

ALASKA LEGISLATURE

HOUSE and SENATE FINANCE COMMITTEE FILES, 2005-2006 3096

## North Sea oil and gas

### The long goodbye

March 16<sup>th</sup> 2006 ABERDEEN

From The Economist print edition

### **High oil prices have helped slow the North Sea's decline. Government flip-flopping could accelerate it again**

NOBODY disputes that Britain's part of the North Sea is past its prime. Oil and gas production peaked at 4.5m barrels a day in 1999 and has fallen steadily ever since, to 3.3m now (see chart). Yet in Aberdeen, Britain's main oil town, talk of an old "province" in decline is not tolerated. "The North Sea is enjoying a vibrant middle age," insists one oilman. "I think I'd describe it as mature rather than declining," muses another. Indeed, most of the industry's problems seem to be the sort associated with a boom, not a bust. Oil bosses complain about a shortage of skilled labour and the astronomical price of rig rentals, which have doubled since 2003.

A combination of high oil prices and some new government policies have made it profitable to keep working in what is an increasingly difficult and expensive place to drill for oil and gas. Investment has risen by 30% this year, and more exploration and appraisal wells are being drilled than at any time since 1997. The UK Offshore Operators Association (UKOOA), a trade body, thinks that the rate of decline will slow markedly next year. By 2007, production should be slightly higher than last year.

That will be music to the ears of a government determined that the North Sea should still be pumping 3m barrels a day in 2010. The petrochemical wealth off Britain's eastern shores supports a quarter of a million jobs and has helped to insulate the country from the vagaries of the international oil market for decades. Were the decline to continue at historic rates, production would be all but finished in 20 years.

There is no shortage of hydrocarbons: although 34 billion barrels have been produced, some 23 billion barrels are thought to remain. But many of the big, easily accessible fields are running down, and what is left is much harder to reach. That is changing the character of the industry.

One way to keep production up is to explore the waters off northern Scotland, the Shetland Islands and the deep Atlantic to the west of Scotland, where little exploration has so far been done. Two of the biggest recent finds—Buzard (with around 500m barrels of oil and gas) and Lochnagar (perhaps 250m barrels)—were found off the beaten track. But developing them can be difficult. Rhum, a big gas field in the northern North Sea, was first discovered by BP in 1977, but the high pressure and temperature in the field meant that gas was not produced until December of last year. "A decade ago, a lot of this stuff would have been literally impossible to extract," says

Mike Tholen, UKOOA's economics director. "But technology has moved on."

Another option is to scrounge every last drop of oil and gas from existing fields. Finance, not geology, determines when an oil company quits a field, and it may leave behind substantial amounts of oil that are technically (but not economically) recoverable. The dregs of the big fields are often of only marginal interest to the big firms, which prefer chasing bigger and easier finds in other parts of the world such as the Gulf of Mexico or west Africa. Smaller, leaner companies are often able to pull the remaining oil out at a profit.

With all that in mind, ministers have been changing the rules to encourage smaller and more innovative firms. New licences allow companies to explore patches of ocean before they have finance arranged, and to hold on to difficult areas for six years instead of four. New rules prevent companies from sitting on unexploited discoveries for years at a time. And changes to the code of practice on access to pipelines (which are often owned by big oil companies) ensure that smaller companies can get their oil to market.

The new rules have proved popular. The latest licensing round, held in the summer of 2005, was the most successful in years. A total of 152 licences were offered to 99 companies, many of them in the frontier areas around northern Scotland and the Shetlands. A quarter of the companies were new to the North Sea.

But government can hinder as well as help, and not all its policies are so popular. The oil industry's relations with the Treasury have been poisoned by a series of sudden tax changes.

The first came in 2002, when Gordon Brown, the chancellor of the exchequer, raised the corporation tax for oil firms to 40% (most companies pay 30%). In November last year, he bumped it up to 50%. Furious oilmen accused the chancellor of risking the North Sea's future. UKOOA says that the changes create uncertainty, threatening future investment, and that they will do the most harm to the small firms that the government wants to attract. In its defence, the Treasury points to record oil company profits and insists that its only aim is "a fair deal for the taxpayer".

**"The new taxes will probably bump the North Sea a few notches down the competitiveness ladder," says Geoff Gillies, an analyst at Wood Mackenzie, an energy consultancy. "But at today's oil price, the impact on development will be minimal." The danger will come if prices start to slip, as Wood Mackenzie thinks they will do over the next few years. Kieron McFadyen, a director at Shell UK, says that if expensive oil justifies higher taxes, then cheaper oil ought to bring tax cuts to compensate.**

The death of the North Sea has been predicted many times before, points out Melfort Campbell, the head of the Scottish branch of the Confederation of British Industry. Yet technological advances have always confounded the gloom-mongers. The region will be even more dependent on innovation in its old age than it was in its youth. Most of the government's reforms reflect that. It would be a shame to see them undone by another tax grab.

## Repeal Severance Tax Breaks for Oil and Gas

By Sarah Gorin, Equality State Policy Center

June 12, 2000

Since the beginning of fiscal year 1994, the people of Wyoming have lost over \$48 million dollars in severance tax breaks granted to our state's oil and gas industry on promises of greater - or at least sustained - production and employment. A new University of Wyoming study shows these promises were empty.

Over the past 15 years, the Wyoming Legislature has approved severance tax breaks - ranging from 33% to 75% - for several categories of oil production. Since 1993, it has also enacted a 67% break for certain categories of natural gas production.

Proponents of the tax breaks asserted they would result in increased production and employment, or would help preserve existing production and jobs. But no data was ever presented to support these assertions. They were upheld entirely by the lobbying power of the oil and gas industry and the willingness of a majority of legislators to accept the industry's assurances without evidence.

Thanks to an effort led by Senator Cale Case (R-S25, Lander), the evidence is finally in. Case successfully amended the most recent severance tax break legislation to include funding for a study to ask: Did the tax breaks trigger the well-advertised effect?

Part of that study has just been completed and released by a team of University of Wyoming economists, and the answer for oil and gas is: No. (The remainder of the study, focusing on coal, is in progress and will be completed by year's end.)

The UW economists created a oil and gas industry model capable of predicting the effects of changing tax rates. The model showed that cutting Wyoming's oil severance tax from 6% to 4% reduces the present value of oil severance tax revenues by 14%, while generating an increase in production of less than one-half of one percent (compared to a long-term "base case" of what would likely happen without any changes).

Similarly, a percentage point increase in the tax rate would still reduce production by less than one percent, but boost oil and gas severance tax collections by 17% compared to the base case.

One of the main reasons behind the minimal effect on production is that state taxes are deductible from federal taxes. A state tax break just means the producer pays more to the federal government. Thus the Wyoming Legislature sent oil and gas revenues to Washington, D.C. instead of to Cheyenne and to Wyoming's cities, towns and counties.

Second, because severance taxes are paid on oil and gas coming out of the ground, a severance tax break provides little incentive for the exploration and drilling activities that must come first.

Wyoming needlessly sacrificed just under \$48 million in oil and gas tax revenues for fiscal years 1994-99. This amount understates the loss because it does not include prior years when the tax breaks were in place but there was no reporting.

# **PRESENTATION ON ALASKA GAS PIPELINE PROJECT**

**to Alaska State House and Senate Finance Committees  
April 5, 2006**

**Analysis of PPT**

**Barry Pulliam & Dr. Anthony Finizza**

*5th Floor  
601 W 5th Street  
Los Angeles, California 90071  
213 624 9600*

*Suite 1170  
1215 K Street  
Sacramento, California 95814  
916 449 2860*

*Suite 2825  
Three Allen Center  
333 Clay Street  
Houston, Texas 77002  
713 228 2700*

*Suite 230  
106 E 6th Street  
Austin, Texas 78701  
512 476 3711*

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# Econ One Research, Inc.

- An economic research and consulting firm with offices in California (Los Angeles and Sacramento) and Texas (Houston and Austin)
- We provide consulting services in various industries, including petroleum and natural gas, regulated utilities, electricity, telecommunications, and computer software
- We have worked for:
  - A number of state governments on energy-related matters, including the States of Alaska, California, Hawaii, Louisiana, New Mexico, New York, and Texas
  - Federal government agencies, including the Department of Justice, the Federal Trade Commission, the Department of the Interior, and the President's Council of Economic Advisors
  - A number of foreign countries and international agencies, including the World Bank, Mexico, Nigeria, Turkey, and Tanzania on matters related to economic development and privatization of state-owned utilities
  - A number of companies in the petroleum and natural gas industries, including BP, Occidental Petroleum, ANR Pipeline, Koch Gateway Pipeline, Sempra Energy, KN Energy Corp., Lyondell-CITGO Refining, Total Petrochemicals U.S.A., Panhandle Eastern Corp., and ONEOK, Inc.

# Barry Pulliam

- Senior Economist with Econ One Research, Inc.
- Masters Degree in Economics from the Claremont Graduate School, with 17 years of experience consulting in the petroleum and natural gas industries
- Has consulted with or served as an economic expert for the State of Alaska on a number of occasions, including:
  - Several severance tax matters involving the valuation of crude oil
  - Operation of the TAPS Quality Bank in proceedings before the FERC and Alaska PUC
  - Merger and antitrust investigations
  - Recent arbitration between State and ExxonMobil involving crude oil royalties
- Consulted with the States of California, New Mexico, Texas, and Louisiana on economic issues related to the petroleum industry
- Consulted with federal government agencies, including the Department of the Interior and the Federal Trade Commission
- Co-author of two recent studies prepared for the Alaska Department of Natural Resources related to natural gas markets and royalty valuation issues

# Dr. Anthony Finizza

- Economist working in conjunction with Econ One Research, Inc.
- Ph.D. in Economics and Finance from the University of Chicago with over 30 years of experience working in the petroleum industry
- Chief Economist for ARCO from 1975 to 1998
- At ARCO, Dr. Finizza was in charge of petroleum price forecasting for the company's Long Range Planning Process and conducted scenario-planning exercises with senior management responsible for investment decisions
- Consulted with the California Energy Commission, the State of Hawaii, and the International Hydrogen Infrastructure Group (a consortium of private companies and the U.S. Department of Energy) on energy-related matters
- Currently teaches forecasting and modeling at the University of California, Irvine
- Published articles in *Business Economics*, *The Journal of Corporate Renewal*, and *The International Journal of Forecasting*
- Senior Fellow with the U.S. Association for Energy Economics
- Former President of the International Association for Energy Economics

# Oil Price Issues

# Conclusions/Observations Regarding Oil Price Forecasts

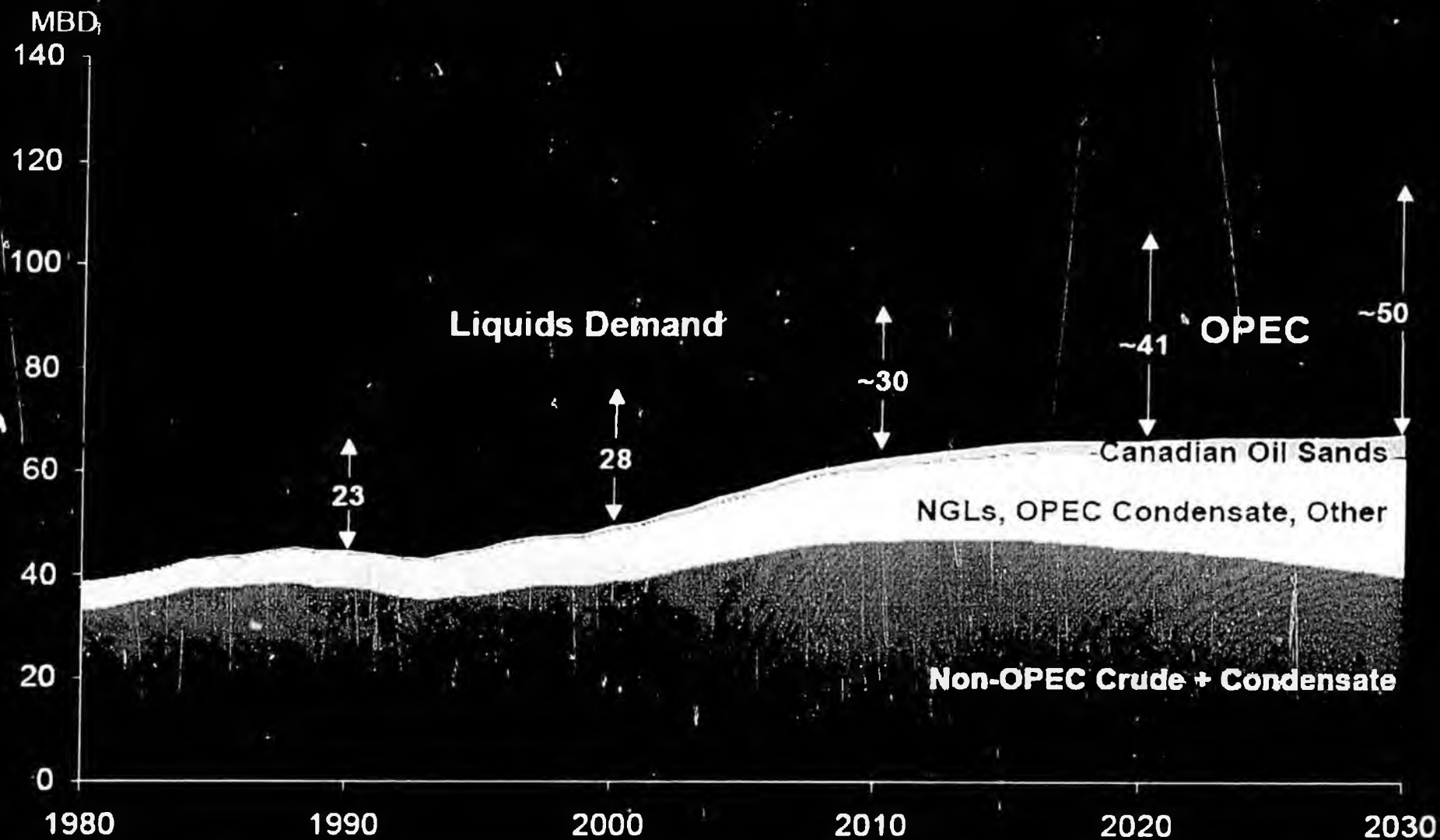
- Producers are using \$40 as a planning base case with \$30 as a stress price case. Majors may be using a slightly lower price range than independents, but are moving their views up.
  - This range may actually be lower than their best estimate, but is consistent with their “prudent” planning approach
  - This range is consistent with recent observed oil asset purchases
- This range is consistent with publicly available forecasts although the recent EIA AEO 2006 is above this range. (~\$54)
- What really matters is what forecasts are the “risk takers” using?
- Forecasters have been humbled (and will continue to be humbled) by their forecasts

# Oil Price Outlook

- **Factors Suggesting Continued Higher Prices (short-term)**
  - Strong oil demand, especially in China and rest of Asia
  - Growing Gap Between Global Demand and Global Non-OPEC Supply
    - Non-OPEC oil supply cannot keep up with growing world demand permitting increase in OPEC's market power
- **Factors Opposing Higher Oil Prices (long-term)**
  - Conventional oil faces threat from alternative sources of liquids when prices are high
    - Tar Sands: economic at ~\$20-30 oil
    - Coal Liquids: economic above \$30/bbl
    - Shale Oil: economic above \$45-50/bbl
  - Penetration of Alternative Transportation Vehicles
    - Oil's key position in the transportation market will be eroded by Hybrid vehicles, Grid-Connected Hybrid vehicles, Fuel Cell Vehicles
  - A \$10/bbl difference in oil prices is a \$73 Billion increase in total consumer costs per year

# ExxonMobil Outlook

## World Liquids Production Outlook



Source: ExxonMobil, *The Outlook for Energy*, December 2004

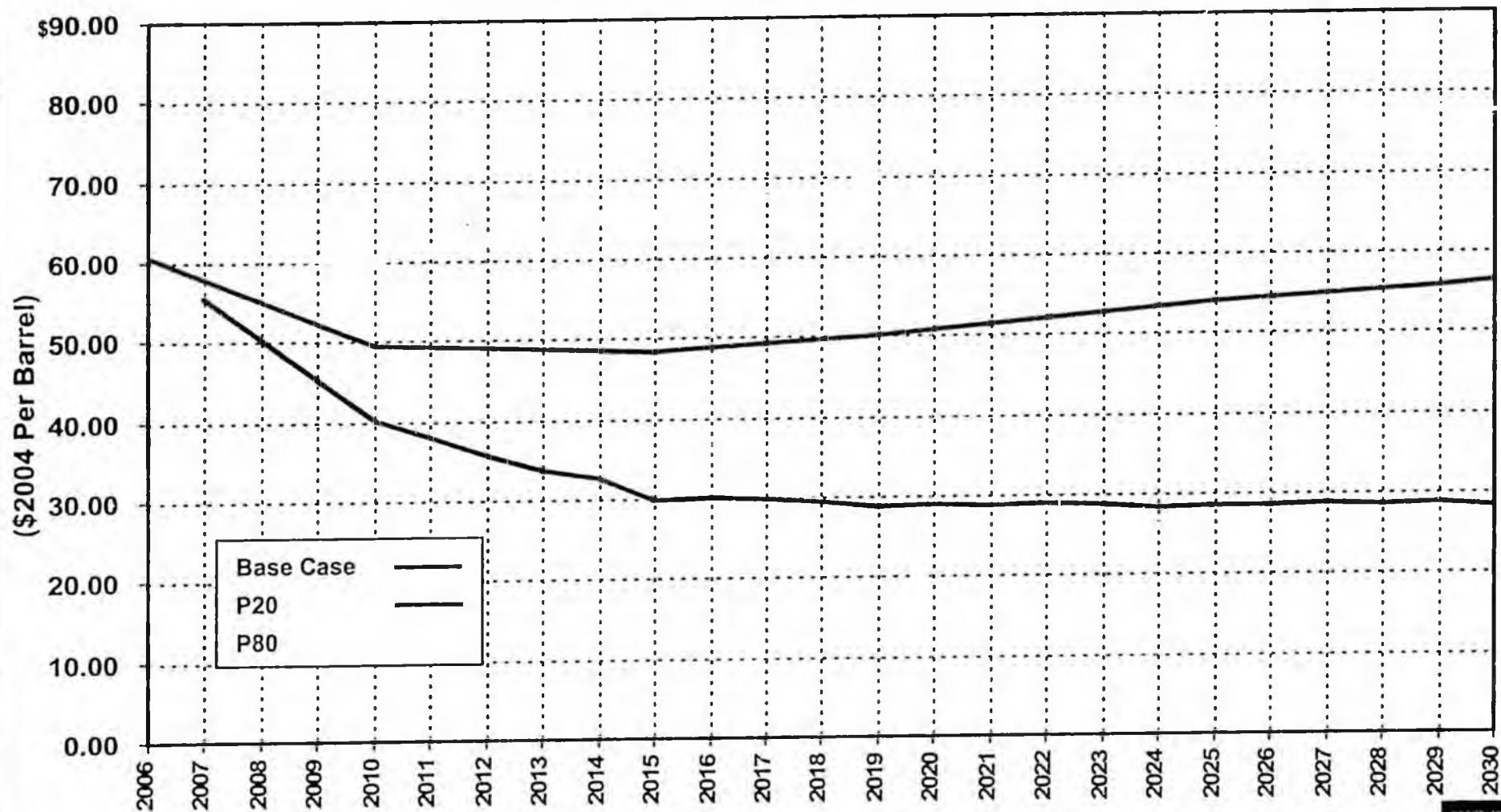


# Oil Price Forecasts

- **EIA's Annual Energy Outlook (AEO) – January 2006**
  - Forecast of oil prices (through 2030, converted to WTI by Econ One)
  - Include Alternative scenarios, probabilistic forecasts developed by Econ One
- **International Energy Agency (Paris) – 2005**
- **Reuters Poll of 18 Oil Analysts for WTI in 2010 (March 2006)**
- **NYMEX Futures market**
  - WTI oil contract traded since early 1980s

# Oil Price Outlook – EIA Annual Energy Outlook 2006

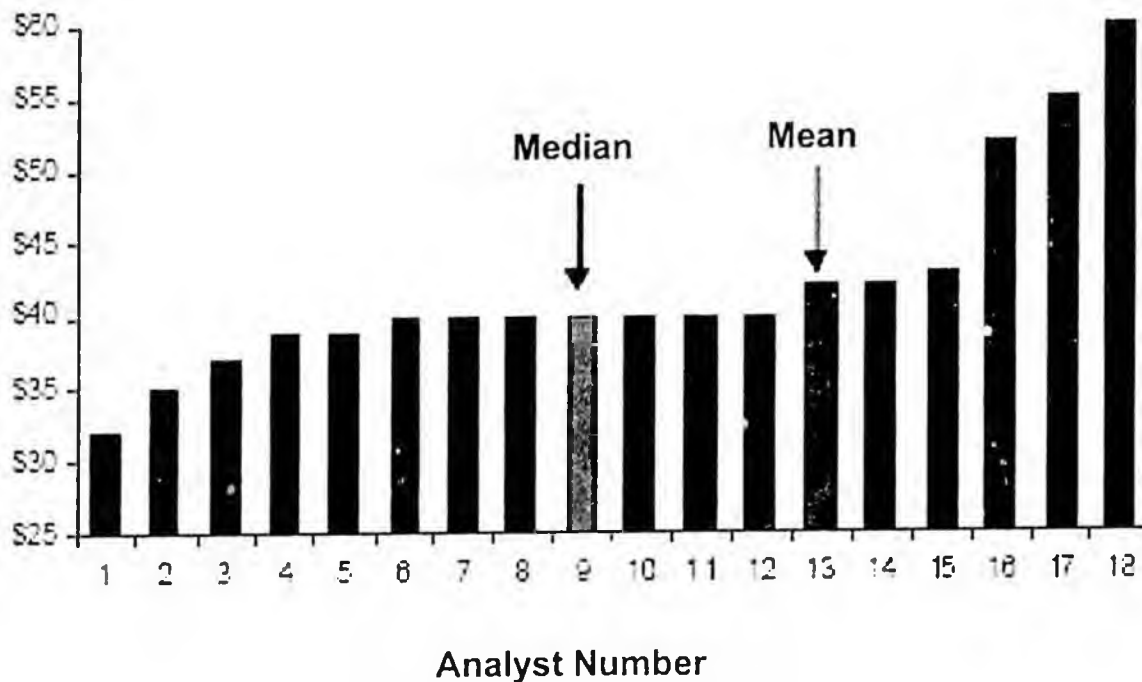
## EIA AEO 2006 WTI Crude Oil Price Forecast



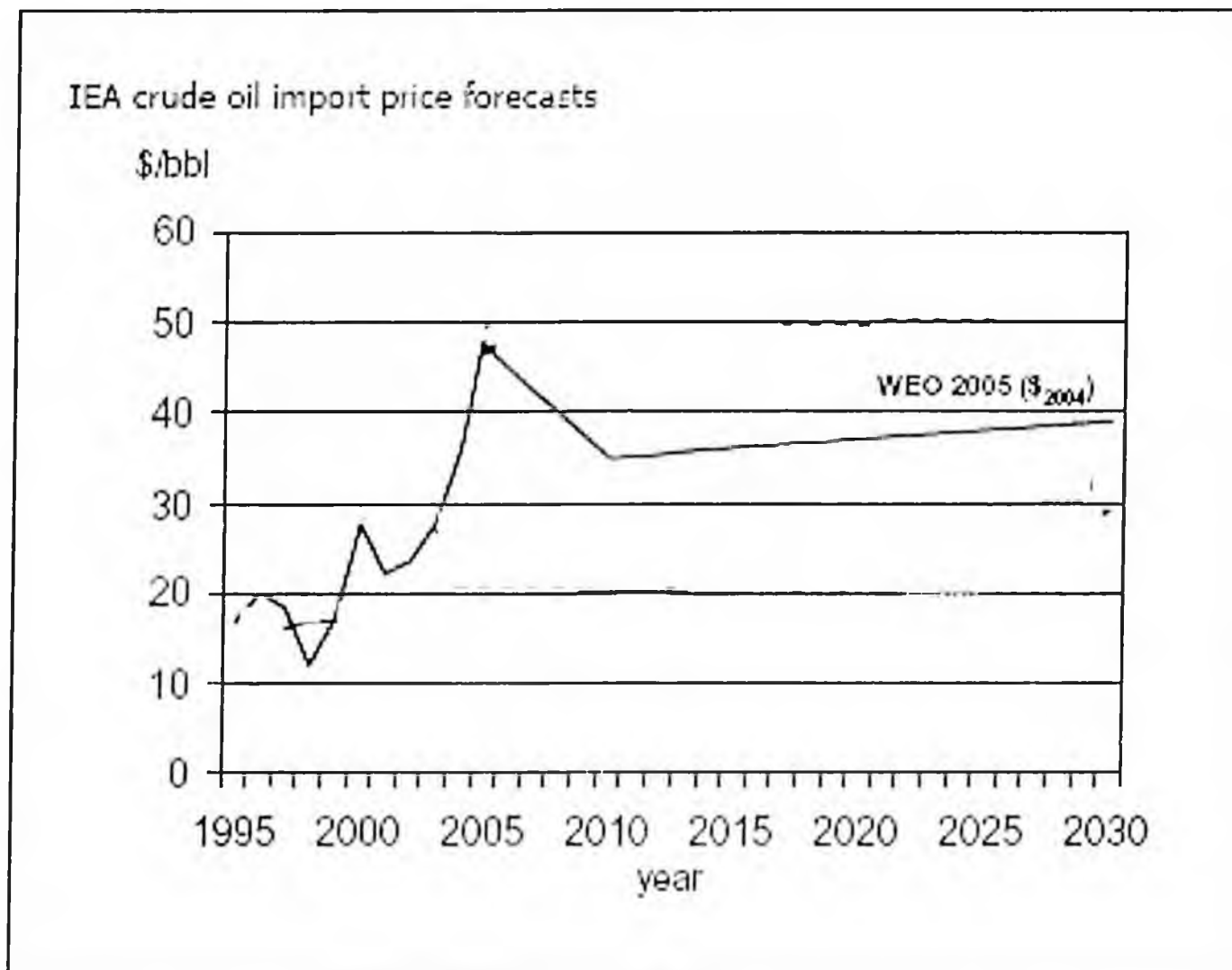
Source: AEO 2006 for Base Case; Econ One for Probabilistic Variance.

# Alternative Oil Price Forecasts – Reuters Poll (March 10, 2006)

Price Forecast for WTI in 2010  
Reuters Poll of 18 Oil Analysts

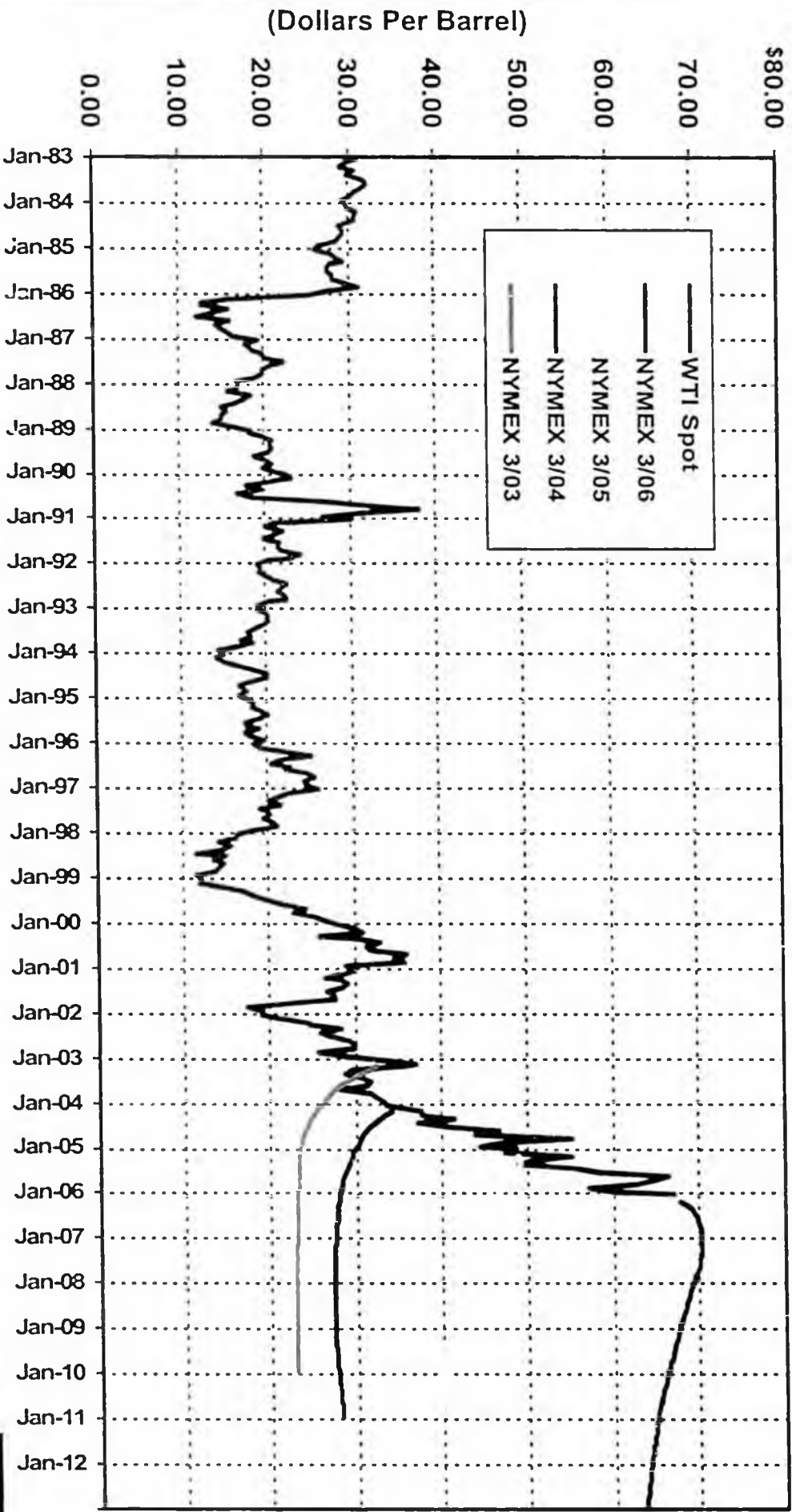


# IEA (2005) Oil Price Forecasts



# WTI Prices: History and Market Forecast

WTI Spot With Selected NYMEX Strips



Source: NYMEX

# Producer View of Future Oil Prices

- Producers have been “burned” by forecasts of high oil prices in the past
- Producers will test their projects against a price path that is below their “Most Likely” view
  - They use the “official price view” as a speed limit to signal caution
  - By “high-grading,” they will have a suite of projects resilient to price risk
  - Their price view lags the current market price by as much as 5-7 years as prices rise, and by 2 years as prices fall.
  - Current view might be: \$35-40/barrel
  - Producers will also “stress” test their projects at \$30/barrel
- The consequences of error are not symmetrical
  - If a producer underestimates the future path of prices, they will not undertake high risk projects and their returns will skyrocket (the current situation relative to a few years ago)
  - If a producer overestimates the future path of prices, they will be scorned by Wall Street and investors (their position in the late 1990s)
  - They will “miss” opportunities, but these misses will not be fully “penalized” by the market

## Implied Oil Company Price Views

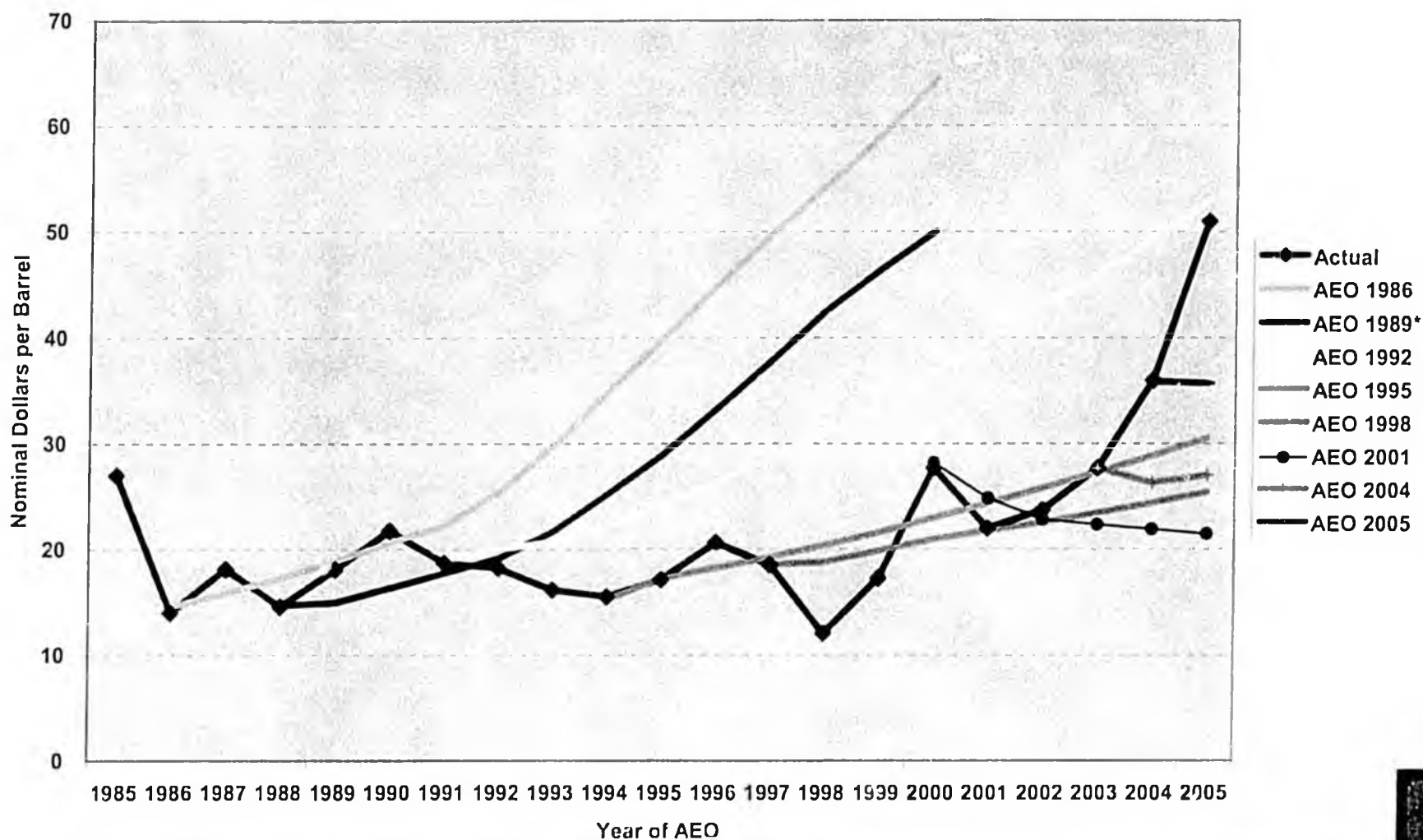
- **Marubeni acquisition (2/23/06) of Pioneer GOM assets: ~ \$40**
- **Norsk Hydro acquisition (9/19/05) of Spinnaker Exploration: ~\$35**
- **Statoil acquisition (4/28/05) of EnCana's Deepwater GOM: ~ \$30**

## Some Examples of Humbling Oil Price Forecasting

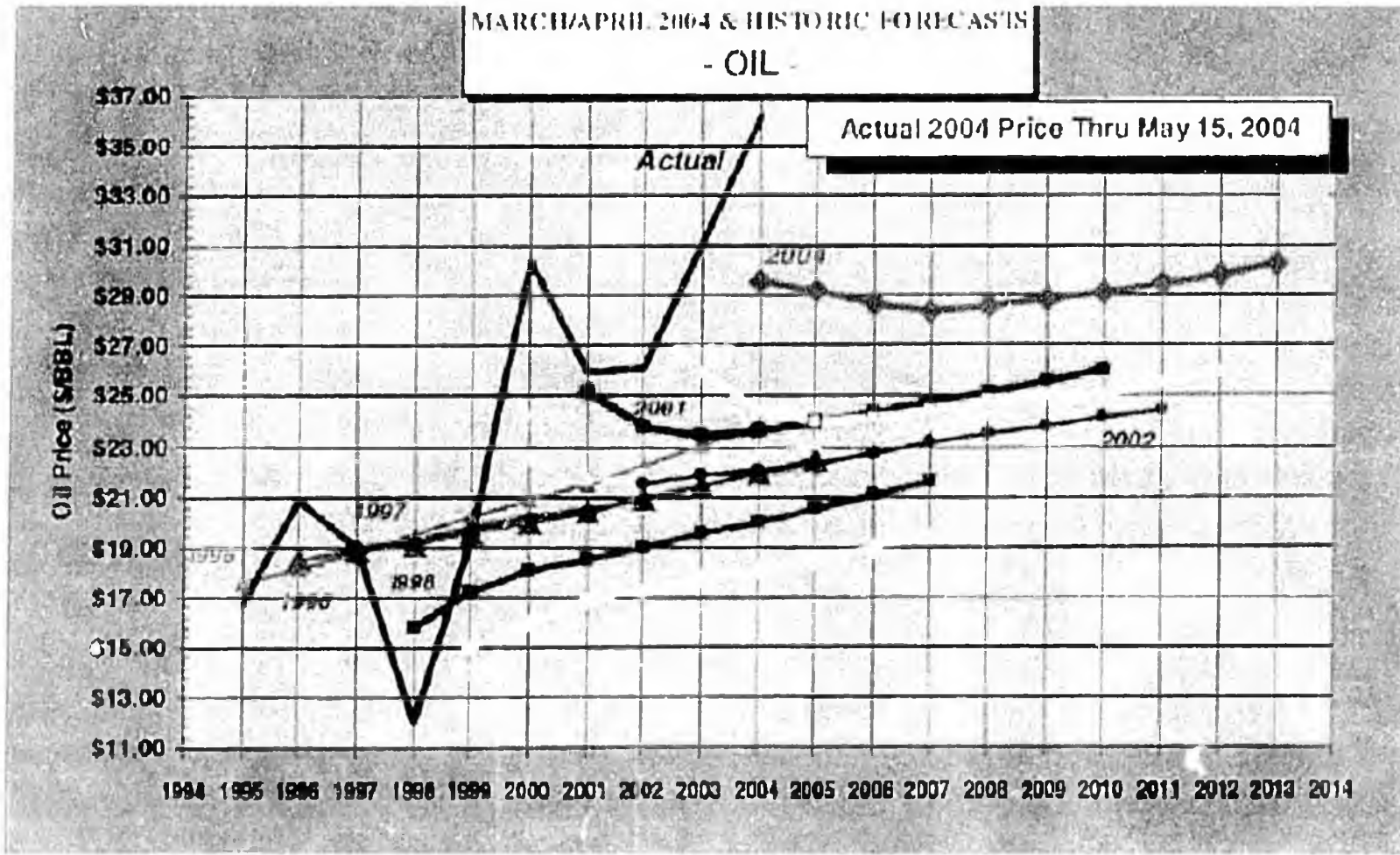
- **Energy Information Administration (US DOE)**
- **Polls of “experts” – Society of Petroleum Evaluation Engineers**

# EIA's Annual Price Outlooks

EIA's Annual Energy Outlook  
Forecast Evaluation



# SPEE Annual Delphi Poll

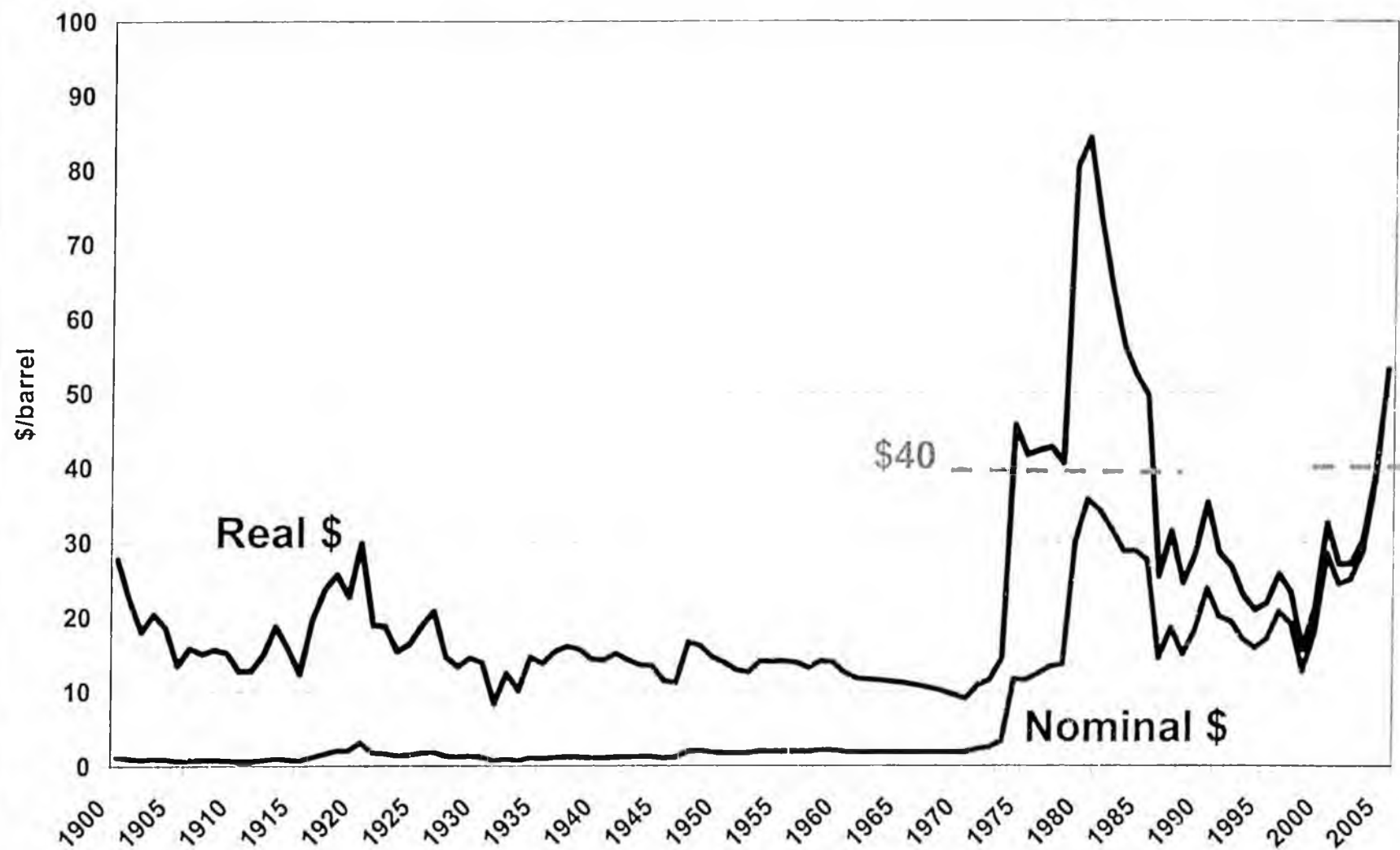


Source: Society of Petroleum Evaluation Engineers (SPEE)



# Historical Crude Oil Prices

## World Crude Oil Prices

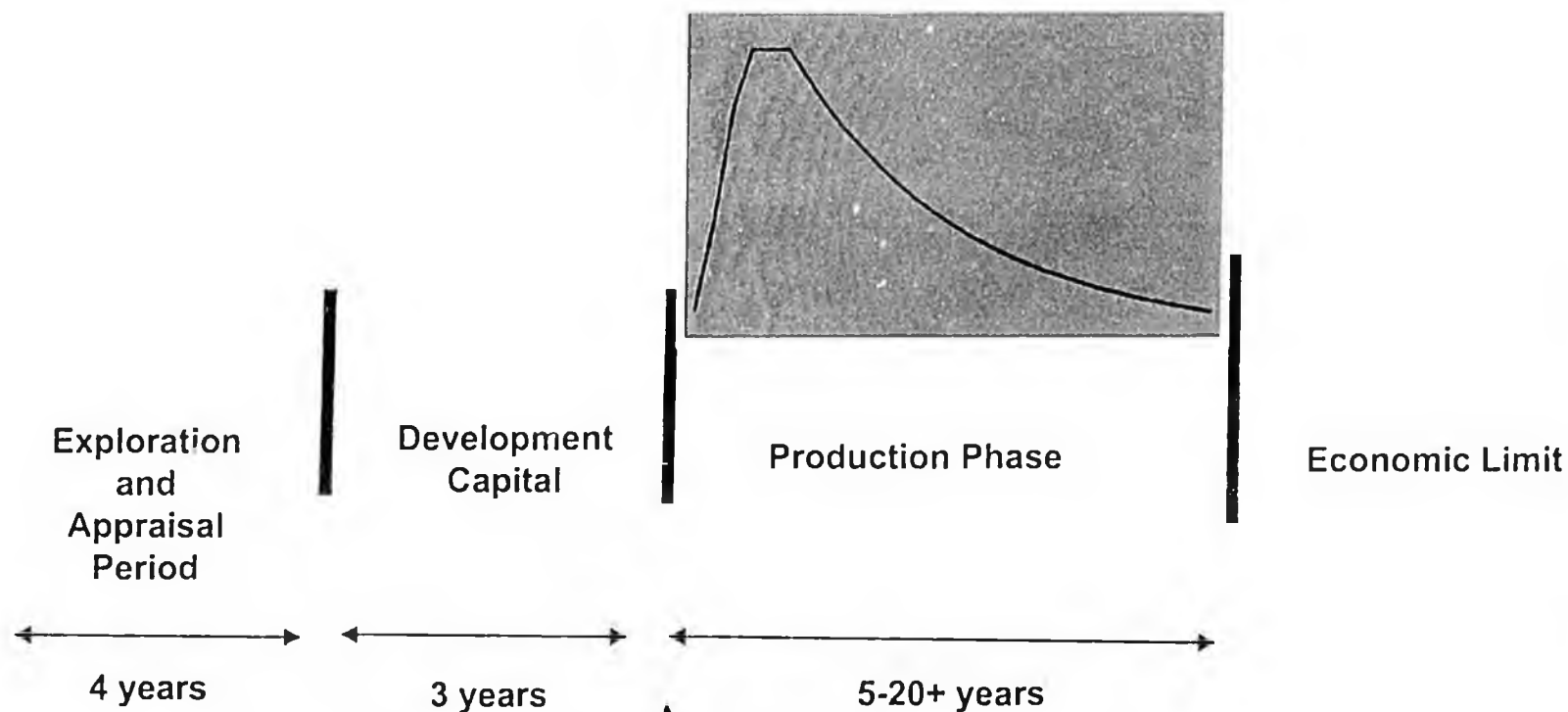


# **Economics of New Fields**

# Conclusions/Observations Regarding Exploration Impacts

- Without ANWR opening, expectation of large oil discoveries are unlikely, due to the Field Size Distribution of remaining economic reserves
- At low prices, 25/20 helps explorer more than 20/20
- Incentives are required at low prices (say, \$73 M, although alternative approaches could work as well, e.g. “production tax holiday”)
  - “Sunset” provision in tax free barrel allowance in Senate CS not likely to provide incentive due to long-lived exploration-production cycle
- At low prices, 20/20 and 25/20 preferred over SQ, in order to incent exploration

# Stylized Lifecycle of New Field



**“Sunset” Provision in Senate CS for Tax Free Barrels  
(if New Exploration follows this pattern)**

# Comparison of Reserves – Central North Slope vs. ANWR

## Undiscovered Technically Recoverable Oil Reserves

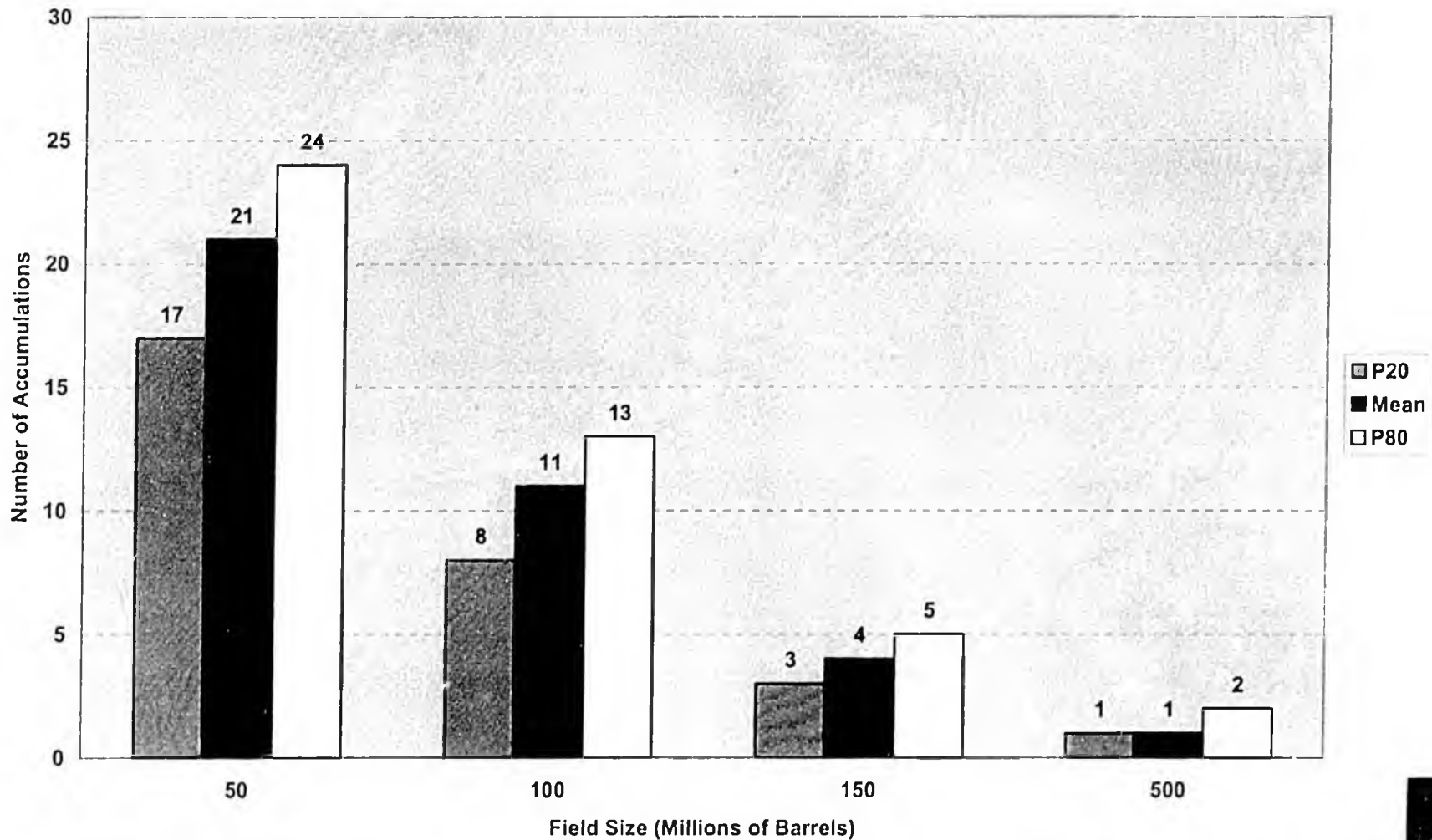
	Central North Slope	ANWR
Mean Estimate of Reserves (Billions of barrels)	4.0	10.4
Amount in Fields Over 1 B Barrels	0%	22%
Amount in Fields Over 500 M Barrels	2%	43%
Amount in Fields Smaller than 64 M Barrels	51%	1%

Note: Not all these reserves are economic

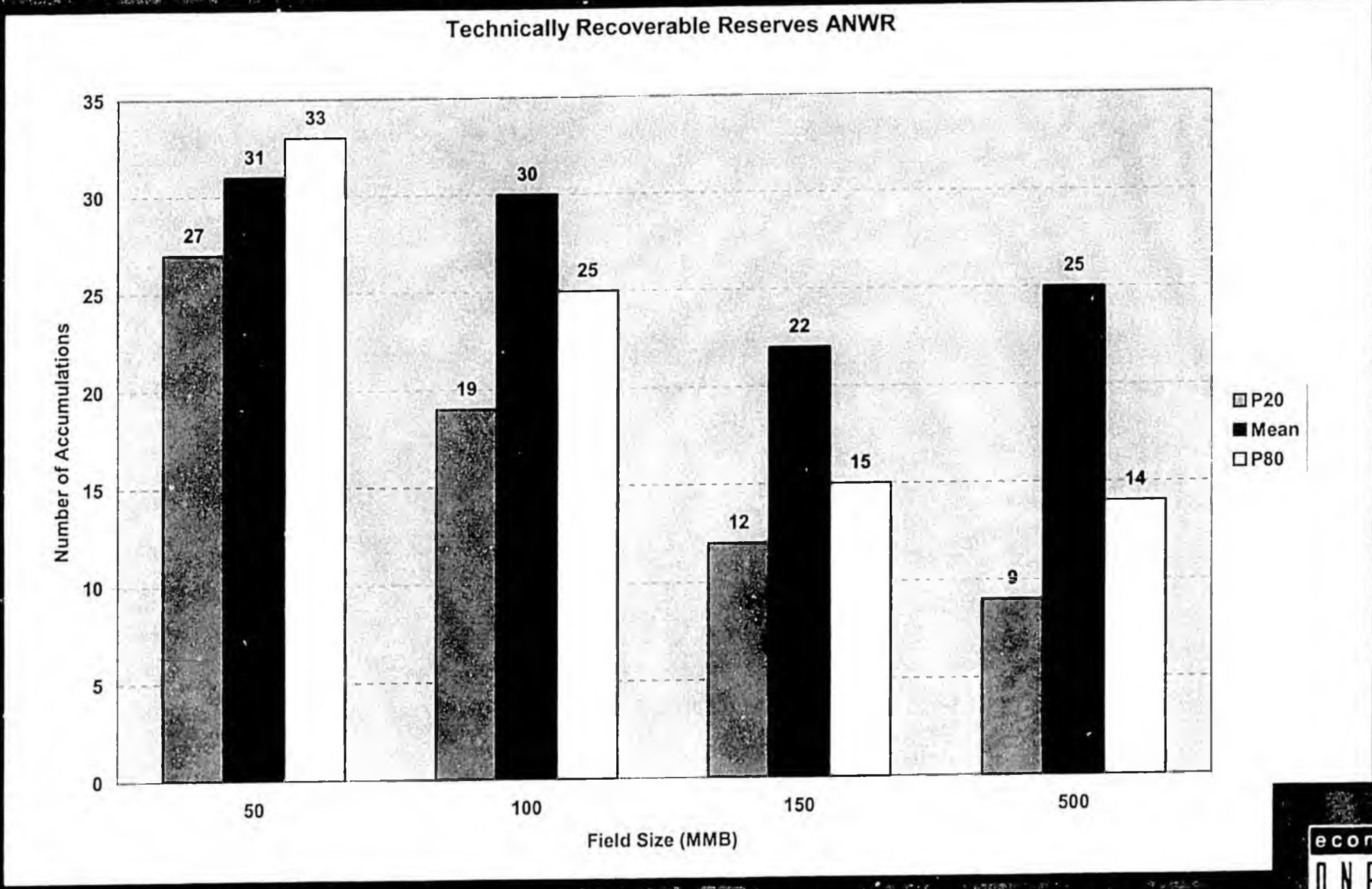
Source: USGS

# Size Distribution of Undiscovered Fields in Central North Slope

Technically Recoverable Reserves  
Central North Slope  
(no ANWR)



# Size Distribution of Undiscovered Fields – ANWR

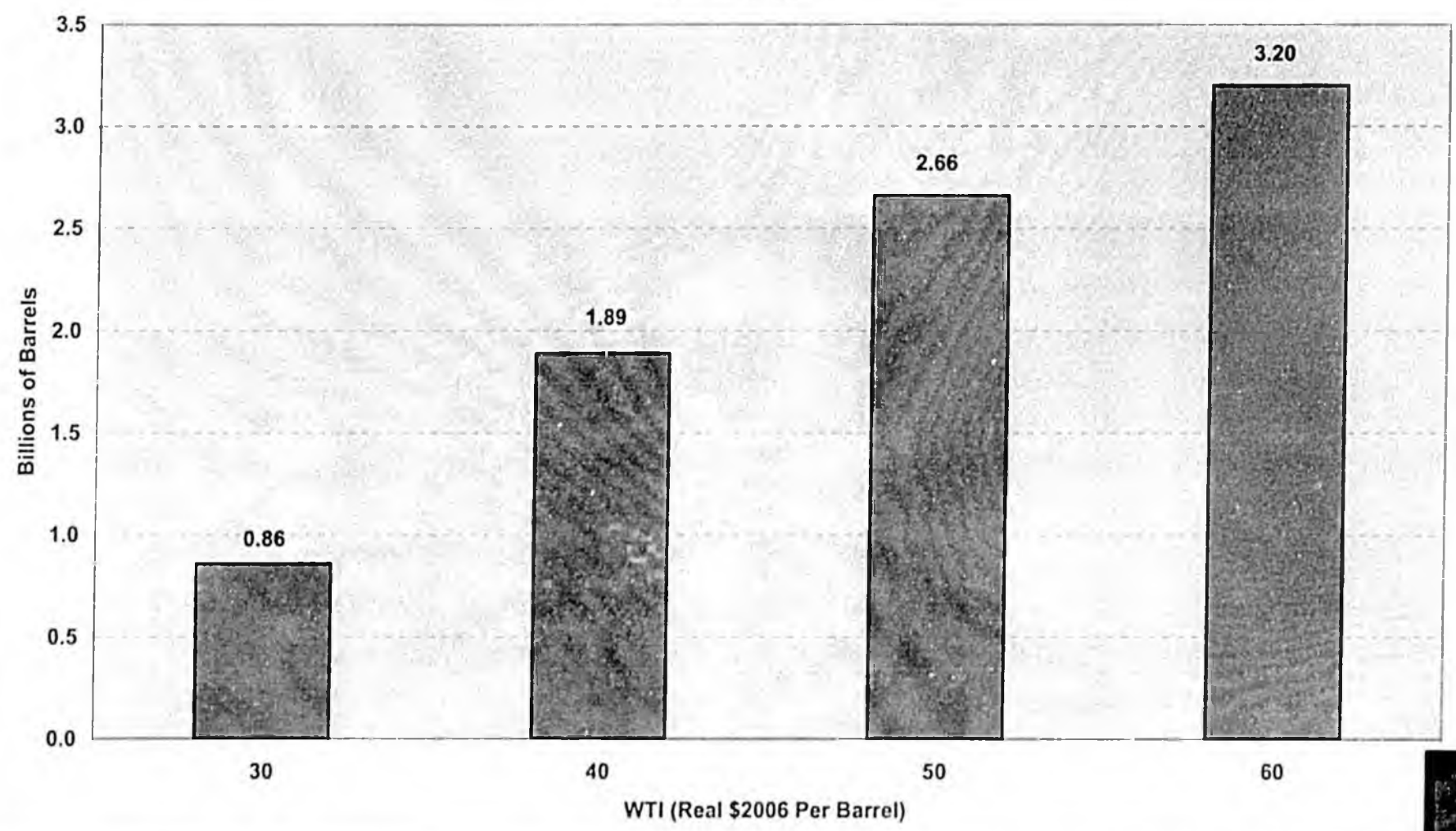


10 Billion Barrels of Technically Recoverable Oil Reserves in ANWR



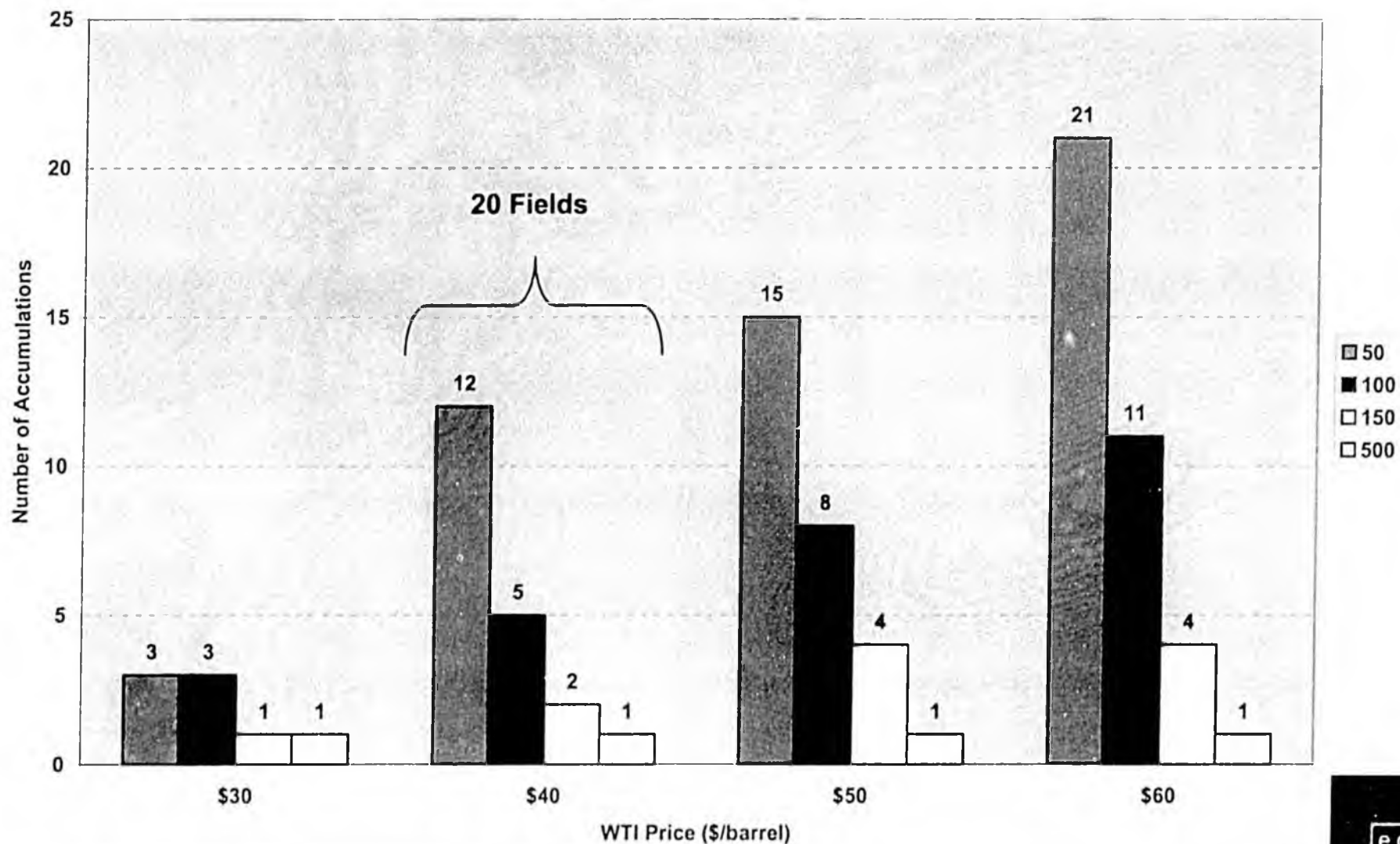
# Economic Oil Reserves in Central North Slope Alaska At Alternative Prices

Economically Recoverable Reserves  
Central North Slope  
Mean Estimate  
(No ANWR)



# Expected Discoveries Under Alternative Prices

Expected Discoveries under Alternative WTI Prices  
Central North Slope

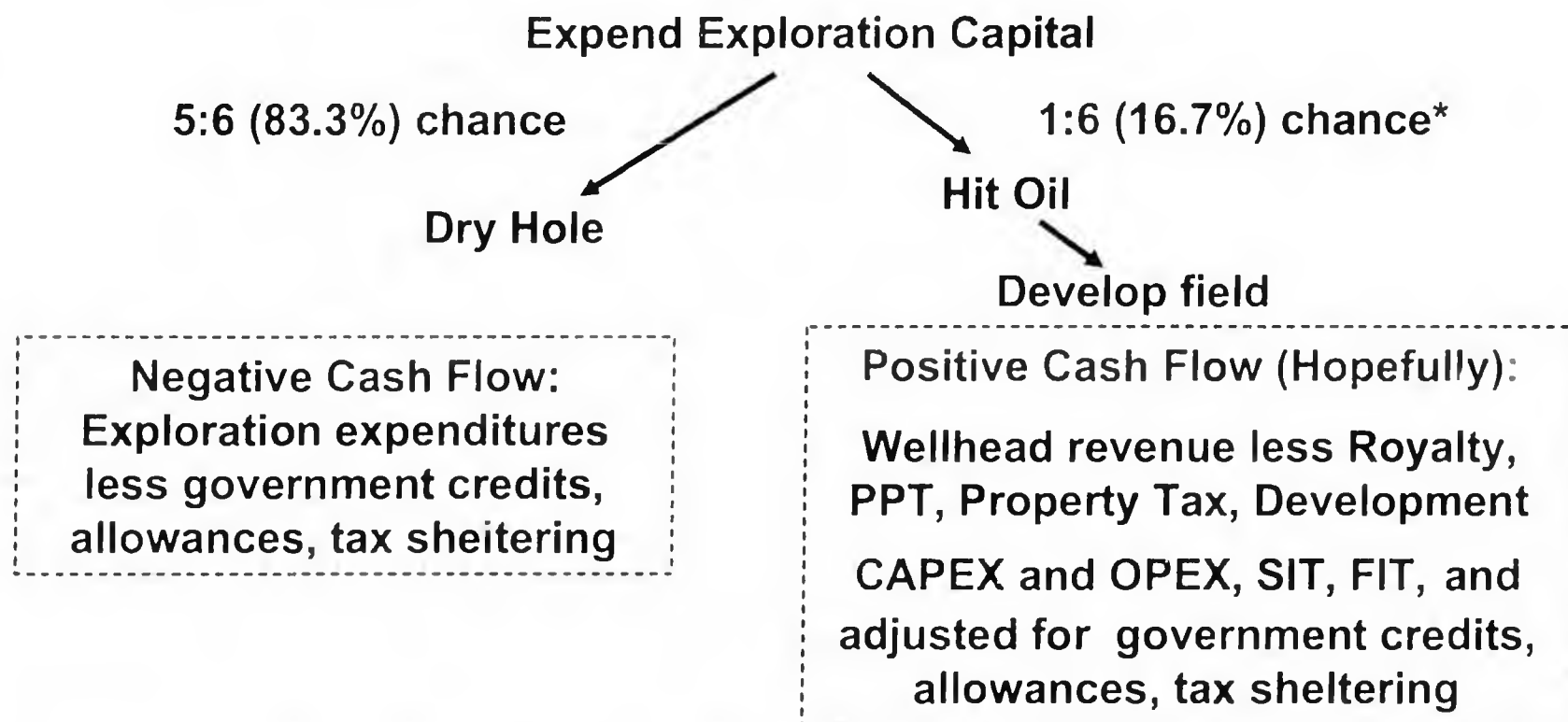


## Likely Distribution of New Field Discoveries

Size of Field	Percent
50 MMB	60%
100 MMB	25%
150 MMB	10%
500 MMB	5%

# How An Explorer Will Look At The Exploration Proposition

- Calculate the Net Present Value of all outcomes, weighted by the expectation of the outcome
- $EMV = NPV(\text{a successful development project}) \times (\text{Chance of hitting oil}) - NPV(\text{cash flow from undertaking exploration})$

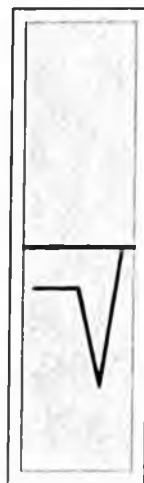


\*The experience in Alaska from 1994-2003 is 17.9% according to Wood Mac GOGRR 2004

# Schematic of Cash Flows For This Example

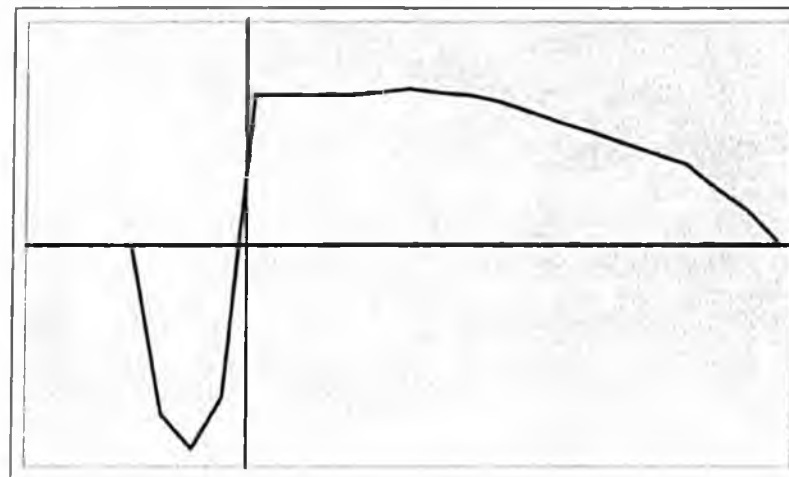
Cash Flow From  
Exploration

100% of Time



Cash Flow From  
Development  
and Production

16.7% of Time



# Avoiding Gambler's Ruin

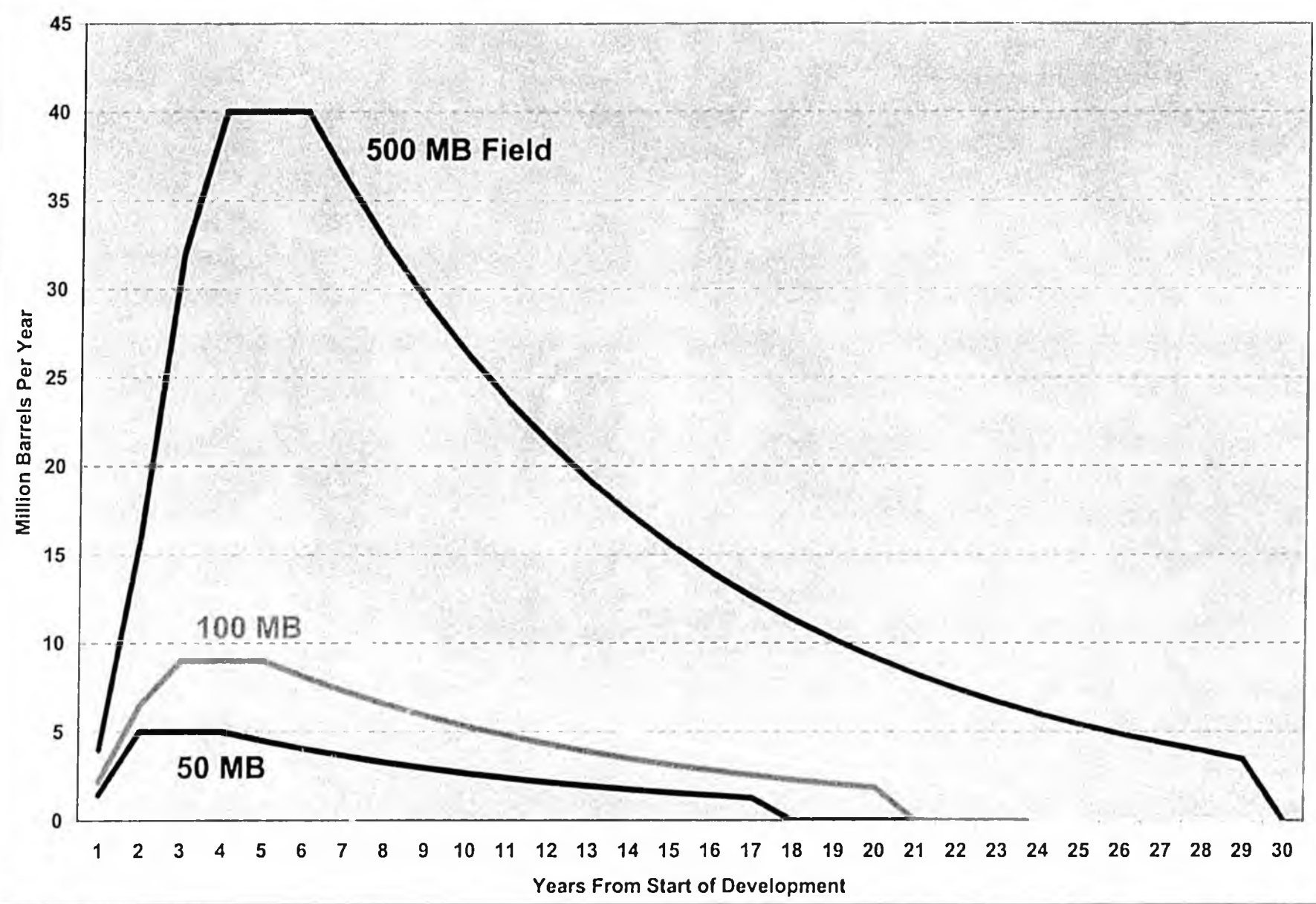
- Say the chance of drilling a successful well is 1-in-6, or .167
- An explorer will want to mitigate the risk of failure by drilling more wells. (Possibly shared.)
- The chance of failure with one well is .833 ( $=1-.167$ ). The chance of failure with a 6 well program is .334 ( $=.833^6$ )
- An explorer can drill six wells with an expected number of successful wells = 1.0

No. of Successes	Chance	Expected Value
0	.3341	0
1	.4019	.4019
2	.2015	.4030
3	.0538	.1614
4	.0081	.0324
5	.0007	.0033
6	.0001	.0078
Total		1.000

# Illustration of A Failed Exploration Program

		SQ ELF	20/20	25/20
a	Revenue	0	0	0
b	CAPEX	120	120	120
c	Production Tax	0	-24	-30
d	Tax Credit	0	24	24
a-b-c+d	<b>Producer Cash Flow (pre SIT/FIT)</b>	<b>-120</b>	<b>-72</b>	<b>-66</b>
c-d	<b>State Revenue (pre SIT/FIT)</b>	<b>0</b>	<b>-48</b>	<b>-54</b>

# Oil Production Profiles



# Economics of an 6-Well Exploration Program

## 50 MM Field (High Cost, Low Productivity)

Without \$60 M Allowance

	Explorer NCF NPV10		
Price (Real \$2006)	20/20	25/20	SQ
\$ 30	-37.4	-36.1	-79.8
\$ 40	44.5	40.7	22.6
\$ 50	126.3	117.4	124.9
	Total State Revenues (\$M) NPV10		
\$ 30	-0.4	-2.5	68.8
\$ 40	64.5	70.7	100.3
\$ 50	129.4	143.9	131.7

# Economics of an 6-Well Exploration Program 50 MM Field (High Cost, Low Productivity)

With \$60 M Allowance

	Explorer NCF NPV10		
Price (Real \$2006)	20/20	25/20	SQ
\$ 30	-13.8	-6.6	-79.8
\$ 40	72.6	75.9	22.6
\$ 50	154.7	152.9	124.9
	Total State Revenues (\$M) NPV10		
\$ 30	-38.9	-50.7	68.8
\$ 40	18.5	13.2	100.3
\$ 50	83.0	86.0	131.7

# Economics of an 6-Well Exploration Program

## Without \$60 M Allowance

	Explorer NCF NPV10		
Price (Real \$2006)	20/20	25/20	SQ
\$ 30			-35.5
\$ 40			147.4
\$ 50			330.4
	Explorer IRR		
\$ 30			8.6
\$ 40			15.3
\$ 50			21.0
	Total State Revenues (\$M) NPV10		
\$ 30			137.7
\$ 40			198.4
\$ 50			259.0

# Economics of an 6-Well Exploration Program

## Without \$60 M Allowance

	Explorer NCF NPV10		
Price (Real \$2006)	20/20	25/20	SQ
\$ 30	5.1	3.3	-35.5
\$ 40	149.7	138.9	147.4
\$ 50	294.3	274.5	330.4
	Explorer IRR		
\$ 30	10.3	10.2	8.6
\$ 40	17.1	16.9	15.3
\$ 50	22.7	21.0	21.0
	Total State Revenues (\$M) NPV10		
\$ 30	51.2	54.0	137.7
\$ 40	165.7	183.4	198.4
\$ 50	280.3	312.7	259.0

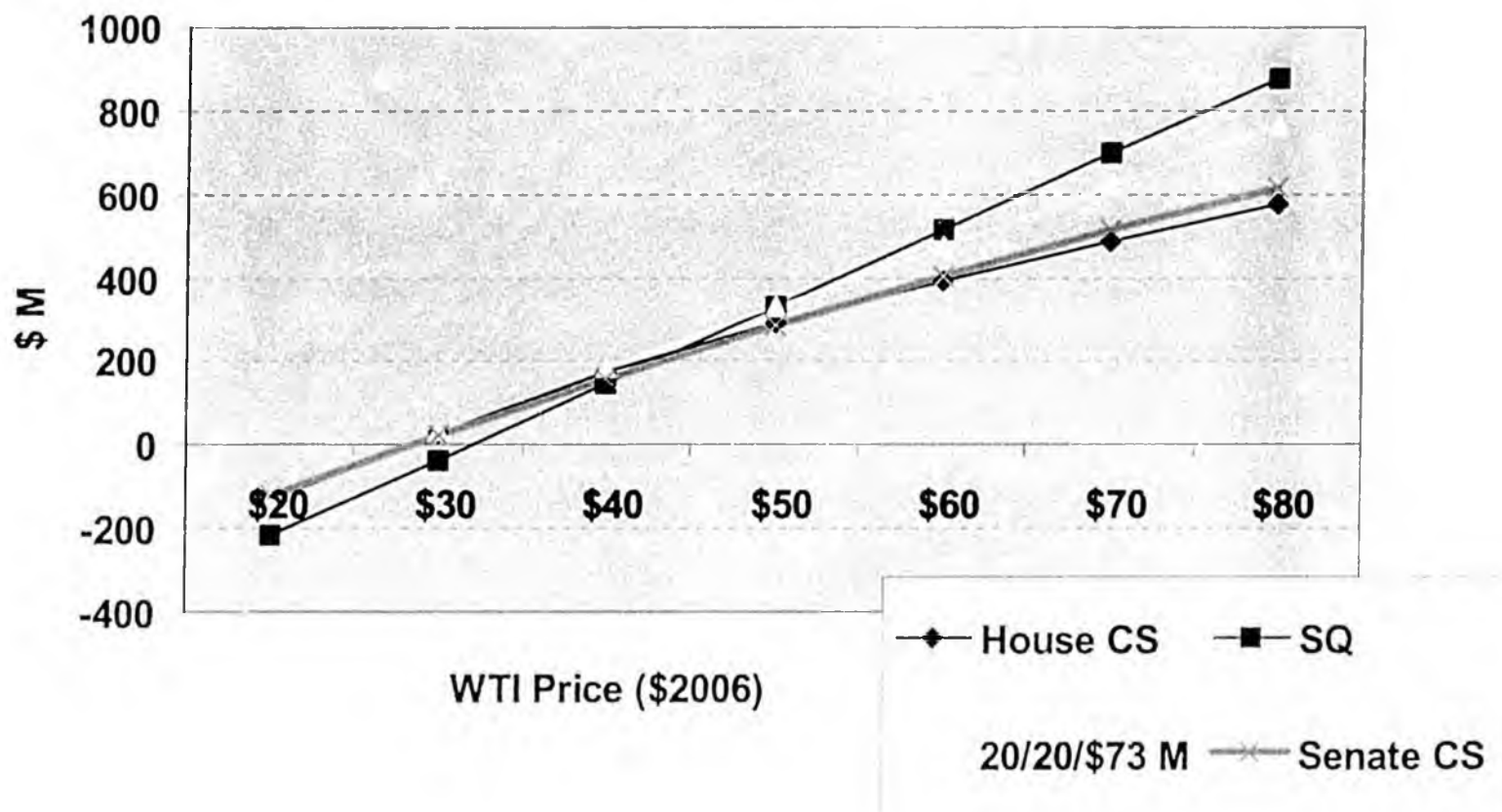
# Economics of an 6-Well Exploration Program

With \$60 M Allowance

	Explorer NCF NPV10		
Price (Real \$2006)	20/20	25/20	SQ
\$ 30	30.4	34.9	-35.5
\$ 40	178.8	175.3	147.4
\$ 50	323.8	311.1	330.4
	Explorer IRR		
\$ 30	11.5	11.8	8.6
\$ 40	18.2	18.3	15.3
\$ 50	23.7	23.7	21.0
	Total State Revenues (\$M) NPV10		
\$ 30	9.9	2.5	137.7
\$ 40	118.2	124.0	198.4
\$ 50	232.2	252.5	259.0

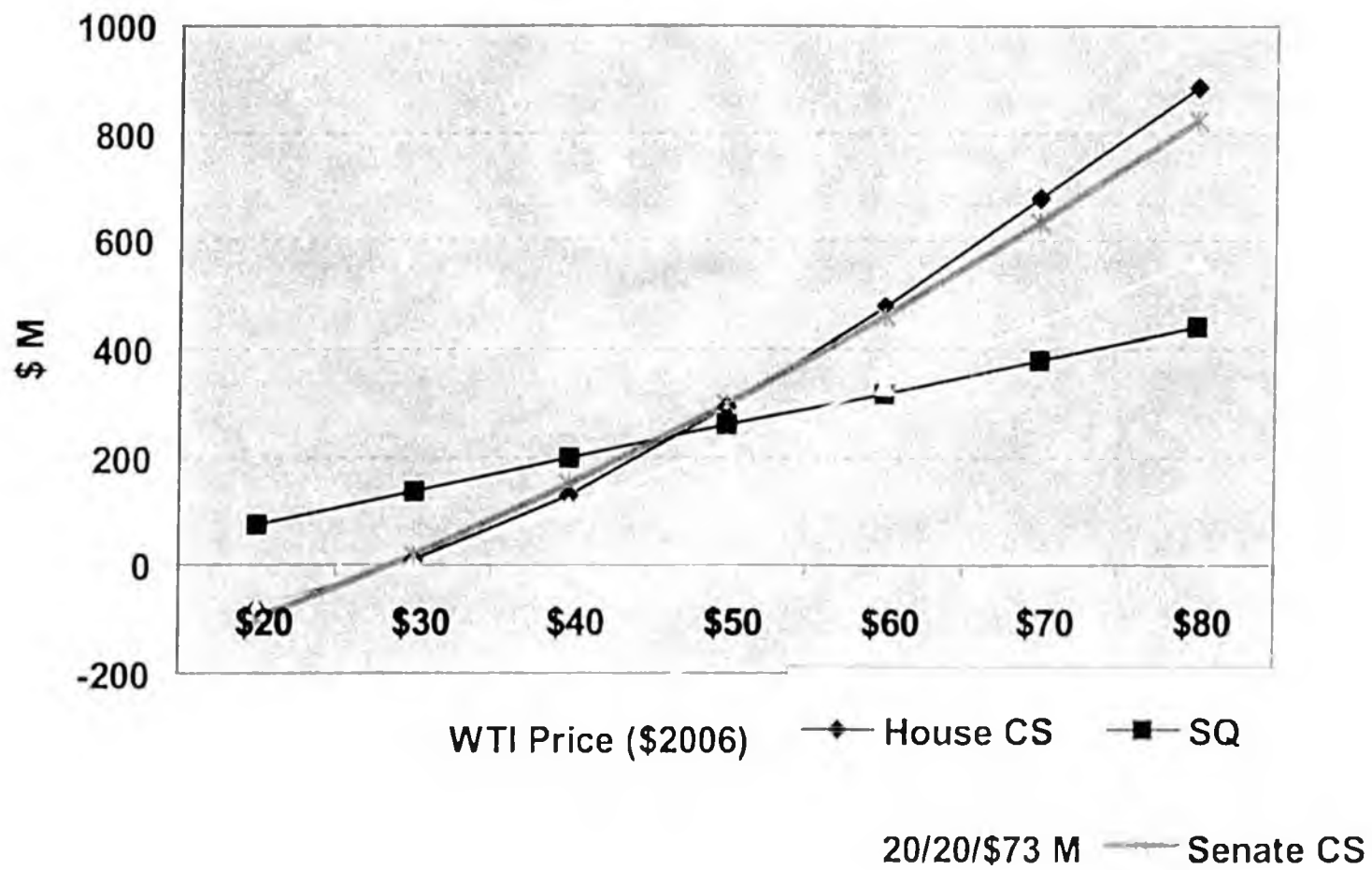
# Comparison of Tax Proposals

### Producer Net Cash Flow NPV 10



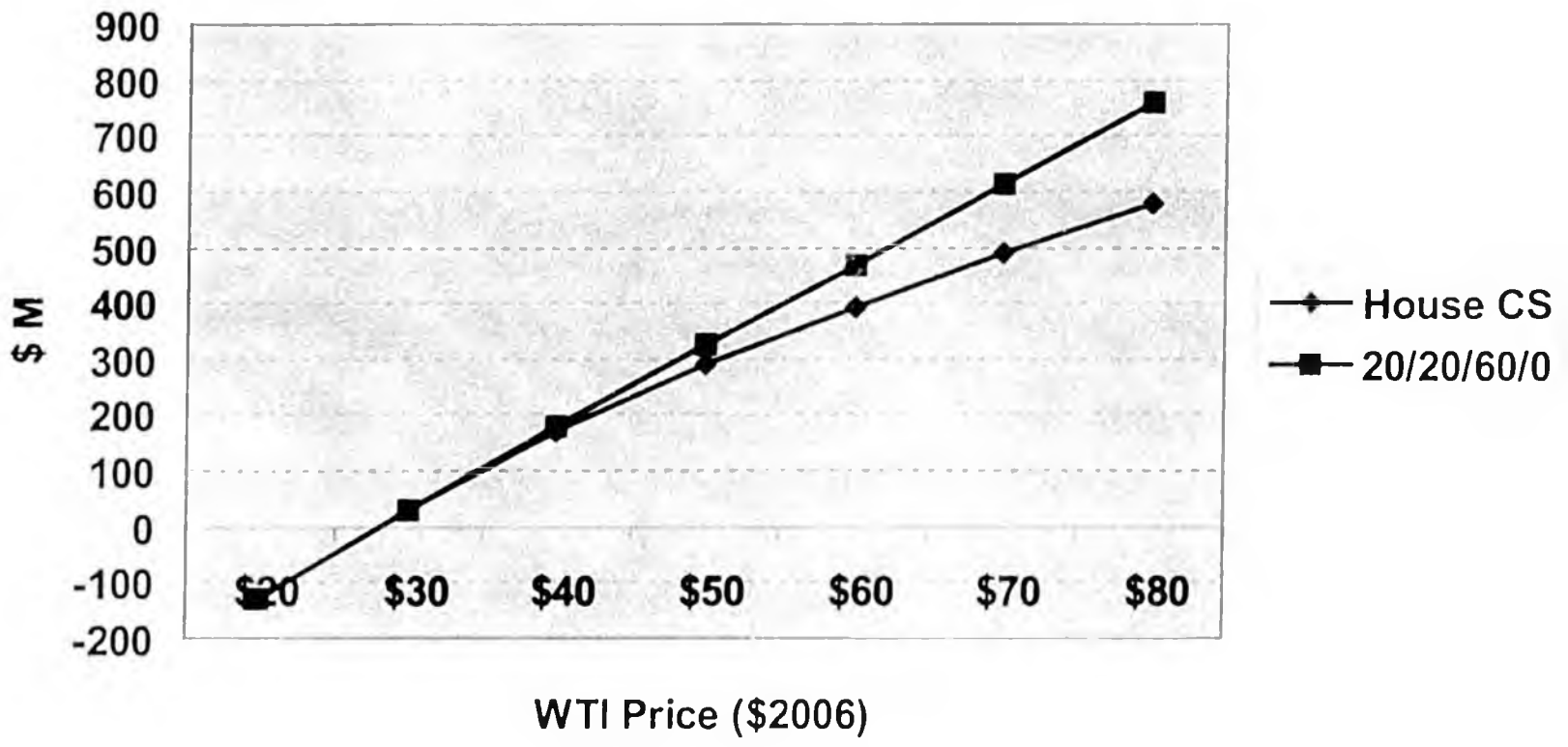
# Comparison of Tax Proposals

Total State Revenues  
NPV 10



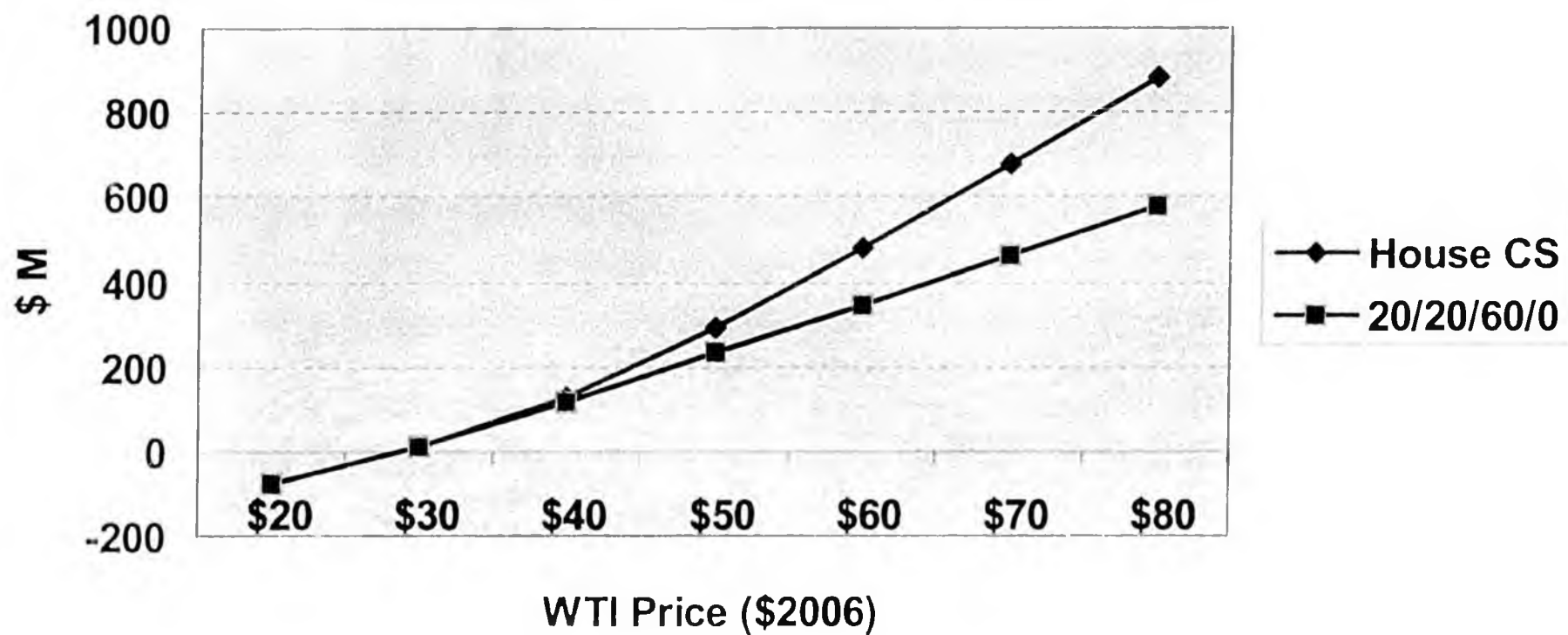
# Impact of Progressivity

## Producer Net Cash Flow NPV 10



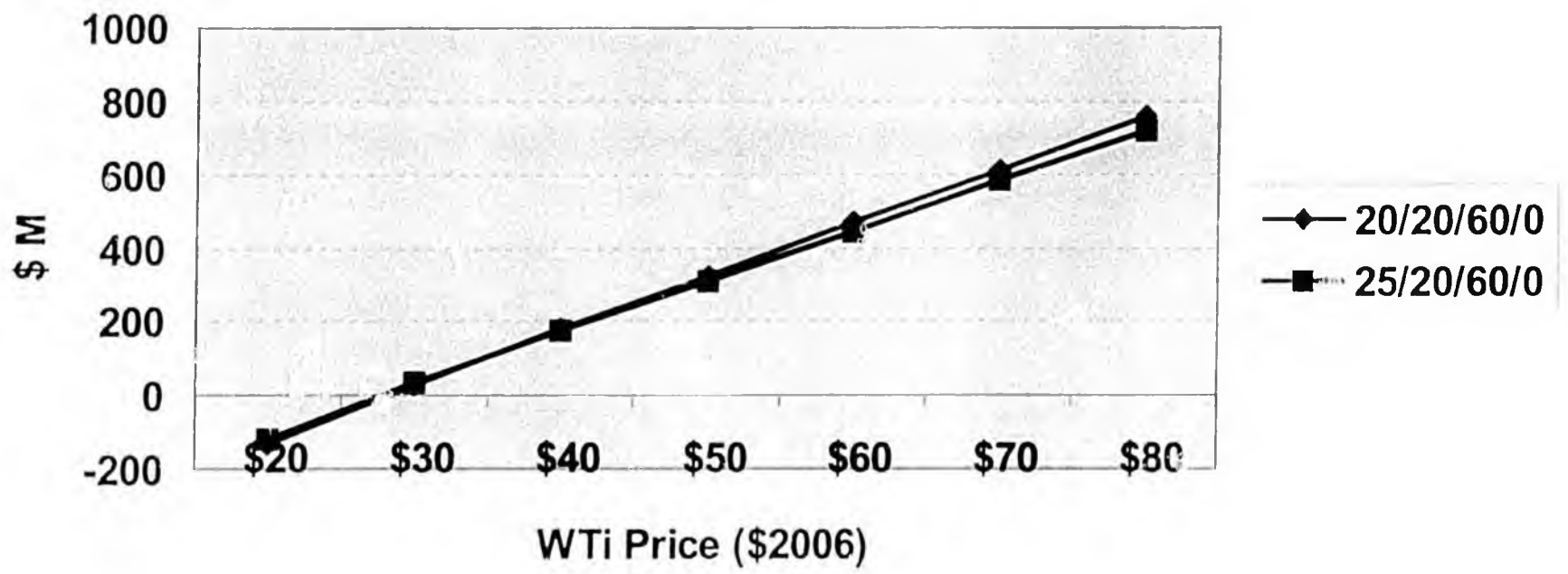
# Impact of Progressivity

## Total State Revenue NPV10



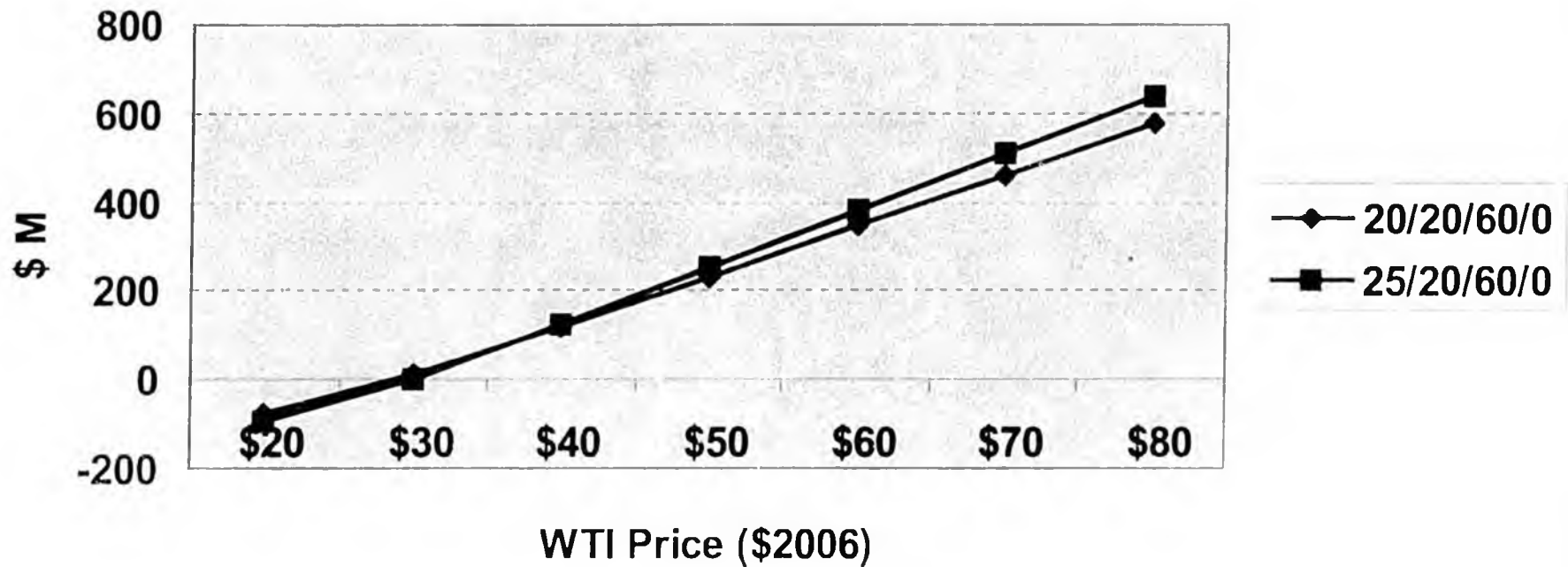
# Impact of 25/20 versus 20/20

## Producer Net Cash Flow NPV 10



# Impact of 25/20 versus 20/20

## Total State Revenues NPV 10

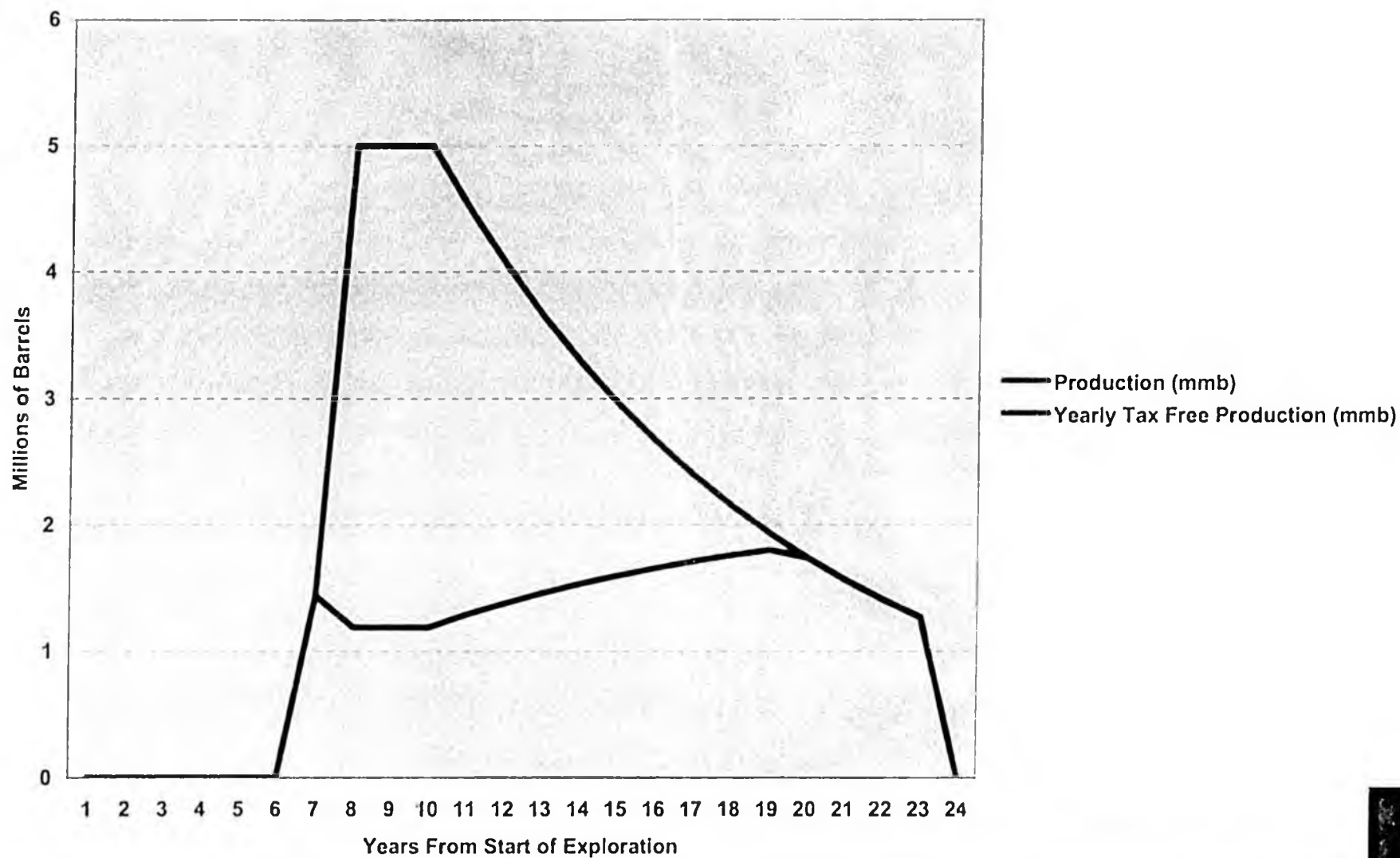


# Exploration Forgiveness - An Alternative to Tax Free Allowance

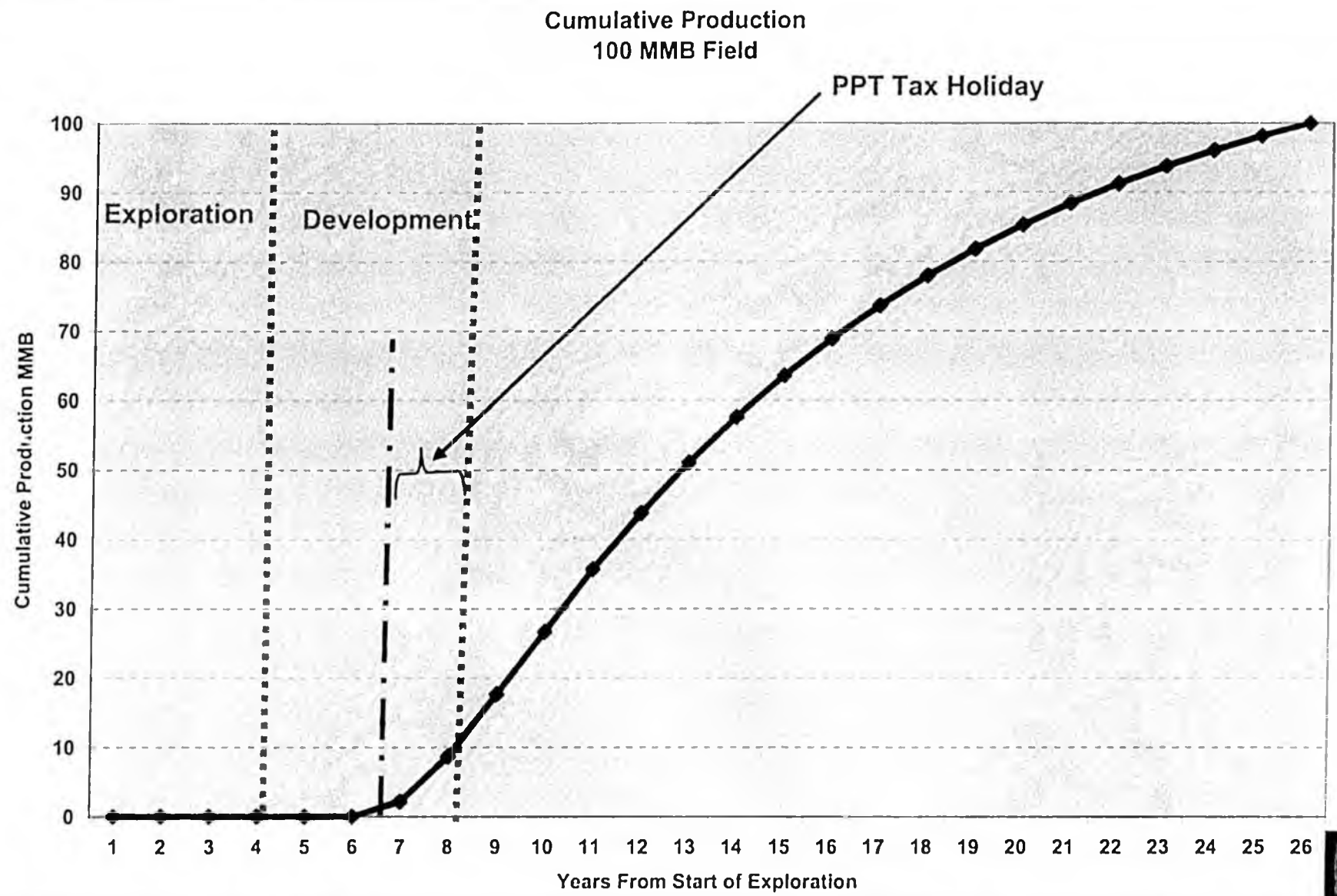
- For each new field give a “Tax Holiday” from the PPT for the first 10 million barrels of production
- This provides an incentive for new exploration
  - Improves producers cash flow in the early stages of the production process
  - Producers cannot seek royalty relief if they opt for the “Tax Holiday”
- Also provides incentive to put the field on early
- This tax holiday is NOT applied to existing fields
- The fiscal impact on the State of Alaska will be felt after the field is producing, e.g. seven years after exploration starts

# Tax Free Production – 50 MB Field

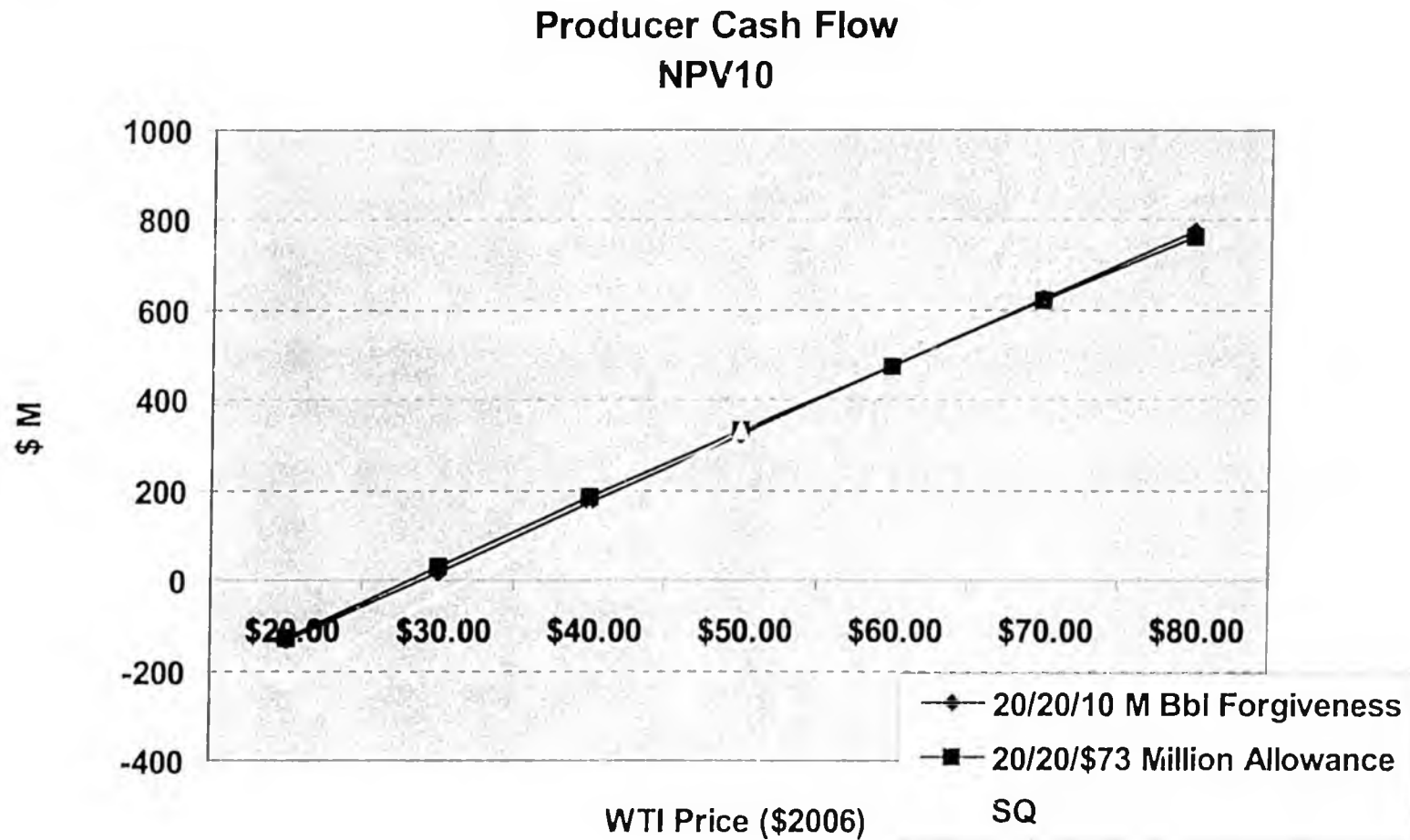
Annual Production 50 MB Field



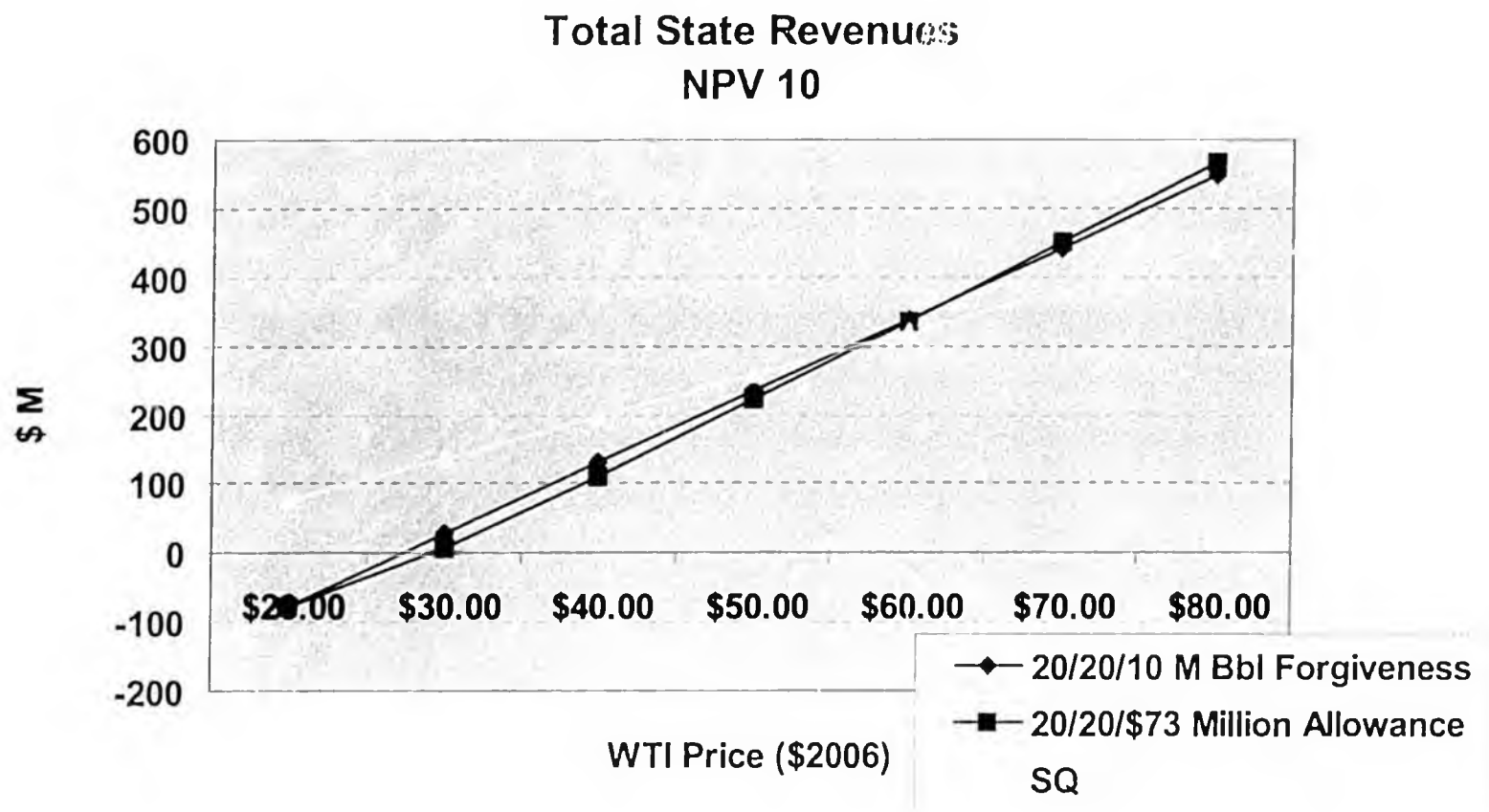
# Typical Cumulative Production Profile – 100 MMB Field



# Impact on Producer Economics

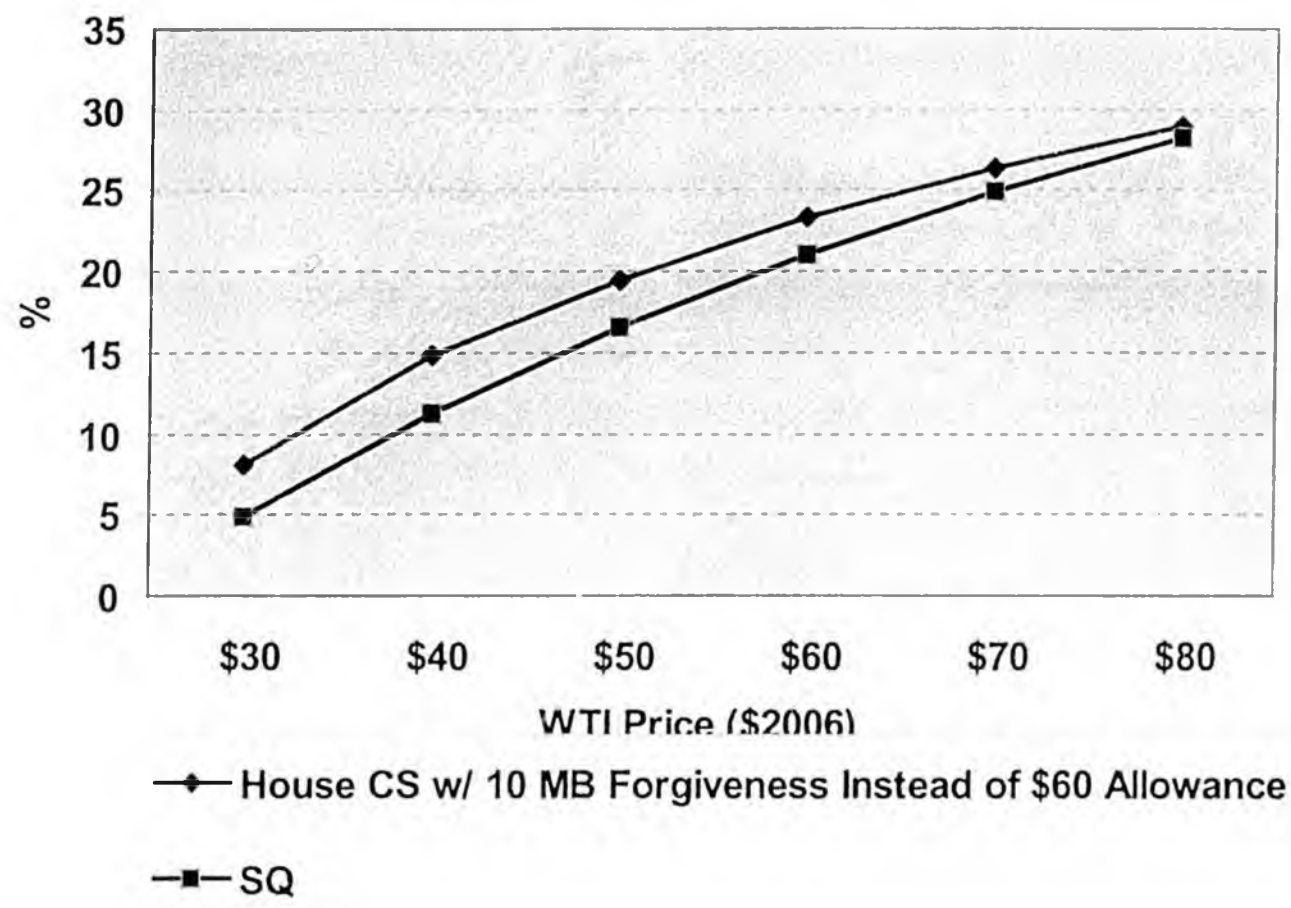


# Impact on State Revenues (NPV 10)



# Impact on Small Field Economics – 50 MB Field

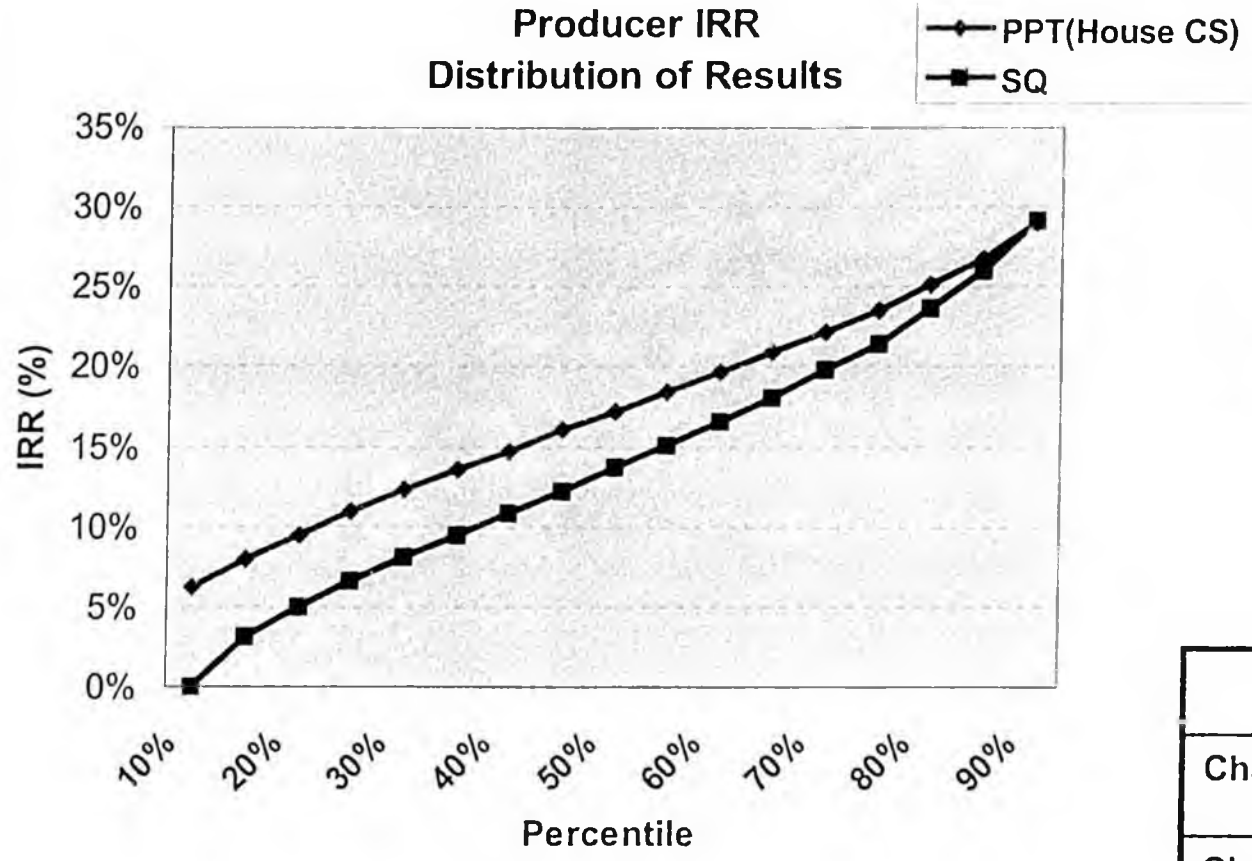
## Producer IRR



## Probabilistic Results

- Producers may look at results on a probabilistic basis
- Suppose their view of future WTI prices is:
  - Mean (Most Likely) of \$40
  - P20 of \$25, P80 of \$55 (i.e.  $\$40 \pm \$15$ )

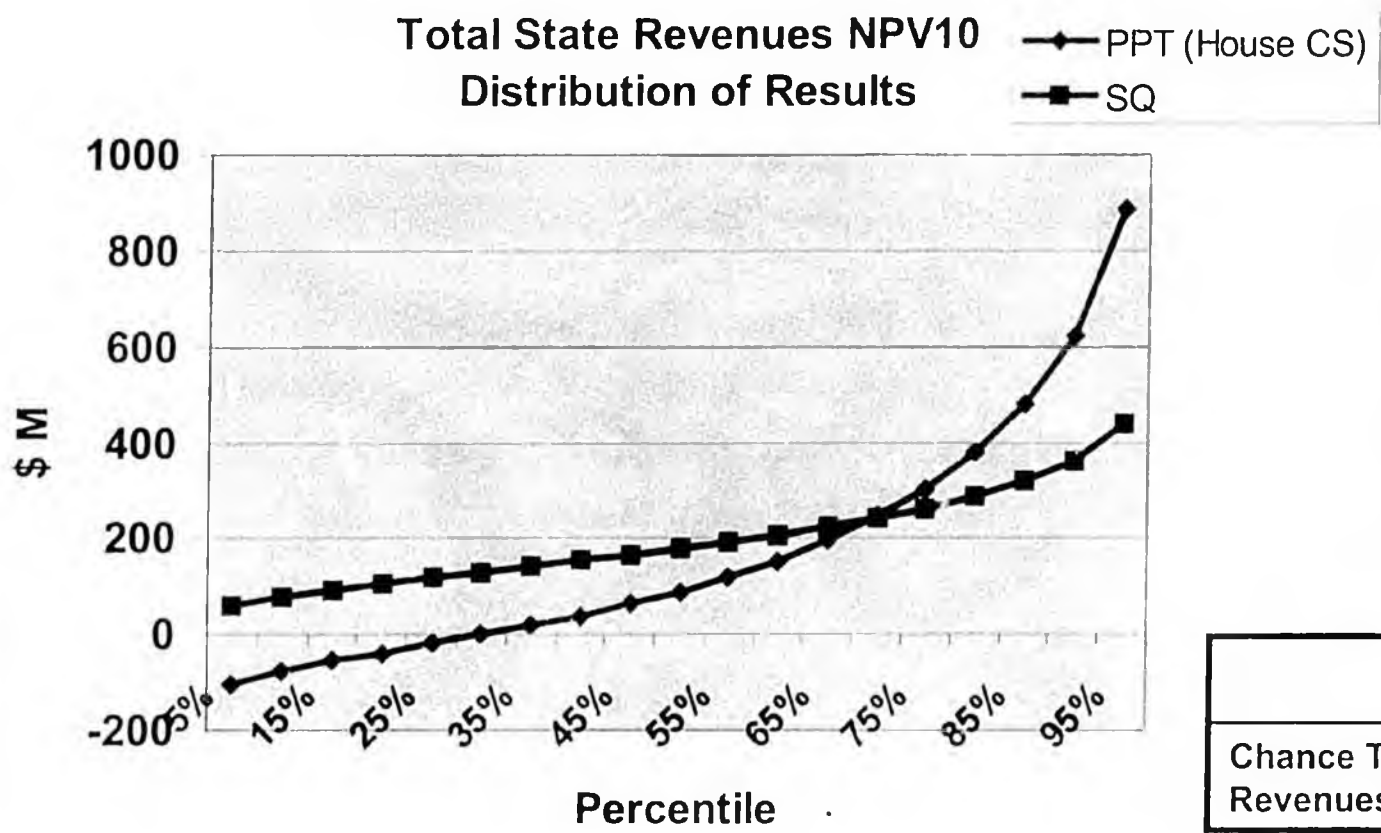
# Distribution of Results – Producer IRR



IRR	PPT	SQ
Median (P50)	17.2%	13.7%
P20	9.5%	5.0%

	PPT	SQ
Chance IRR < 12%	30%	45%
Chance IRR < 15%	40%	55%

# Distribution of Results – Total State Revenues NPV10



Total State Revenues NPV10 (\$M)	PPT	SQ
Median (P50)	89	180
P20	-38	107

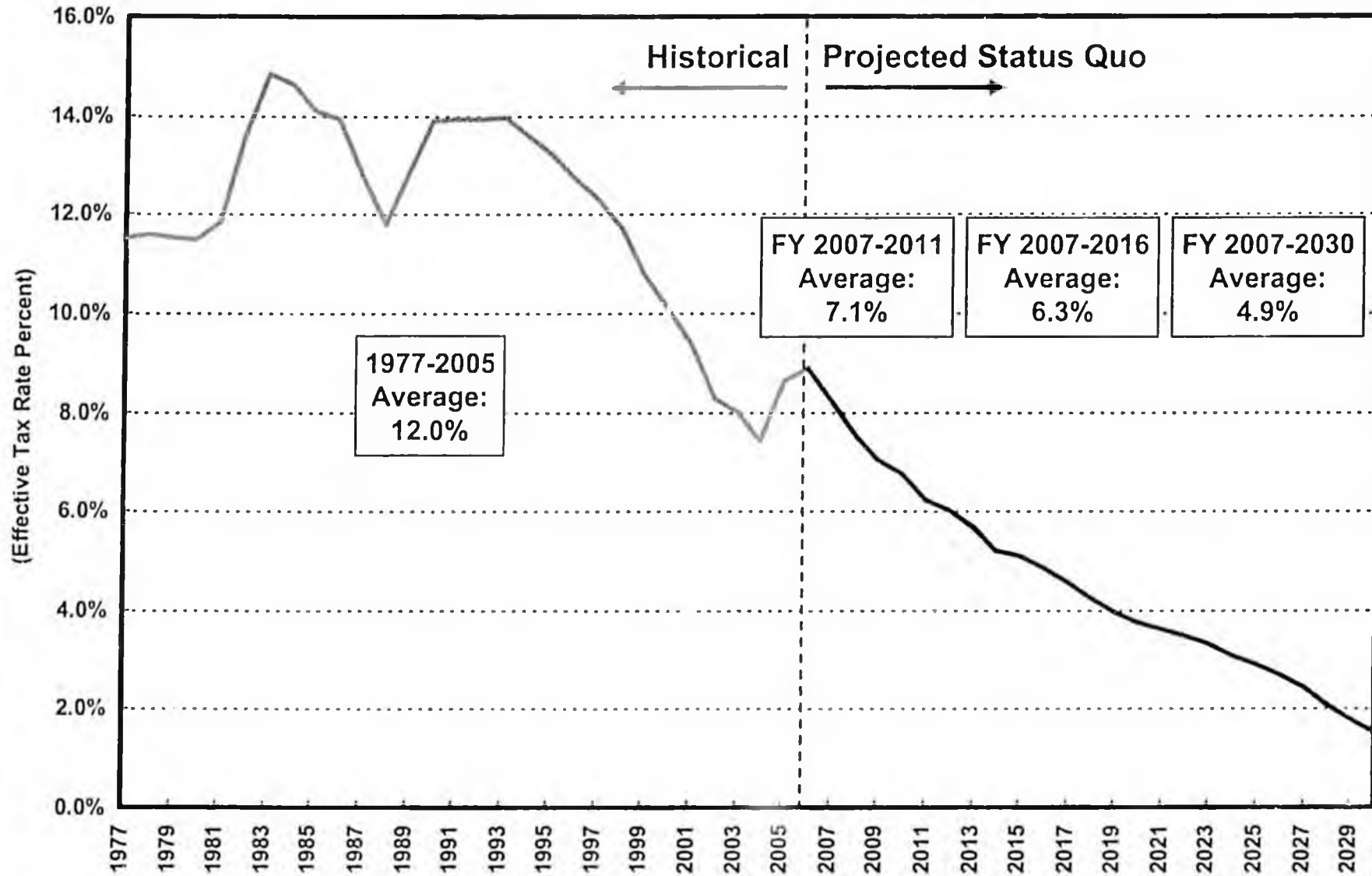
	PPT	SQ
Chance Total State Revenues <0	30%	1%

# Conclusions/Observations Regarding Exploration Impacts

- Without ANWR opening, expectation of large oil discoveries are unlikely, due to the Field Size Distribution of remaining economic reserves
- At low prices, 25/20 helps explorer more than 20/20
- Incentives are required at low prices (say, \$73 M, although alternative approaches could work as well, e.g. “production tax holiday”)
  - “Sunset” provision in tax free barrel allowance in Senate CS not likely to provide incentive due to long-lived exploration-production cycle
- At low prices, 20/20 and 25/20 preferred over SQ, in order to incent exploration
- Exploration is still a risky business. Probabilistic results using “Industry View” of oil prices yields smaller chance of a “losing IRR” under PPT than under SQ. Higher chance of “loss” for State under PPT.
- Under either a 20/20 or 25/20 program, remaining reserves are economic, except for low prices (<\$30?)

## **Existing Fields**

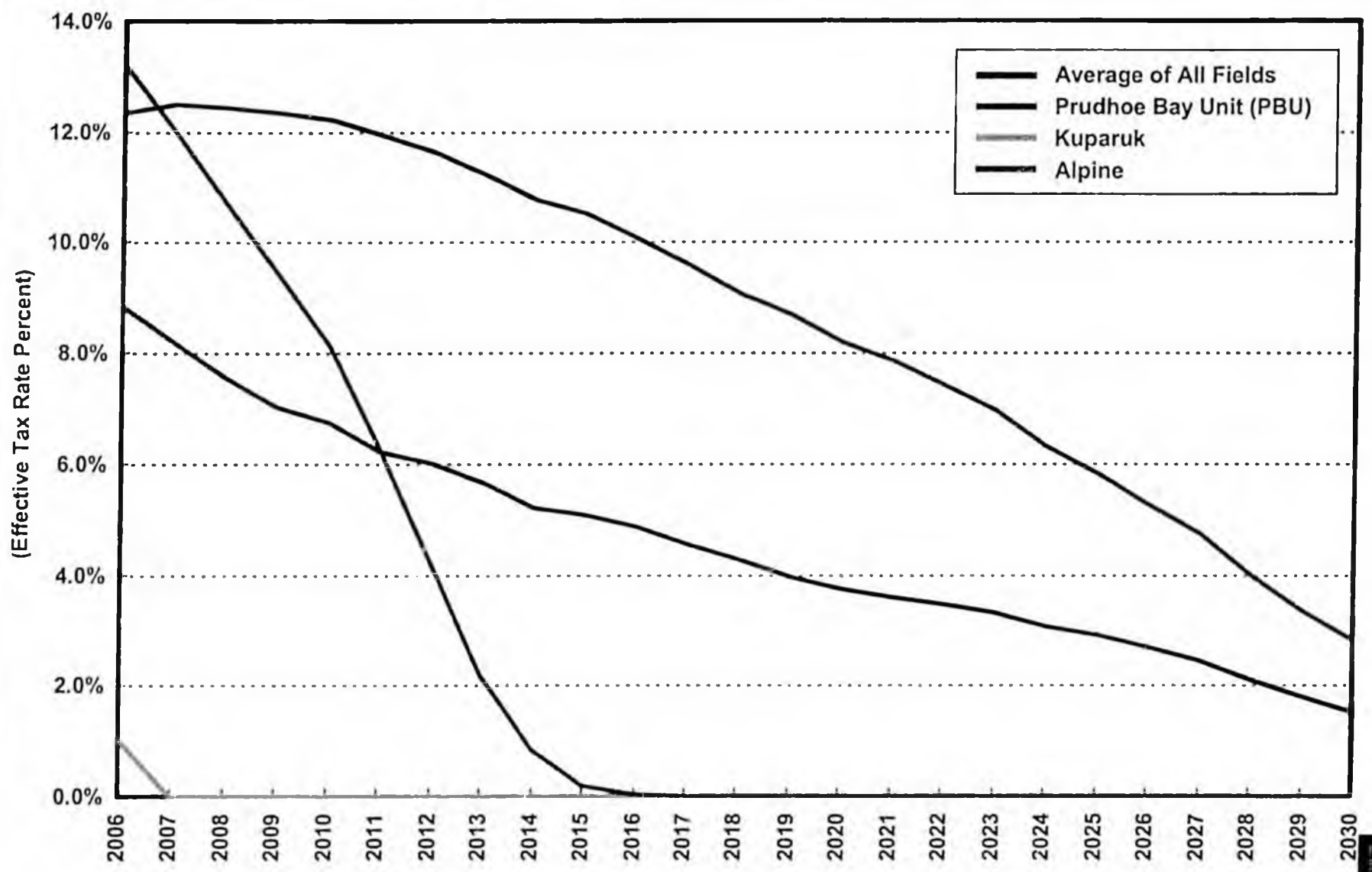
# Effective Severance Tax Rates Over Time



Source: Historical: Alaska Department of Revenue.



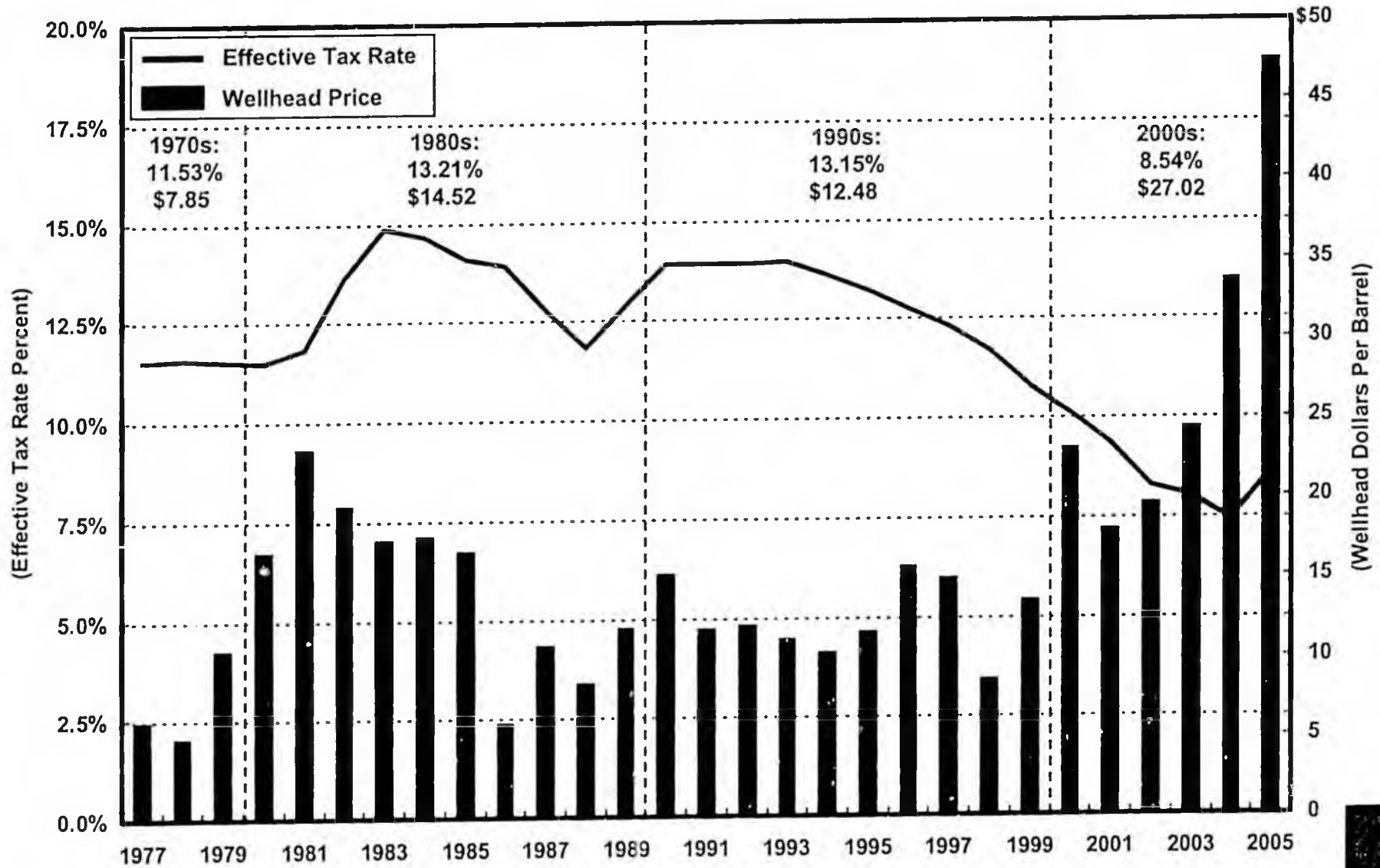
# Projected Effective Severance Tax Rates\* by Field



\* Volumes per DOR Fall 2005 Forecast with Oooguruk projection.



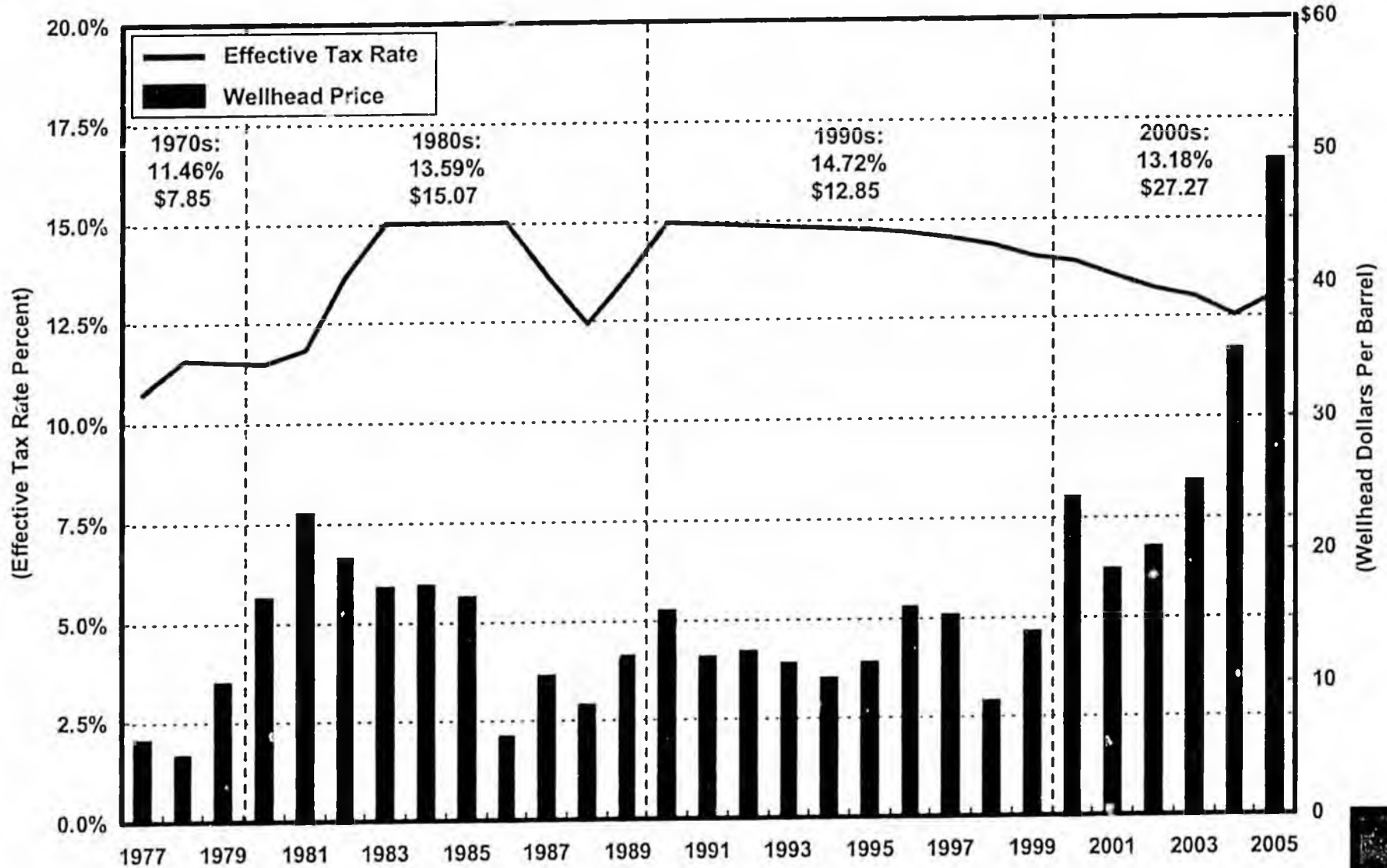
# Effective Tax Rates and Wellhead Prices Over Time (All North Slope Fields)



Source: Alaska Department of Revenue.



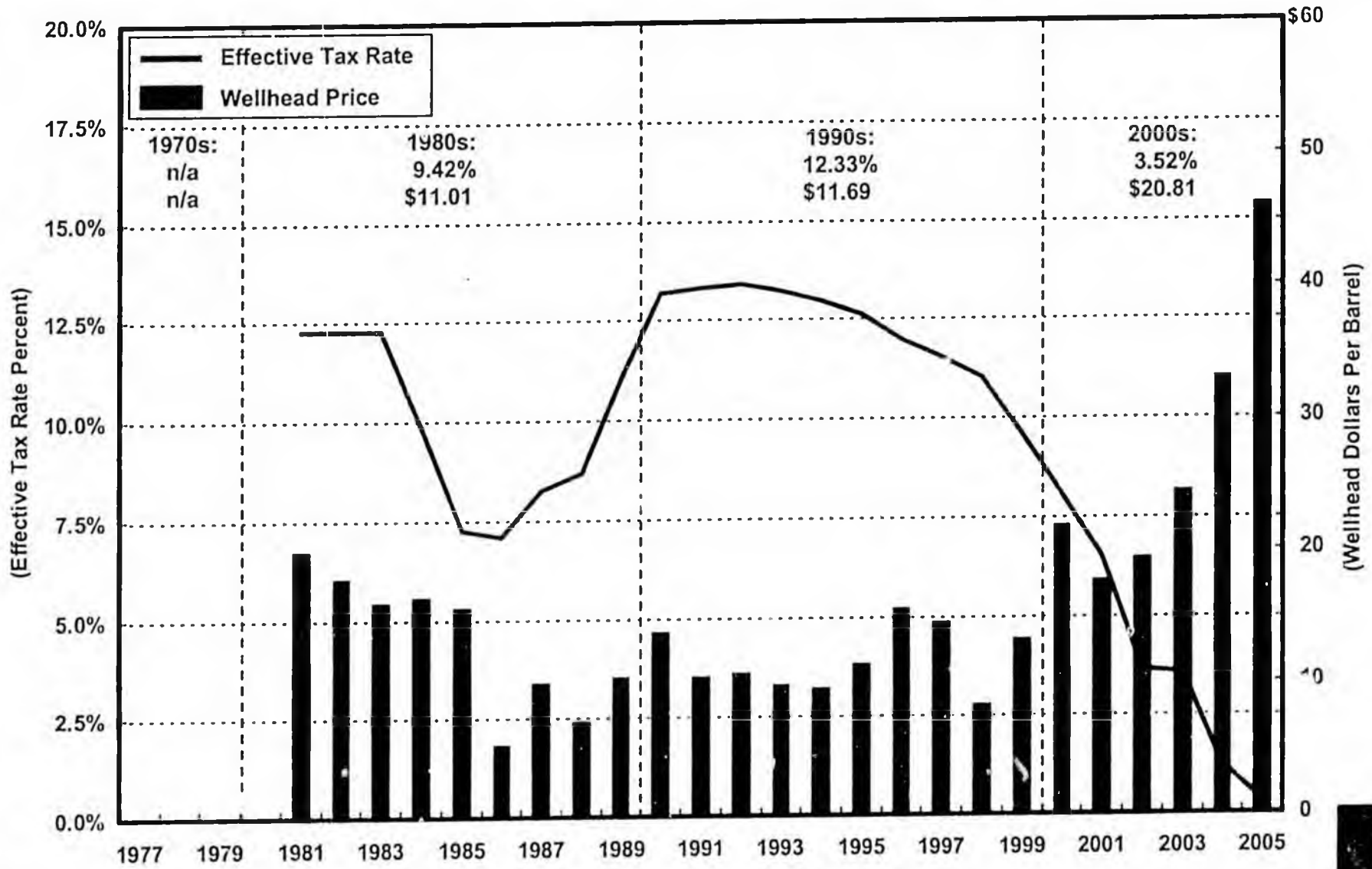
# Effective Tax Rates and Wellhead Prices Over Time (Prudhoe Bay Field)



Source: Alaska Department of Revenue.



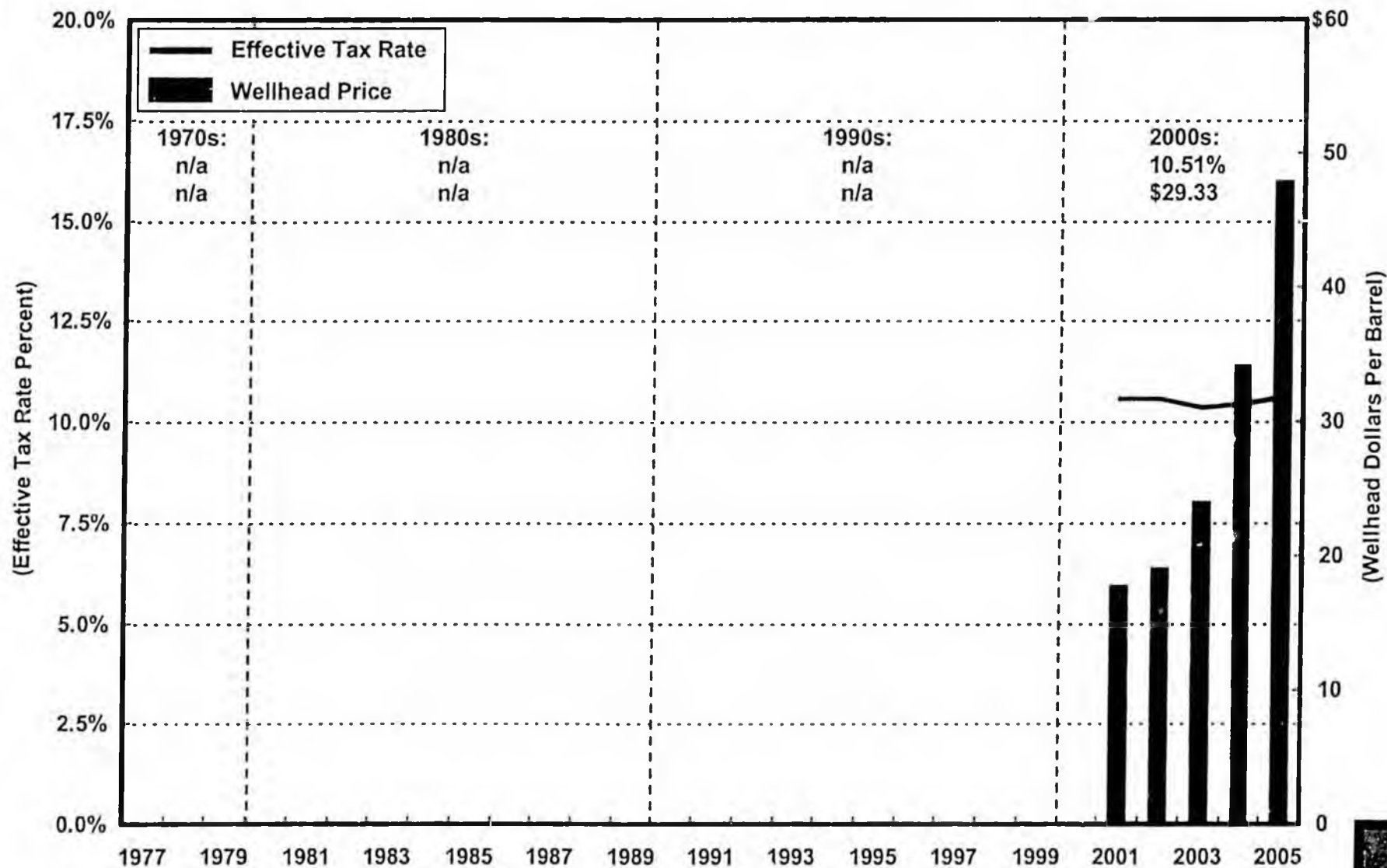
# Effective Tax Rates and Wellhead Prices Over Time (Kuparuk Field)



Source: Alaska Department of Revenue.



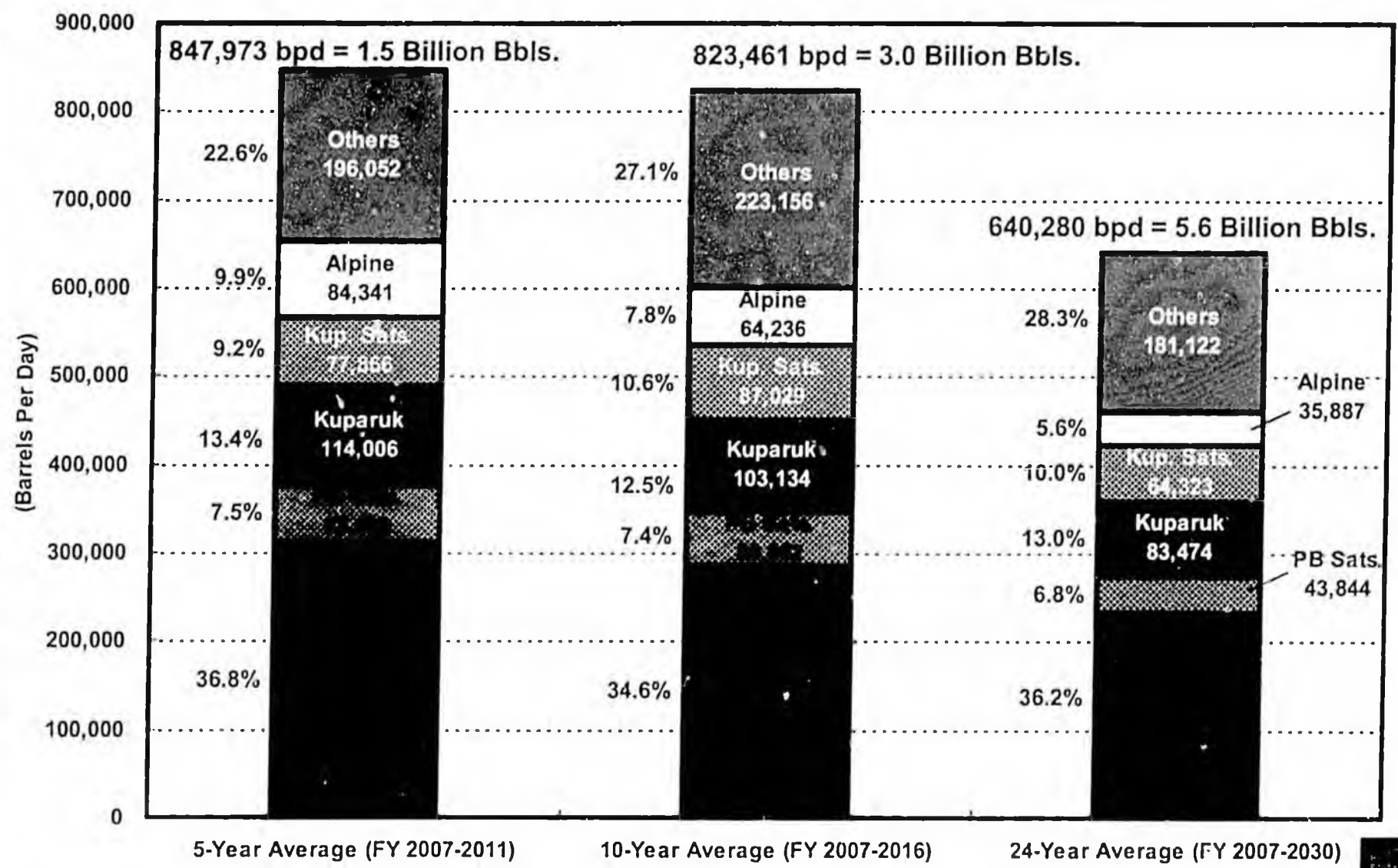
# Effective Tax Rates and Wellhead Prices Over Time (Alpine Field)



Source: Alaska Department of Revenue.



# Projected North Slope Crude Oil\* Production (FY 2007-2030)

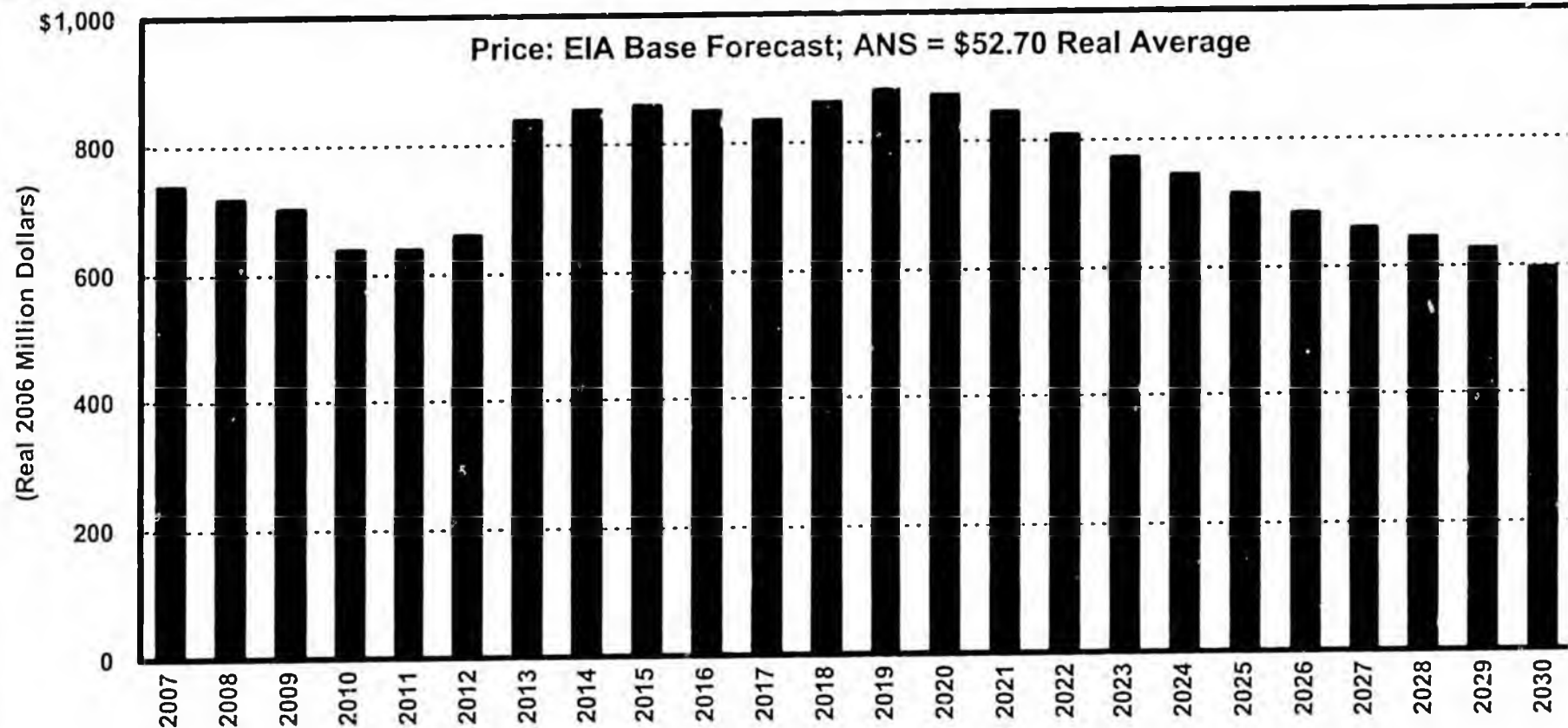


\* Includes NGLs.

Source: Alaska Department of Revenue.



# Change in Projected Taxes Under a 20/20 Tax DOR Forecast Production (FY 2007-2030)\*



	FY 2007-2011	FY 2007-2016	FY 2007-2030
Total Difference from SQ (\$Million)	\$3,417	\$7,471	\$17,971
Annual Average Difference from SQ (\$Million)	\$683	\$747	\$749
PPT Effective Tax Rate (Percent)	12.2%	12.4%	12.6%
SQ Effective Tax Rate (Percent)	7.1%	6.3%	4.9%

\* Calculated from July 2006; includes 6-year transition (100% 2001-2005) and \$73 Million exemption over 7 companies; volumes per DOR Fall 2005 Forecast with Oooguruk projection.

# Change in Projected Taxes Under a 20/20 Tax DOR Forecast Production (FY 2007-2030)\*

	EIA WTI Price Forecast:			Fixed \$40 ANS Price	FY2007-2011 Breakeven	FY2007-2016 Breakeven	FY2007-2030 Breakeven
	Base	Low	High				
Average ANS Price in Real 2006 Dollars:	\$52.70	\$33.40	\$70.00	\$40.00	\$30.40	\$28.50	\$26.80

<b>FY 2007-2011</b>							
Total Difference from Status Quo (Million 2006\$)	\$3,417	\$2,459	\$4,637	\$1,673	\$0	-	-
Annual Average Difference from Status Quo (Million 2006\$)	\$683	\$492	\$927	\$335	\$0	-	-
PPT Effective Tax Rate (Percent)	12.2%	11.4%	13.2%	10.7%	7.2%	-	-
Status Quo Effective Tax Rate (Percent)	7.1%	7.2%	7.1%	7.1%	7.2%	-	-

<b>FY 2007-2016</b>							
Total Difference from Status Quo (Million 2006\$)	\$7,471	\$3,614	\$11,688	\$4,156	-	\$0	-
Annual Average Difference from Status Quo (Million 2006\$)	\$747	\$361	\$1,169	\$416	-	\$0	-
PPT Effective Tax Rate (Percent)	12.4%	10.3%	13.8%	10.8%	-	6.3%	-
Status Quo Effective Tax Rate (Percent)	6.3%	6.5%	6.2%	6.3%	-	6.3%	-

<b>FY 2007-2030</b>							
Total Difference from Status Quo (Million 2006\$)	\$17,971	\$4,824	\$30,262	\$9,796	-	-	\$0
Annual Average Difference from Status Quo (Million 2006\$)	\$749	\$201	\$1,261	\$408	-	-	\$0
PPT Effective Tax Rate (Percent)	12.6%	8.7%	14.5%	10.6%	-	-	5.0%
Status Quo Effective Tax Rate (Percent)	4.9%	5.4%	4.7%	4.9%	-	-	5.0%



\* Calculated from July 2006; includes 8-year transition (100% 2001-2005) and \$73 Million exemption over 7 companies; volumes per DOR Fall 2005 Forecast with Oooguruk projection.

# Change in Projected Taxes Under a 20/20 Tax with Costs Increased by 20% DOR Forecast Production (FY 2007-2030)\*

	EIA WTI Price Forecast:			Fixed \$40 ANS Price	FY2007-2011 Breakeven	FY2007-2016 Breakeven	FY2007-2030 Breakeven
	Base	Low	High				
Average ANS Price in Real 2006 Dollars:	\$52.70	\$33.40	\$70.00	\$40.00	\$34.80	\$32.60	\$30.50

## FY 2007-2011

Total Difference from Status Quo (Million 2006\$)	\$2,659	\$1,701	\$3,878	\$915	\$0	-
Annual Average Difference from Status Quo (Million 2006\$)	\$532	\$340	\$776	\$183	\$0	-
PPT Effective Tax Rate (Percent)	11.1%	10.1%	12.2%	9.1%	7.1%	-
Status Quo Effective Tax Rate (Percent)	7.1%	7.2%	7.1%	7.1%	7.1%	-

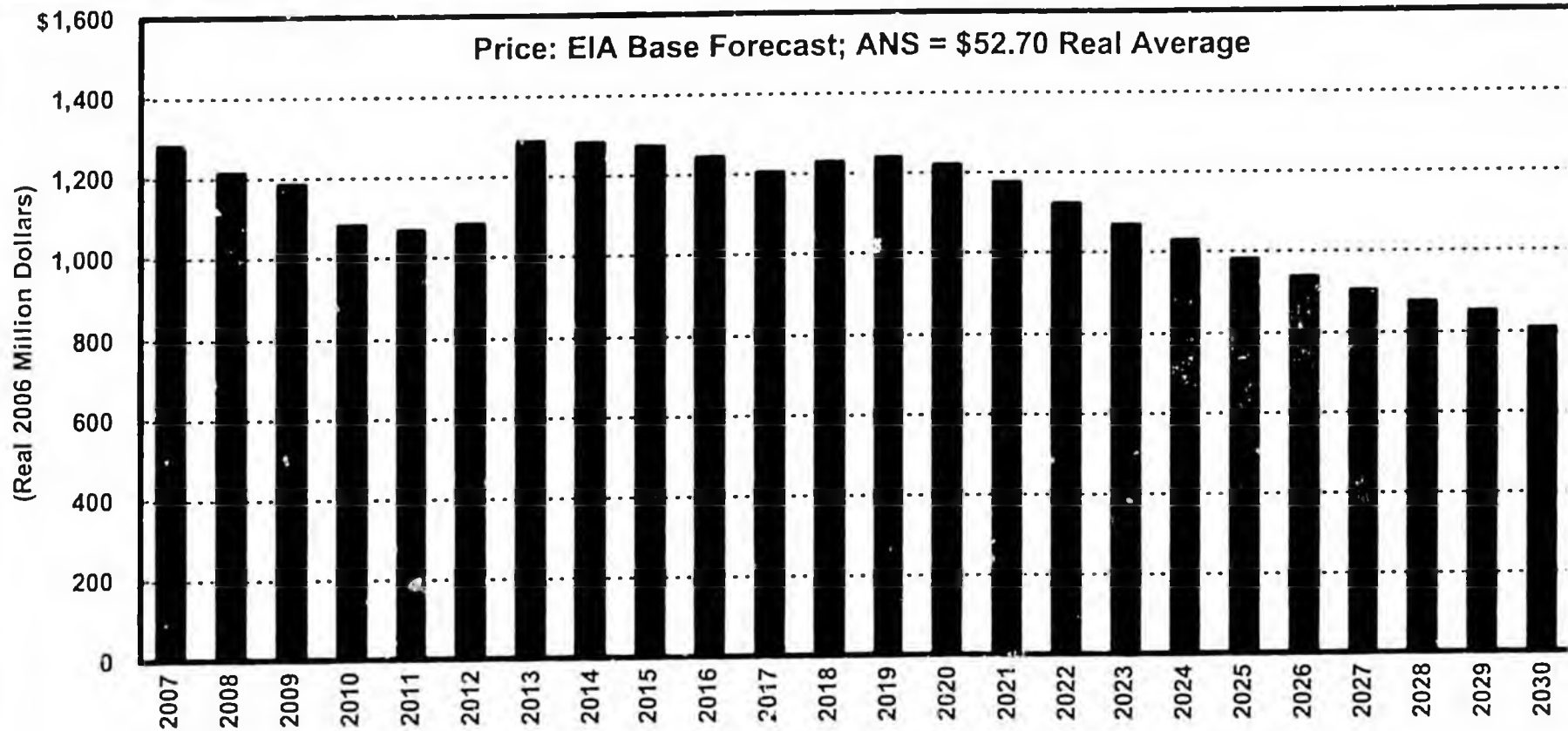
## FY 2007-2016

Total Difference from Status Quo (Million 2006\$)	\$6,002	\$2,145	\$10,219	\$2,687	-	\$0
Annual Average Difference from Status Quo (Million 2006\$)	\$600	\$214	\$1,022	\$269	-	\$0
PPT Effective Tax Rate (Percent)	11.2%	8.8%	12.9%	9.2%	-	6.3%
Status Quo Effective Tax Rate (Percent)	6.3%	6.5%	6.2%	6.3%	-	6.3%

## FY 2007-2030

Total Difference from Status Quo (Million 2006\$)	\$15,221	\$2,129	\$27,511	\$7,046	-	\$0
Annual Average Difference from Status Quo (Million 2006\$)	\$634	\$89	\$1,146	\$294	-	\$0
PPT Effective Tax Rate (Percent)	11.5%	6.8%	13.6%	9.0%	-	4.9%
Status Quo Effective Tax Rate (Percent)	4.9%	5.4%	4.7%	4.9%	-	4.9%

# Change in Projected Taxes Under a 25/20 Tax DOR Forecast Production (FY 2007-2030)\*



	FY 2007-2011	FY 2007-2016	FY 2007-2030
Total Difference from SQ (\$Million)	\$5,816	\$11,968	\$26,555
Annual Average Difference from SQ (\$Million)	\$1,163	\$1,197	\$1,106
PPT Effective Tax Rate (Percent)	15.8%	16.0%	16.4%
SQ Effective Tax Rate (Percent)	7.1%	6.3%	4.9%

\* Calculated from July 2006; Includes 6-year transition (100% 2001-2005) and \$73 Million exemption over 7 companies; volumes per DOR Fall 2005 Forecast with Ooguruk projection.

# Change in Projected Taxes Under a 25/20 Tax DOR Forecast Production (FY 2007-2030)\*

	EIA WTI Price Forecast:			Fixed \$40 ANS Price	FY2007-2011 Breakeven	FY2007-2016 Breakeven	FY2007-2030 Breakeven
	Base	Low	High				
Average ANS Price in Real 2006 Dollars:	\$52.70	\$33.40	\$70.00	\$40.00	\$26.40	\$25.10	\$24.10

## FY 2007-2011

Total Difference from Status Quo (Million 2006S)	\$5,816	\$4,480	\$7,492	\$3,283	\$0	-	-
Annual Average Difference from Status Quo (Million 2006S)	\$1,163	\$896	\$1,498	\$657	\$0	-	-
PPT Effective Tax Rate (Percent)	15.8%	14.8%	16.9%	14.1%	7.2%	-	-
Status Quo Effective Tax Rate (Percent)	7.1%	7.2%	7.1%	7.1%	7.2%	-	-

## FY 2007-2016

Total Difference from Status Quo (Million 2006S)	\$11,968	\$6,740	\$17,656	\$7,317	-	\$0	-
Annual Average Difference from Status Quo (Million 2006S)	\$1,197	\$674	\$1,766	\$732	-	\$0	-
PPT Effective Tax Rate (Percent)	16.0%	13.6%	17.7%	14.2%	-	6.3%	-
Status Quo Effective Tax Rate (Percent)	6.3%	6.5%	6.2%	6.3%	-	6.3%	-

## FY 2007-2030

Total Difference from Status Quo (Million 2006S)	\$26,555	\$9,286	\$42,717	\$15,610	-	-	\$0
Annual Average Difference from Status Quo (Million 2006S)	\$1,106	\$387	\$1,780	\$650	-	-	\$0
PPT Effective Tax Rate (Percent)	16.4%	11.7%	18.5%	14.0%	-	-	5.0%
Status Quo Effective Tax Rate (Percent)	4.9%	5.4%	4.7%	4.9%	-	-	5.0%

\* Calculated from July 2006; includes 6-year transition (100% 2001-2005) and \$73 Million exemption over 7 companies; volumes per DOR Fall 2005 Forecast with Ooguruk projection.