

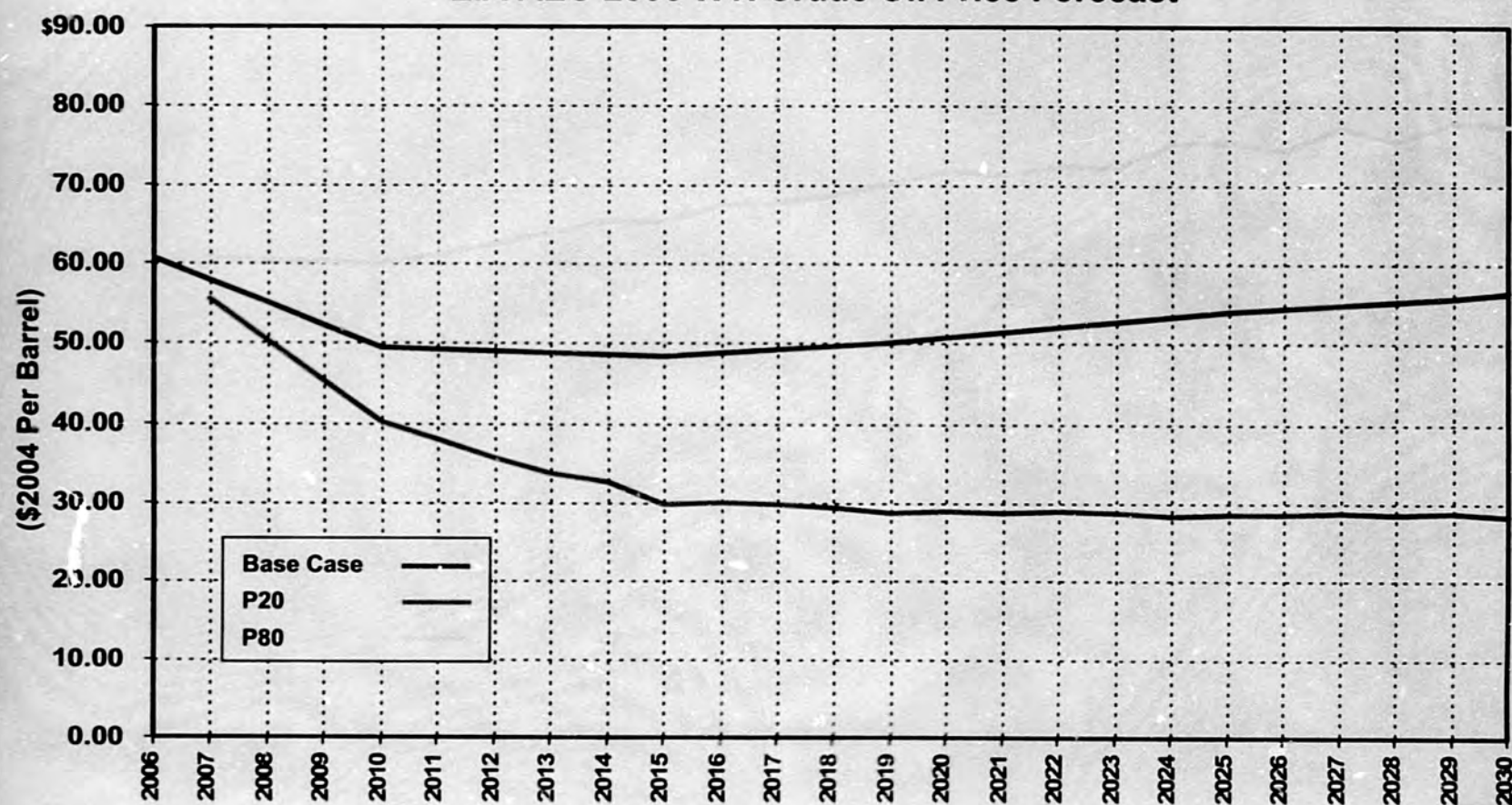
AK LEGISLATURE SPECIAL COMMITTEE FILES SCOMM 148 323206

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

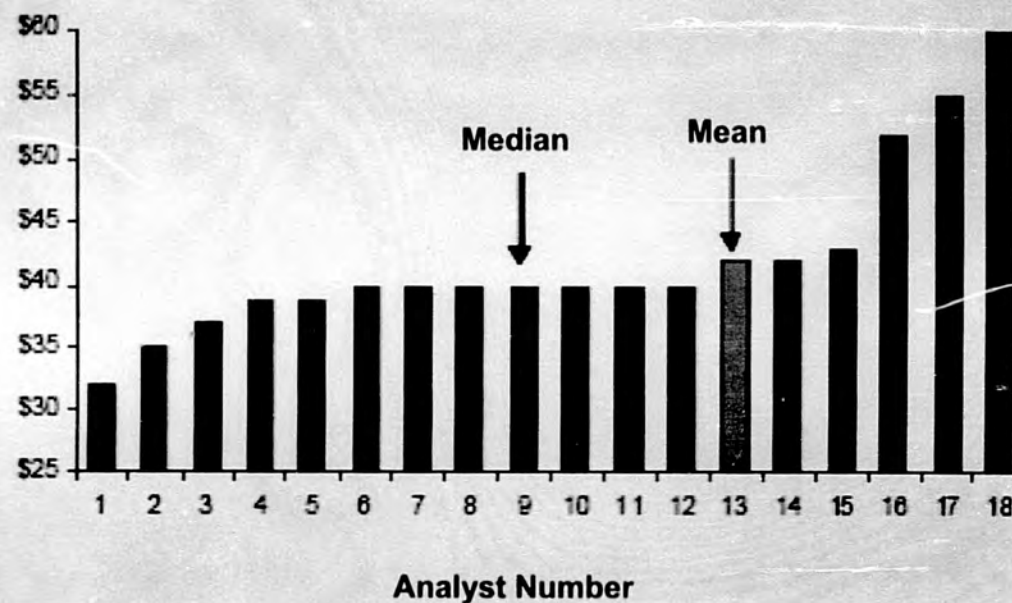
EIA AEO 2006 WTI Crude Oil Price Forecast



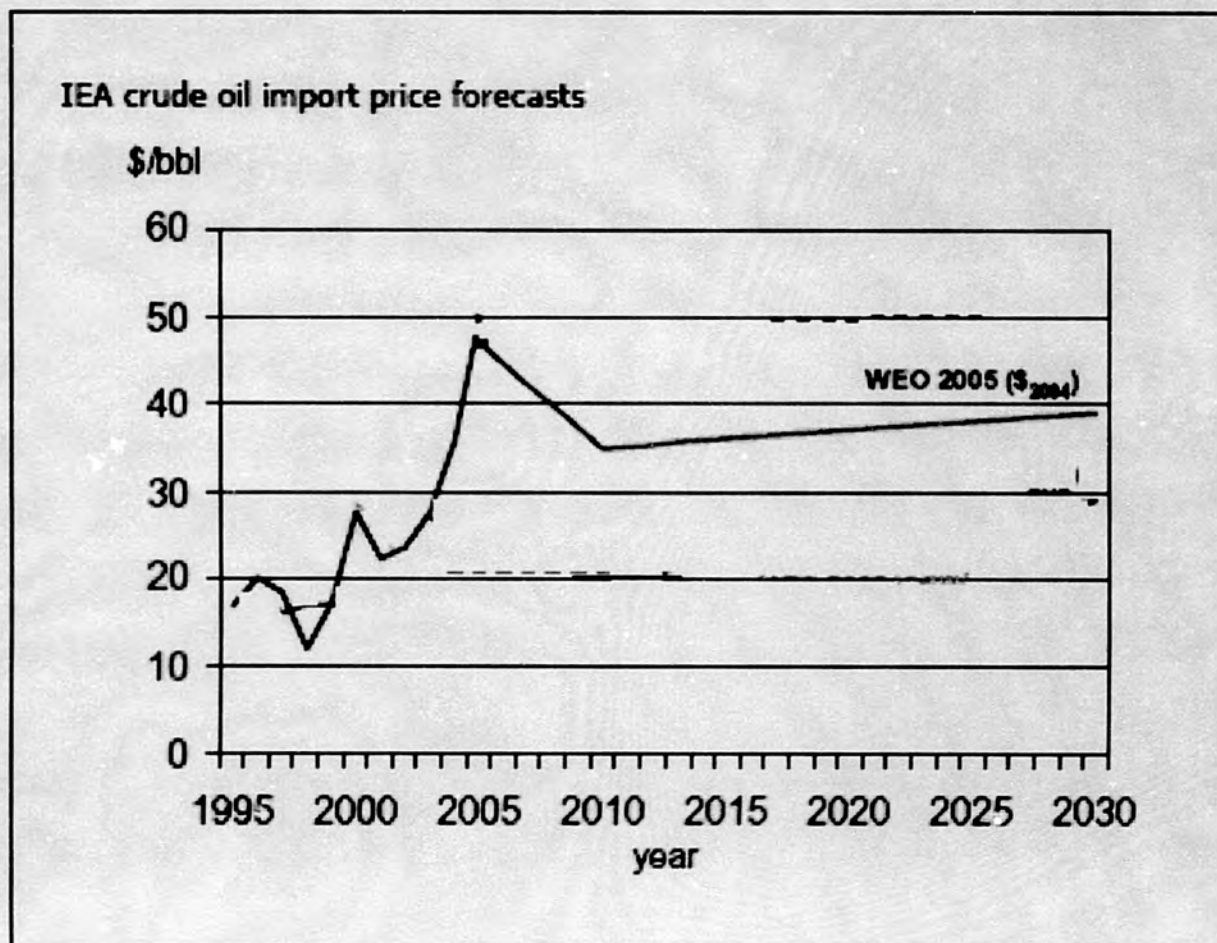
Source: AEO 2006 for Base Case; Econ One for Probabilistic Variance.

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

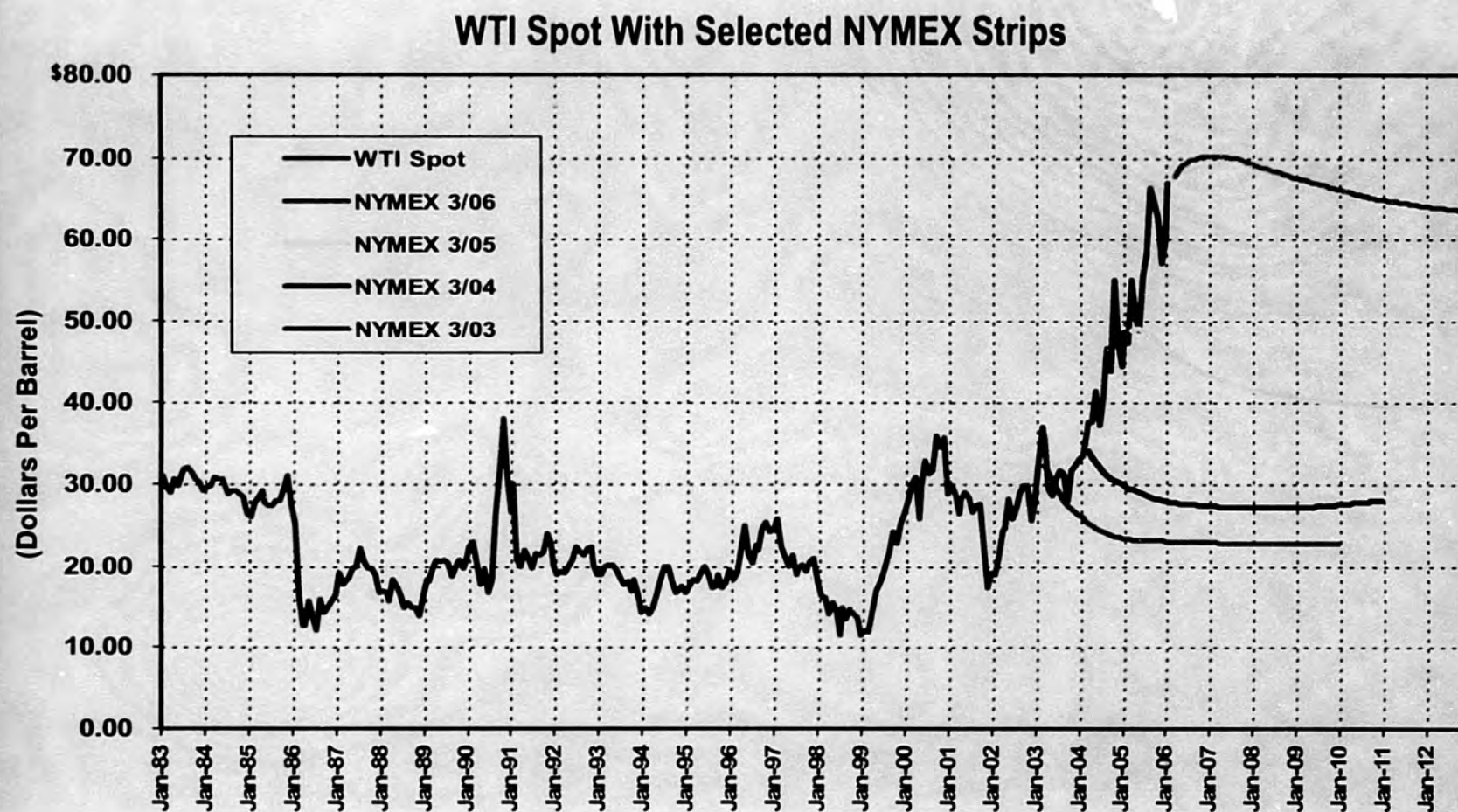
Price Forecast for WTI in 2010
Reuters Poll of 18 Oil Analysts



IEA (2005) Oil Price Forecasts



WTI Prices: History and Market Forecast



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

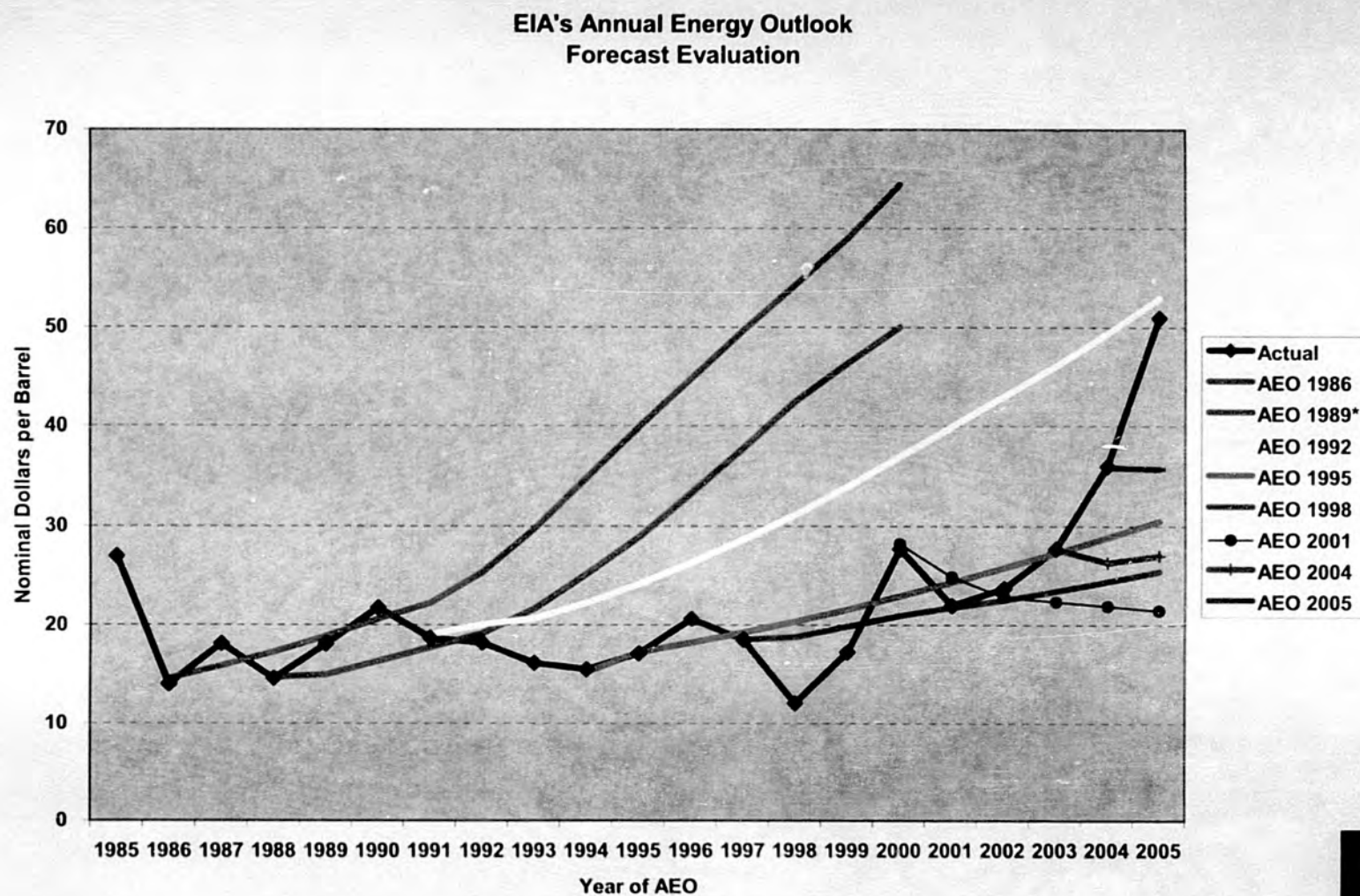
Implied Oil Company Price Views

- **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**

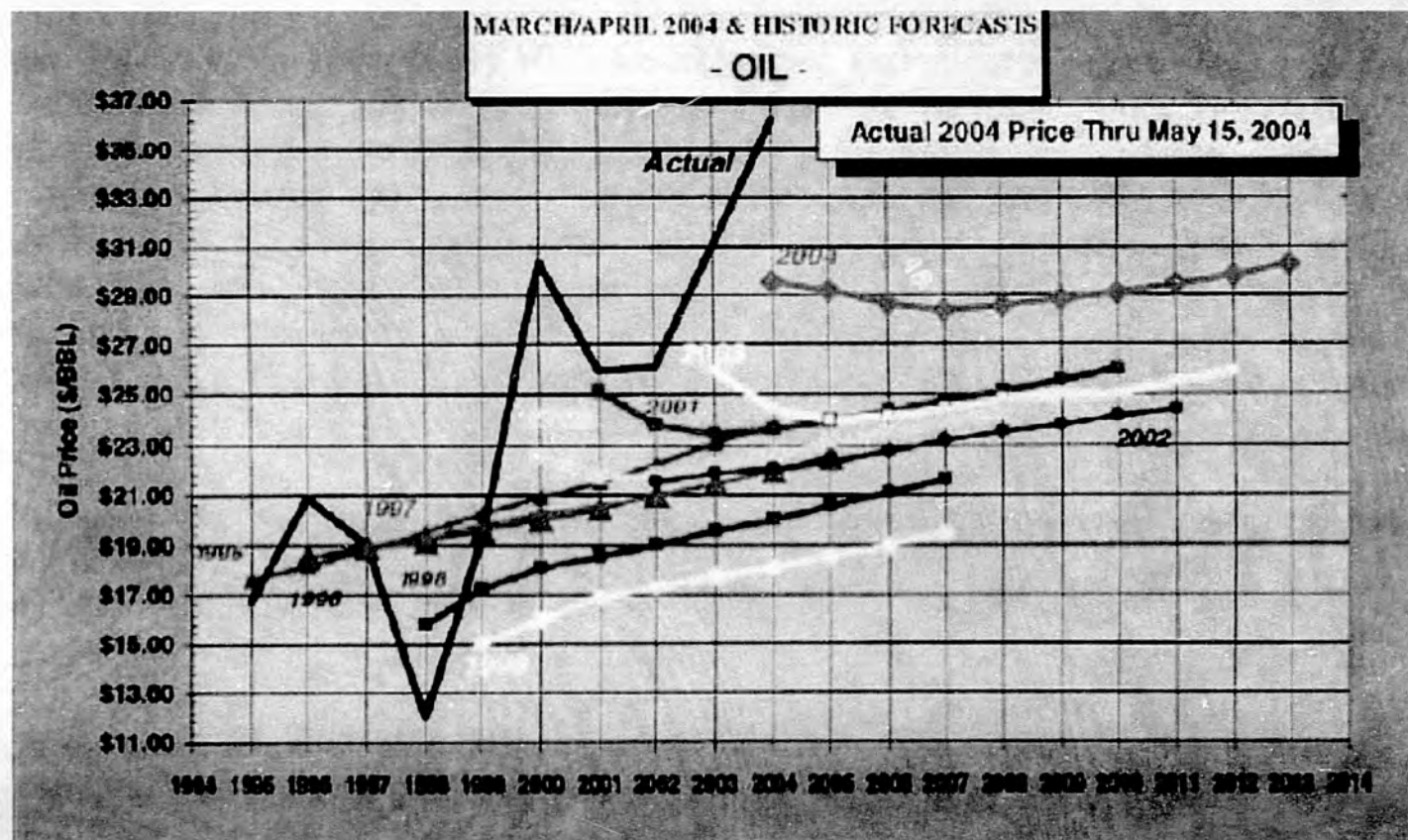
Some Examples of Humbling Oil Price Forecasting

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

EIA's Annual Price Outlooks

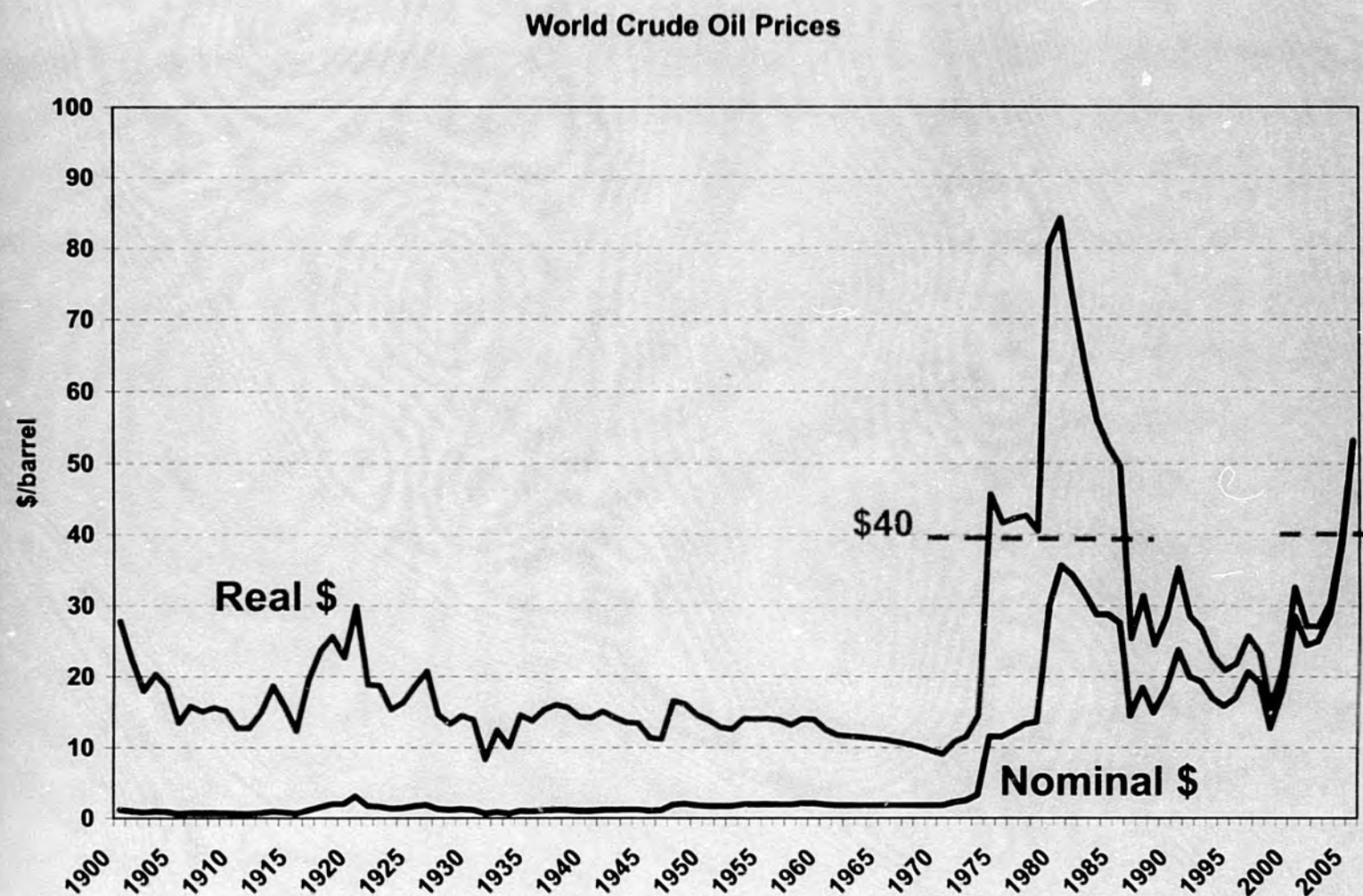


SPEE Annual Delphi Poll



Source: Society of Petroleum Evaluation Engineers (SPEE)

Historical Crude Oil Prices

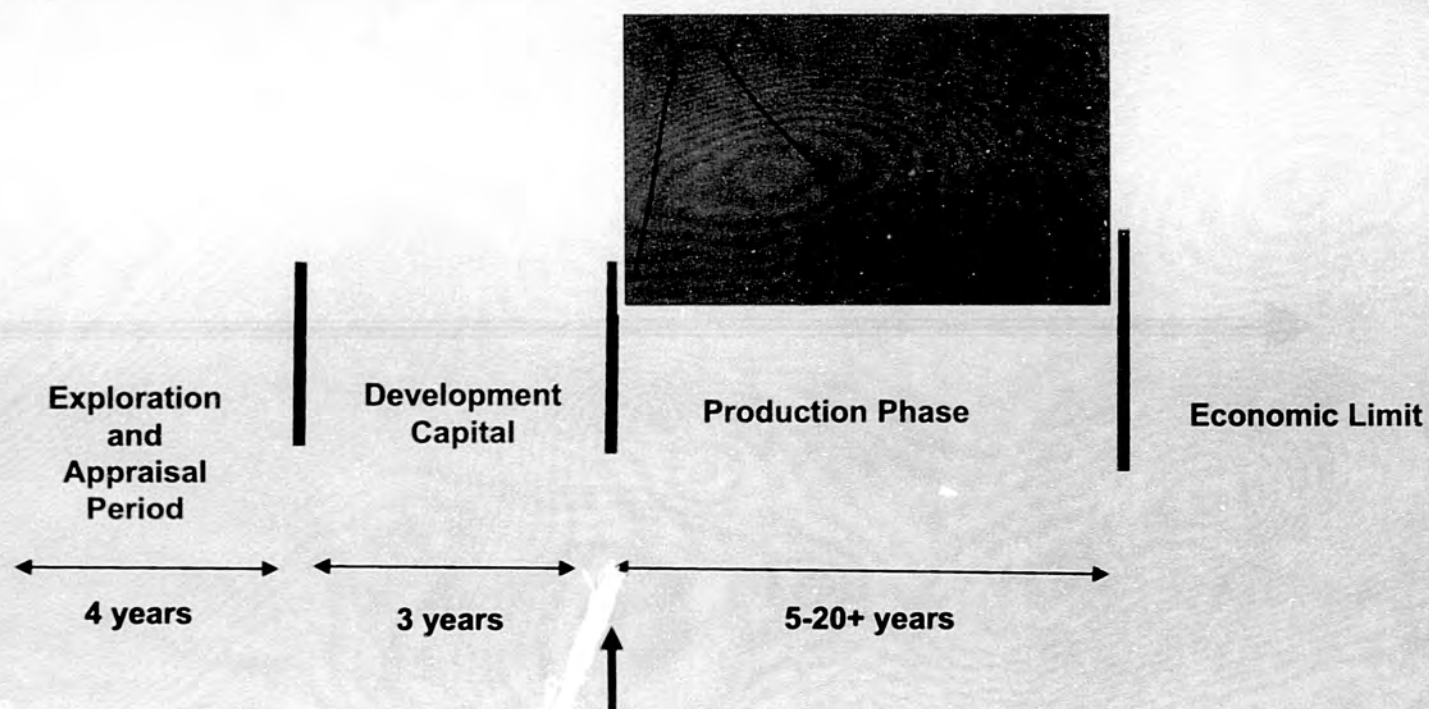


Economics of New Fields

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**
- **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?)**

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

23

Undiscovered Technically Recoverable Oil Reserves

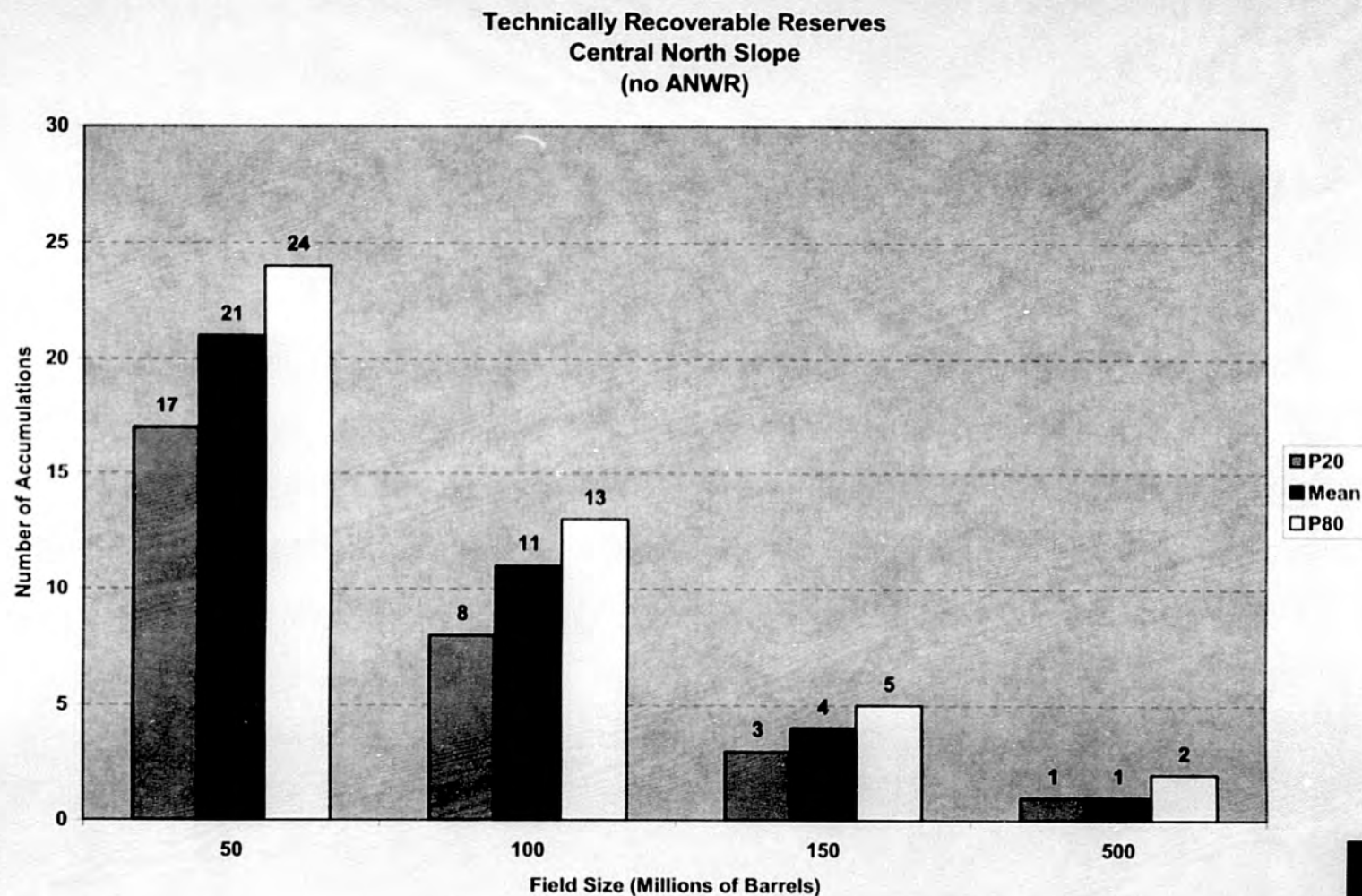
	Central North Slope	ANWR
Mean Estimate of Reserves (Billions of barrels)	4.0	10.4
Amount in Fields Over 1 B Barrels	0% ✓	22%
Amount in Fields Over 500 M Barrels	2%	43%
Amount in Fields Smaller than 64 M Barrels	51%	1%

Note: Not all these reserves are economic

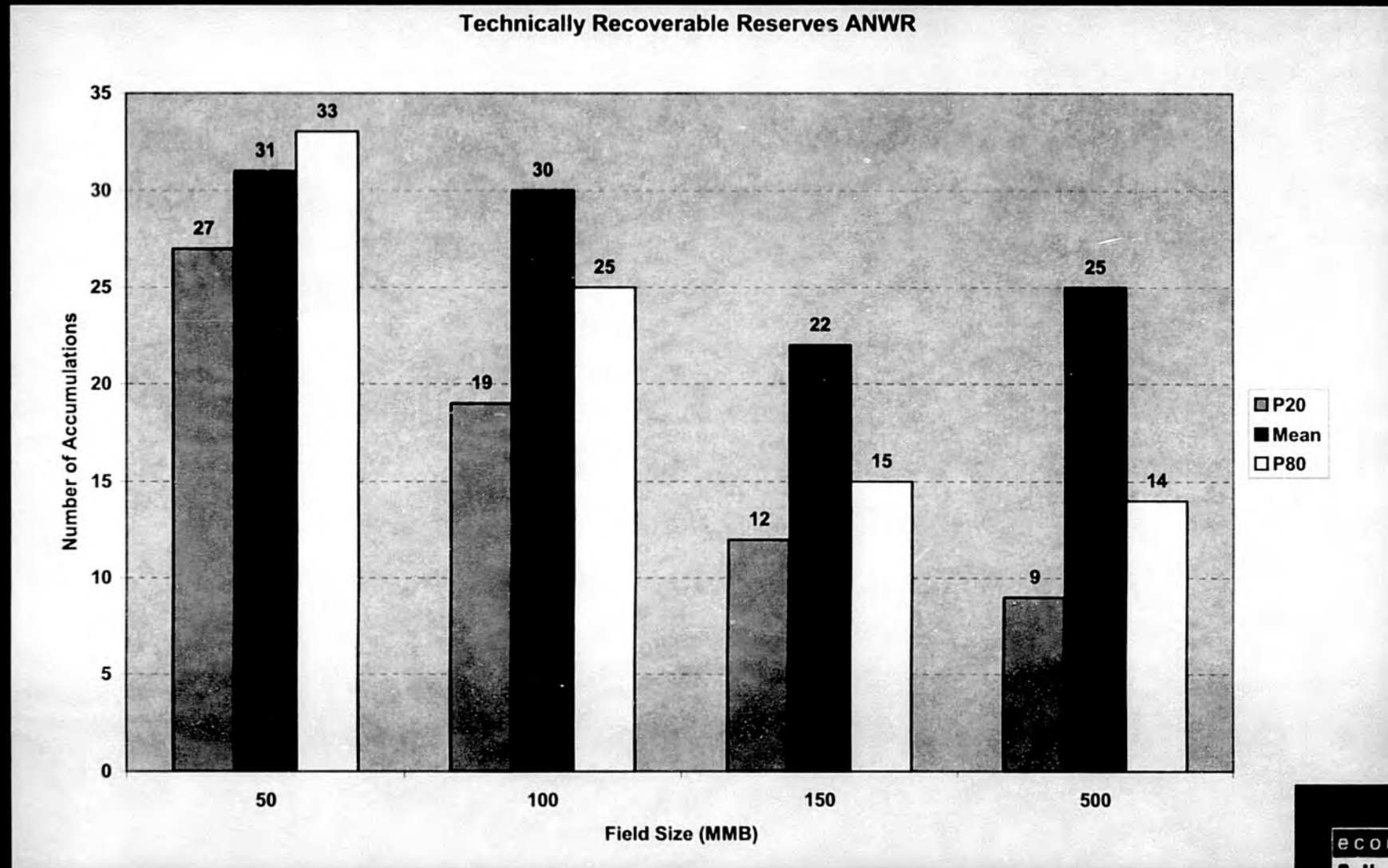
Source: USGS

Size Distribution of Undiscovered Fields in Central North Slope

24



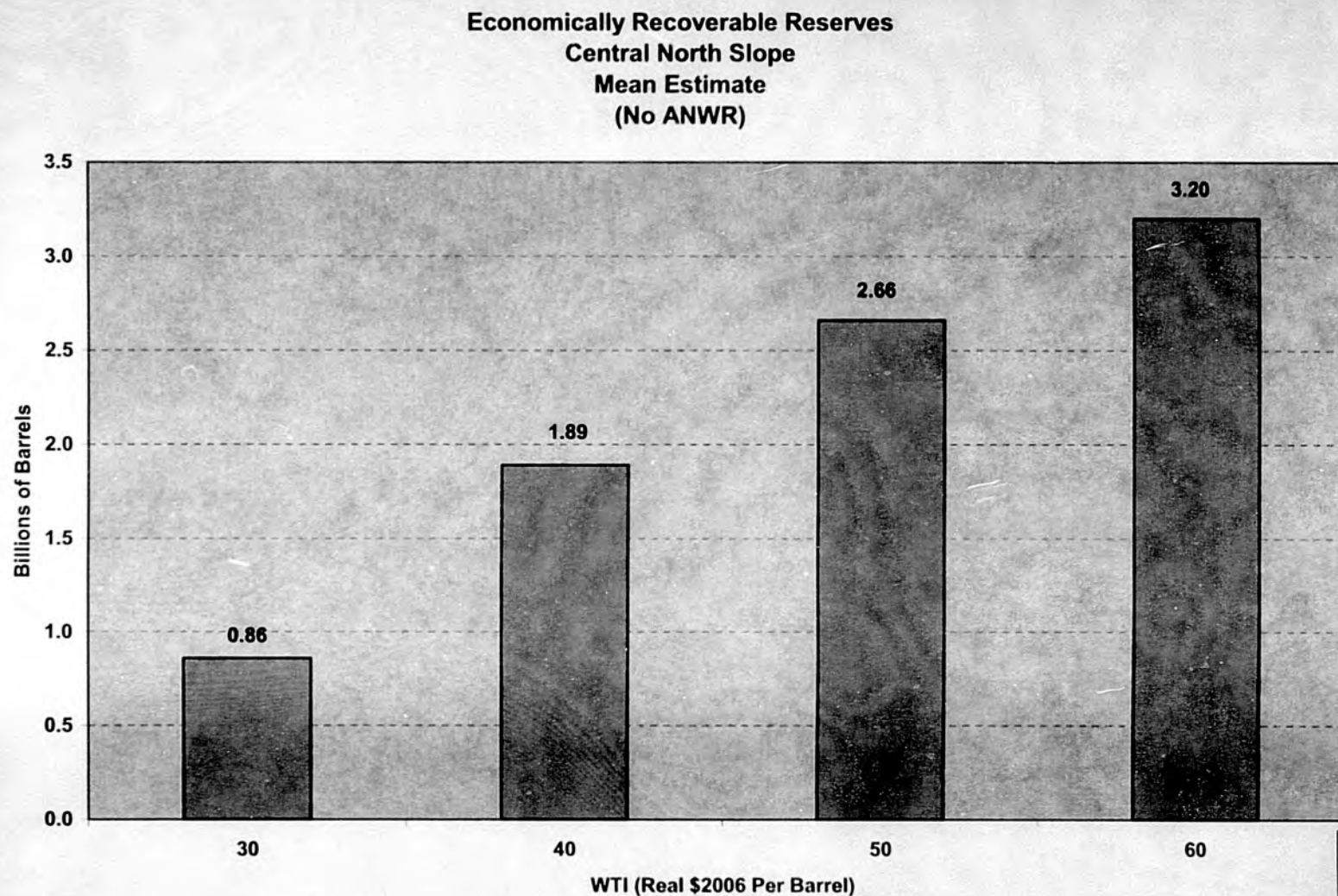
Size Distribution of Undiscovered Fields – ANWR



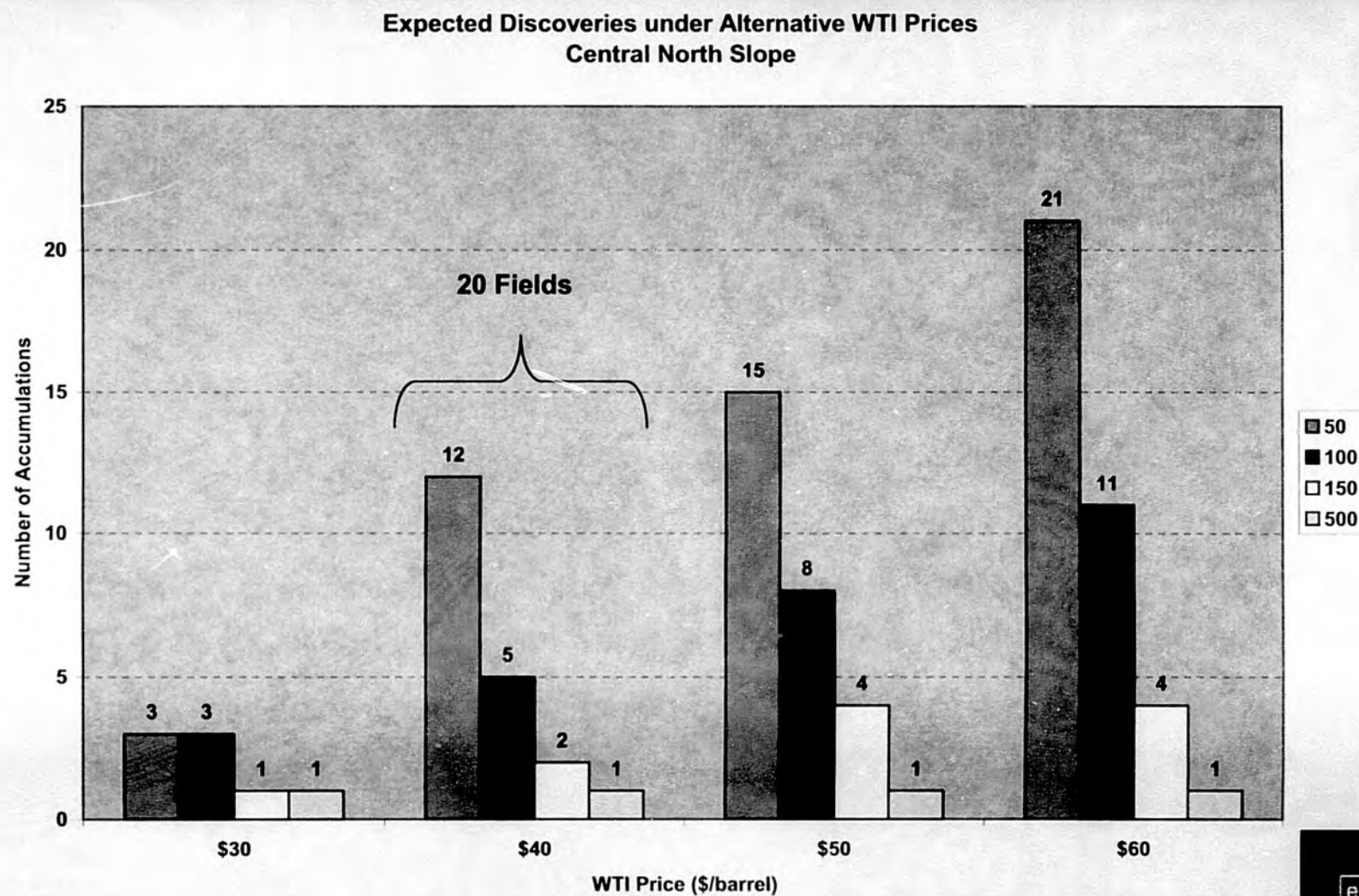
10 Billion Barrels of Technically Recoverable Oil Reserves in ANWR

Economic Oil Reserves in Central North Slope Alaska At Alternative Prices

26



Expected Discoveries Under Alternative Prices

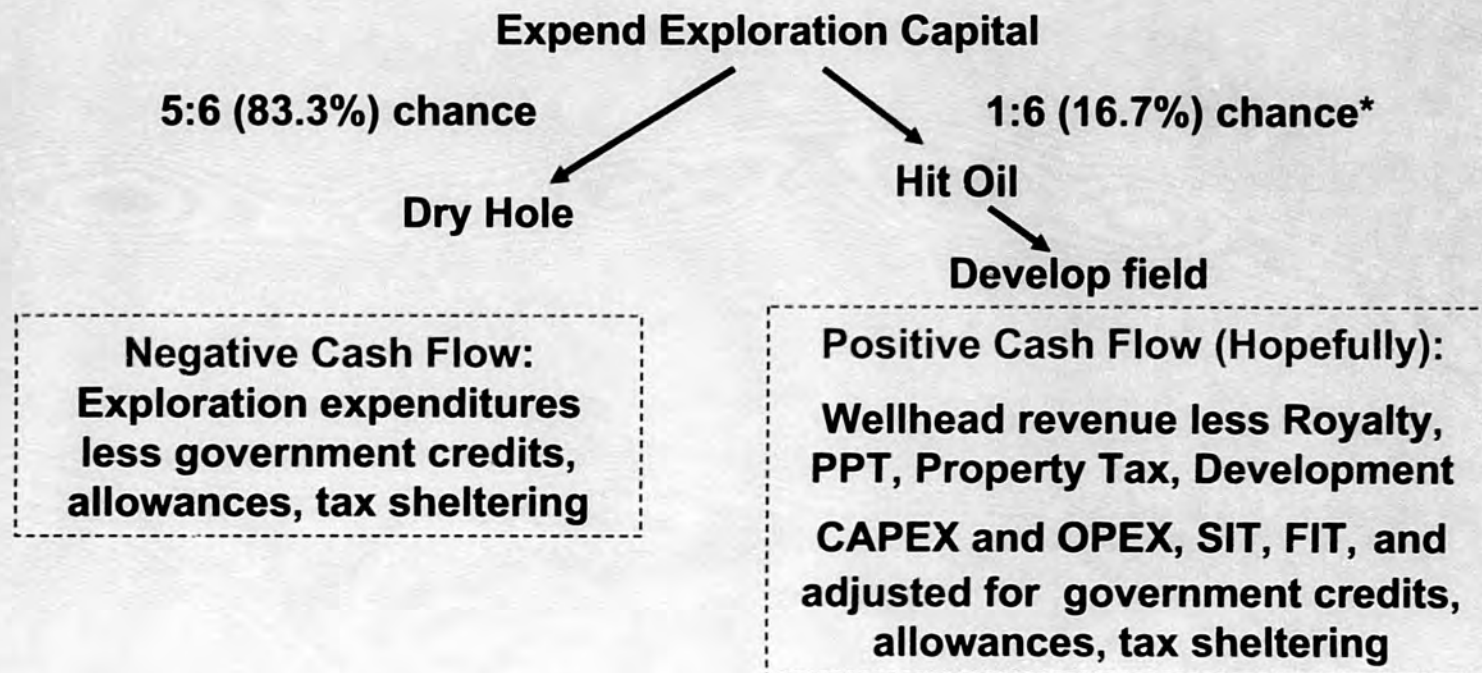


Likely Distribution of New Field Discoveries

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
- $EMV = NPV \text{ (a successful development project)} \times (\text{Chance of hitting oil}) \text{ less } NPV \text{ (cash flow from undertaking exploration)}$



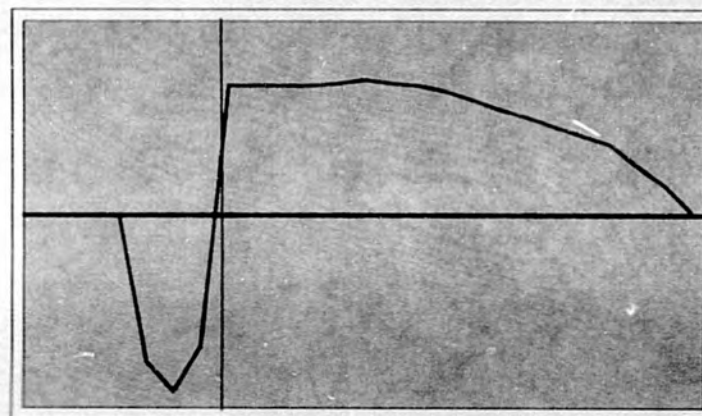
*The experience in Alaska from 1994-2003 is 17.9% according to Wood Mac GOGRR 2004

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

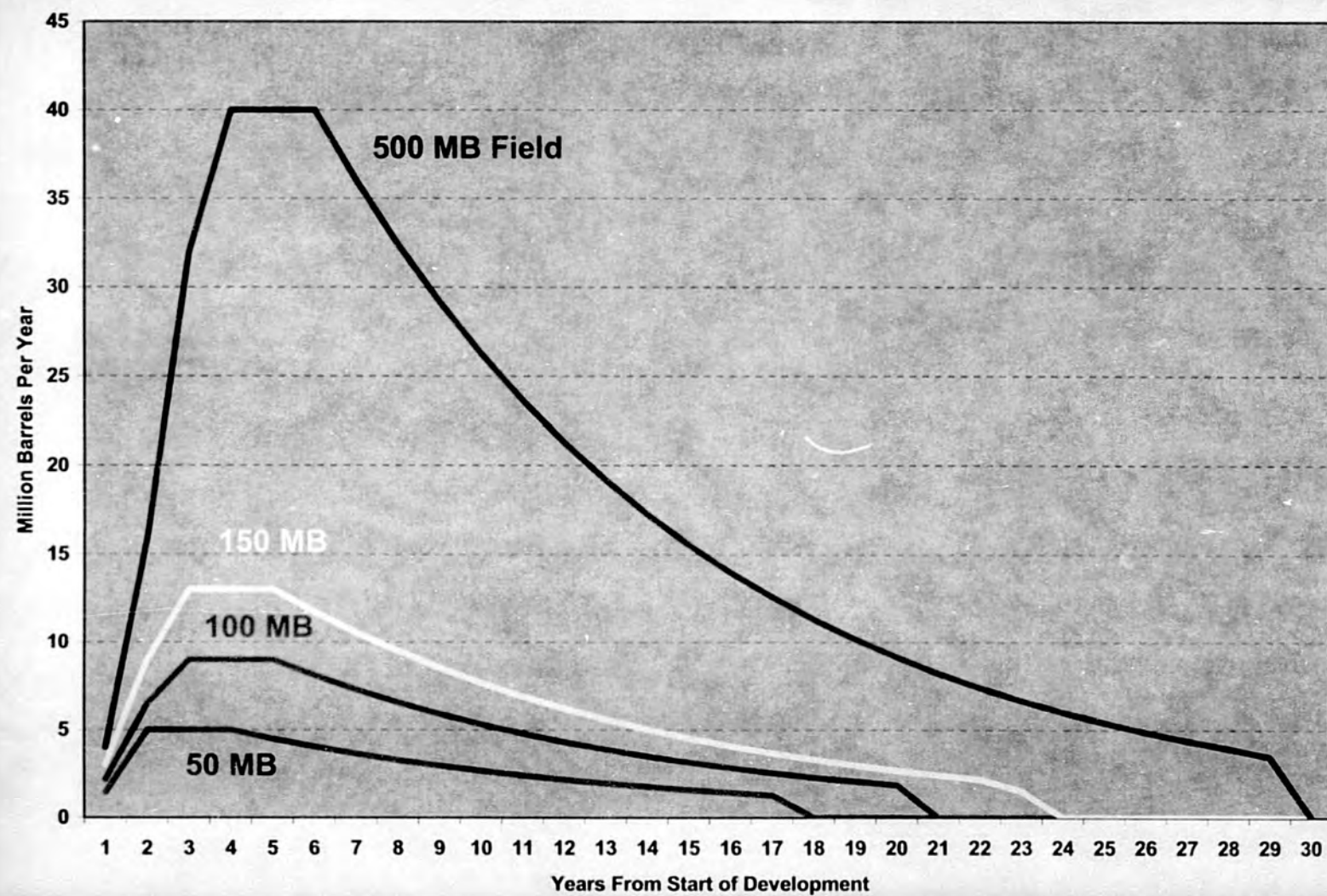
- Say the chance of drilling a successful well is 1-in-6, or .167
- An explorer will want to mitigate the risk of failure by drilling more wells. (Possibly shared.)
- The chance of failure with one well is .833 ($=1-.167$). The chance of failure with a 6 well program is .334 ($=.833^6$)
- An explorer 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	Producer Cash Flow (pre SIT/FIT)	-120	-50	-54
c-d	State Revenue (pre SIT/FIT)	0	-48	-54

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

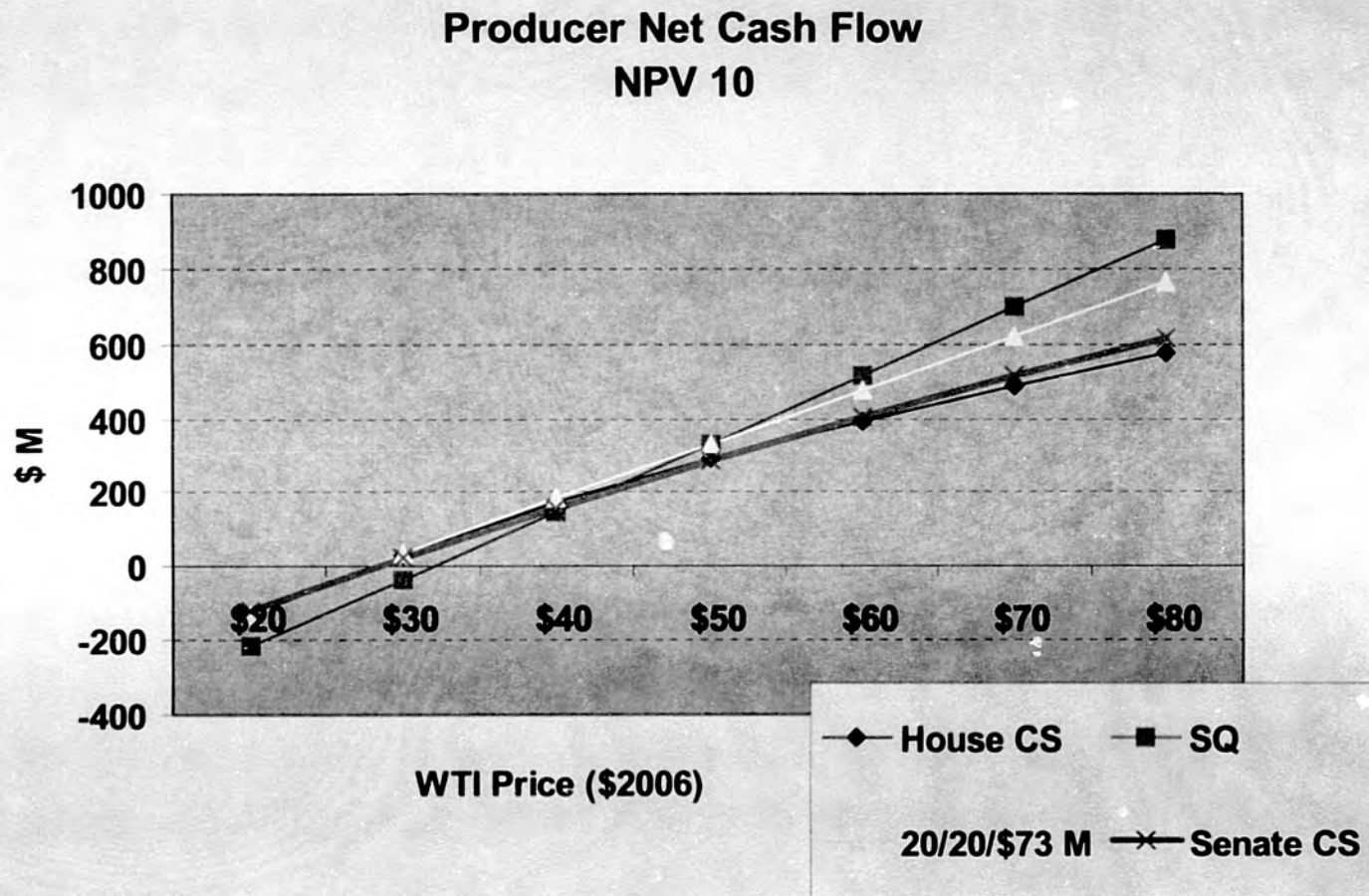
	Explorer NCF NPV10		
Price (Real \$2006)	20/20	25/20	SQ
\$ 30	5.1	3.3	-35.5
\$ 40	149.7	138.9	147.4
\$ 50	294.3	274.5	330.4
	Explorer IRR		
\$ 30	10.3	10.2	8.6
\$ 40	17.1	16.9	15.3
\$ 50	22.7	21.0	21.0
	Total State Revenues (\$M) NPV10		
\$ 30	51.2	54.0	137.7
\$ 40	165.7	183.4	198.4
\$ 50	280.3	312.7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

Economics of an 6-Well Exploration Program

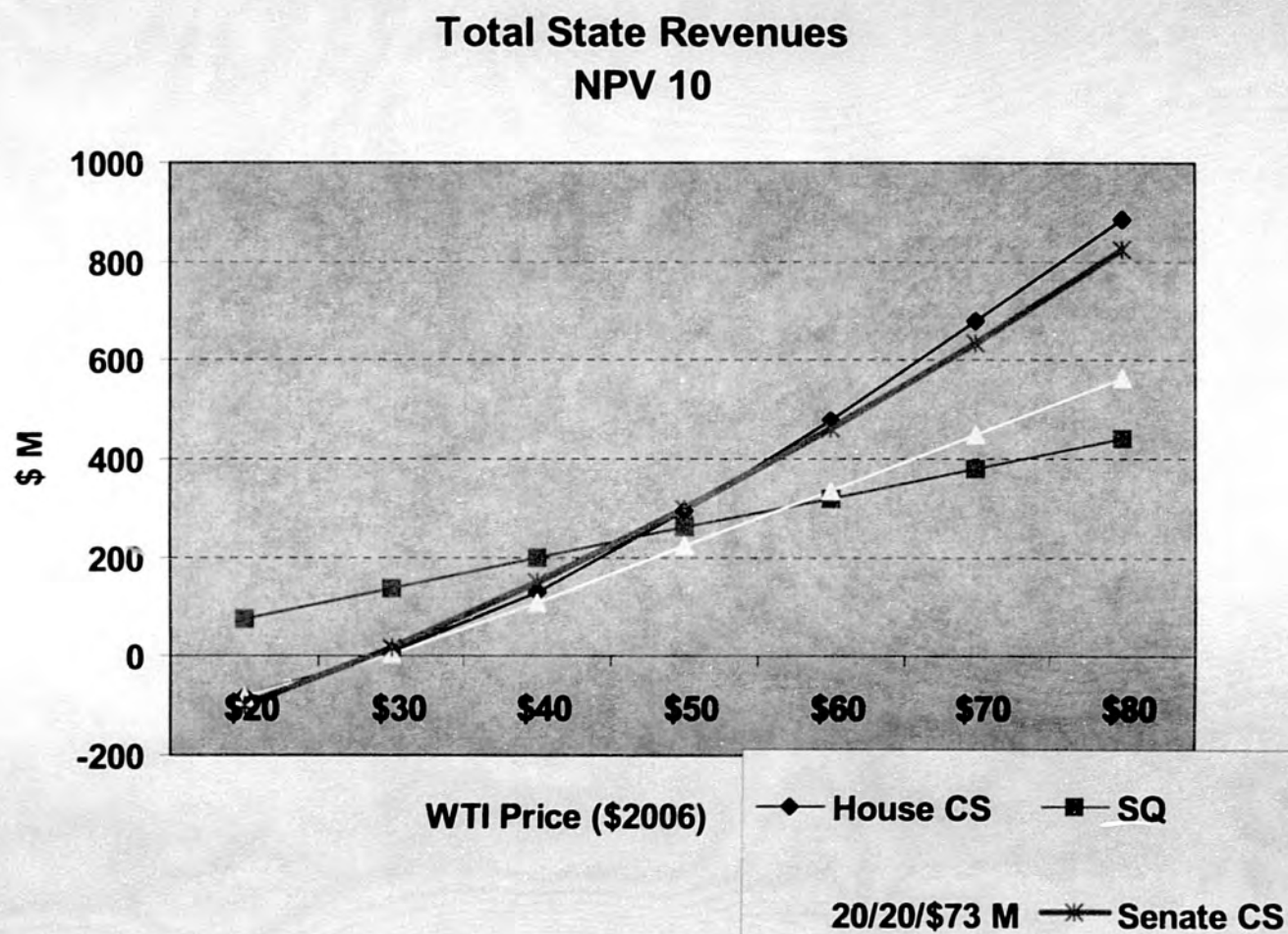
With \$60 M Allowance

	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

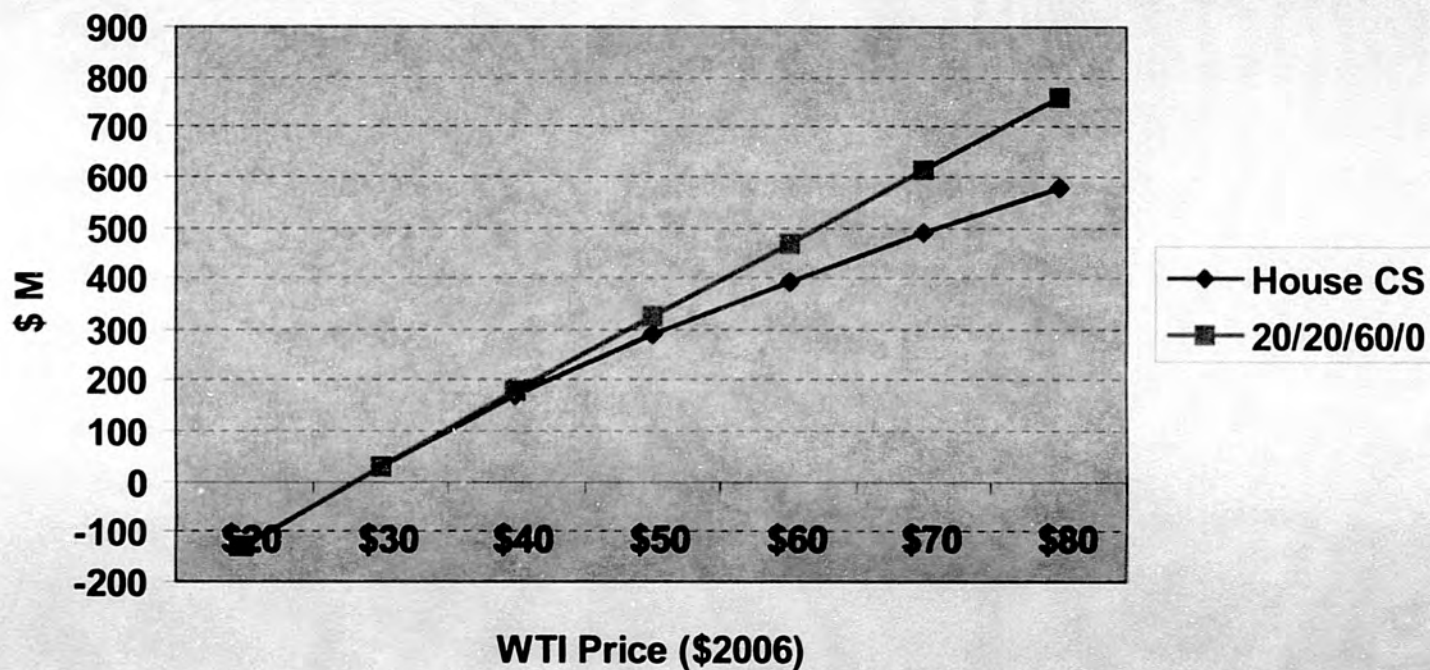


Comparison of Tax Proposals



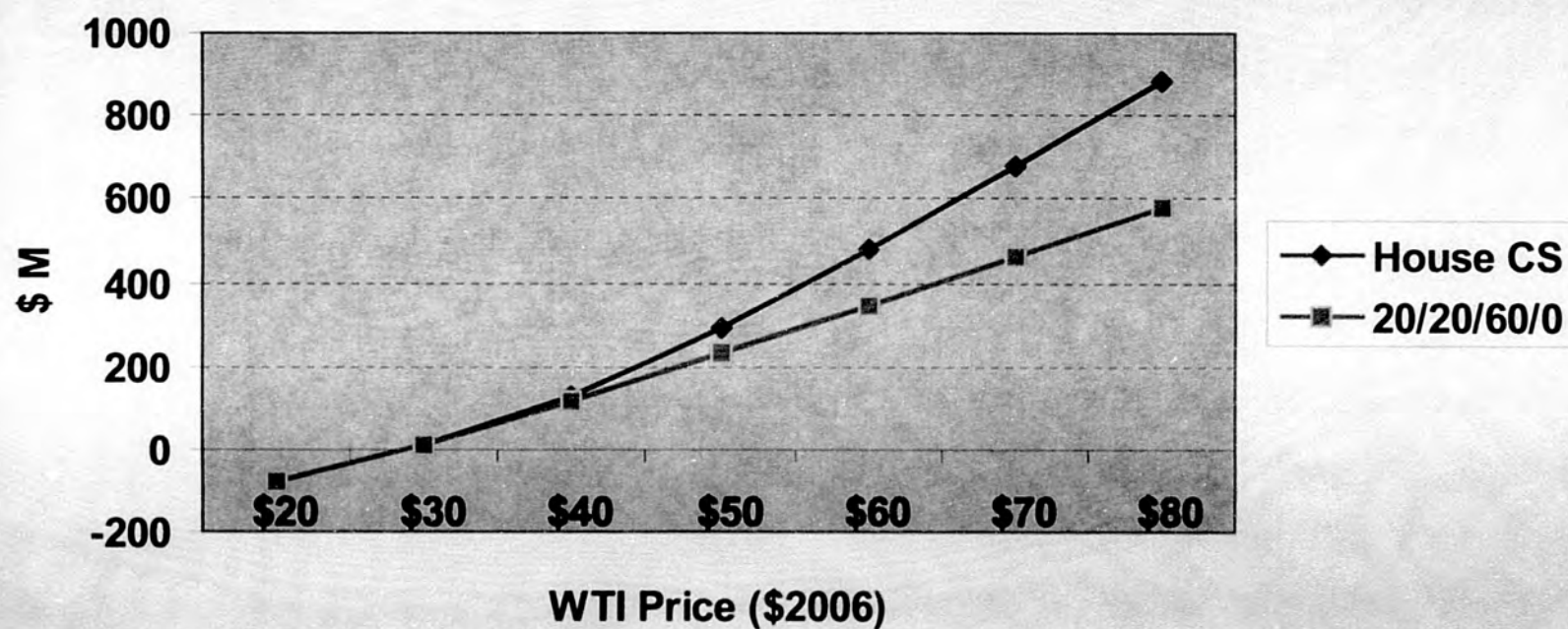
Impact of Progressivity

Producer Net Cash Flow
NPV 10

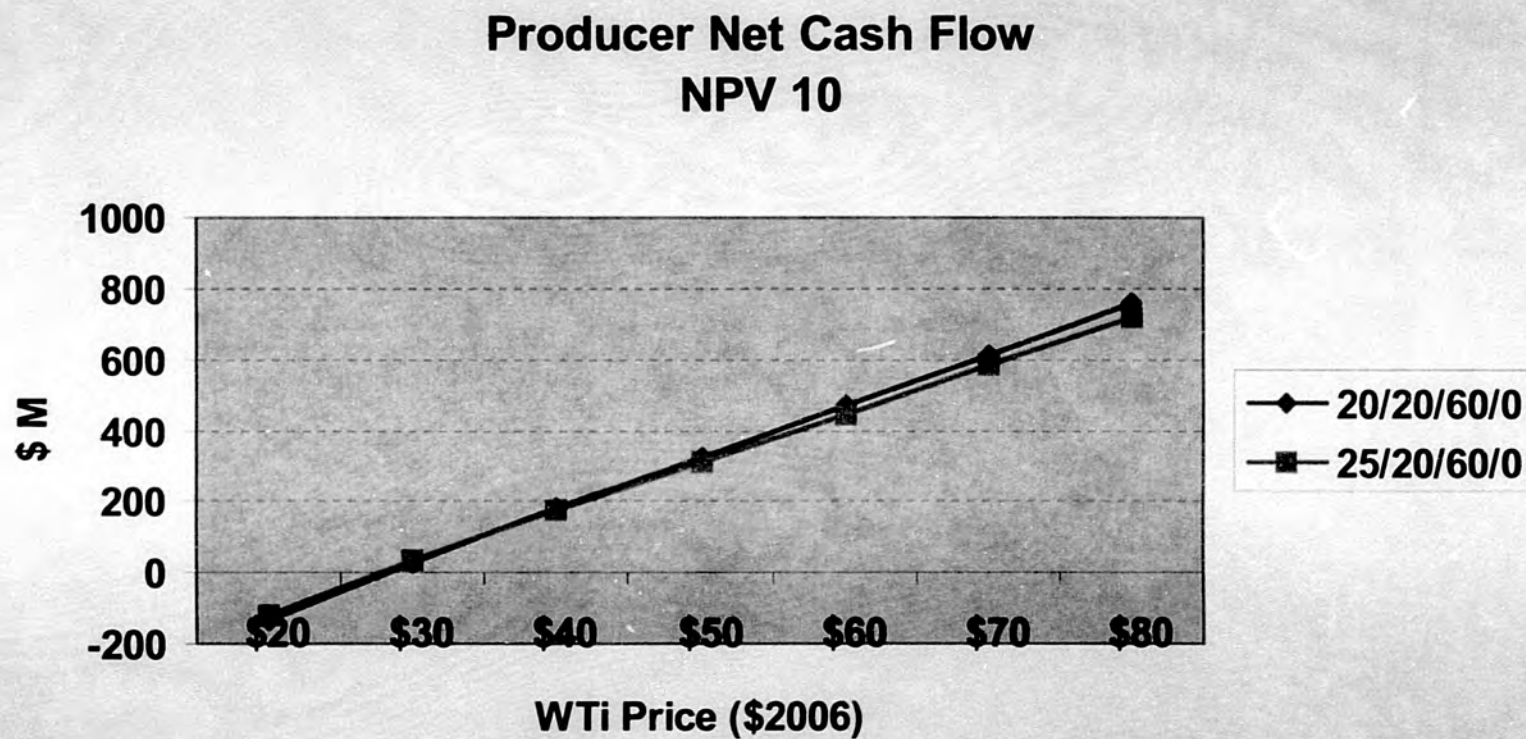


Impact of Progressivity

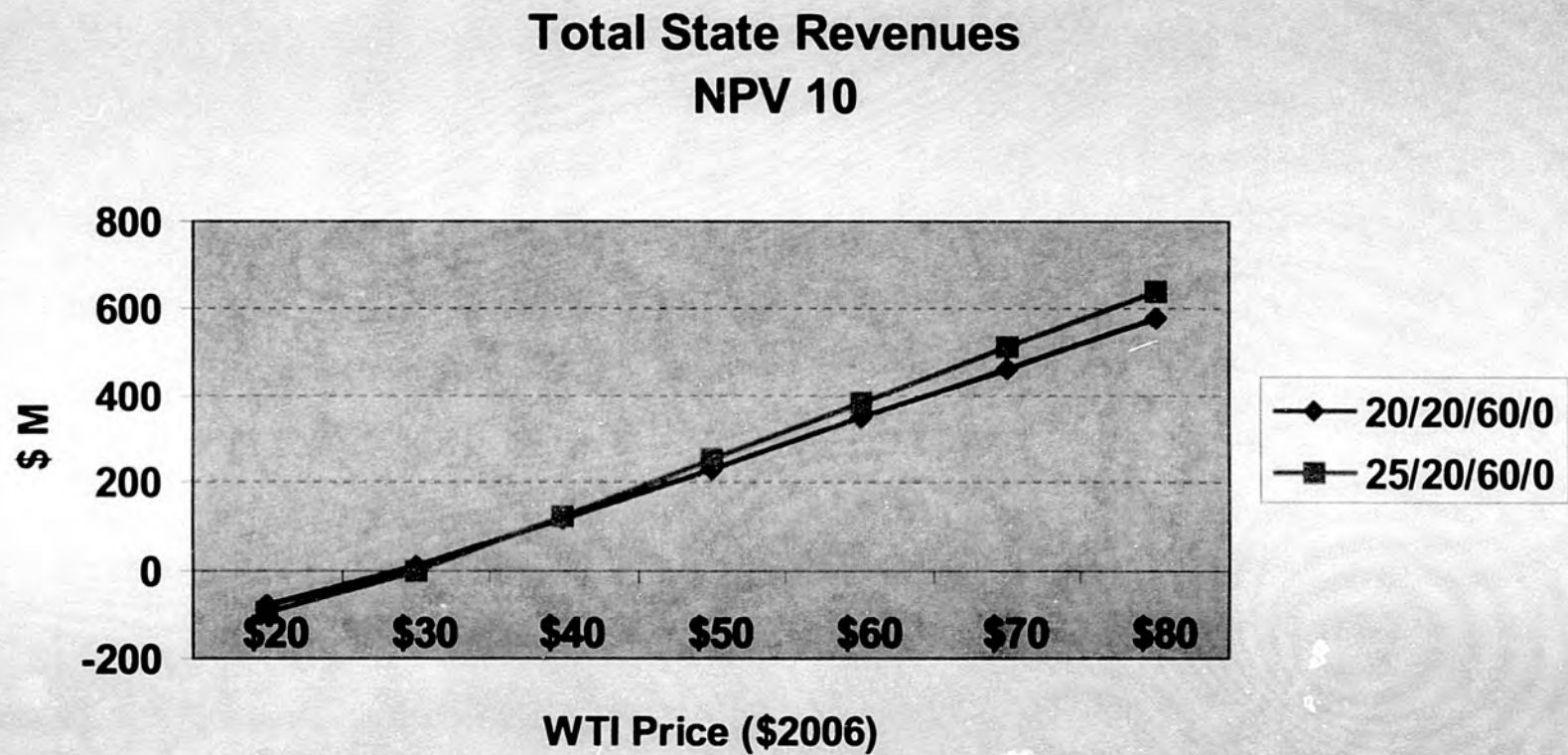
Total State Revenue NPV10



Impact of 25/20 versus 20/20



Impact of 25/20 versus 20/20

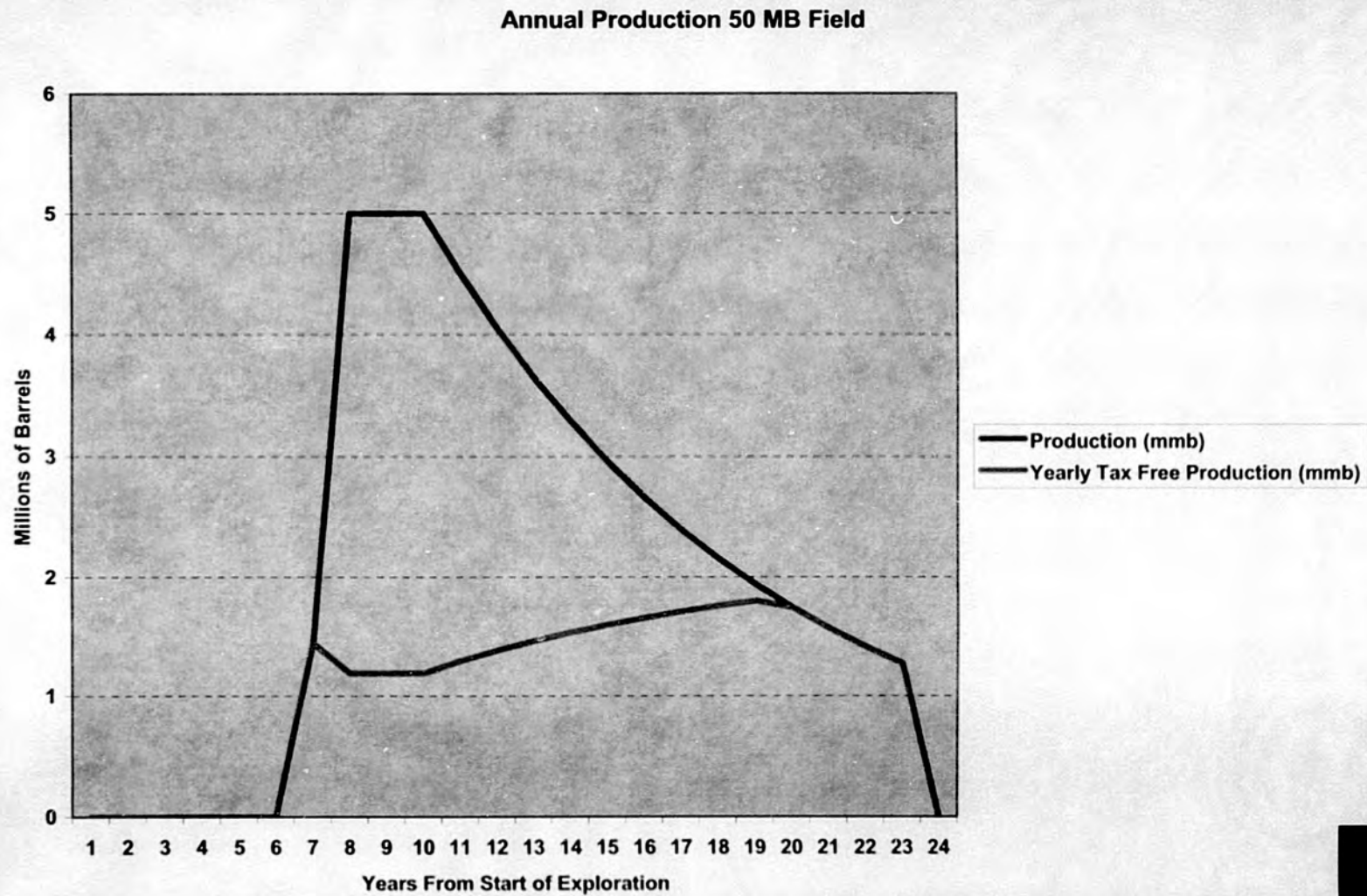


Exploration Forgiveness - An Alternative to Tax Free Allowance

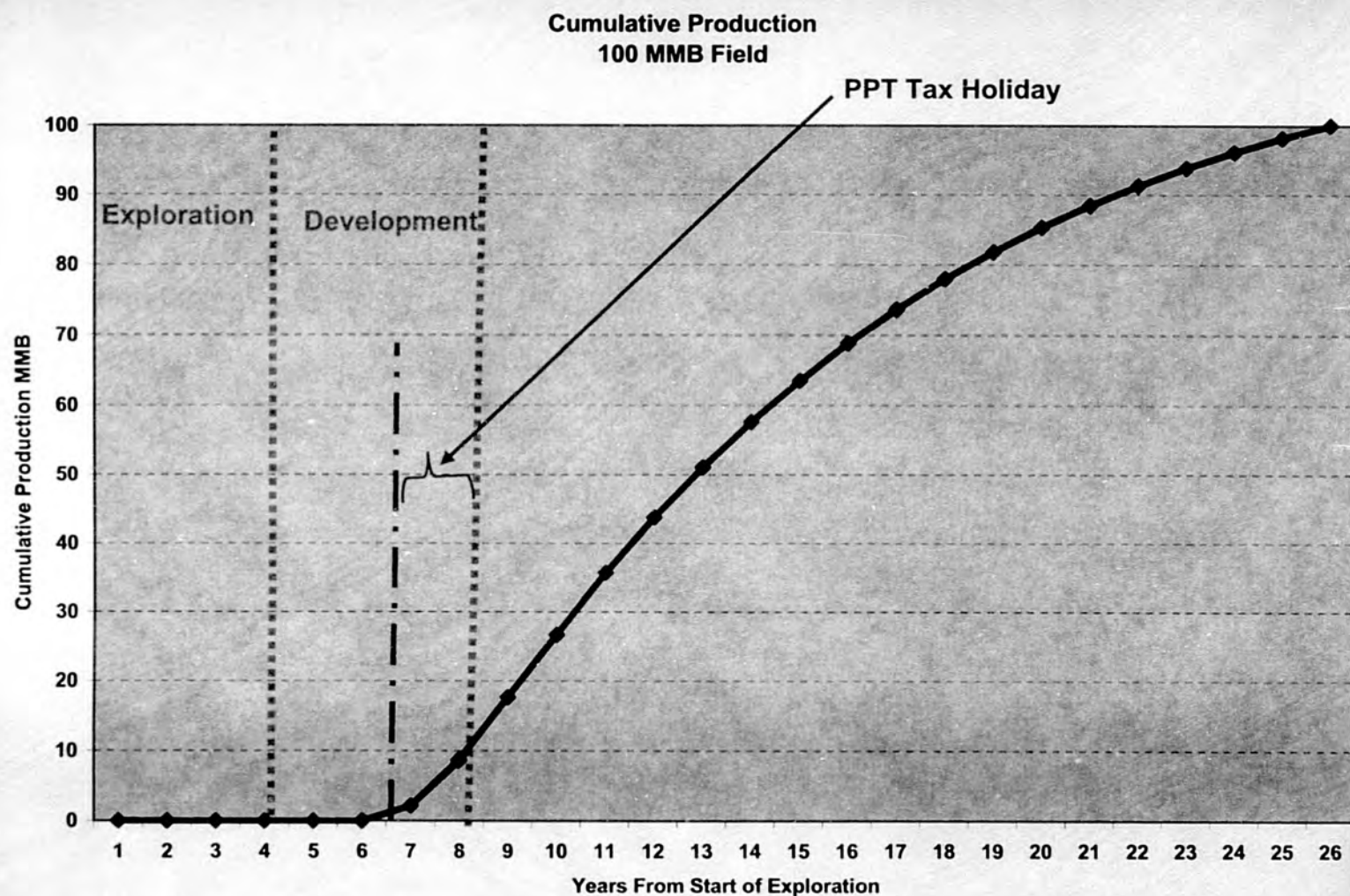
45

- 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

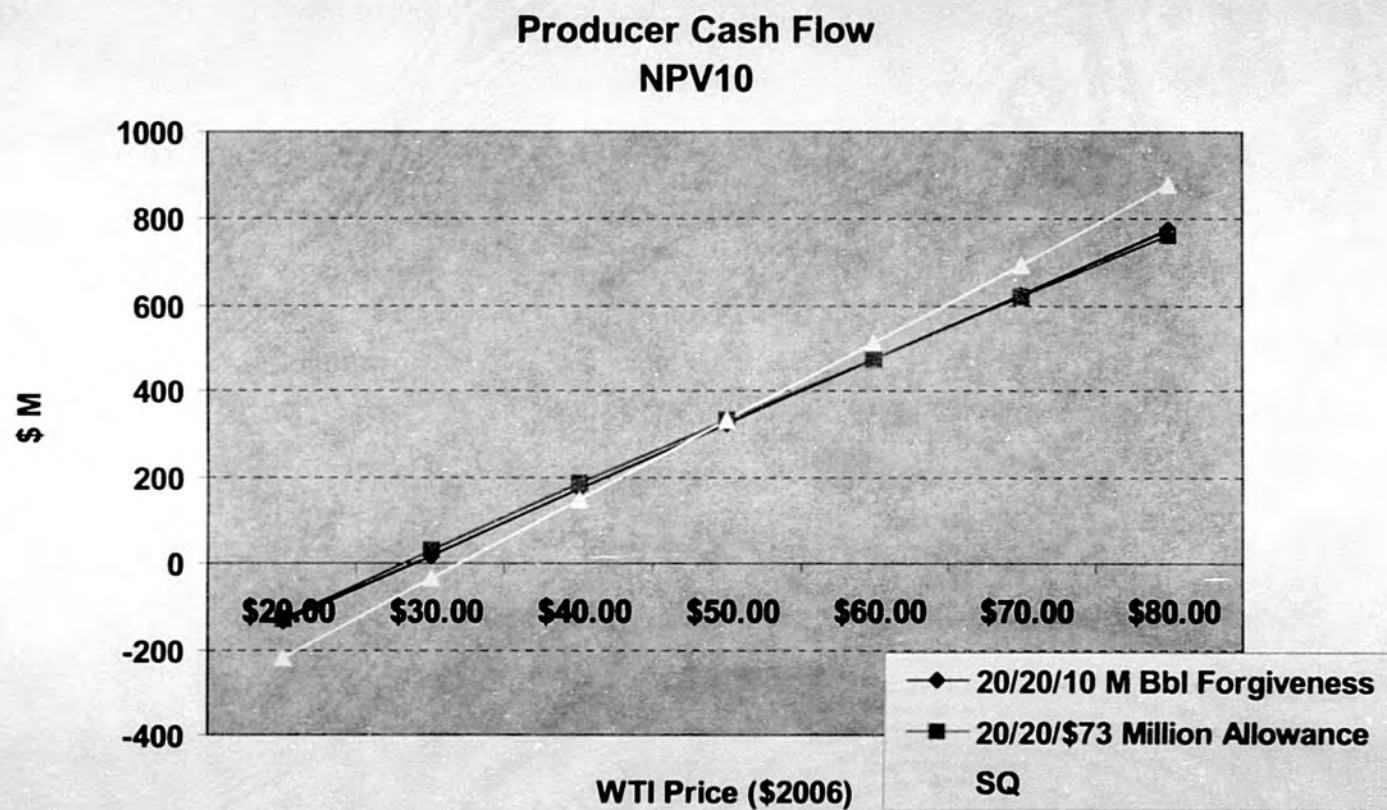
Tax Free Production – 50 MB Field



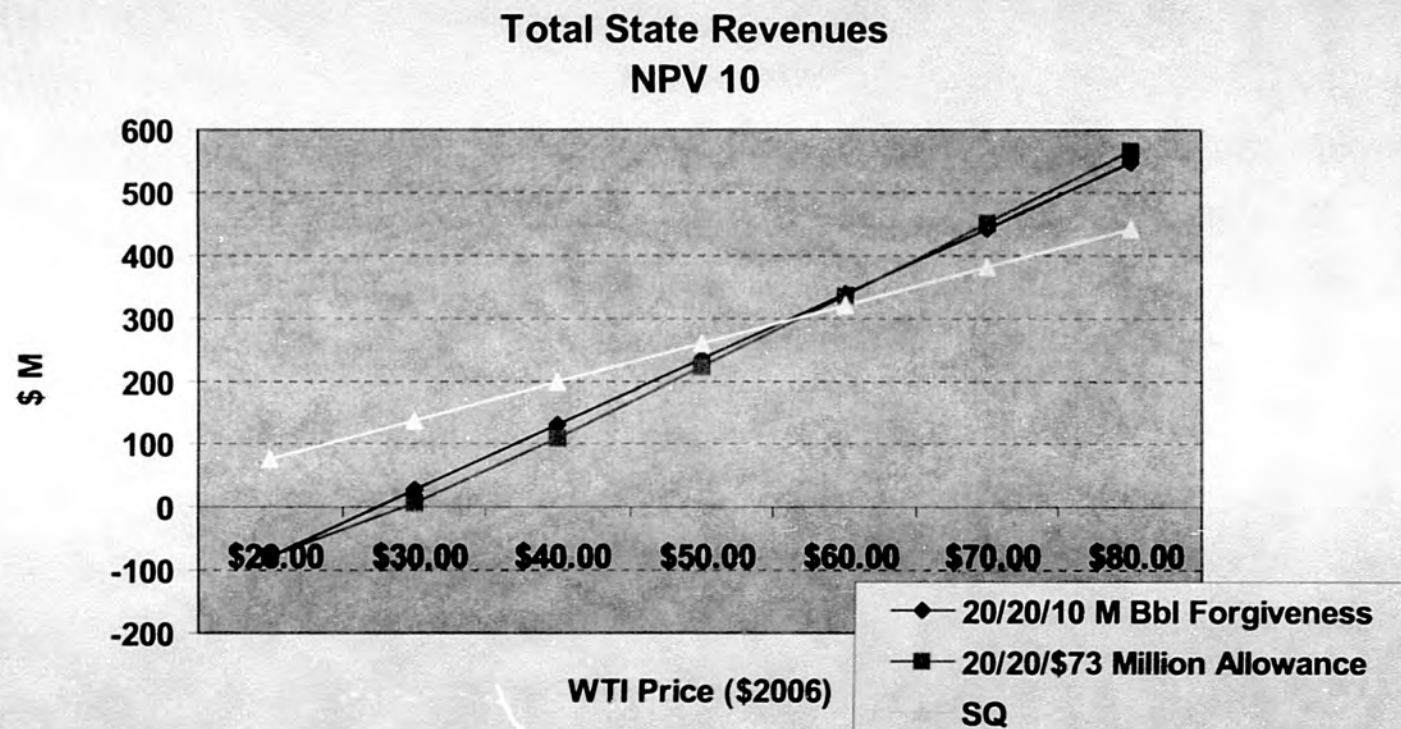
Typical Cumulative Production Profile – 100 MMB Field



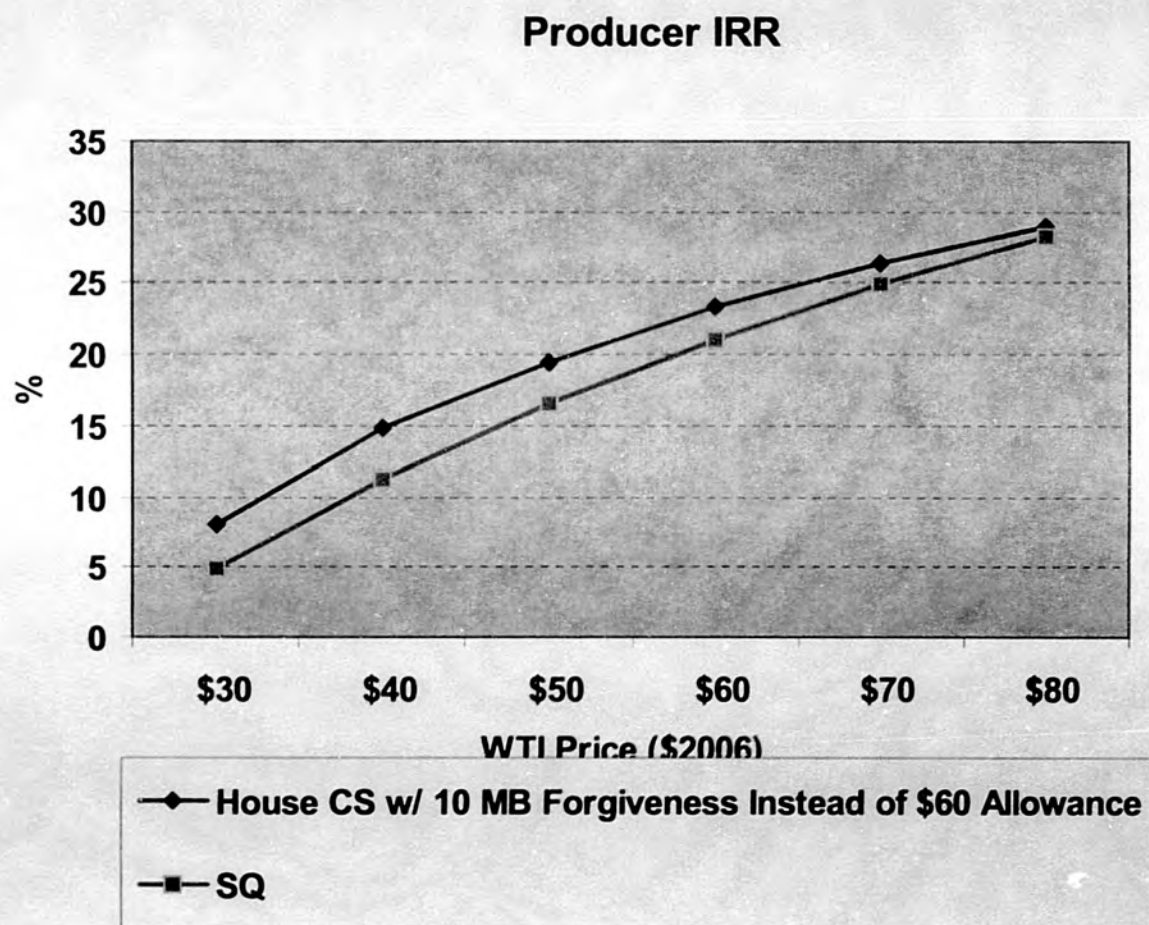
Impact on Producer Economics



Impact on State Revenues (NPV 10)



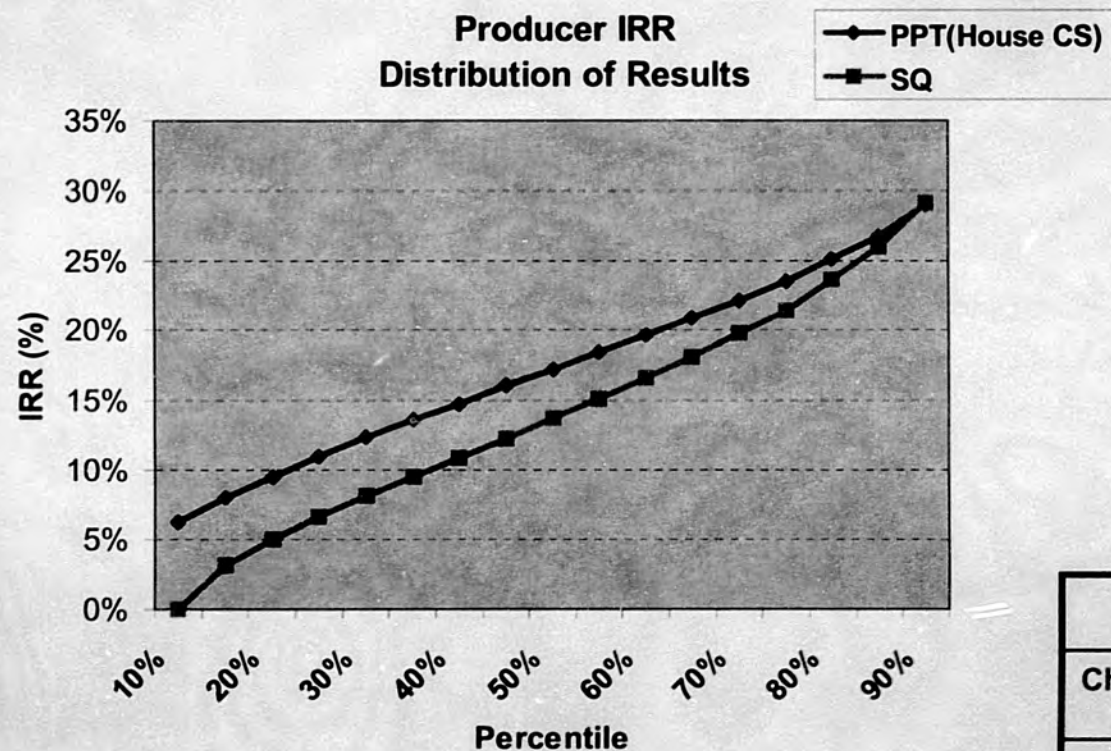
Impact on Small Field Economics – 50 MB Field



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. $\$40 \pm \$15$)**

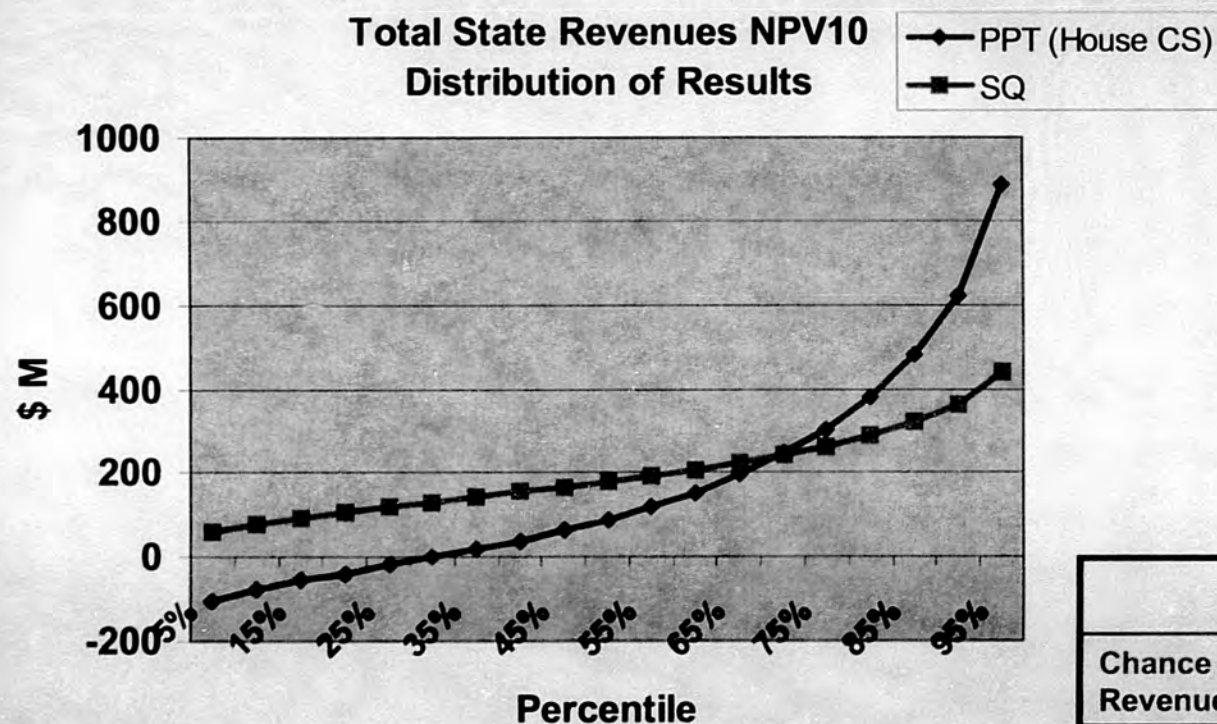
Distribution of Results – Producer IRR



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

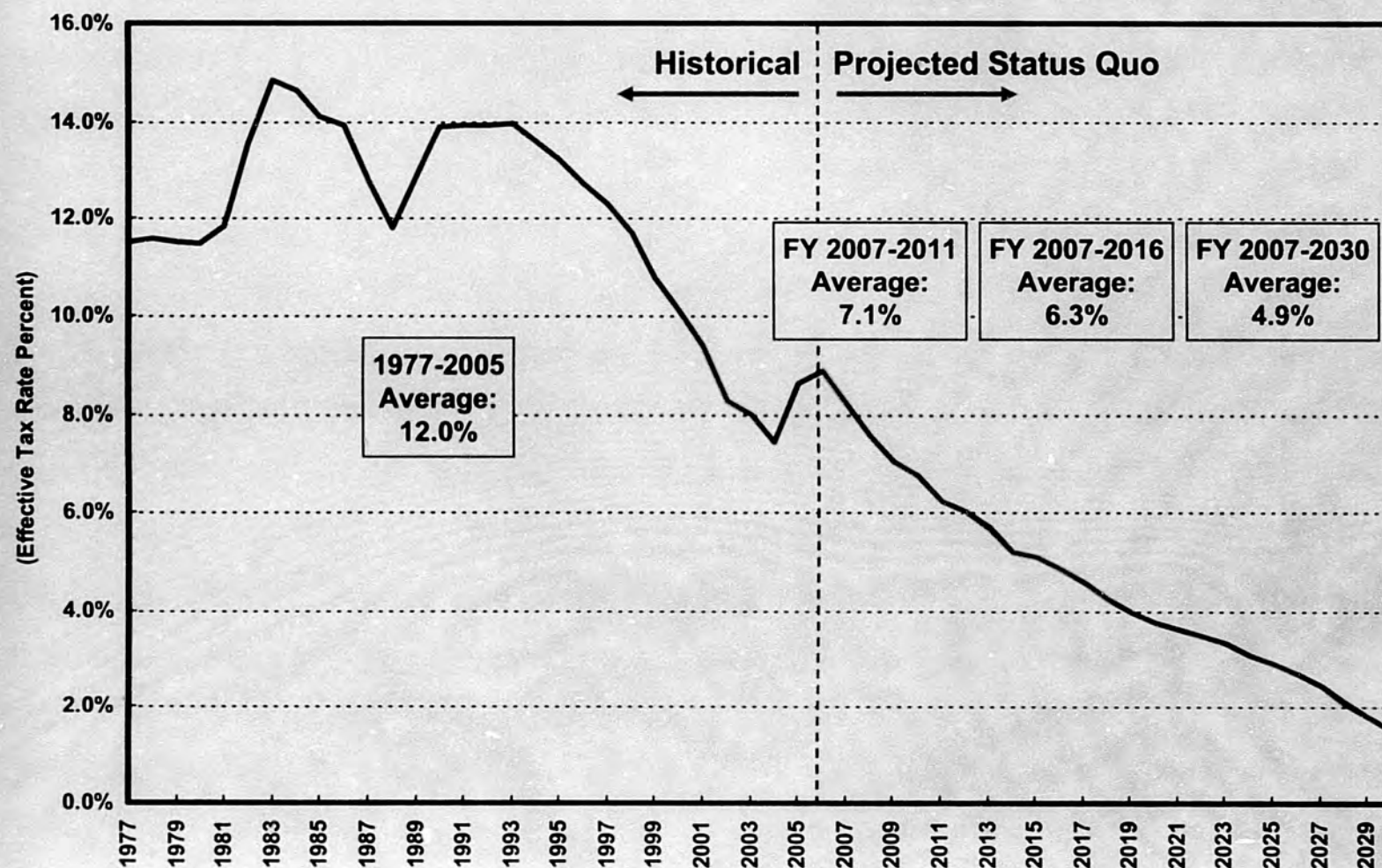
	PPT	SQ
Chance Total State Revenues <0	30%	1%

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?)**

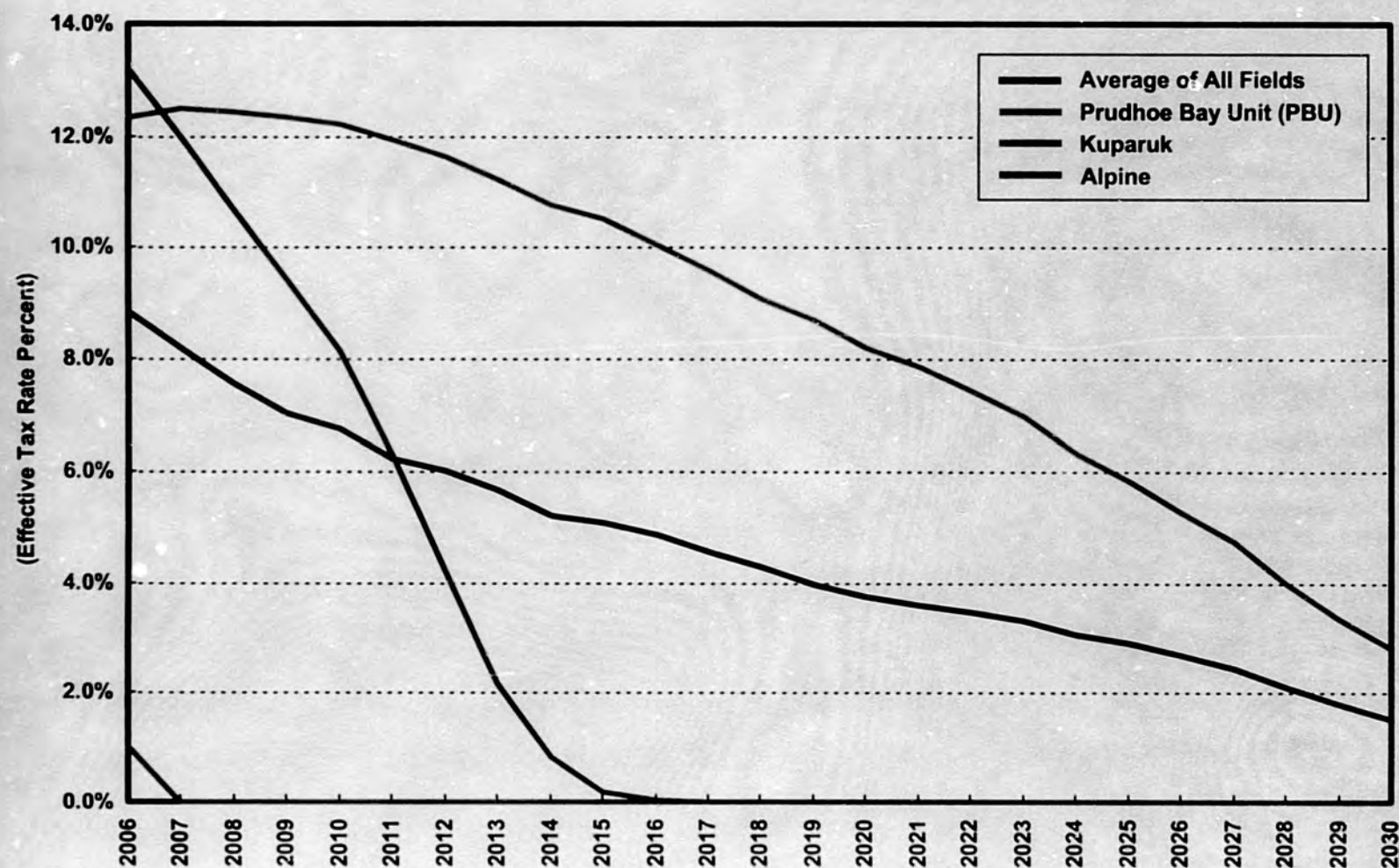
Existing Fields

Effective Severance Tax Rates Over Time



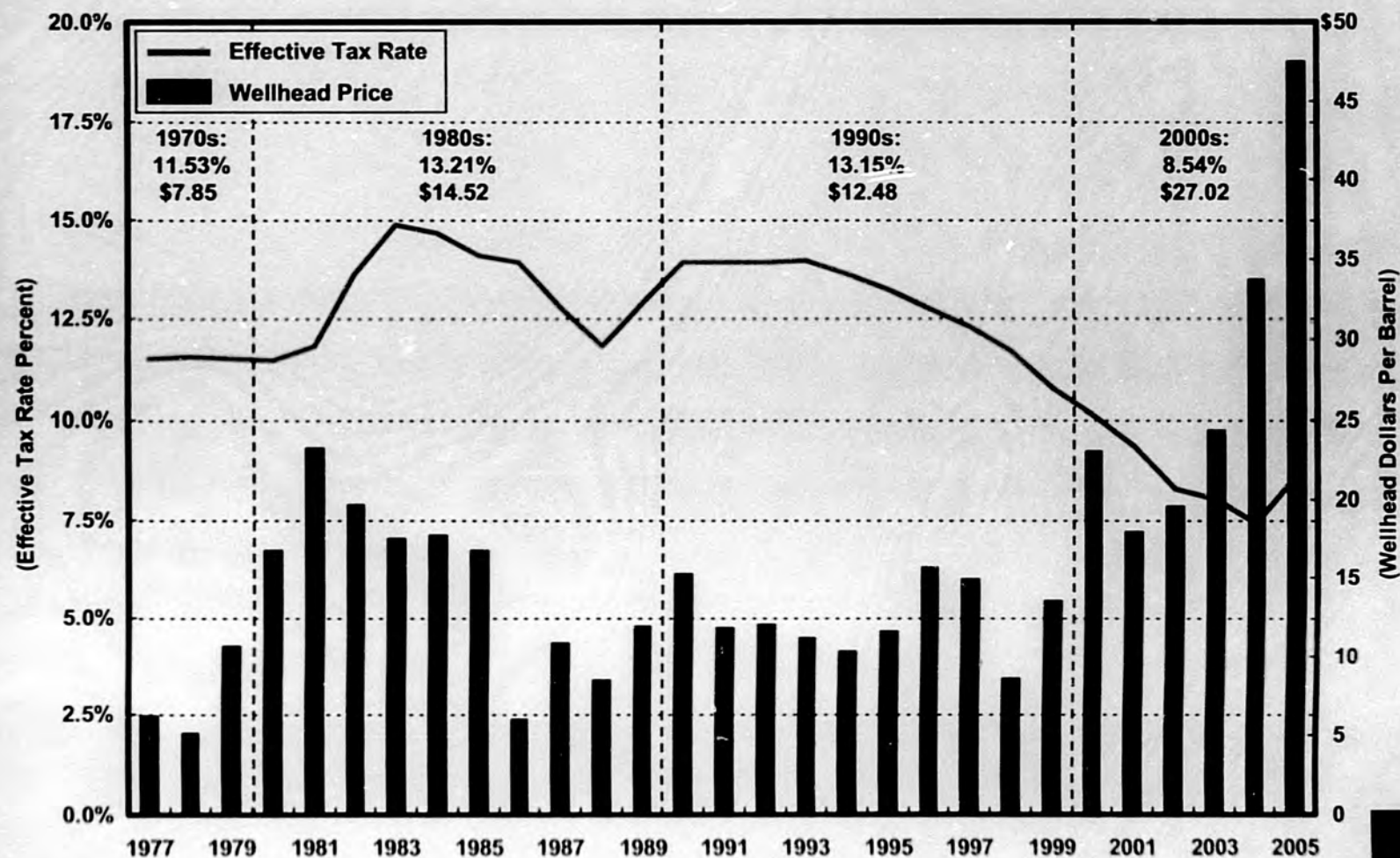
Source: Historical: Alaska Department of Revenue.

Projected Effective Severance Tax Rates* by Field



* Volumes per DOR Fall 2005 Forecast with Oooguruk projection.

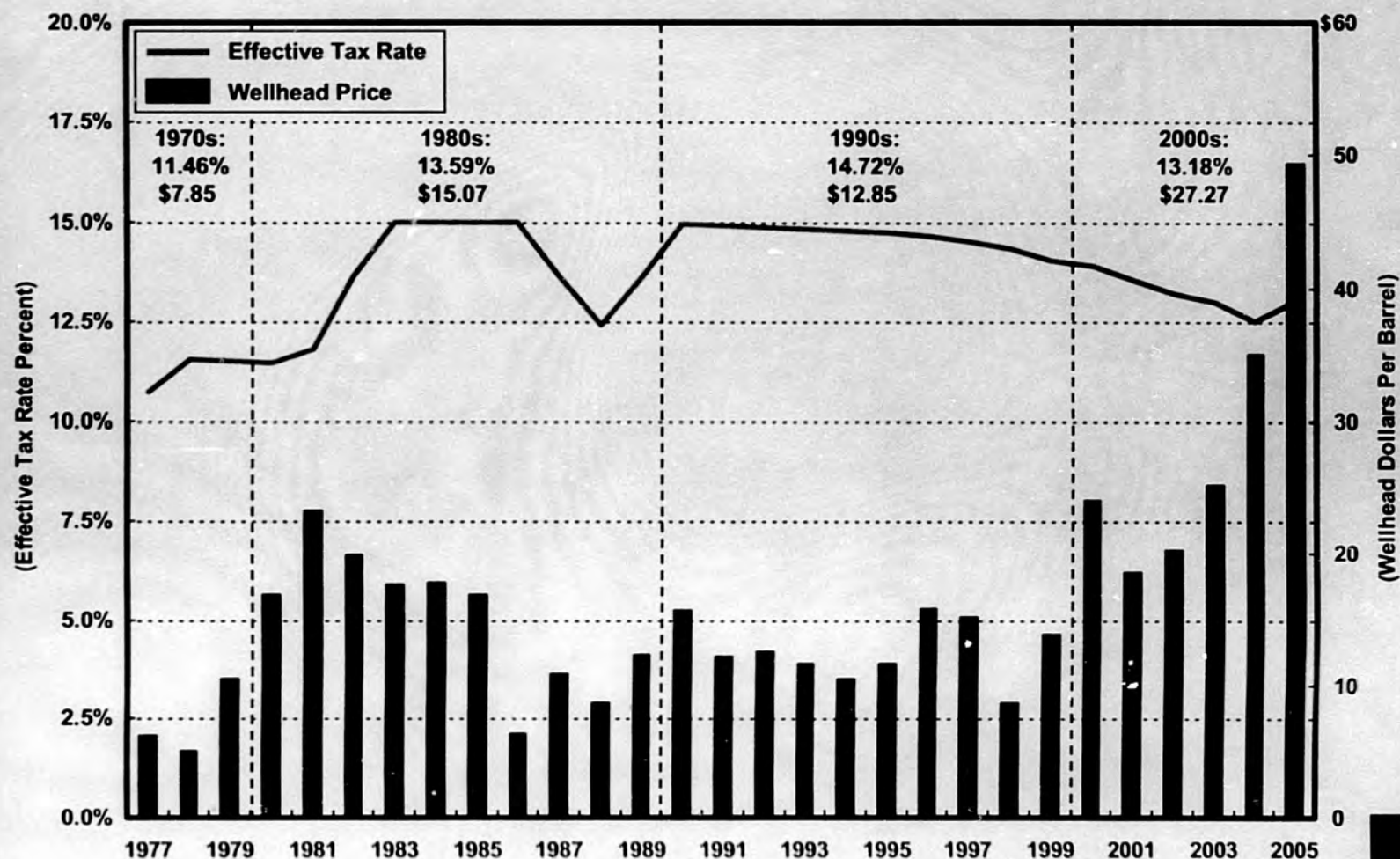
Effective Tax Rates and Wellhead Prices Over Time (All North Slope Fields)



Source: Alaska Department of Revenue.

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

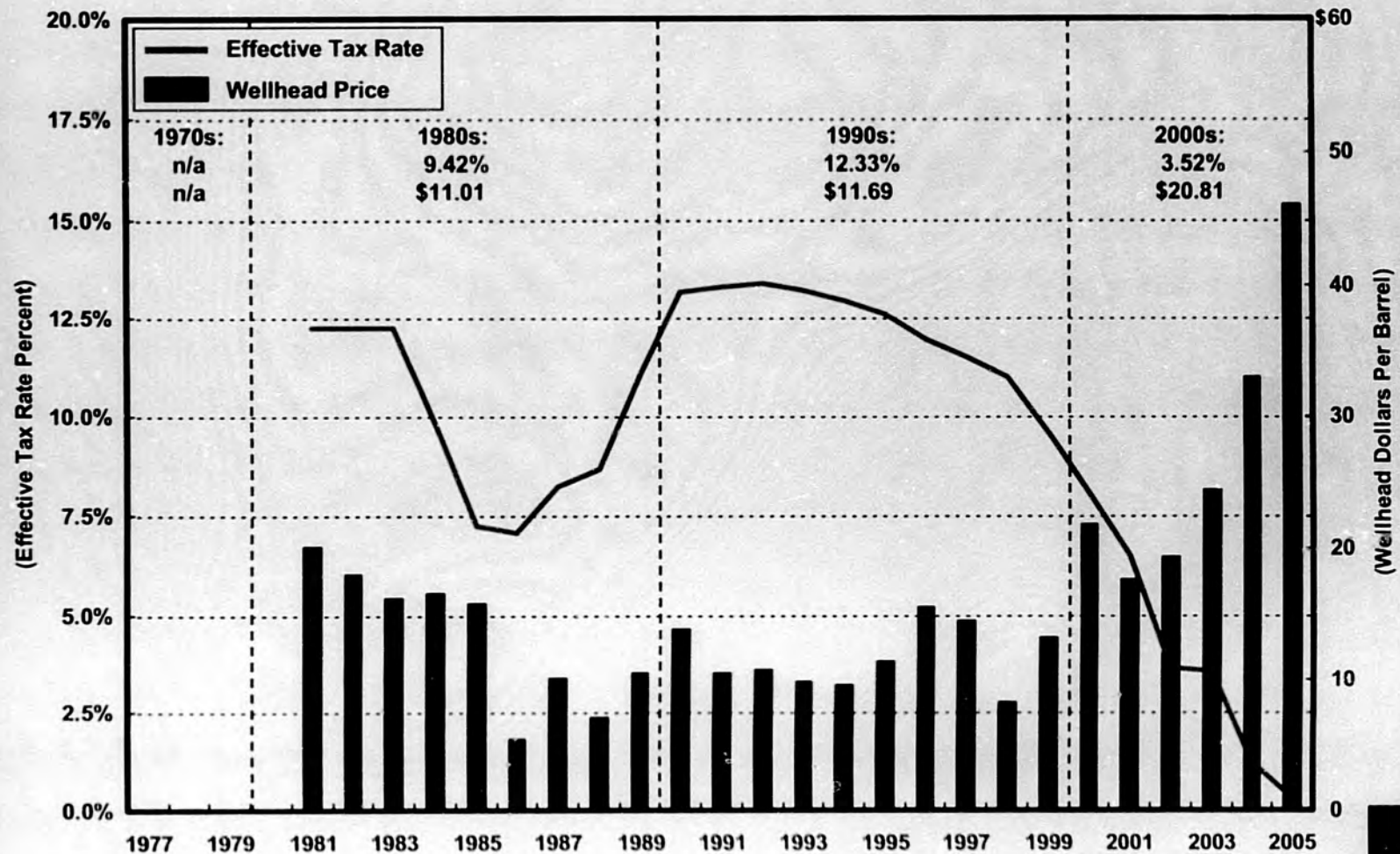
59



Source: Alaska Department of Revenue.

econ
ONE

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

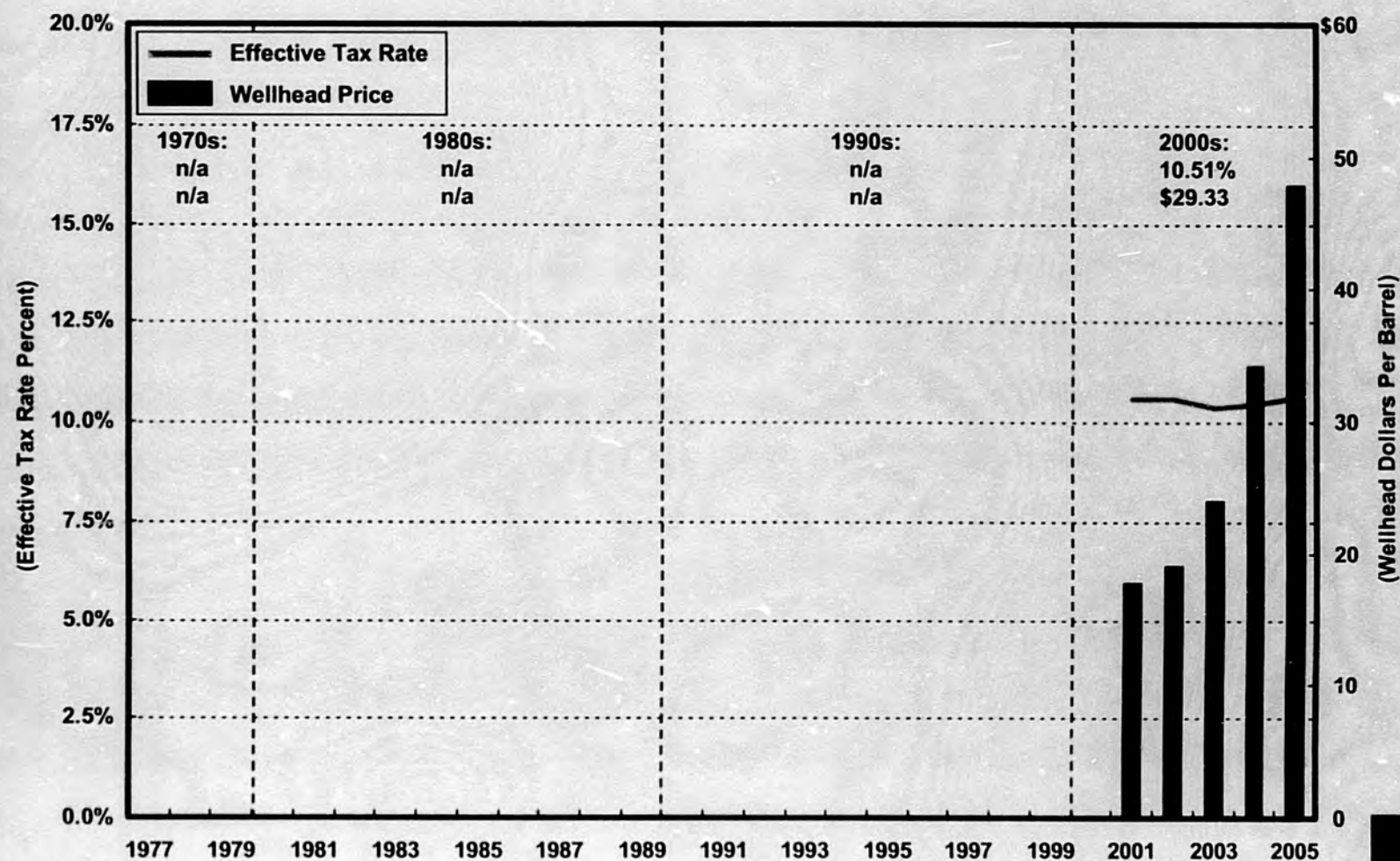


Source: Alaska Department of Revenue.



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

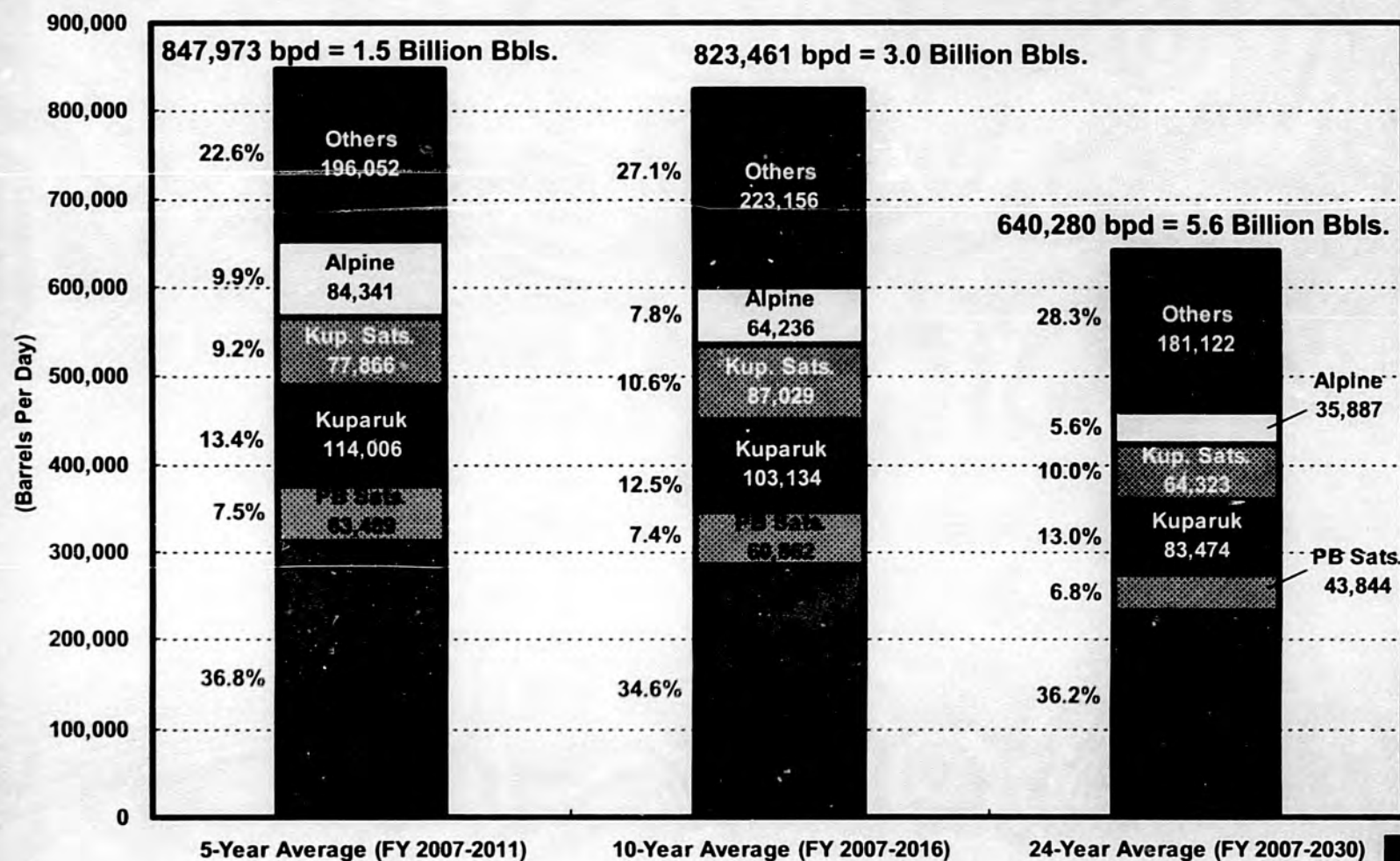
61



Source: Alaska Department of Revenue.

econ
ONE

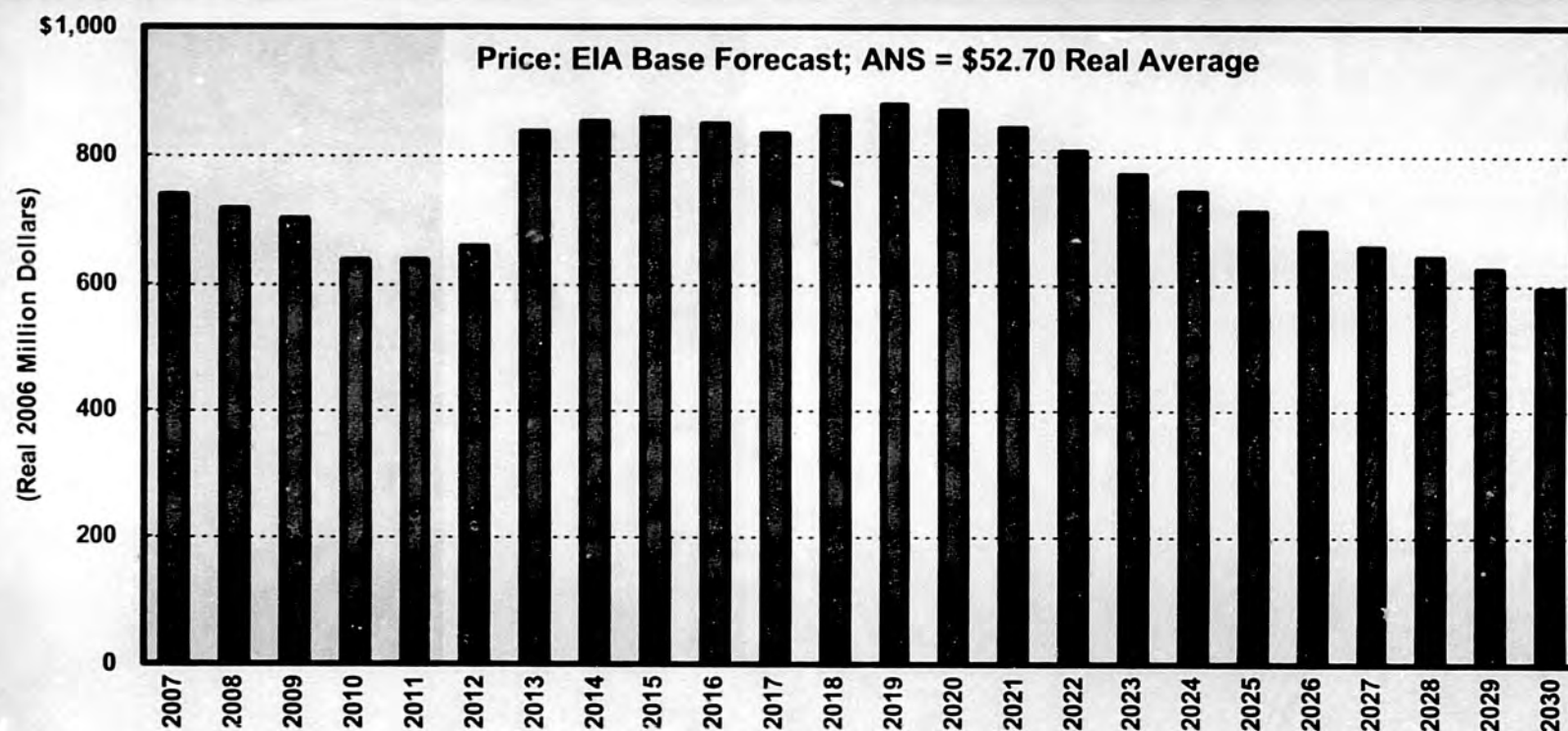
Projected North Slope Crude Oil* Production (FY 2007-2030)



* 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
FY 2007-2011							
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%	-	-
FY 2007-2016							
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%	-
FY 2007-2030							
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 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 with Costs Increased by 20% DOR Forecast Production (FY 2007-2030)*

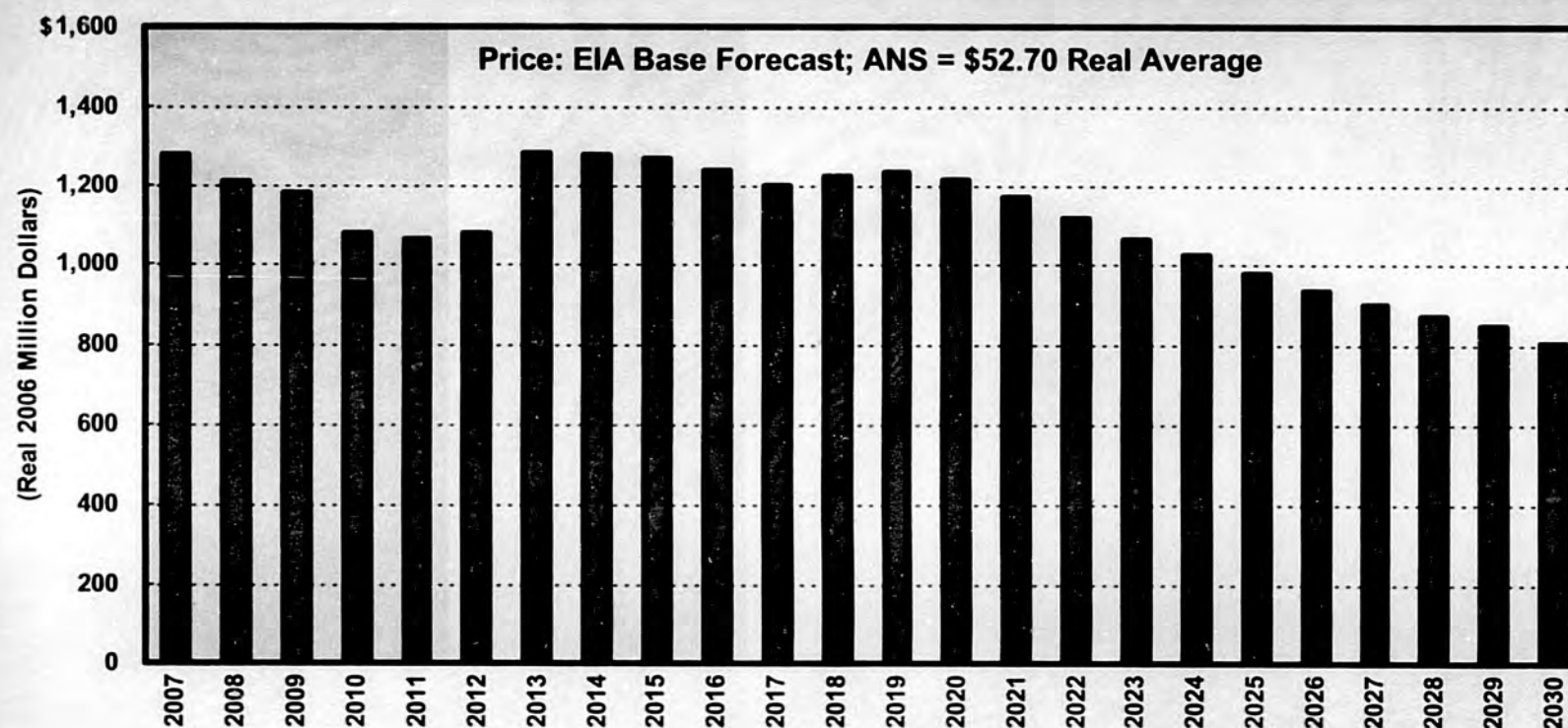
b5

	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%

* 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 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 Oooguruk 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	FY2007-2016	FY2007-2030
	Base	Low	High		Breakeven	Breakeven	Breakeven
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 2006\$)	\$5,816	\$4,480	\$7,492	\$3,283	\$0	-	-
Annual Average Difference from Status Quo (Million 2006\$)	\$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 2006\$)	\$11,968	\$6,740	\$17,656	\$7,317	-	\$0	-
Annual Average Difference from Status Quo (Million 2006\$)	\$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 2006\$)	\$26,555	\$9,286	\$42,717	\$15,610	-	-	\$0
Annual Average Difference from Status Quo (Million 2006\$)	\$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 Oooguruk projection

Change in Projected Taxes Under a 25/20 Tax with Costs Increased by 20% DOR Forecast Production (FY 2007-2030)*

68

	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	\$30.10	\$28.60	\$27.30
FY 2007-2011							
Total Difference from Status Quo (Million 2006\$)	\$4,938	\$3,602	\$6,614	\$2,405	\$0	-	-
Annual Average Difference from Status Quo (Million 2006\$)	\$988	\$720	\$1,323	\$481	\$0	-	-
PPT Effective Tax Rate (Percent)	14.5%	13.3%	15.8%	12.2%	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 2006\$)	\$10,268	\$5,040	\$15,956	\$5,617	-	\$0	-
Annual Average Difference from Status Quo (Million 2006\$)	\$1,027	\$504	\$1,505	\$562	-	\$0	-
PPT Effective Tax Rate (Percent)	14.6%	11.8%	16.6%	12.4%	-	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\$)	\$23,371	\$6,110	\$39,533	\$12,426	-	-	\$0
Annual Average Difference from Status Quo (Million 2006\$)	\$974	\$255	\$1,647	\$518	-	-	\$0
PPT Effective Tax Rate (Percent)	15.0%	9.5%	17.5%	12.1%	-	-	4.9%
Status Quo Effective Tax Rate (Percent)	4.9%	5.4%	4.7%	4.9%	-	-	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

