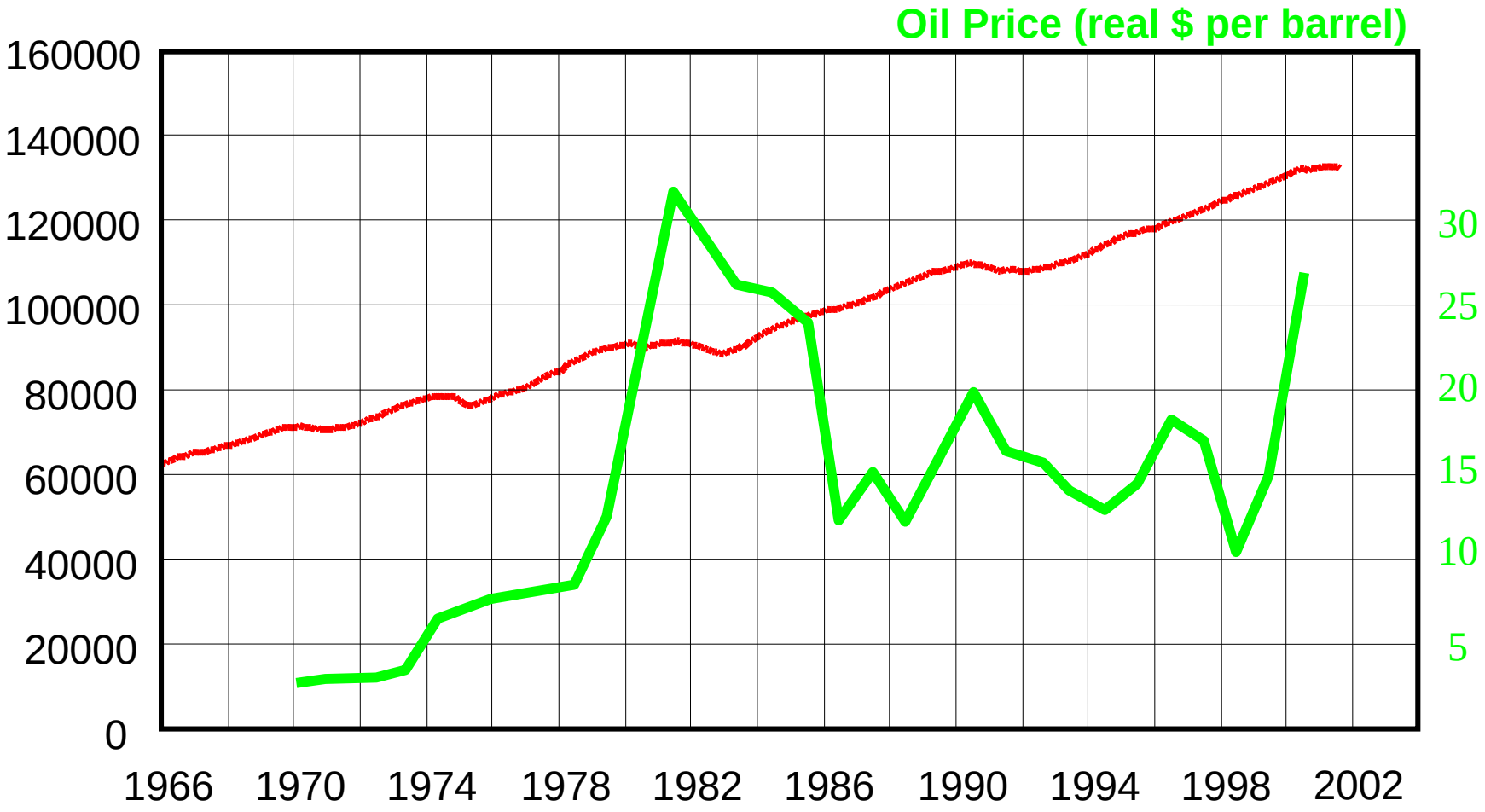
Source: P.E. Lewis

- U.S. employment impact

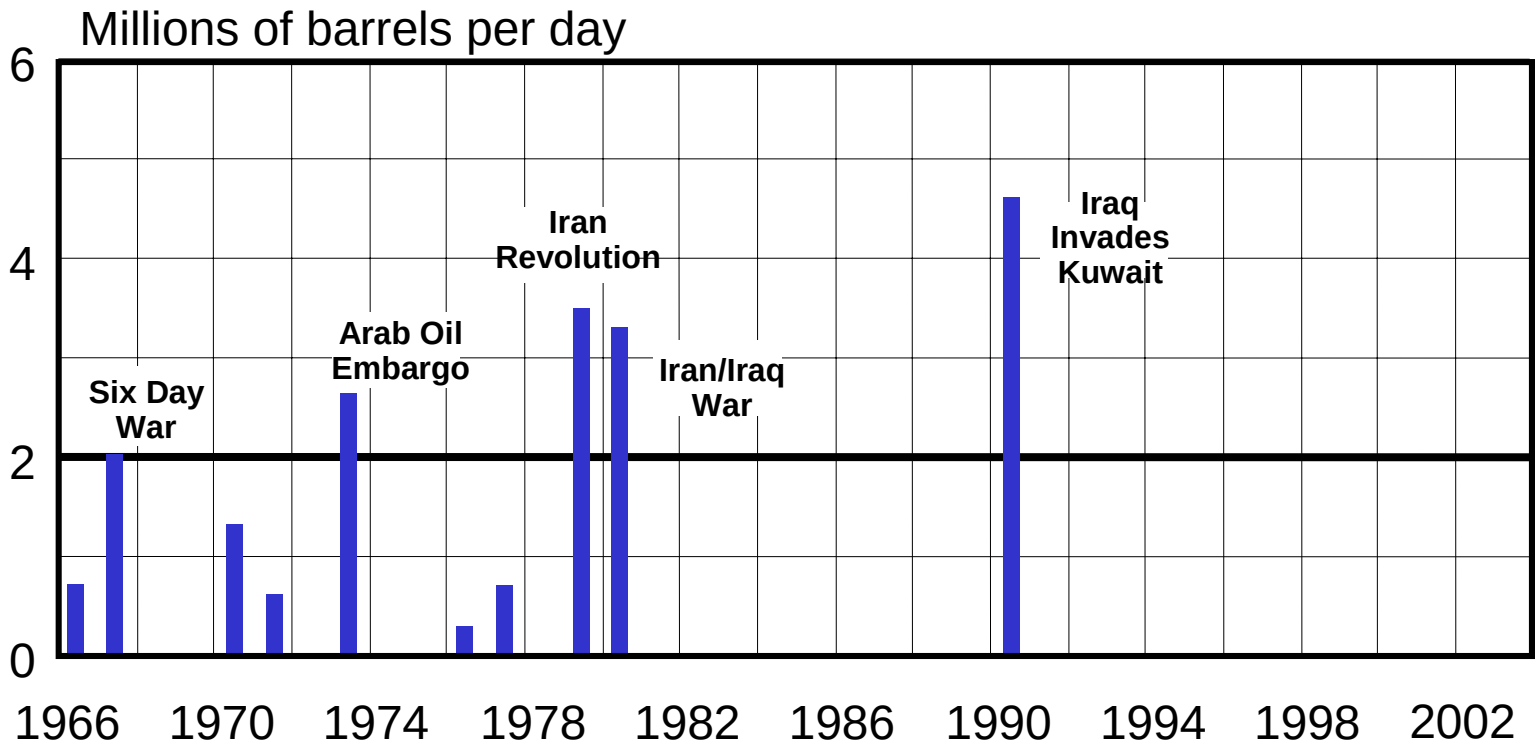
U.S. Employment (1000s)



U.S. Employment (1000s)



Major Energy Supply Disruptions

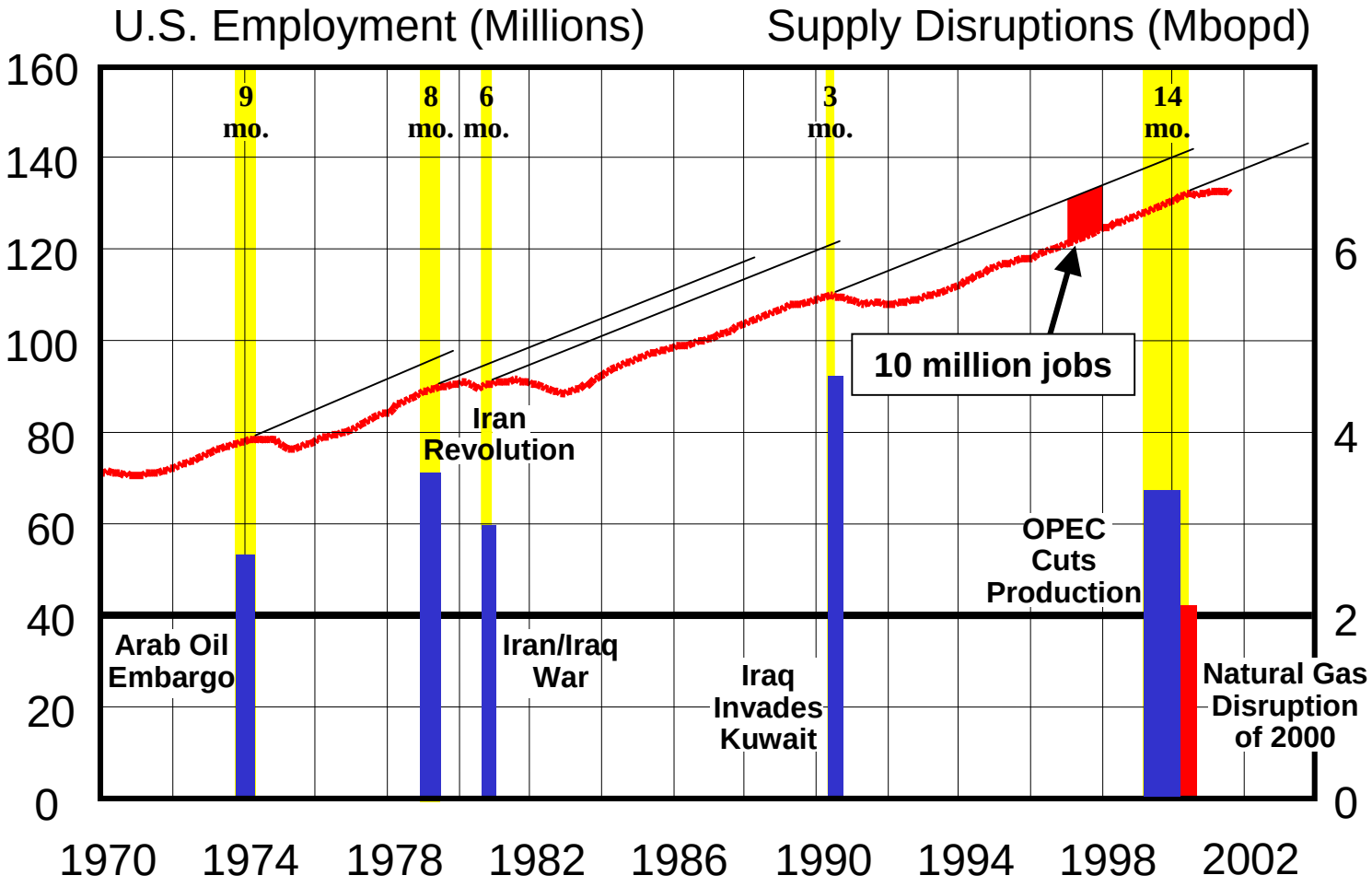


Source: EIA

U.S. Employment

- All negative job growth periods in OPEC era correlate directly to oil supply disruptions greater than 2 million barrels per day.
- Employment trend lines illustrate clearly that jobs lost are never regained.
- As economy transitions lower carbon fuels, natural gas infrastructure and not oil embargoes may pose the greatest threat of supply disruptions.
- U.S. natural gas supply and power shortages in 2000 exacerbated latest oil supply disruption.

U.S. Employment and Major Energy Supply Disruptions in OPEC Era



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U.S. Employment

- Last major energy disruption (1990) resulted in permanent loss of 10 million U.S. jobs.
- Latest energy supply disruption may ultimately result in 20 to 40 million jobs lost.
- Delaying action on energy situation may nominally cost 1 million U.S. jobs per month.

Alaska Employment Impact

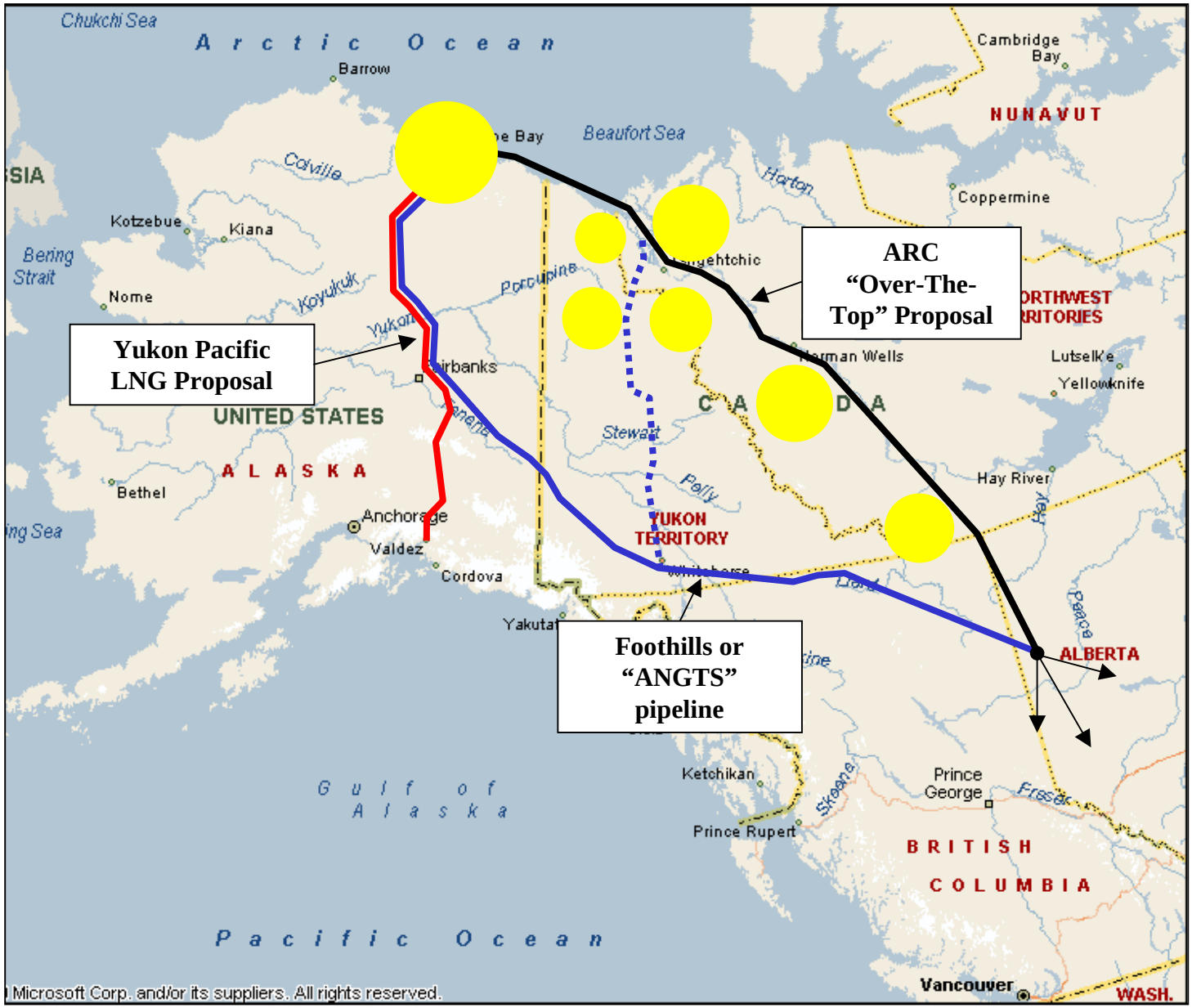
Scenario	Impact
• Mandate uneconomic pipeline, natural gas demand materializes	– 10 million jobs
• Mandate uneconomic pipeline, demand does not materialize	0 jobs
• Clarify requirements, allow market solution(s)	+225,000 jobs

Arctic Pipeline Direct Employment

• Production	5 Bcf per day
• Natural gas price	$2.50 per Mscf
• Direct contribution to GDP	$12 million per day
	$4.5 billion per year
• GDP per employee (U.S.)	$69,230
• Direct employment	66,000 jobs

- Alaska dynamic

Potential Alaska-Canada Natural Gas Pipeline Routes



Debate in Alaska

- Natural gas supply for Fairbanks/Anchorage
- Alaska construction jobs
- Environmental issues

- Concerns are poorly quantified, but opinions are strongly held.
- Alaska politicians are ready to take action, and have been for 20 years.

Excerpt from H.R. 4 (Passed August 1, 2001)

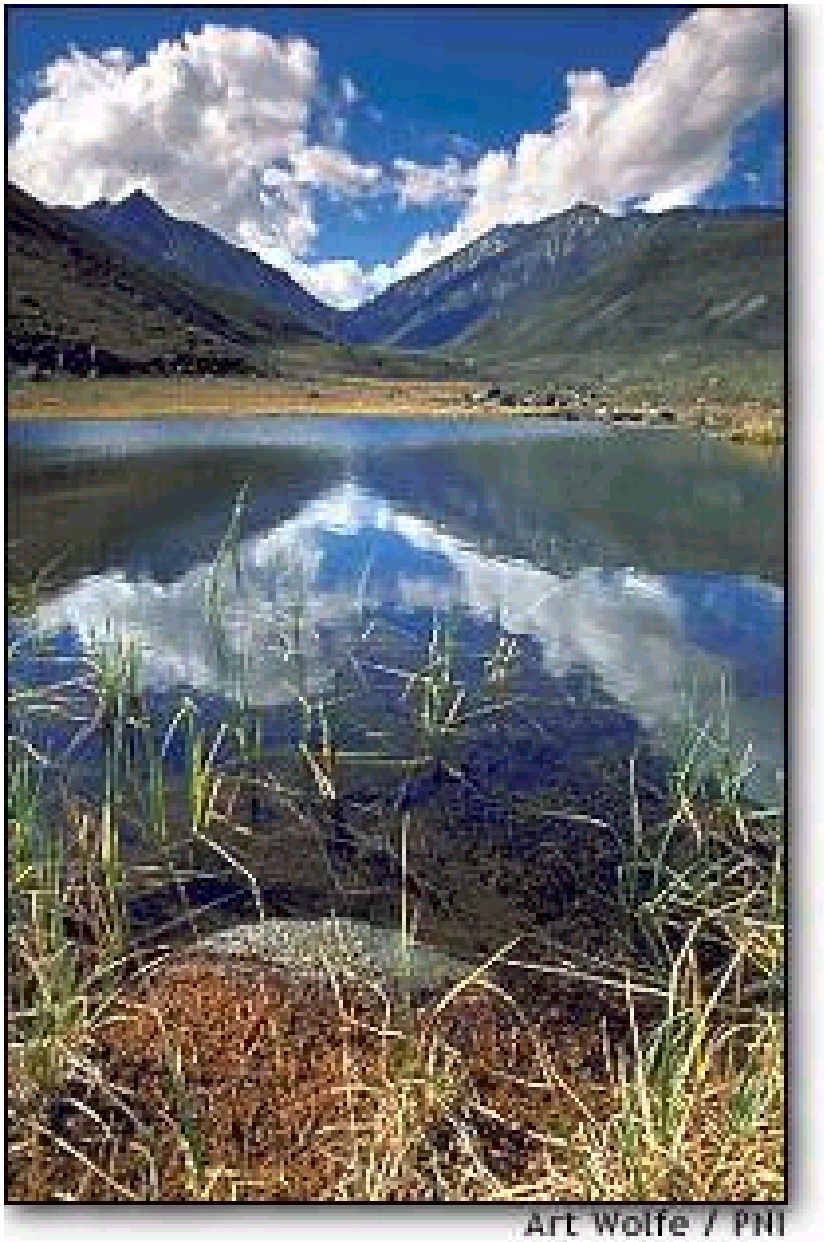
TITLE VII—PIPELINES

SEC. 801. PROHIBITION ON CERTAIN PIPELINE ROUTE.

No license, permit, lease, right-of-way, authorization or other approval required under Federal law for the construction of any pipeline to transport natural gas from lands within the Prudhoe Bay oil and gas lease area may be granted for any pipeline that follows a route that traverses—

(1) the submerged lands (as defined by the Submerged Lands Act) beneath, or the adjacent shoreline of, the Beaufort Sea; and

(2) enters Canada at any point north of 68 degrees North latitude.



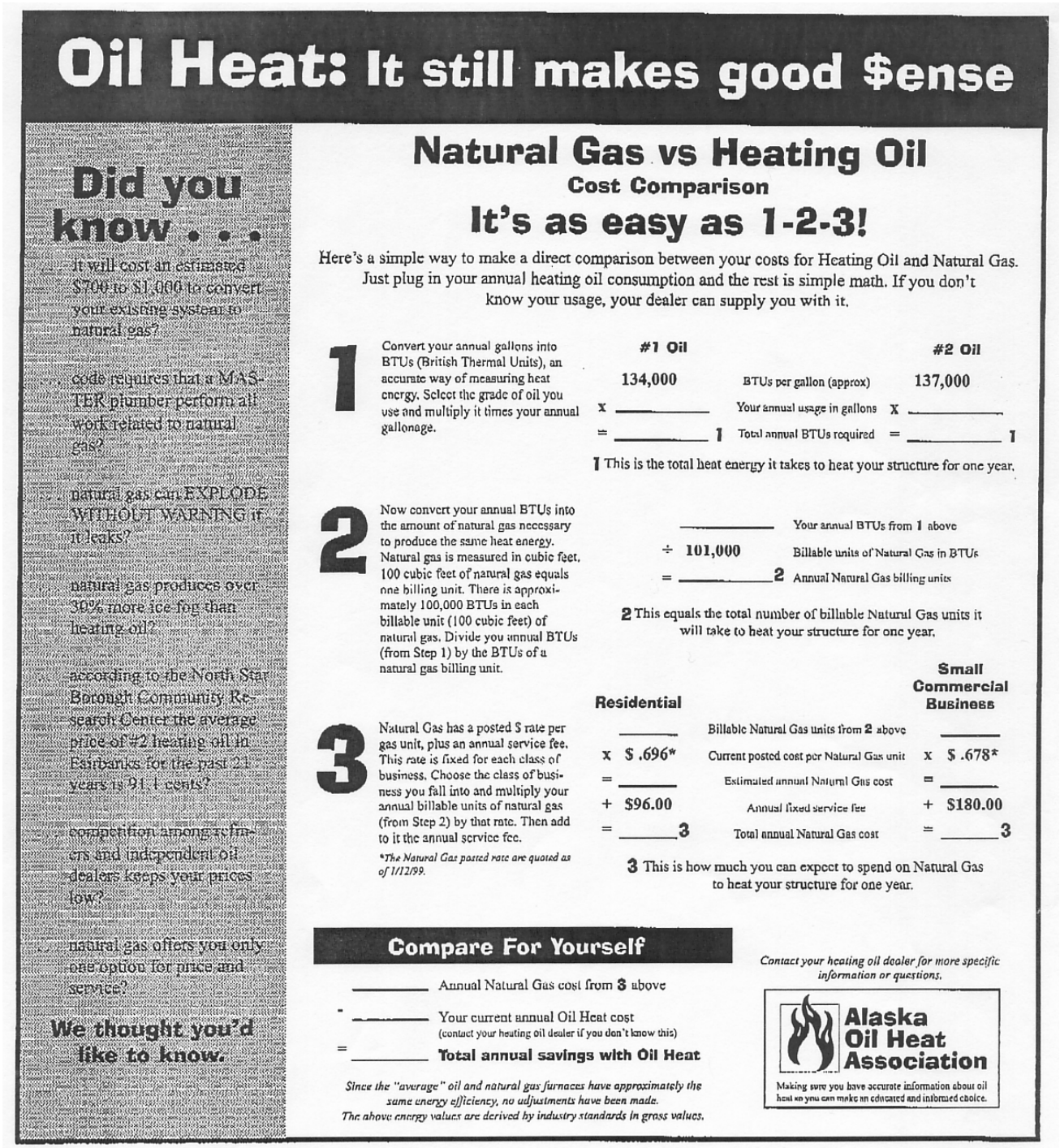
ANWR MSNBC

The Real ANWR in Summer

Oligney and Longbottom, Nov. 2001

Fairbanks Natural Gas LDC is Forming

- Fairbanks Natural Gas, LLC
- Alaska minority owners, Houston funding
- Built LNG facility in Wasilla
- Adding 10 miles of pipe per summer in Fairbanks
- 400 customers now
- $7 per Mscf at the burner tip
- Expect to ship 25,000 gallons per day this winter (2 MMscf/d)
- Selling the LDC is clearly the endgame



Oil Heat: It still makes good $ense

Did you know . . .

. . . it will cost an estimated $700 to $1,000 to convert your existing system to natural gas?

. . . code requires that a MASTER plumber perform all work related to natural gas?

. . . natural gas can EXPLODE WITHOUT WARNING if it leaks?

. . . natural gas produces over 30% more ice fog than heating oil?

. . . according to the North Star Borough Community Research Center the average price of #2 heating oil in Fairbanks for the past 21 years is 91.1 cents?

. . . competition among refiners and independent oil dealers keeps your prices low?

. . . natural gas offers you only one option for price and service?

We thought you'd like to know.

Natural Gas vs Heating Oil

Cost Comparison

It's as easy as 1-2-3!

Here's a simple way to make a direct comparison between your costs for Heating Oil and Natural Gas. Just plug in your annual heating oil consumption and the rest is simple math. If you don't know your usage, your dealer can supply you with it.

1 Convert your annual gallons into BTUs (British Thermal Units), an accurate way of measuring heat energy. Select the grade of oil you use and multiply it times your annual gallonage.

#1 Oil		#2 Oil
134,000	BTUs per gallon (approx)	137,000
x _____	Your annual usage in gallons	x _____
= _____ 1	Total annual BTUs required	= _____ 1

1 This is the total heat energy it takes to heat your structure for one year.

2 Now convert your annual BTUs into the amount of natural gas necessary to produce the same heat energy. Natural gas is measured in cubic feet. 100 cubic feet of natural gas equals one billing unit. There is approximately 100,000 BTUs in each billable unit (100 cubic feet) of natural gas. Divide you annual BTUs (from Step 1) by the BTUs of a natural gas billing unit.

_____	Your annual BTUs from **1** above
÷ 101,000	Billable units of Natural Gas in BTUs
= _____ 2	Annual Natural Gas billing units

2 This equals the total number of billable Natural Gas units it will take to heat your structure for one year.

3 Natural Gas has a posted $ rate per gas unit, plus an annual service fee. This rate is fixed for each class of business. Choose the class of business you fall into and multiply your annual billable units of natural gas (from Step 2) by that rate. Then add to it the annual service fee.

**The Natural Gas posted rate are quoted as of 1/12/99.*

Residential		Small Commercial Business
_____	Billable Natural Gas units from **2** above	_____
x $ .696*	Current posted cost per Natural Gas unit	x $ .678*
= _____	Estimated annual Natural Gas cost	= _____
+ $96.00	Annual fixed service fee	+ $180.00
= _____ 3	Total annual Natural Gas cost	= _____ 3

3 This is how much you can expect to spend on Natural Gas to heat your structure for one year.

Compare For Yourself

_____ Annual Natural Gas cost from **3** above

\- _____ Your current annual Oil Heat cost
(contact your heating oil dealer if you don't know this)

= _____ **Total annual savings with Oil Heat**

Since the "average" oil and natural gas furnaces have approximately the same energy efficiency, no adjustments have been made.
The above energy values are derived by industry standards in gross values.

Contact your heating oil dealer for more specific information or questions.

Alaska Oil Heat Association

Making sure you have accurate information about oil heat so you can make an educated and informed choice.

- **Heating oil jobbers in Fairbanks upset by new natural gas infrastructure (ad at left).**
- **Refiners (e.g. Williams) don't care, would rather focus on making jet fuel anyway.**

Oligney and Longbottom, Nov. 2001

Natural Gas Supply for Fairbanks

Owners looking to…

- Prudhoe Bay (ANGTS pipeline)
- Nenana (conventional)
- Coalbed methane ("research")

We suggest…

- Dedicated pipeline from North Slope maybe, but hard to justify (est. $400 million/Mustang, $1 billion/ARC)
- Nenana or coalbed methane potential limited, maybe enough
- Cook Inlet supply most likely, LNG for now, then by pipeline
- Total ultimate market just 100 MMscf/day

- A new economic model for development of Arctic natural gas infrastructure

Summary of Results from Other Studies—AKA "A Pig's Breakfast"

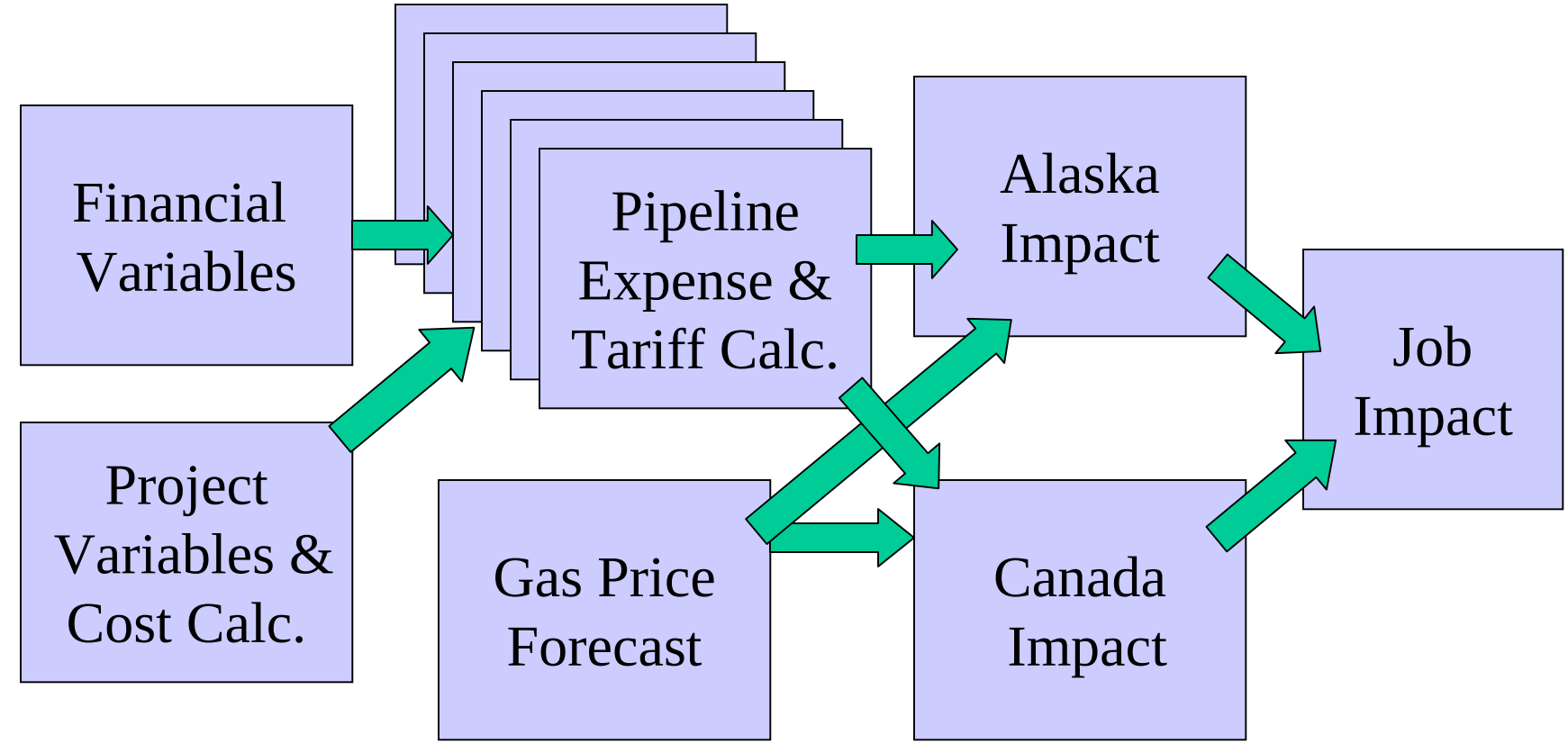
	CERI	CERI	AGPPT	AGPPT	Purvin & Gertz	Purvin & Gertz	INGAA	INGAA
Route	Northern	Southern	Northern	Southern	Northern	Southern	Northern	Southern
Miles	1218	2450	1803	2139			1220	2725
Size (inch)	42/48	36/48/30	52	52			42/2x30	42/48/30
Alaska Capacity (Bcf/d)	2.5	2.5	4	4	2.5	4.0	4	4
Canadian Capacity (Bcf/d)	1.6	1.6	0.8	0.8	1.5	0	2	2
Pipeline Cost	$5.570B CAD	$8.100B CAD	$7.7B	$11.3B	$7.1B	$12.0B	$7.4B	$10.3B
Tariff per mmBtu	$0.53* CAD/gj	$1.26* CAD/gj	$1.29	$1.61	$1.14	$1.41	$0.53†	$0.74†
Gas Price			$3.00	$3.00	$2.59	$2.59		
Netback to Alaska			$0.93**	$0.61**	$0.77	$0.50		

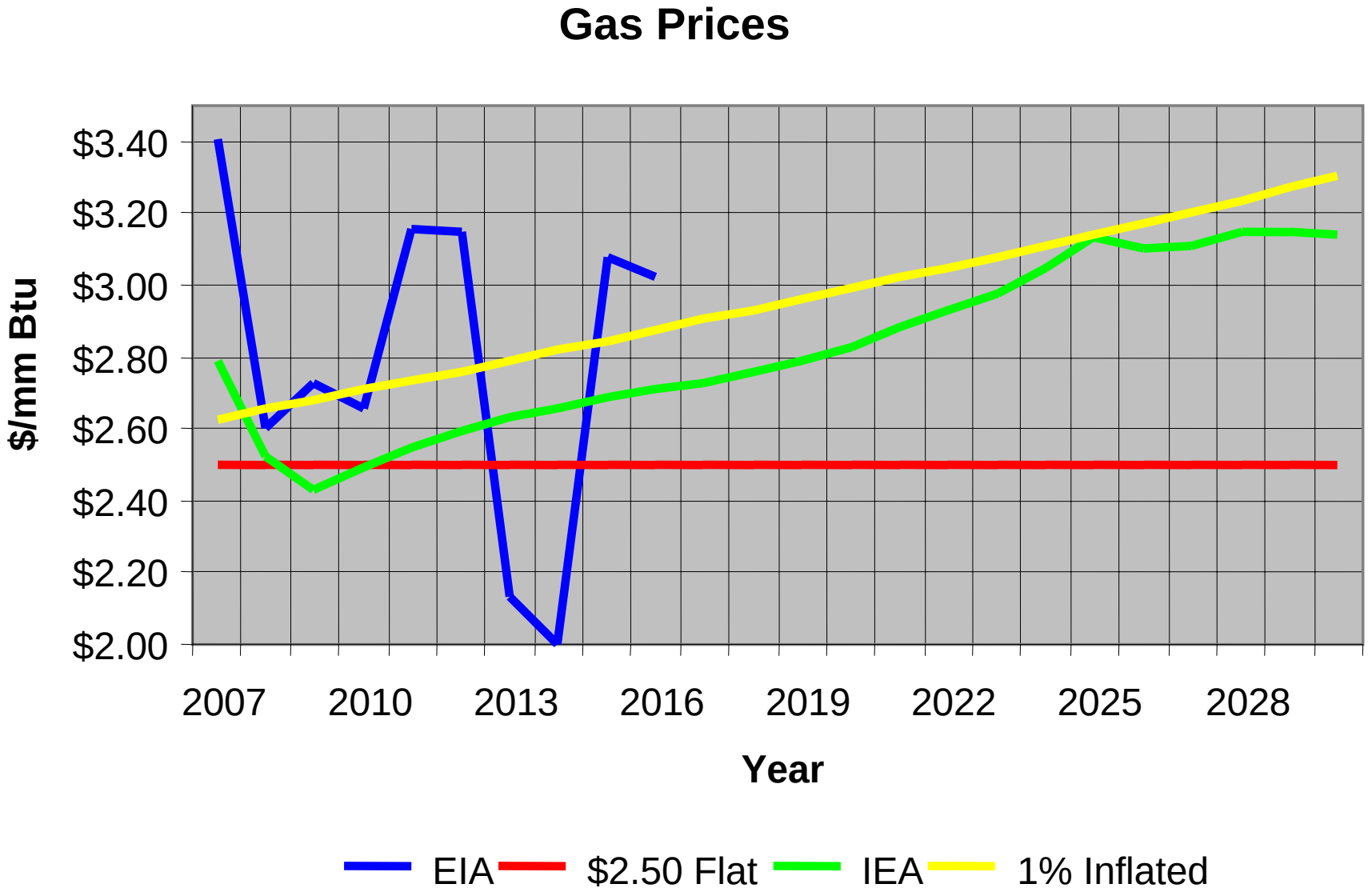
*Tariff given for only Canadian gas in Canadian dollars with no mention of gas conditioning cost or its impact on tariff

** No experience with 52" high pressure gas lines, 4.8 bcf/d requires new takeaway capacity with notional $0.78/mcf toll

† No mention of gas conditioning plant cost, 6 bcf/d rate not compatible with 42" line unless pressure extreme

Our Modeling Process

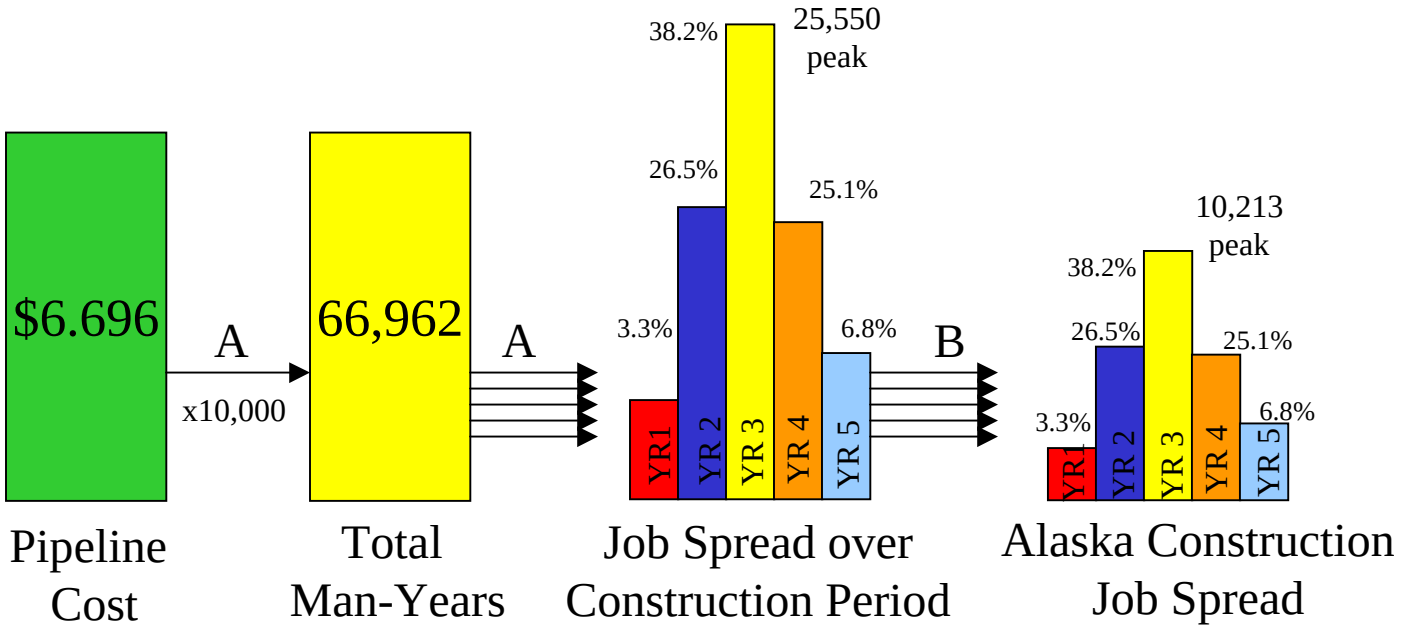



Gas Prices
$/mm Btu
$3.40
$3.20
$3.00
$2.80
$2.60
$2.40
$2.20
$2.00
2007
2010
2013
2016
2019
2022
2025
2028
Year
EIA
$2.50 Flat
IEA
1% Inflated

Key Assumptions

- Pipeline life is 25 years
- Interest on debt is 7.5%
- Expected ROE is 15%
- Gas conditioning plant costs are included in pipeline tariff
- Annual O&M cost for pipeline is 2.2% of capital cost
- Annual O&M for gas conditioning plant is 5.4% of plant capital cost
- Pipeline load factors in years 1/2/3 are 85/90/95 percent
- Canadian federal and provincial income taxes are 37%
- U.S. federal corporate income tax rate is 35%
- Alaska state corporate income tax is 9.4%

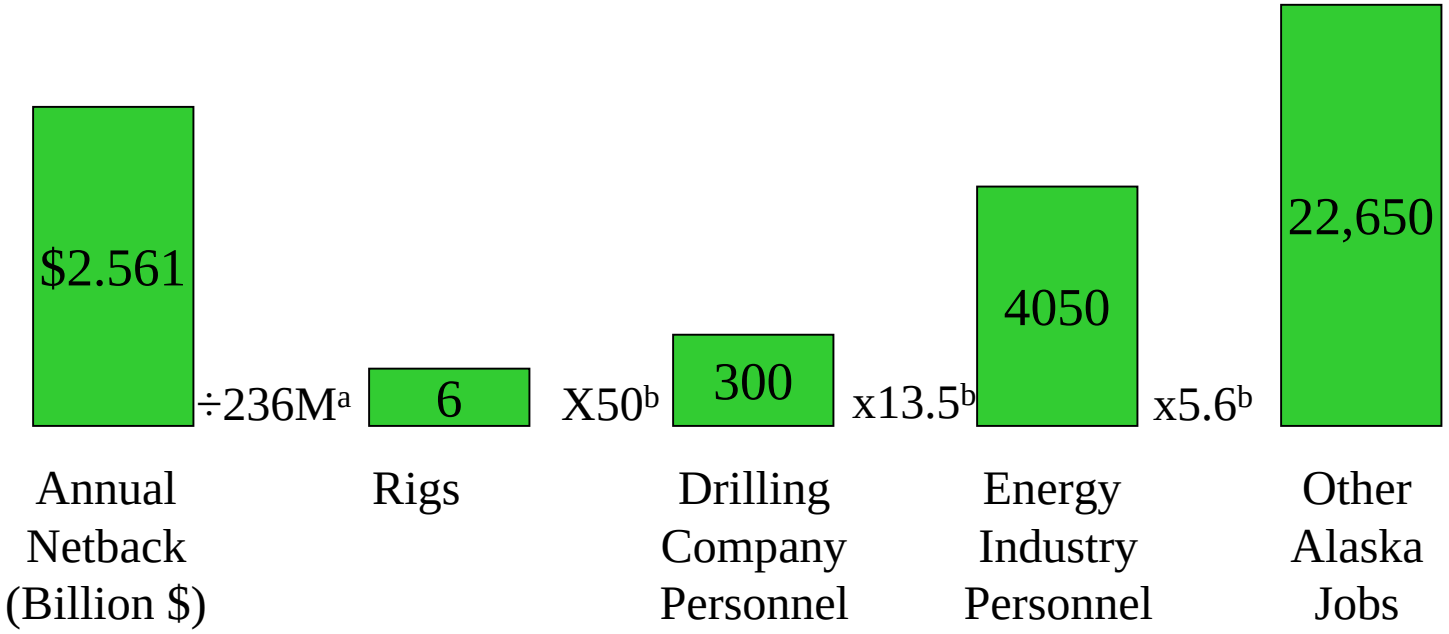
Drivers Used in Calculation of Alaska Construction Jobs



A. 10,000 man-years labor required per billion U.S. dollars un-inflated capital cost with distribution over 5 years, based on TAPS job and capital history as reported by Alyeska Pipeline and recent reports by Alaska Gas Producer Pipeline Team

B. Alaskan and Canadian jobs split based on cost incurred within each state/country (cf. modeling results)

Drivers Used to Calculate Employment Impact



a. Based on Alaska Oil and Gas Association report, "Economic Impact of the Oil and Gas Industry on Alaska." Also reference producer spending and Baker Hughes rig count from Alaska during same period as reported on internet.

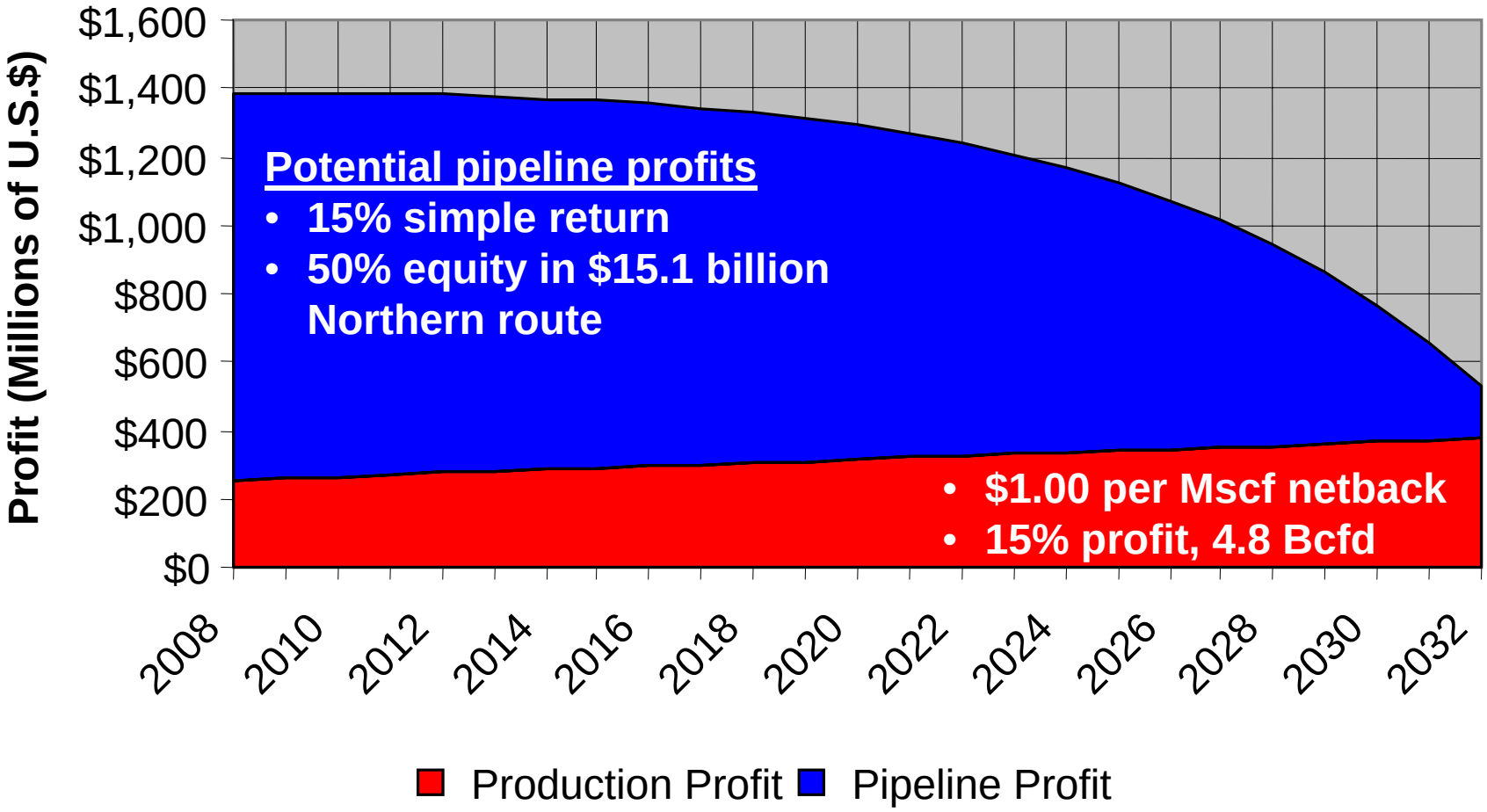
b. Based on employment statistics from Alaska Department of Labor.

Southern Route Not Economic—Even at $3.00

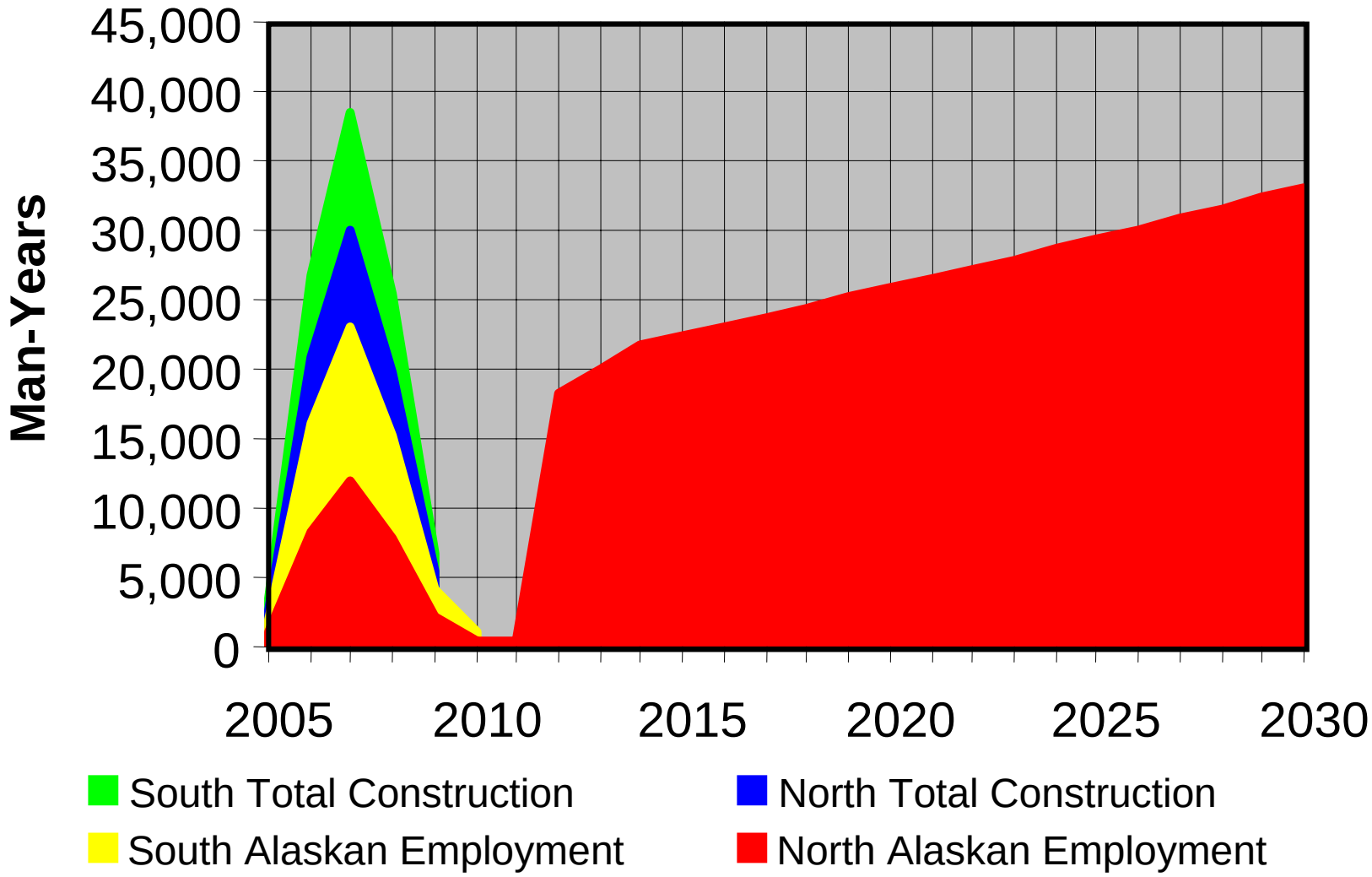
	Southern	Northern
Capital Cost (Billions)*	$10,906	$8,500
Length (miles)	2139	1700
Alaska Capacity (Bcf/d)	4.0	4.0
Canada Capacity (Bcf/d)	0	0
Pipeline Size (inches)	42	42
Tariff to Lower 48*	$2.20	$1.91
Tariff to Alberta*	$1.48	$1.19
Assumed Gas Price	$3.00	$3.00
Netback to Producer ($/mcf)	$0.80	$1.09

* Includes gas conditioning plant

Maybe the producers want more than a $1.00 netback



Which Route Creates Most Permanent Jobs for Alaskans?



Basic Comparison of Northern and Southern Routes

Forcing the Southern route…

- Gains 30,378 man-years of construction work.
- Loses 124,811 man-years of state-wide employment, including a loss of 27,262 man-years of high paying energy sector jobs.
- Trades permanent jobs for Alaskans in return for 3 years of seasonal construction jobs filled largely by out-of-state commuters.
- Runs the risk that no gas pipeline is built for another 15-20 years to access Alaskan reserves.

MIKE & RON www.ColorOfOil.com

A New Strategy

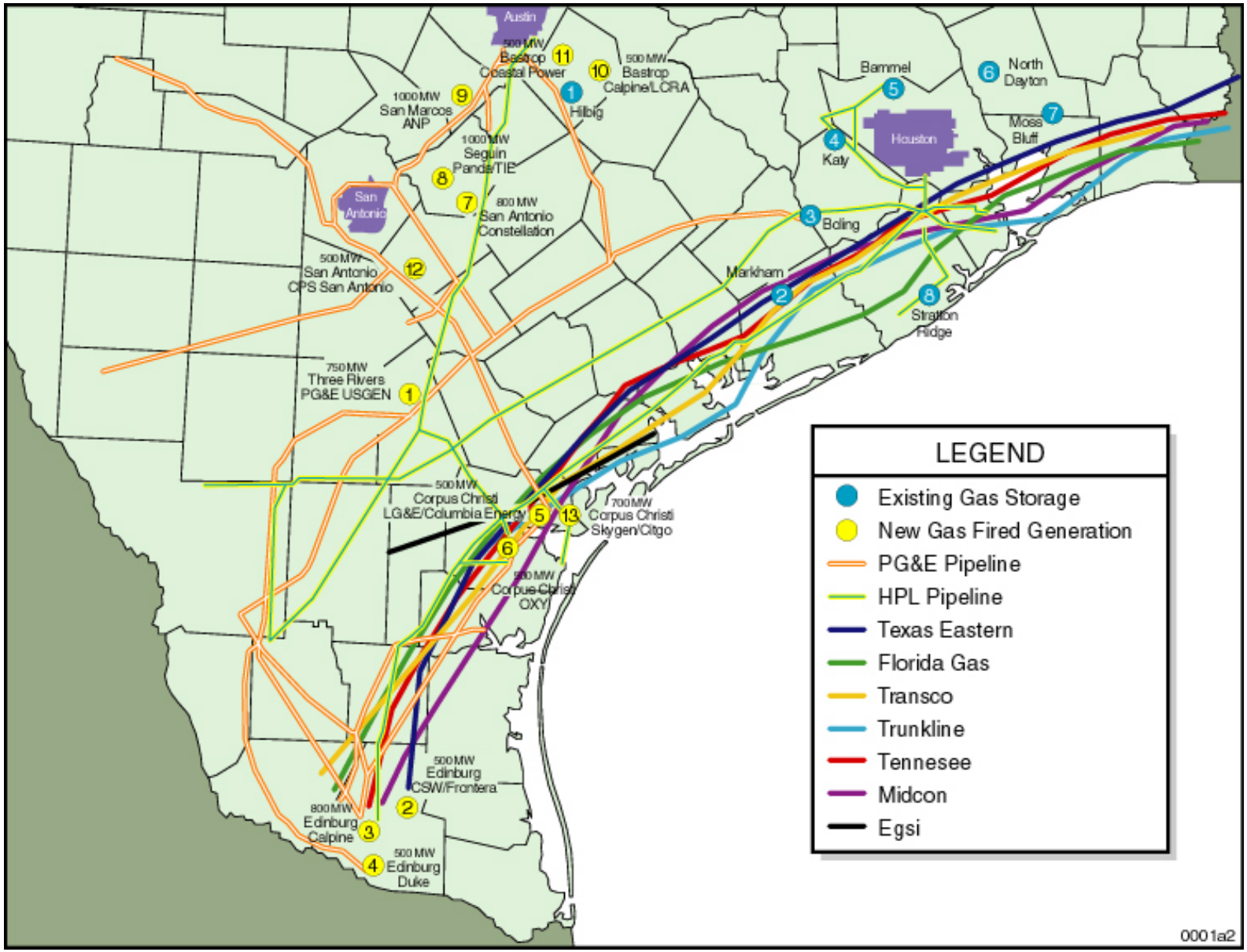
- Use a staged development approach to address the price and environmental/regulatory risk with reduced emphasis on financial variables.

"Opportunity cost is highly sensitive to uncertainty over future value of a project. New economic conditions that may affect the perceived riskiness of future cash flows can have a large impact on investment spending… Much larger than interest rates. Viewing investment as an option puts greater emphasis on the role of risk and less emphasis on interest rates and other financial variables." – *Harvard Business School Press*

Strategy

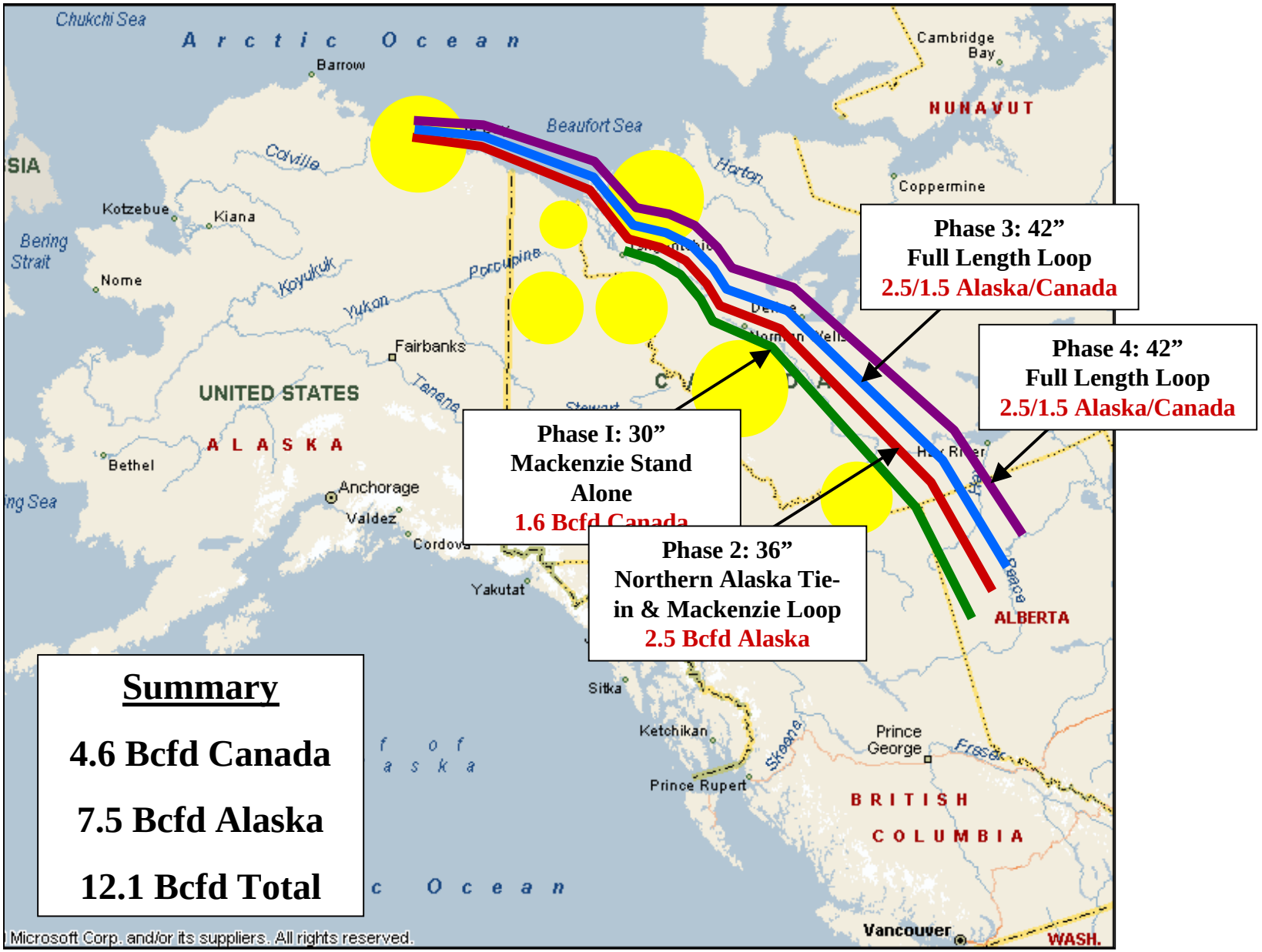
1. Access arctic gas in multiple stages.
2. Expand deliverability target to 12 Bcf/d; Arctic reserves are sufficient.
3. Finance Phase I with 100% debt in bite-size Canada-only line that squarely attacks producer risk.

What a market-driven pipeline corridor looks like.



Oligney and Longbottom, Nov. 2001

Multiple Pipeline Stages Used to Access Arctic Gas



Oligney and Longbottom, Nov. 2001

The Value of Project Staging

Phase 1: 30”
Mackenzie Stand Alone

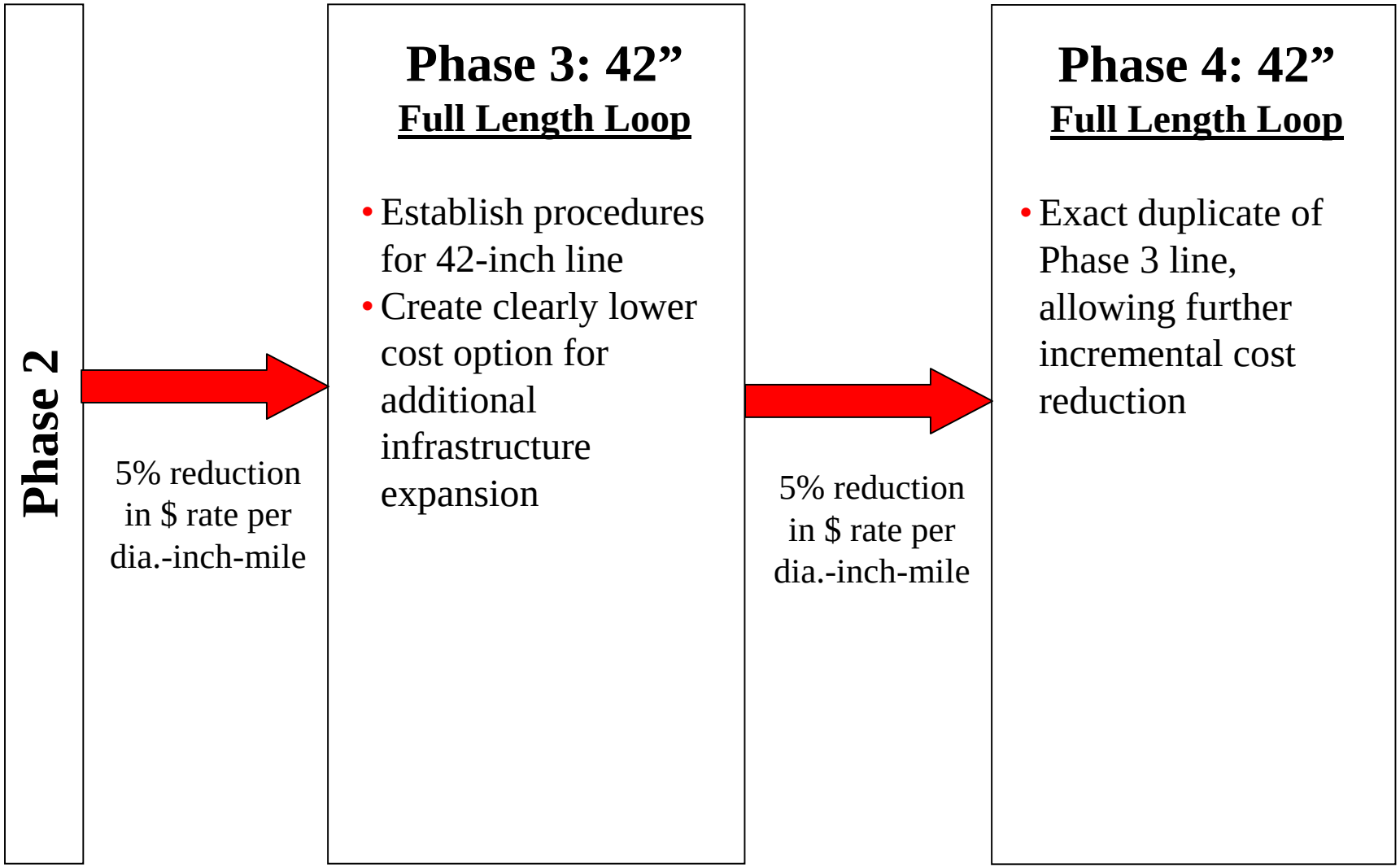
- Establish M. Delta ROW
- Clear Canadian regulatory path
- Establish roads, camps, route details for Mackenzie corridor
- Identify and solve real M. Delta technical challenges
- Create clearly lower cost option for additional infrastructure expansion
- Defer larger capital deployment until more data available on gas price/demand trends and risk is reduced

15% reduction in $ rate per dia.-inch-mile

Phase 2: 36”
Northern Alaska Tie-in & Mackenzie Loop

- Establish Beaufort Sea ROW
- Clear U.S. regulatory path
- Establish roads, camps, route details for northern tie-in
- Identify and solve real arctic offshore technical challenges
- Create clearly lower cost option for additional infrastructure expansion
- Defer larger capital deployment until more data available on gas price/demand trends and risk is reduced

The Value of Project Staging



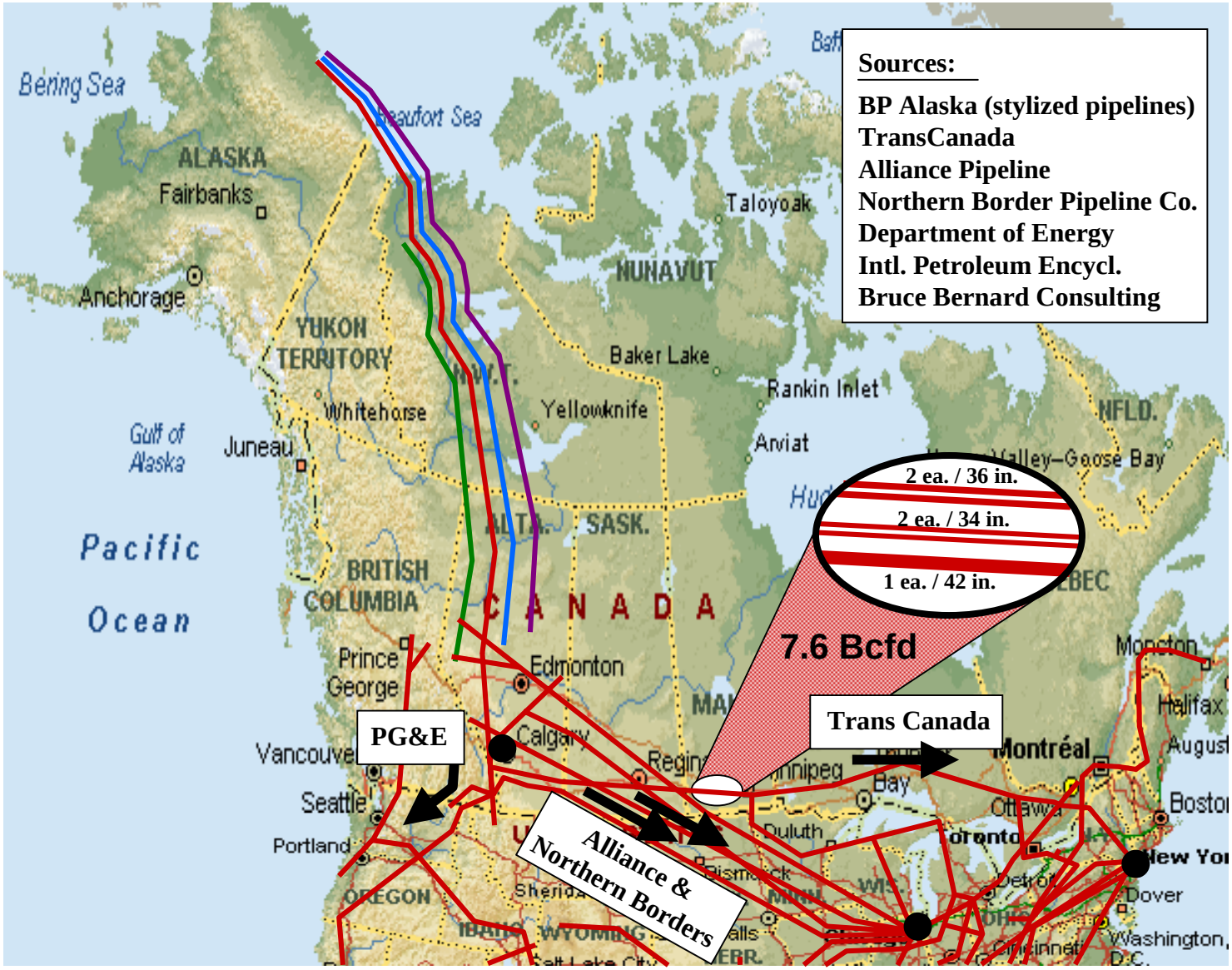
Model Results of Recommended Capacity Additions

	Mackenzie Only	Northern Tie-in + Loop	Full Length Loop	Full Length Loop
Capital Cost (Billion USD)	$3.353	$6.128	$8.326	$8.572
Length (miles)	1040	1700	1700	1700
Alaska Capacity (Bcf/d)	0	2.5	2.5	2.5
Canada Capacity (Bcf/d)	1.6	0	1.5	1.5
Size (inches)	30	36	42	42
Tariff Prudhoe to L48 ($/Mcf)	NA	$1.83	$2.22	$2.27
Tariff Mackenzie to L48 ($/Mcf)	$0.96	NA	$1.45	$1.50
Assumed Gas Price ($/Mcf)	$2.63	$2.71	$2.85	$2.93
Netback to Producers ($/Mcf)	$1.07	$0.88	$0.63	$0.66
Recommended On-line Date	2007	2010	2015	2018
Cumulative Capacity (Bcf/d)	1.6	4.1	8.1	12.1

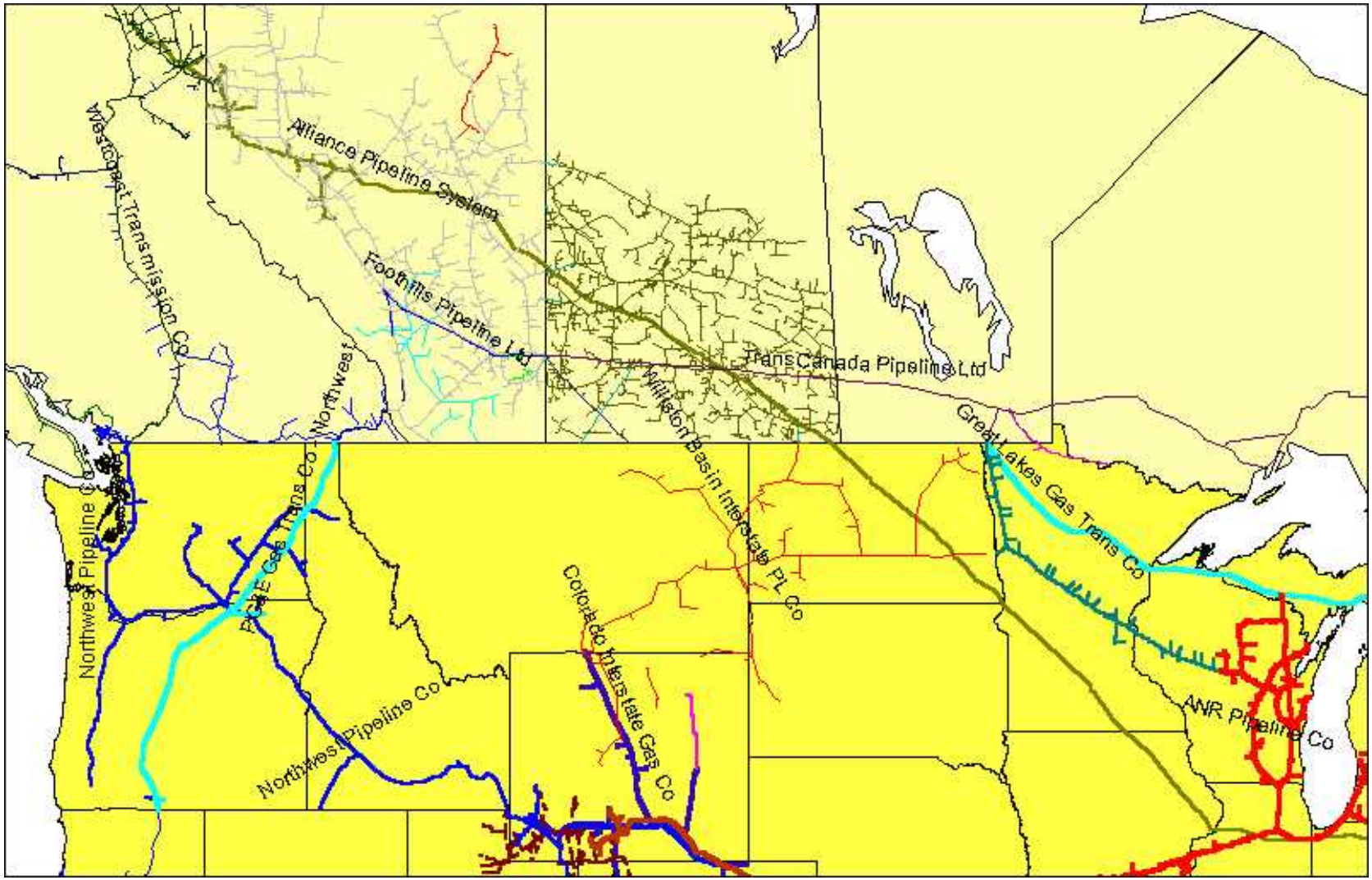
Model Results of Recommended Capacity Additions

	Alberta to Chicago Phase 1	Alberta to Chicago Phase 2
Capital Cost (Bil.)	$4.562	$4.886
Length (miles)	1857	1857
Capacity (Bcf/d)	4.0	4.0
Size (inches)	30	36
Tariff ($/Mcf)	$0.72	$0.77
Recommended On-line Date	2010	2015
Cumulative Capacity (Bcf/d)	4.0	8.0

Excess capacity from Alberta is estimated to be 1.5 to 2 Bcf/day today.

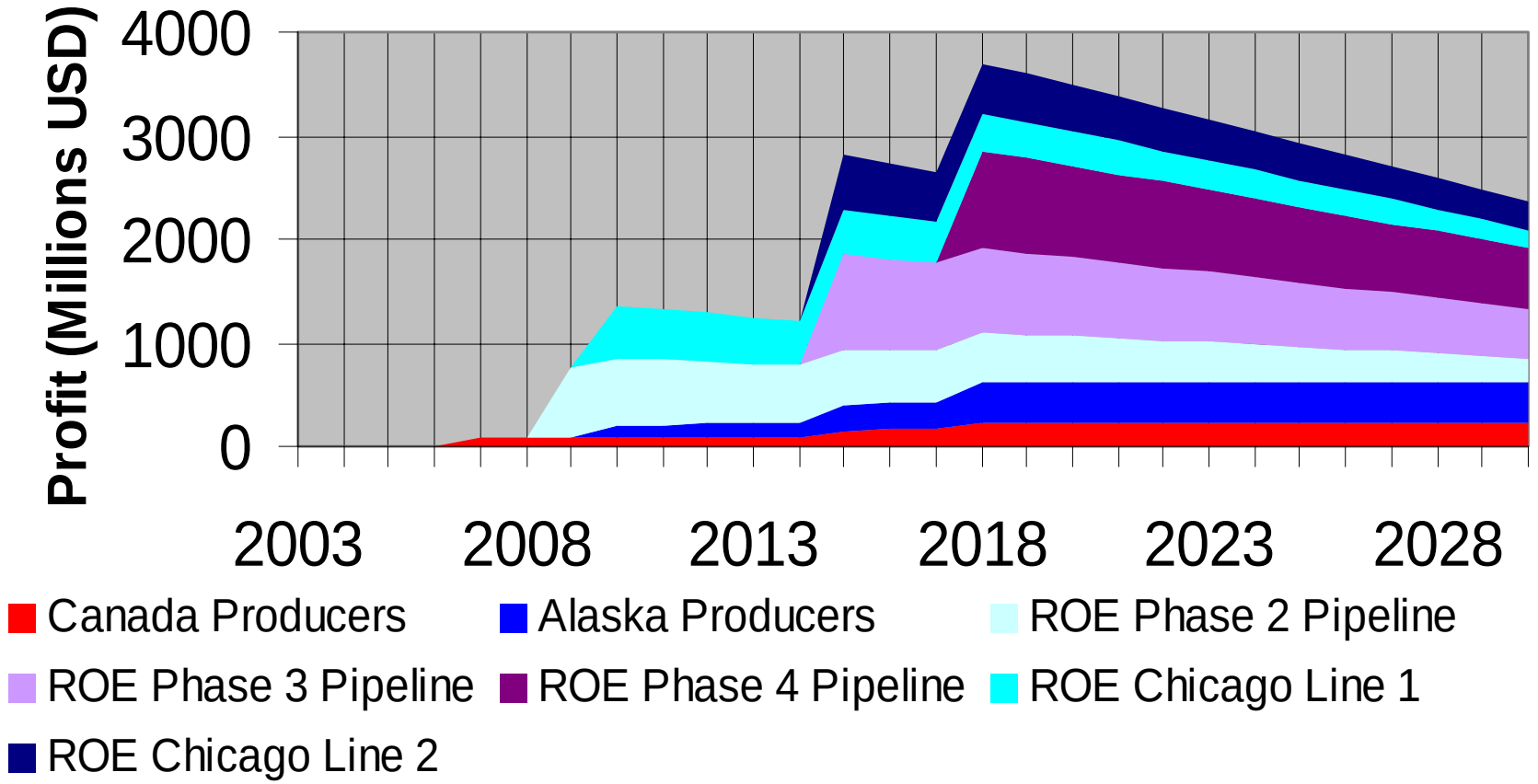


Detailed View of Pipeline Connections From Alberta

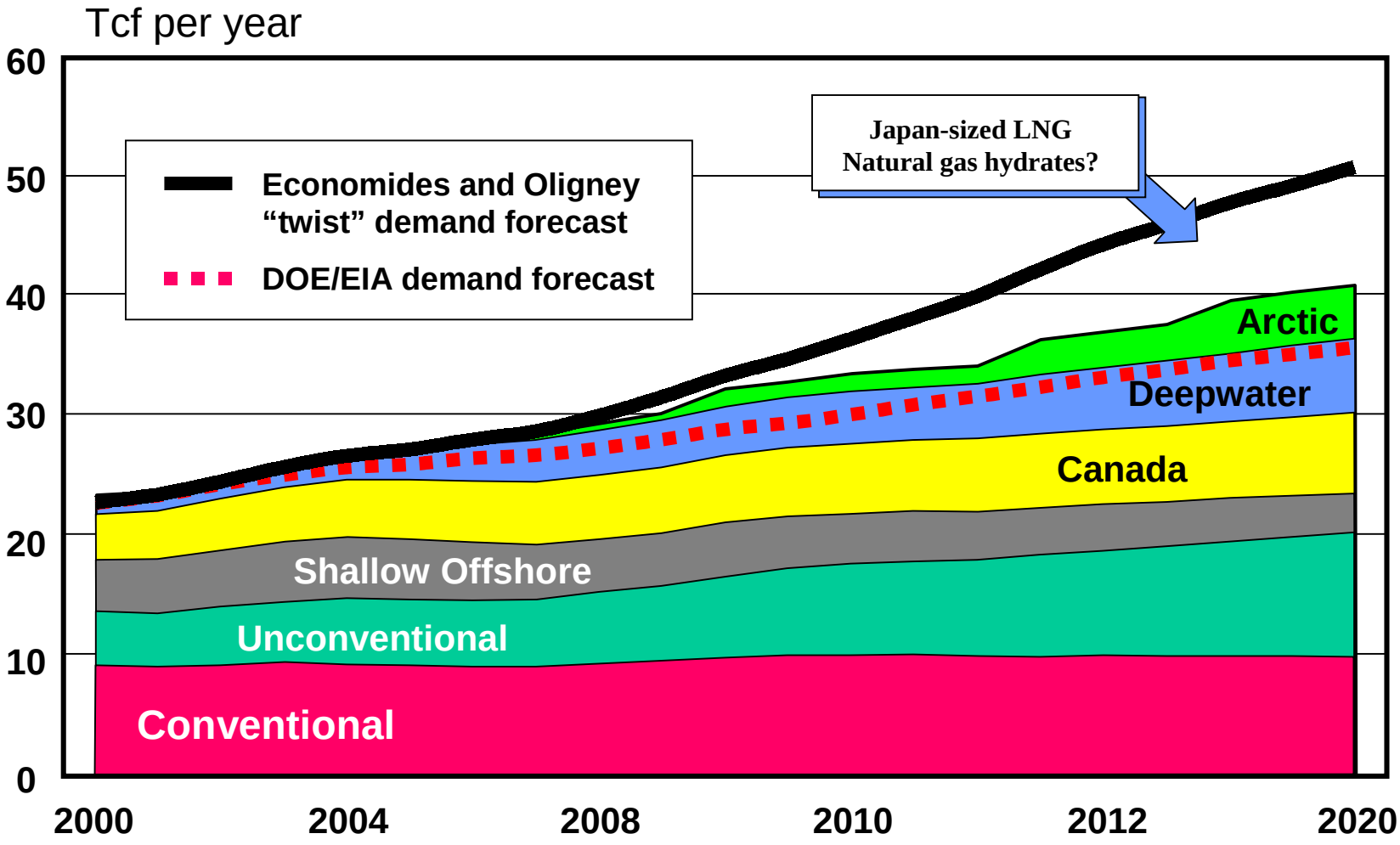


Source: EIA, plotted by Bruce Bernard Consulting

Where is the Profit if Gas Price allows 15% ROE investment and $1.00 netback?



U.S. Natural Gas Demand and Supply Sources



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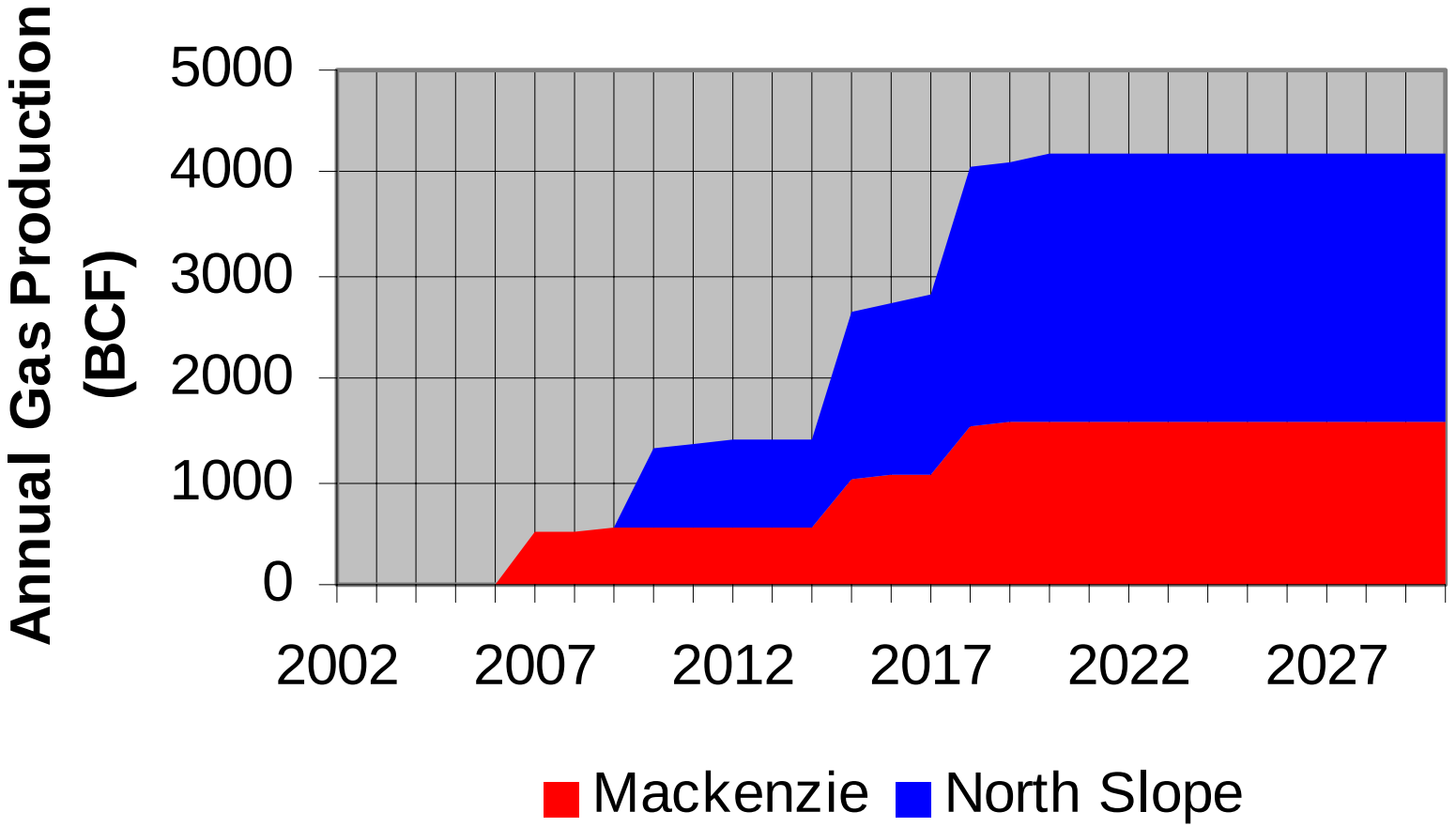
Proposed New Gas Availability for North America Markets

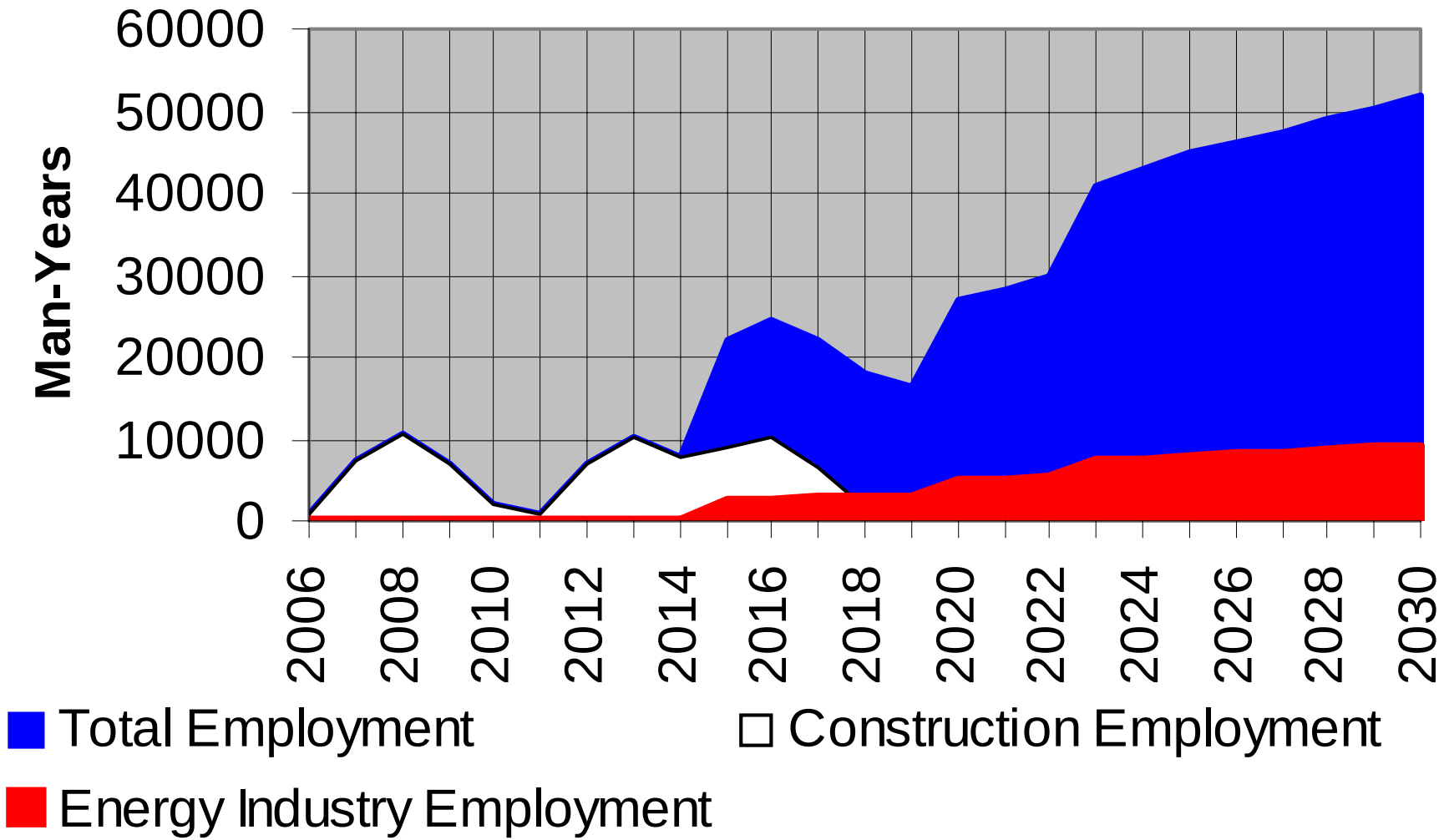


Oligney and Longbottom, Nov. 2001

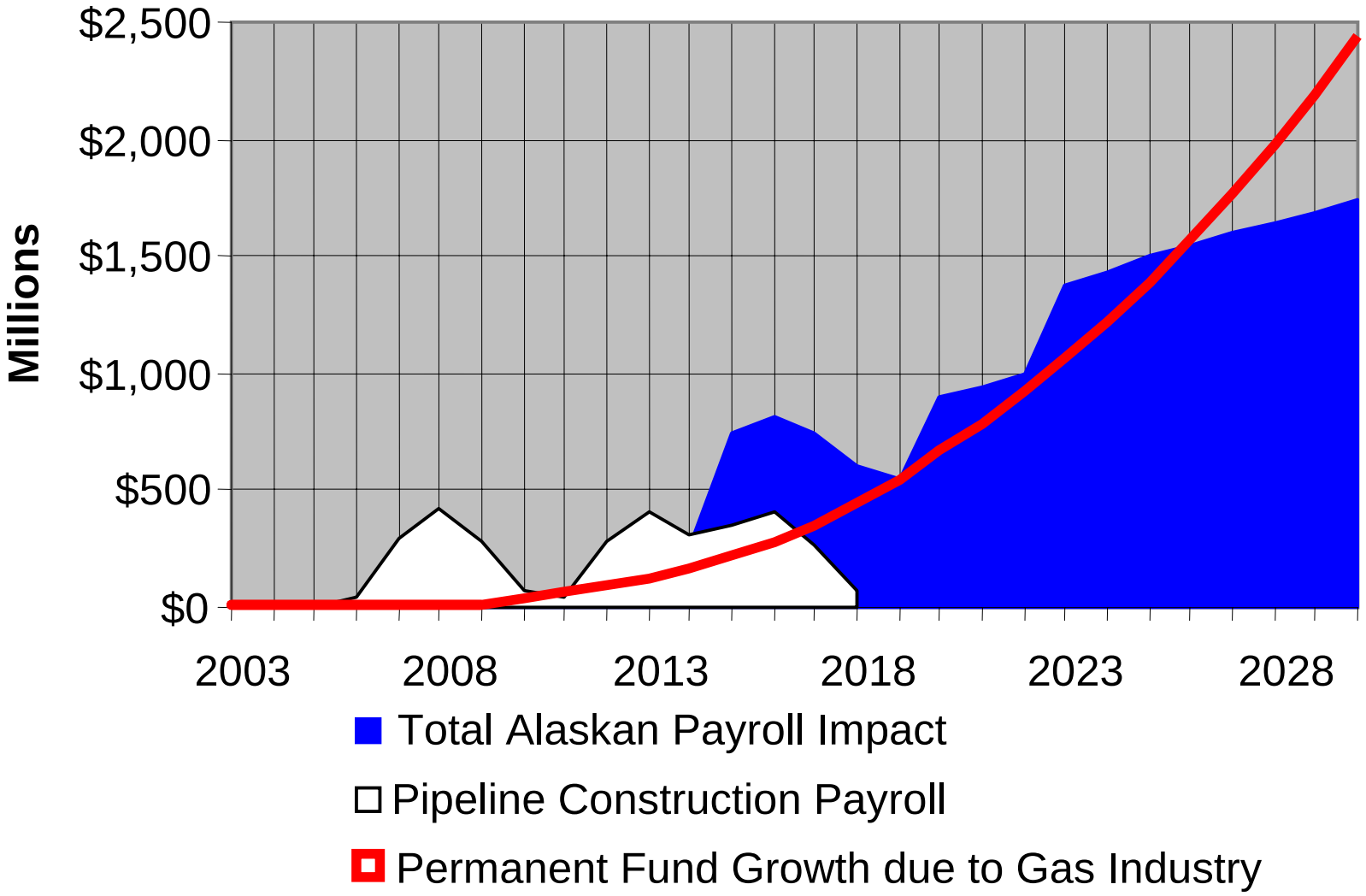
Alaska Gas Employment Impact

- Alaska pipeline construction peak employment in 2008 is 10,412
- Natural gas industry job impact by 2020 is 35,386 permanent jobs
- Gas industry impact in Alaska now to 2030 is 758,628 man-years

Alaska Gas Employment Impact



Alaska Gas Industry Impact in Dollars



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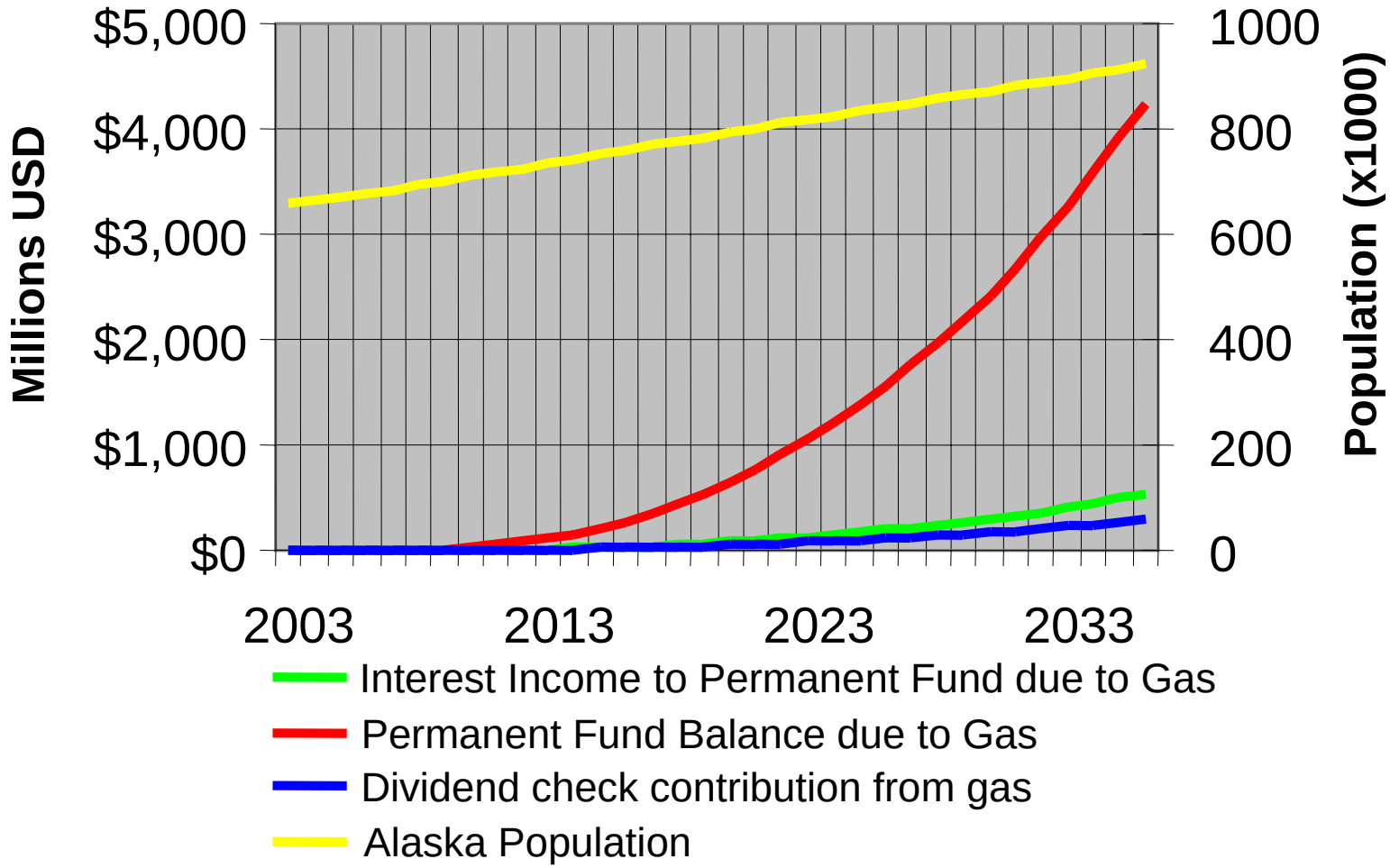
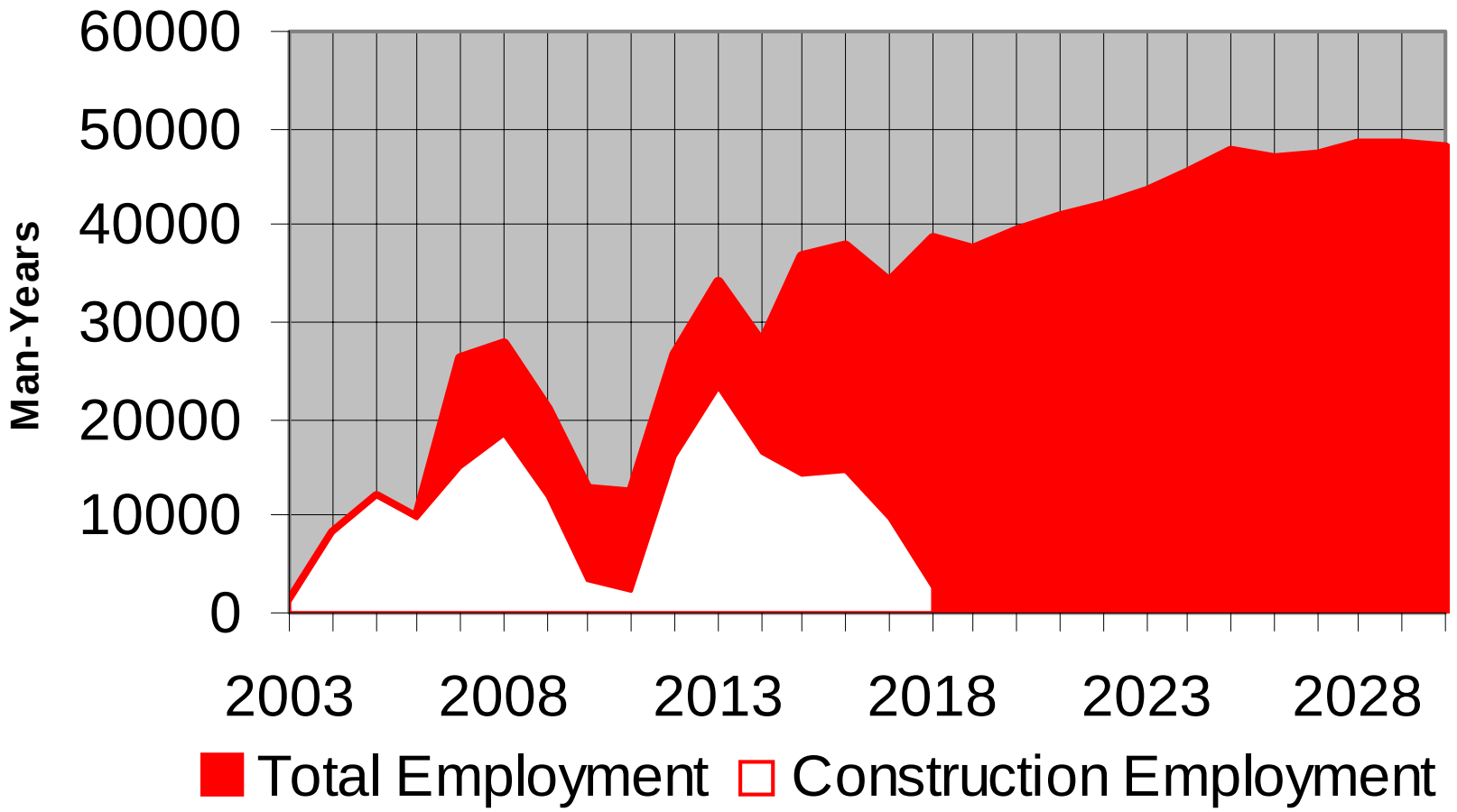
Gas Contribution to Permanent Fund



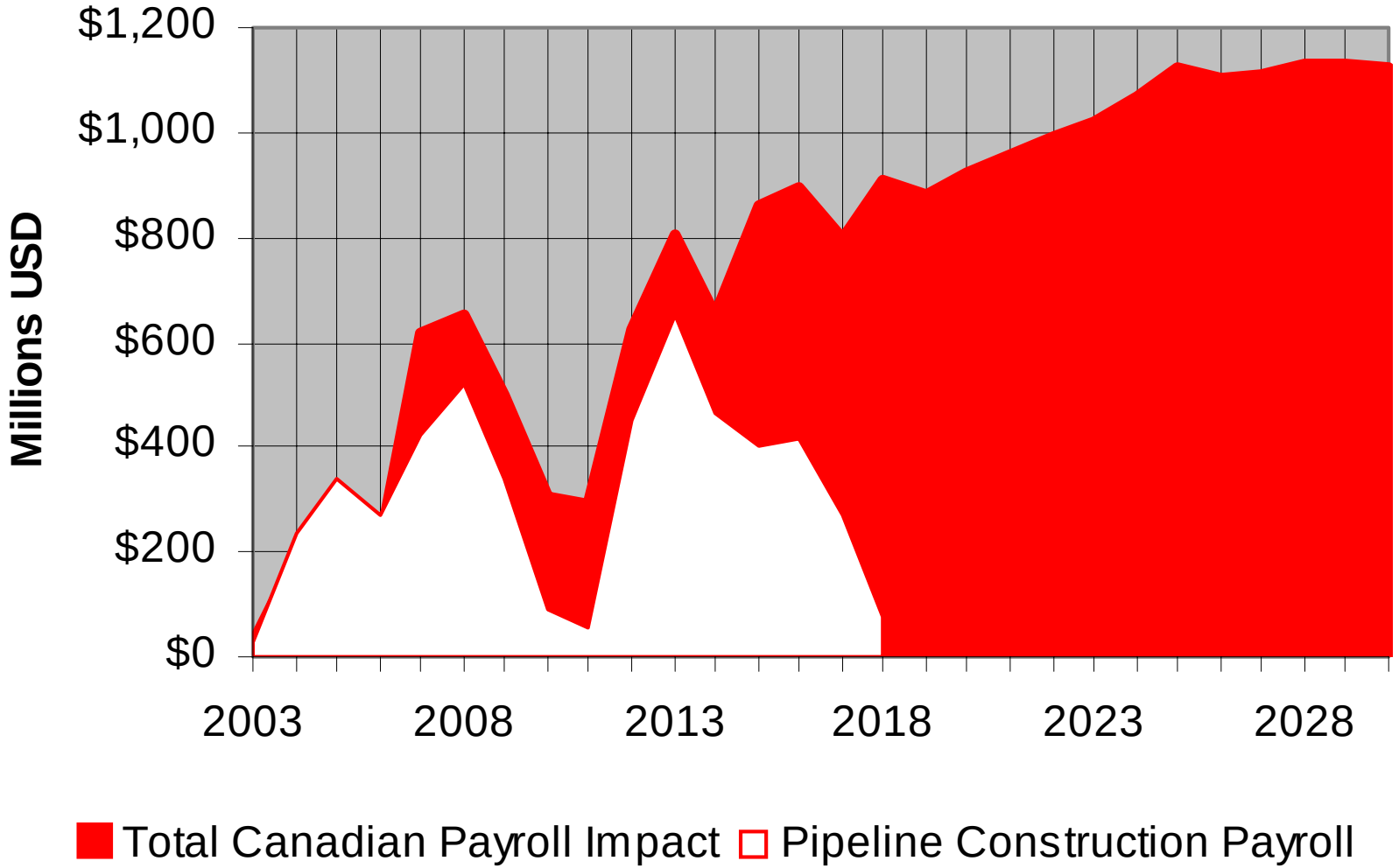
Canadian Gas Employment Impact

- Canadian pipeline construction peak employment in 2013 is 23,161 man-years
- Natural gas industry job impact by 2020 is 39,694 permanent jobs
- Gas industry impact in Canada now to 2030 is 901,802 man-years

Canadian Gas Employment Impact

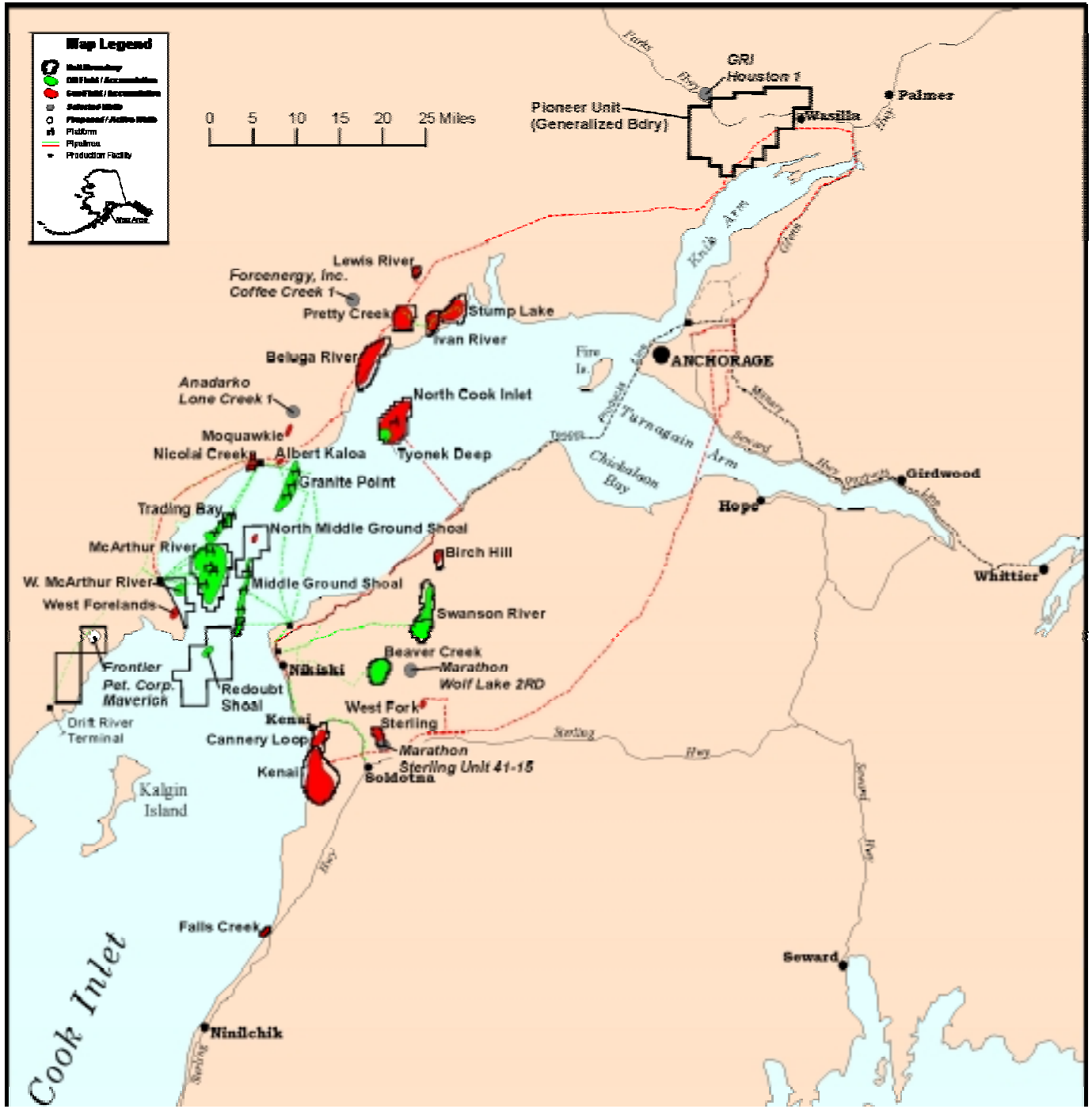


Canadian Gas Industry Impact in US Dollars



- Kenai development

Where will Alaska Source its energy if North Slope Gas Leaves the State via Northern Route?



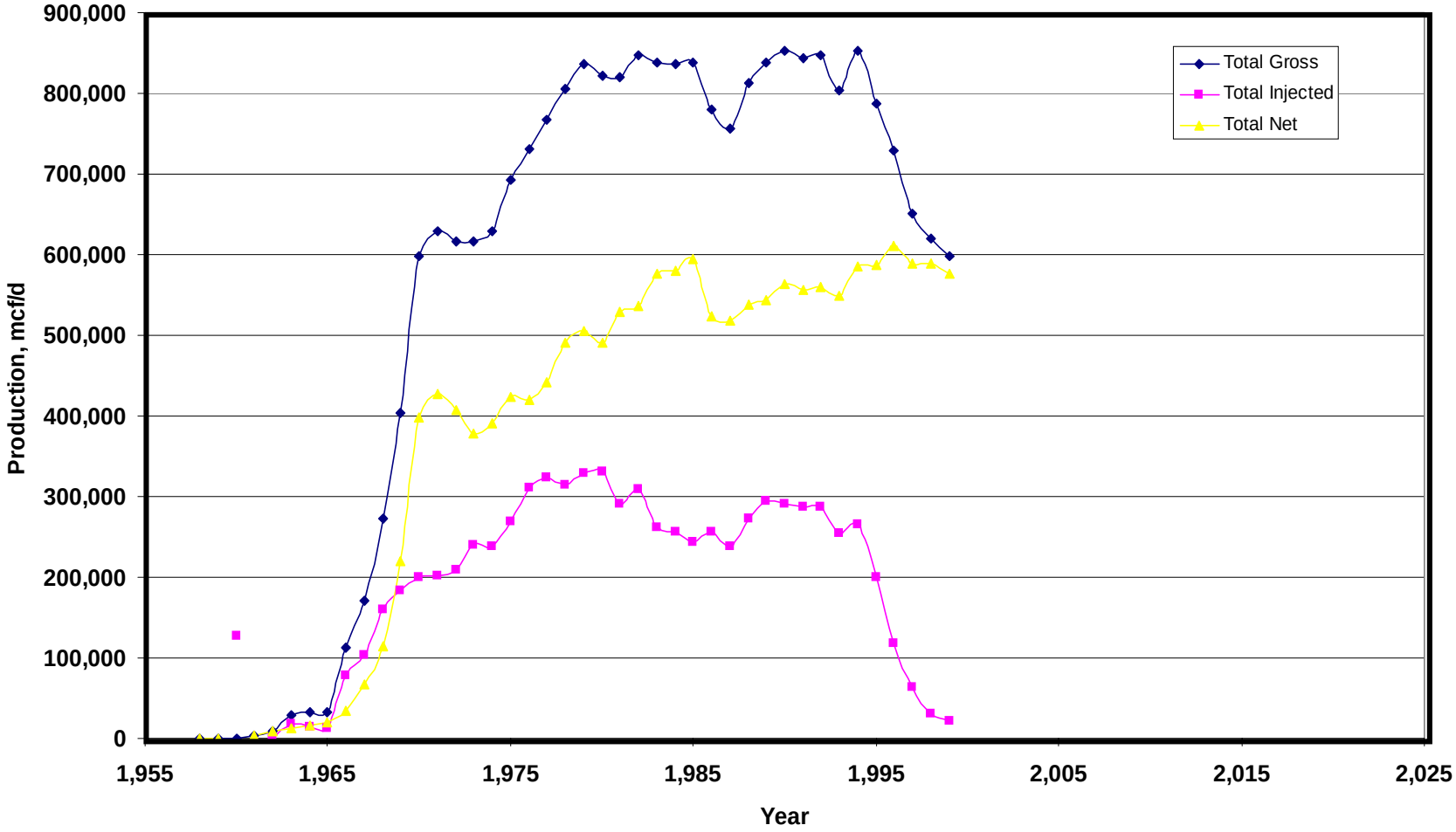
Cook Inlet Oil and Gas Activity, September 1999

Cook Inlet Reserves (1998)

• Original Reserves	8,468 Bcf
• Produced	5,493 Bcf
• Remaining	2,975 Bcf
• Estimated reserve life @ 214 Bcf/year	13 years (thru 2011)
• Undiscovered Recoverable	7,720 Bcf

Source: MMS

Cook Inlet Production History



Cook Inlet Consumption

- LNG Exports 34%
- Ammonia/Urea 24%
- Electrical Power 18%
- Gas Utilities 13%
- Field Operations 8%
- Miscellaneous 3%

Source: Anchorage Economic Development Council

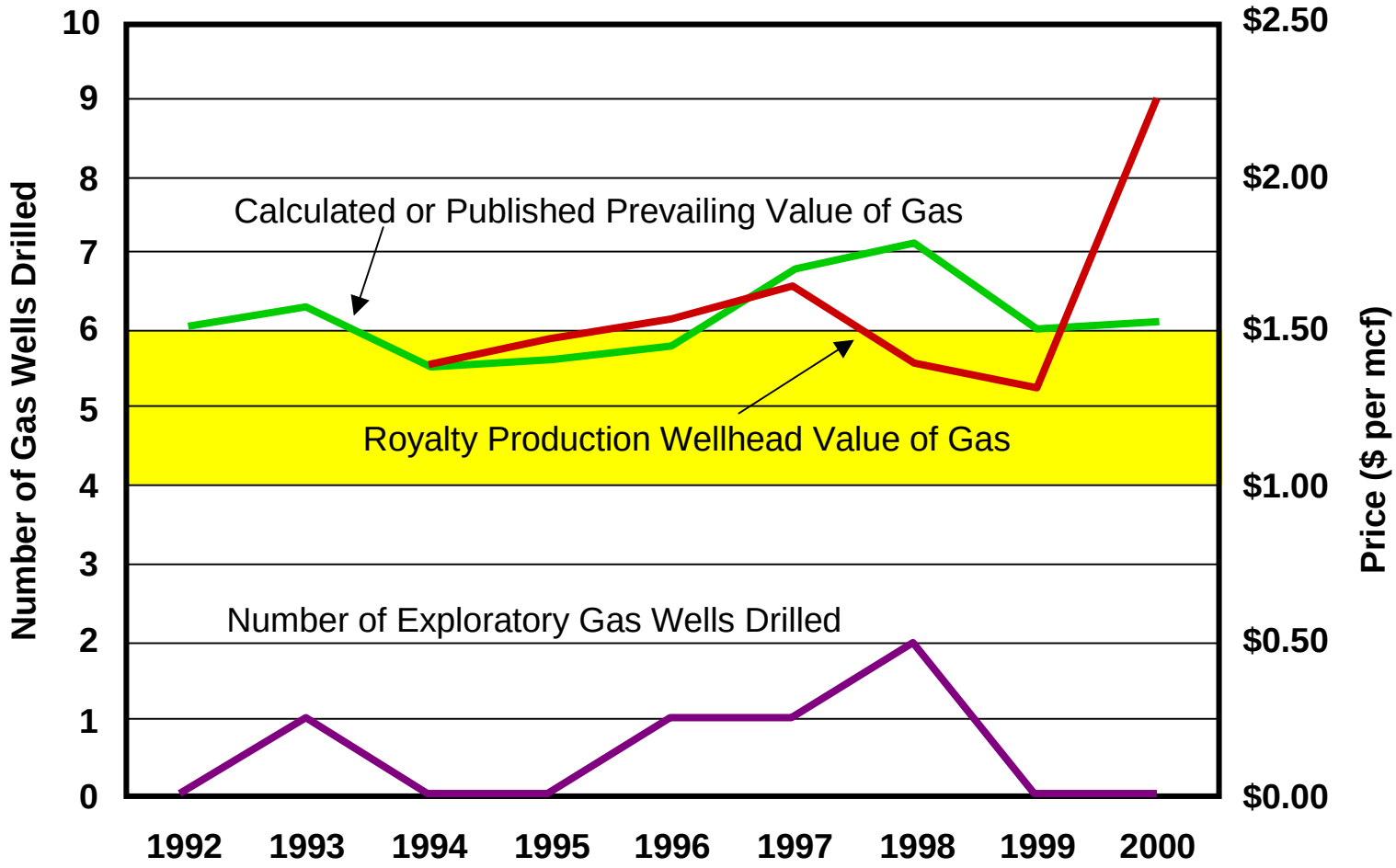
Hand Wringing in Kenai/Anchorage

- During last round of permit extension hearings, local opposition to LNG exports surfaced in response to fears of supply constraints.
- Study done by Anchorage Economic Development Corporation advocates that industrial use of natural gas be cut in half in 2010.
- Sen. John Torgerson (State Senator from Kenia Peninsula) is afraid Kenai will become a “ghost town” after 2009, introduced legislation to prohibit construction of Northern route pipeline.

Prudhoe-Sized Reserves Still to be Discovered in Cook Inlet

- While 7 or 8 years of excess supply is very short in, for example, a Soviet-style planning cycle, it is closer to eternity in a market-driven environment.
- The Reserves-to-Production ratio in Cook Inlet is 14, much higher than the national average of 9.
- A positive price signal to the E&P sector in 2000 has already led to new exploration activity.
- Exploration activity now underway by Phillips, Forest Oil, Unocal and Escopeta.
- Anticipate 20 Tcf+ reserves to be announced in Cook Inlet over the next 24-36 months.

Number of Exploratory Gas Wells Drilled in Cook Inlet, and the Calculated/Prevailing Value and Royalty Production Wellhead Value of Cook Inlet Gas, 1992-2000



Source: Anchorage Economic Development Corporation

Escopeta Oil & Gas and B.B.I., Inc.
Announce Exploration Results in Cook Inlet Basin, Alaska
Estimated 12 Tcf of Recoverable Natural Gas Reserves Located

FOR IMMEDIATE RELEASE
September 26, 2001

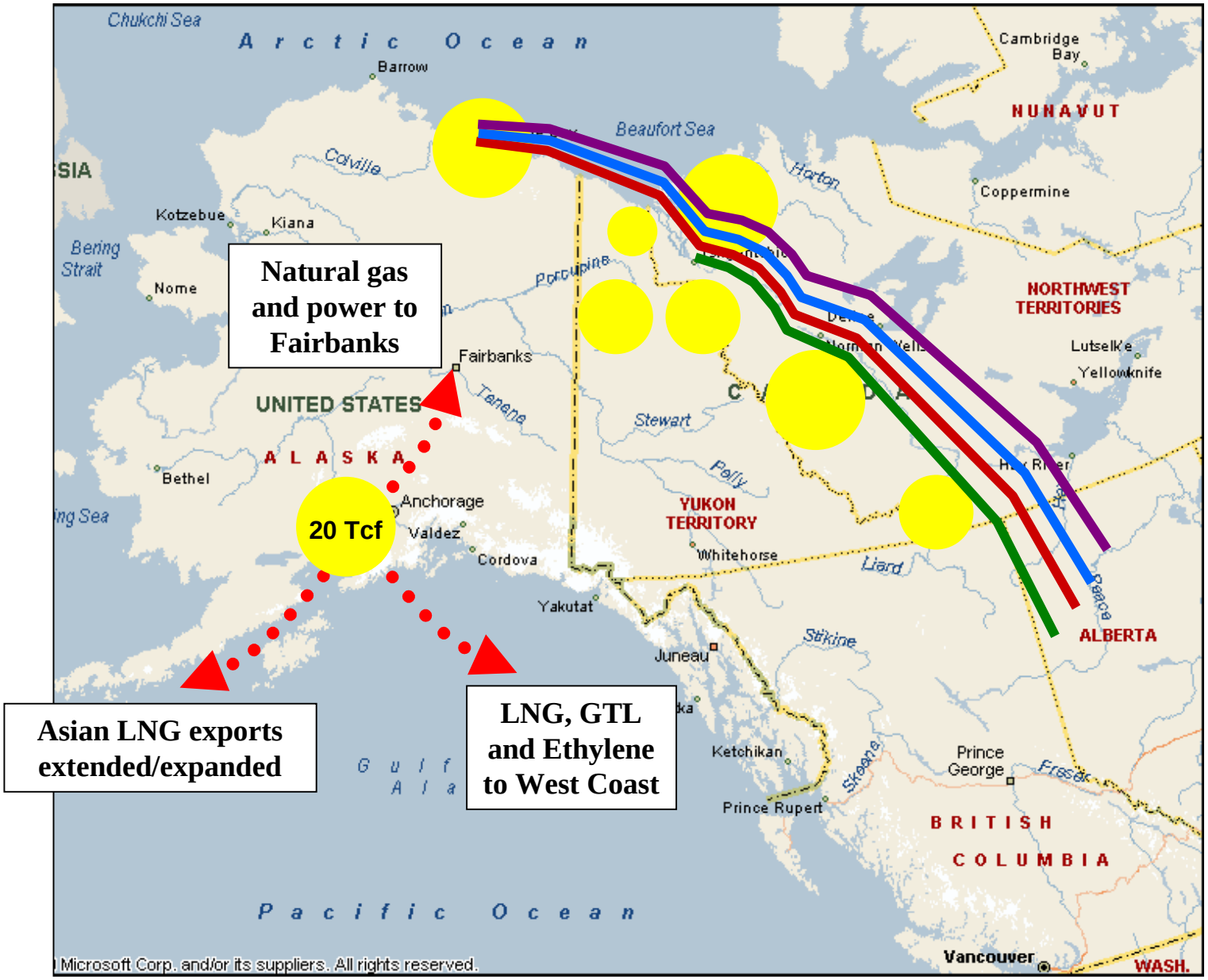
Contact: Mr. Danny Davis
(713) 623-2219

Houston, TX – Escopeta Oil & Gas and BBI, Inc. of Houston, Texas, today announced new seismic reprocessing results that show estimated recoverable reserves of 12 trillion cubic feet (Tcf) of natural gas near the East Forelands area of Alaska's Cook Inlet Basin, at depths of 18,000 to 21,000 ft. Known producing horizons in the same structural trend would likely recover 1.35 billion barrels of oil and an additional 6.1 Tcf of gas.

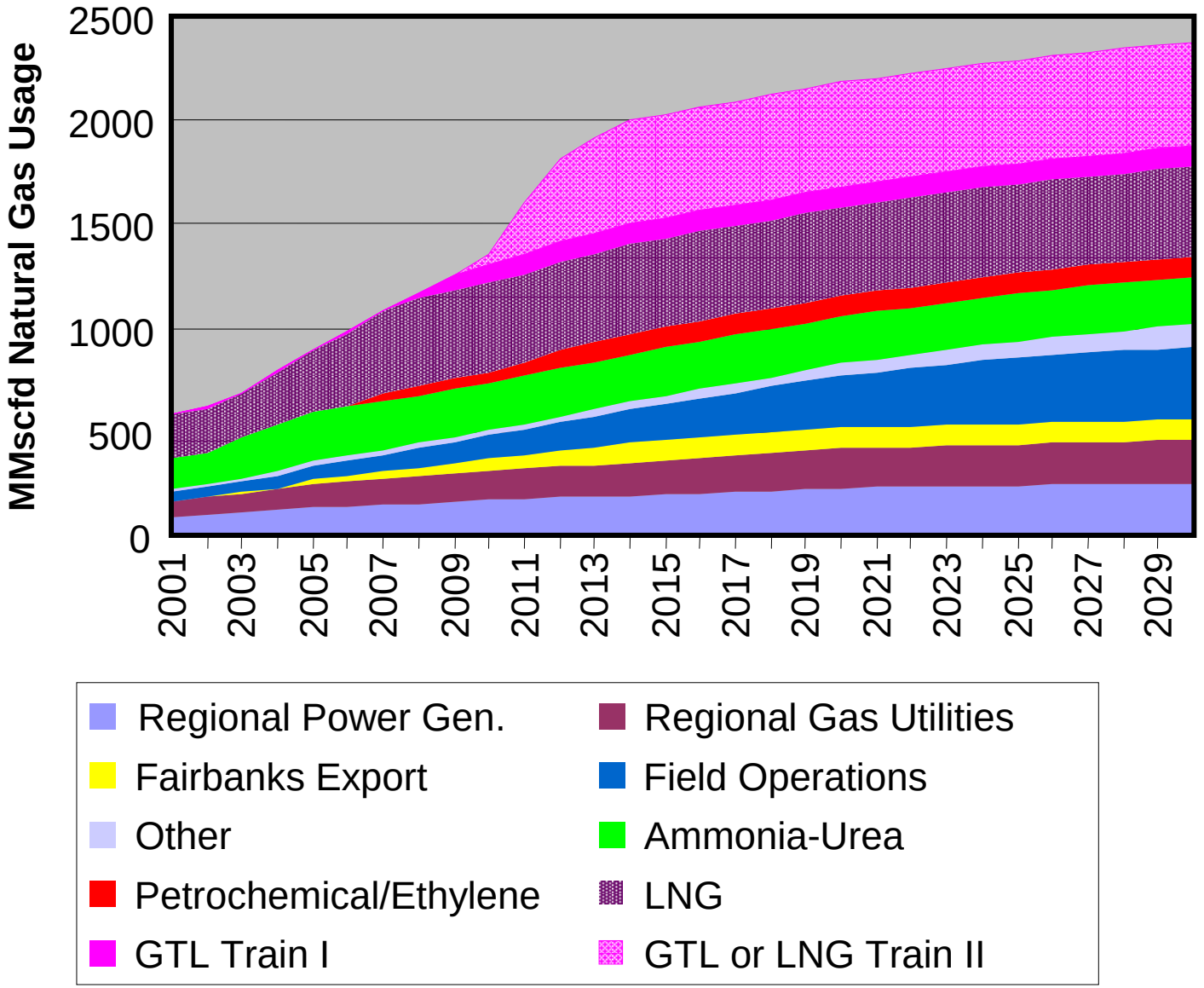
The reprocessed seismic data reveal the presence of a significant complex fault system on the east flank of the Middle Ground Shoal Field (200 million barrels reserves), forming an immense trapping mechanism, possibly the largest untested structural fault block in the Cook Inlet Basin. Geophysical and geological mapping reflect approximately 9000 feet of vertical closure against this fault system representing approximately 69,000 acres of structural closure. The depth of the main targets suggests accumulations of thermogenic gas.

(cont.)

Cook Inlet Natural Gas Changes the Picture



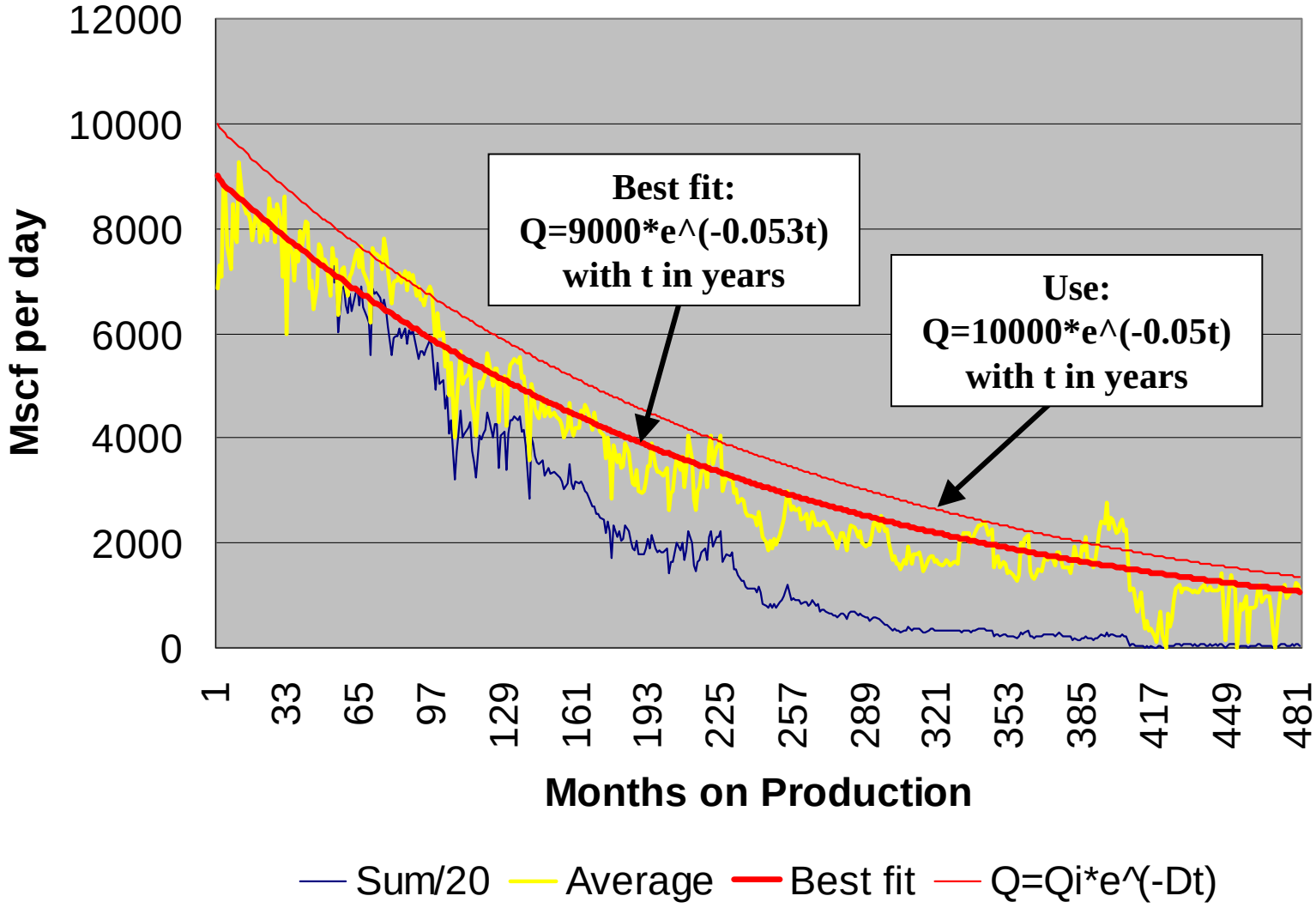
Kenai Development



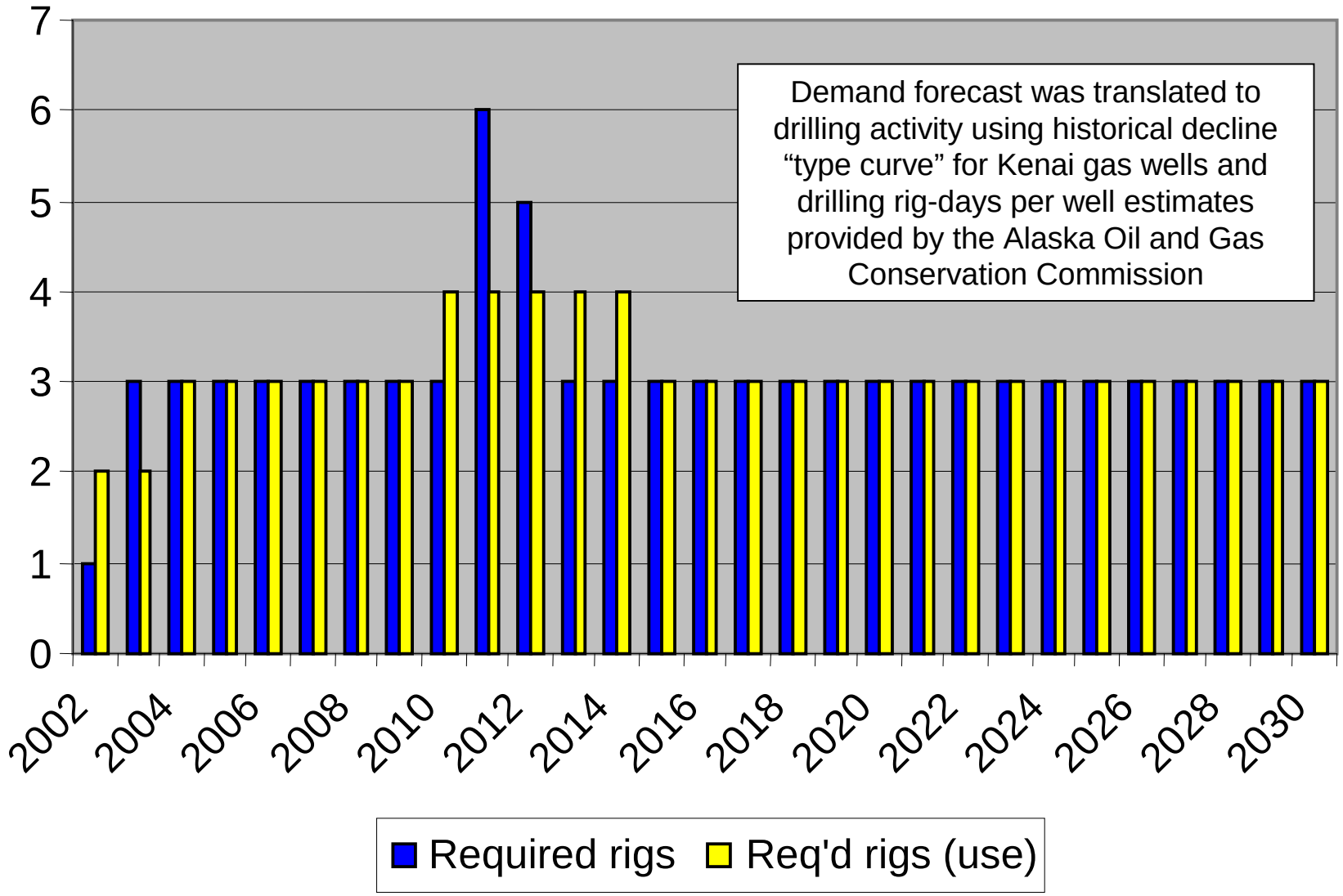
Kenai Development Assumptions

- Base of electric power generation and gas utilities in Anchorage area.
- Fairbanks consumption grows ultimately to 100 MMscfd.
- Field operations use of natural gas grows back to 1990s levels following second round of Cook Inlet oilfield development.
- Ammonia-Urea production expands by 30 Bcf annually beginning in 2004, expansion already on drawing board at Agrium.
- Ethylene production of 2 billion lb/yr established by 2009, with ultimate expansion to 4 billion lb/yr, Williams petrochemical study ongoing.
- LNG exports expand gradually to a still-modest 0.5 Bcf per day by 2008.
- GTL production in Kenai starts with 300 bpd pilot in 2002, followed by a 10,000 bpd (100 MMscfd) unit in 2010 and (subject to reserve base and market demand) a 50,000 bpd (0.5 Bcfd) unit in 2014.

Kenai Gas Field 'Type Curve'

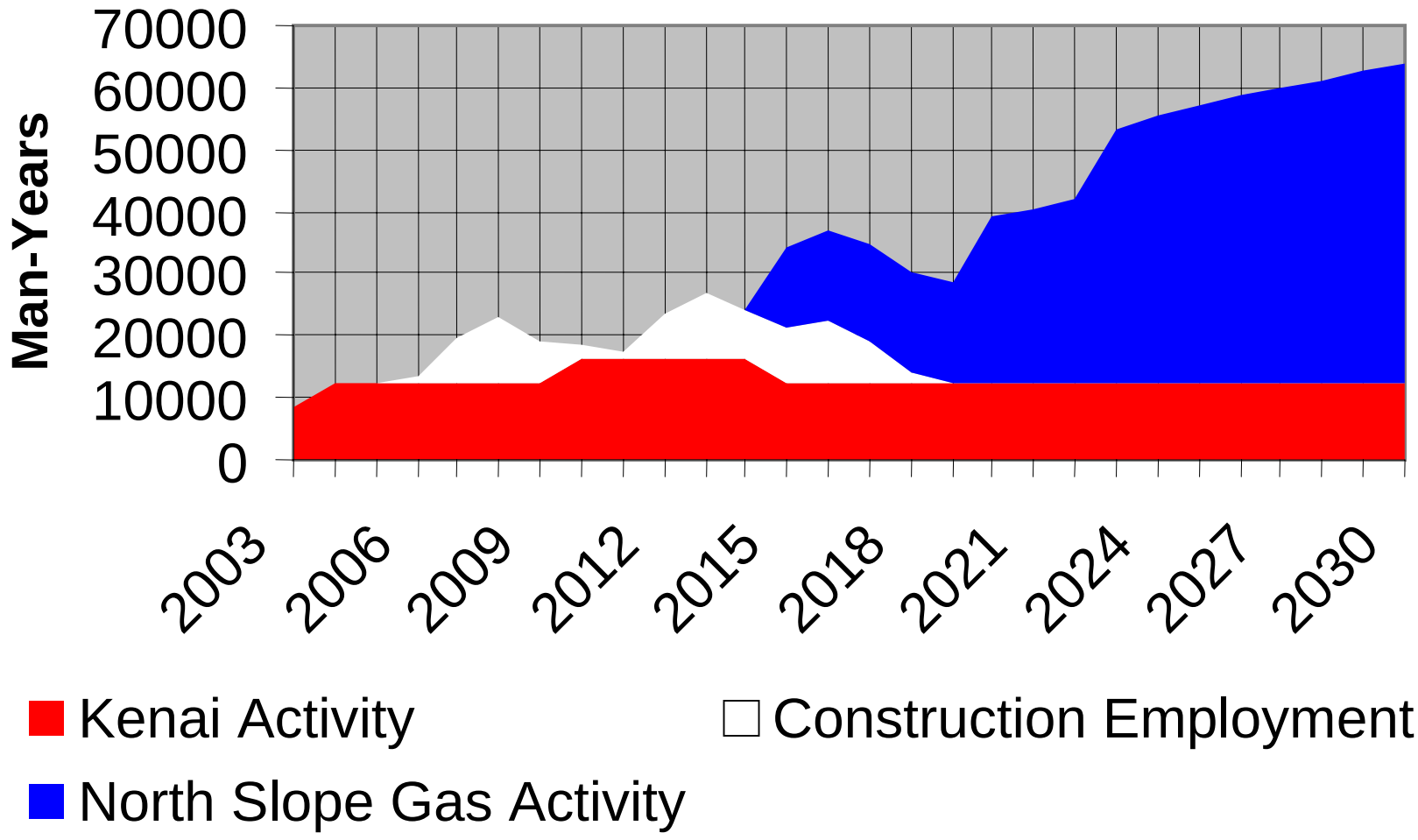


Rigs Required for Kenai Development

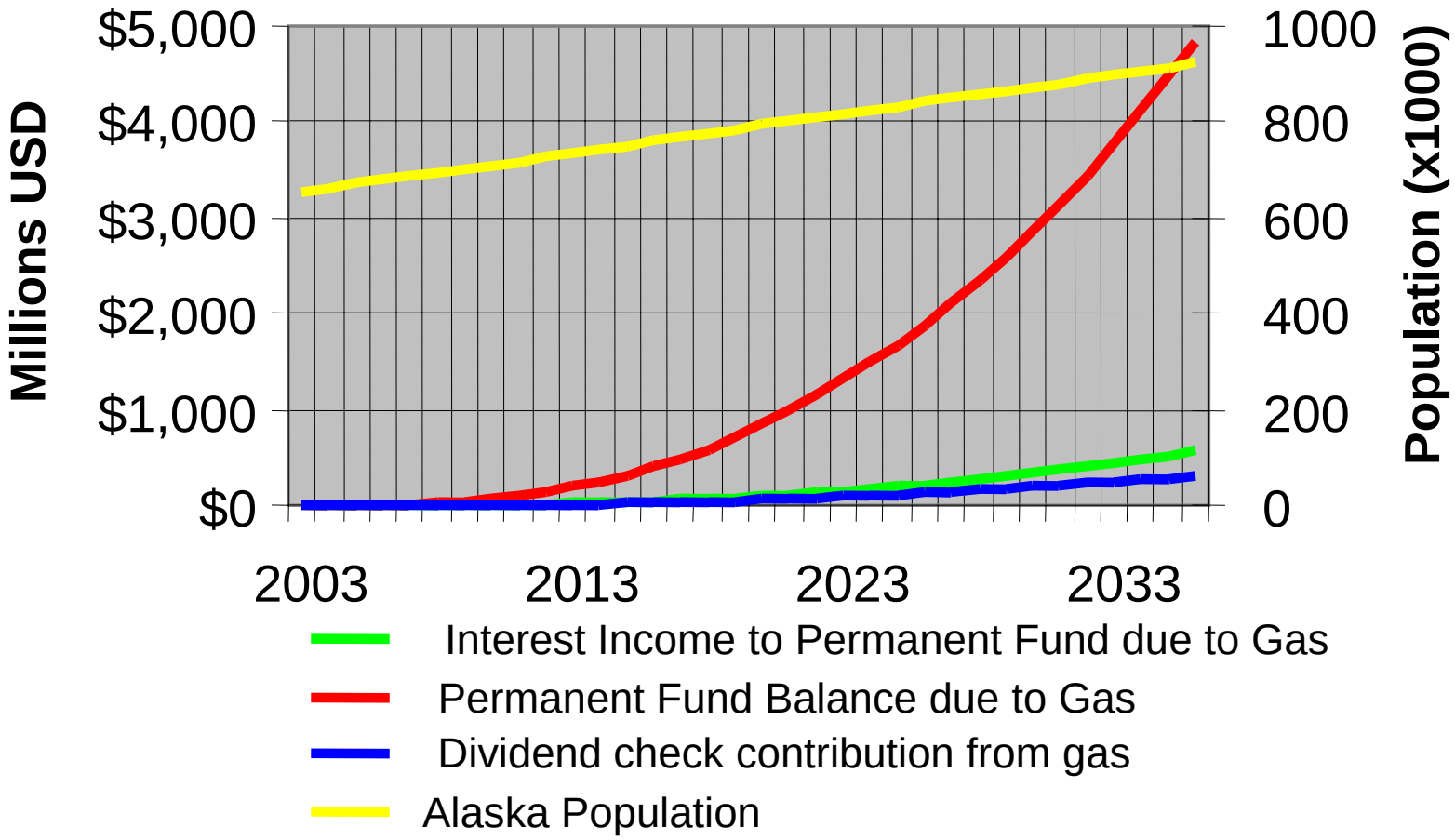


Oligney and Longbottom, Nov. 2001

Alaska Gas Employment Impact, including Kenai



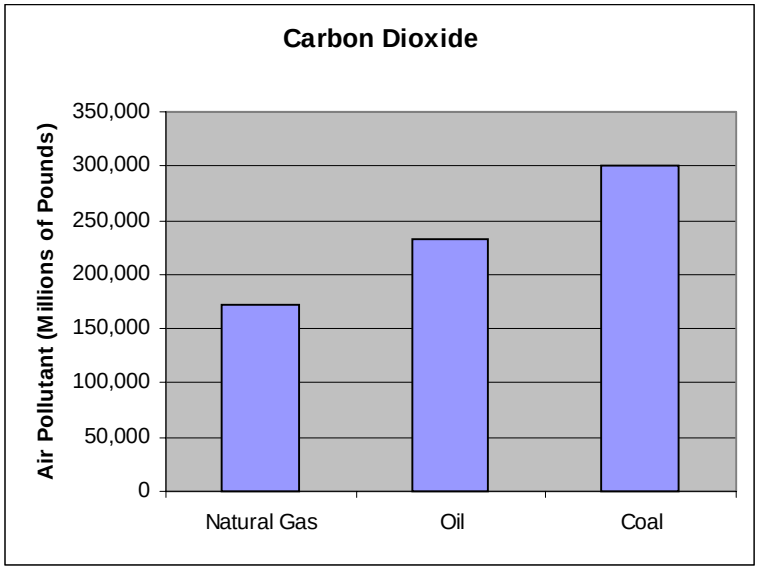
Gas Contribution to Permanent Fund, including Kenai

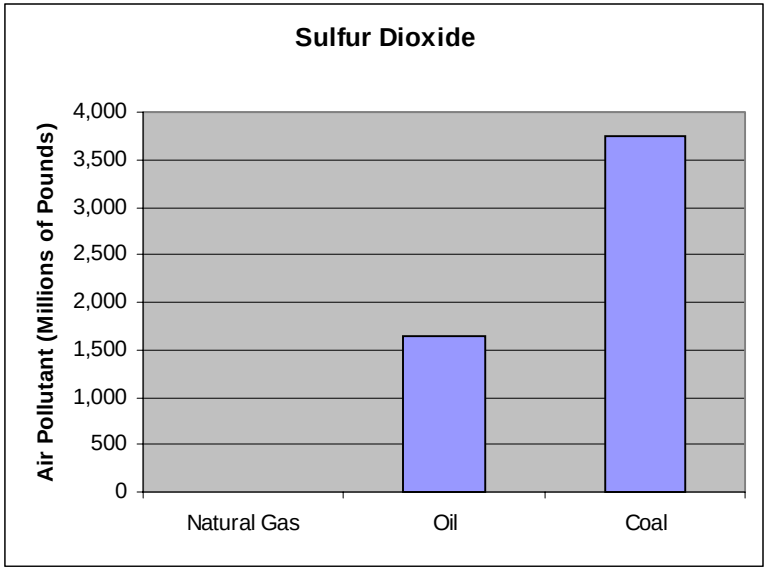


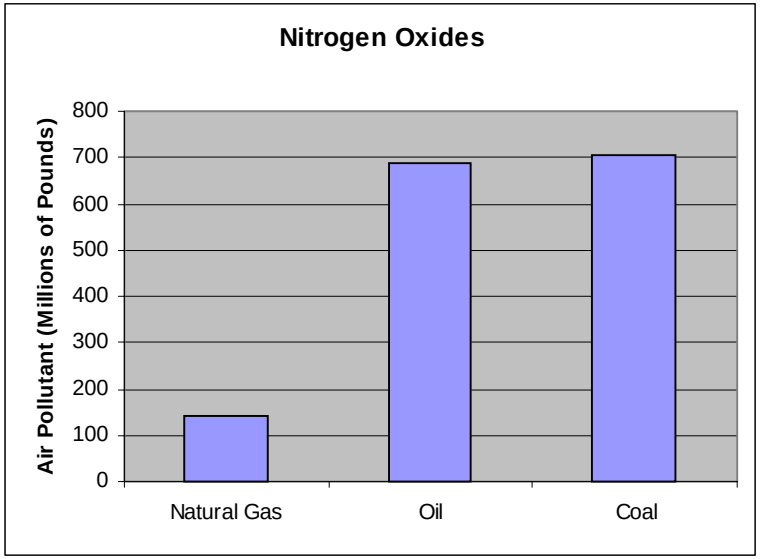
Environmental Impact

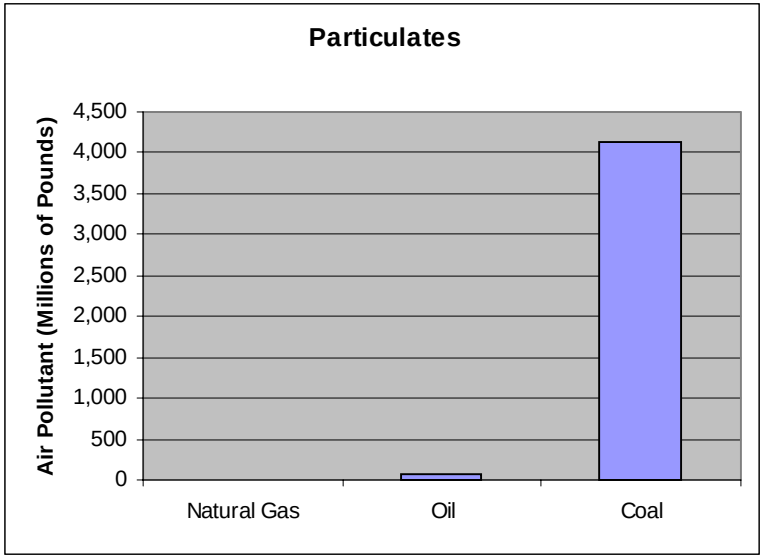
- Construction scheduled not to interfere with whale migration periods in Beaufort Sea.
- Boulder feeding grounds and barrier reefs avoided.
- Design for minimum impact on Caribou herds and Polar Bear dens.
- Impact of pipeline rupture negligible—natural gas and gas liquids are nearly benign.
- Issues related to pipeline access for maintenance must be addressed.
- Energy from natural gas produces far fewer emissions than coal or oil.

Comparison of Annual Air Pollution from Consumption of 4 BCF/D Energy Equivalent









Source: EIA

Aboriginal Issues

- Jobs, benefits, training and Aboriginal businesses must be accommodated.
- Most environmental issues have been addressed.
- Neutral to negotiations with Canadian Federal government on Aboriginal Claims issues.
- Canadian Crown will not subsidize pipeline.

Conclusions

- Natural gas demand growth over next 20 years will far exceed the 4 Bcfd everyone discusses
- Failing to address natural gas demand has major ramifications for U.S employment, as well as Alaska.
- The Southern route for Alaska natural gas is not economic, even at $3.00 gas price.
- A staged development through the Mackenzie Valley corridor that employs the ARC approach can provide common ground for all well-meaning parties.
- Cook Inlet potentially holds enough reserves for Alaska intrastate consumption as well as major industrial development and exports.

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