Strengthening Our Economy: The Untapped U.S. Oil and Gas Resources

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1 EXECUTIVE SUMMARY

1.1 Introduction and Report Findings

This report summarizes an analysis of the potential impact on future U.S. oil and gas production from opening to exploration and development the offshore moratoria areas in the Eastern Gulf of Mexico, the Atlantic, and Pacific, as well as ANWR in Alaska, and a portion of the currently unavailable federal lands in the Rockies. The study summarizes the currently assessed oil and gas resources in these areas, and presents an alternative, higher resource base that we believe can be justified as an alternative "expected" resource, based upon our analysis of the history of oil and gas assessments in the U.S. over the past thirty years. Such oil and gas assessments generally increase as more knowledge is gained over time in developed areas such as the Gulf of Mexico, indicating that initial government resource assessments are generally conservative.

In addition to modeling potential future oil and gas production, the study evaluates the impact on the U.S. economy, including future government revenues from bonuses, severance tax, property tax, and income tax at the federal, state, and local levels. Economic impacts, including employment, are evaluated for direct, indirect, and induced effects.

Table 1 summarizes the major conclusions of the study. Note that the results on this table are only for the development of the off-limits resource. By 2030, U.S. oil production from these areas could increase by 1.13 million barrels per day in the middle resource case and 2.03 million barrels per day in the alternative case. Gas production could increase by 2.54 Bcf per day in the middle resource case and 5.34 Bcf per day in the alternative case. The alternative case oil production increase represents 18 percent of forecast oil imports in 2030, while the alternative case gas production represents 61 percent of gas imports in 2030. Employment totals 114,000 to 161,000 jobs in 2030.

All-time government revenues from developing these areas total $547 billion for the middle resource case and $1,695 billion for the alternative case. As presented in **Table 2** below, when these revenues are added to those from areas already accessible, the total government revenues from development of all US oil and gas resources on federal lands on the OCS, ANWR, and the Rockies could exceed $4 trillion over the life of the resource.

Table 1 Oil and Gas Production and Government Revenue Impacts from Access to Off-Limits Areas of the OCS, ANWR, and Rockies

Middle and alternative resource base cases

Oil and Gas Production Impact - (Additional Production in 2030)

	Oil Th. BOPD		Gas MMcfd	
	Middle	Alternative	Middle	Alternative
OCS	286	900	1,230	2,940
ANWR	812	1,090	627	1,726
Rockies	35	35	677	677
Total	**1,133**	**2,025**	**2,534**	**5,342**

2030 Oil and Gas Production Impact as a Percentage of (AEO) Forecast Imports

OCS	2.6%	8.2%	14.1%	33.7%
ANWR	7.4%	9.9%	7.2%	19.8%
Rockies	0.3%	0.3%	7.8%	7.8%
Total	**10.3%**	**18.4%**	**29.1%**	**61.3%**

Government Revenue Impact from Oil and Gas (All-Time)
Billion 2006$

	Middle	Alternative
OCS	361	1,386
ANWR	164	287
Rockies	22	22
Total	**547**	**1,695**

Employment Impact in Year 2030 from Developing New Resources
Total Employment Impact

	Middle	Alternative
OCS	39,079	76,517
ANWR	62,420	71,801
Rockies	12,318	12,318
Total	**113,817**	**160,636**

Table 2 All-Time Government Revenue from OCS, ANWR, and Rockies [1]

Accessible and Inaccessible Areas

Area	Category	Government Revenues Billion $
OCS	Accessible *	2,347
	Inaccessible (mid./ alternative)	361 - 1,386
	Total	2,708 - 3,733
ANWR	Inaccessible (mid./ alternative)	164 - 287
Rockies	Accessible	395
	Improved Access	22
	Total	417
Total	Accessible *	2,742
	Inaccessible	547 - 1,695
	Total	3,289 - 4,437

* Based on methodology assuming development of entire OCS resource.

1.2 Background

The United States has large assessed volumes of undiscovered oil and gas resources that until recently have been unavailable for exploration and development due to offshore moratoria and onshore access restrictions. The U.S. Minerals Management Service estimates (mean value) that that approximately 18 billion barrels (BBbls) of oil and 77 trillion cubic feet (Tcf) of gas in the Outer Continental Shelf have been off limits to industry due to leasing moratoria. In addition, the Coastal Plain of the Arctic National Wildlife refuge remains inaccessible. The undiscovered resource in that area has been assessed by the U.S. Geological Survey at 10.6 billion barrels of oil (mean value including natural gas liquids) and 8.6 Tcf of gas (mean value including non-associated and associated gas).[2] [3]

Onshore Federal lands are subject to significant access restrictions, and most Lower-48 Federal lands with assessed potential are in the Rockies. A study published this year by the Bureau of Land Management and USGS states that 19 billion barrels or 62 percent of the oil resource and 95 Tcf or 41 percent of the gas resource on U.S. Federal onshore lands

[1] A portion of this analysis is not based on field size distributions or other approaches discussed elsewhere in this report. This portion is a simple calculation of the theoretical revenues from the entire resource base.
[2] U.S. Geological Survey, 2005, "Economics of 1998 U.S. Geological Survey's 1002 Area Regional Assessment: An Economics Update," USGS Open File Report 2005-1359.
[3] U.S. Geological Survey, 1998, "The Oil and Gas Resource Potential of the Arctic National Wildlife Refuge 1002 Area, Alaska," USGS Open File Report 98-34 (CD-ROM).

(including Alaska) is considered inaccessible. [4] A significant percentage of this resource is located in the Rocky Mountains.

In order to estimate the range of future oil and gas production that would be associated with these areas if they were opened to exploration, the U.S. Congress has mandated that several studies be carried out by the U.S. Energy Information Administration. In separate studies, the EIA has estimated the potential production from opening the OCS moratoria areas and the Coastal Plain of ANWR to development. [5] [6] The National Petroleum Council published a report in 2007 that contains a chapter evaluating the potential for improved access to the OCS and for opening ANWR. [7]

No production forecast study has been carried out by EIA for off-limits Rocky Mountain resources, although other organizations, including the National Petroleum Council in 1999 and 2003 developed forecasts for production from this resource. [8] The EIA forecasts for improved OCS access to the Atlantic, Pacific, and Eastern Gulf show significant oil and gas production impacts –- about 160,000 barrels of oil per day (bopd) and 1.6 billion cubic feet per day (bcfd) of gas by 2030. The EIA ANWR study forecast an additional 780,000 bopd from that area using the USGS mean resource estimate. Although they indicate significant future potential from off-limits areas, the EIA studies are based on what may be considered conservative assessments of remaining potential. In addition, there are uncertainties with the assumptions made about timing of industry access, field productivity, and the sequence of discoveries through time.

An important issue in forecasting potential production from restricted areas that has been inadequately addressed is the dynamic nature of oil and gas assessments through time. Analysis of historic U.S. assessments shows that there is a strong tendency for assessments to increase through time as more is learned about an area through exploration and development activity. For example, assessed resources in the Gulf of Mexico have increased greatly since the 1970s. The most important factor behind this trend is that as a basin is developed, more becomes known about the habitat of oil and gas in that area, including the nature of plays and prospects, and the discovery of new productive trends

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[4] U.S. Departments of Interior, Agriculture, and Energy, 2008, "Inventory of Onshore Federal Oil and Natural Gas Resources and Restrictions to Their Development - 2008," Report BLM/WO/GI/-03/002+3100REV08, www.blm.gov

[5] U.S. Energy Information Administration, 2008, "Analysis of Crude Oil Production in the Arctic National Wildlife Refuge," EIA Report SR/OAIF/2008-03, May, 2008. http://www.eia.doe.gov/oiaf/servicerpt/anwr/index.html

[6] U.S. Energy Information Administration, "Annual Energy Outlook, 2007," February, 2007, and website information on AEO "Issues in Focus" land access publication at http://www.eia.doe.gov/oiaf/aeo/otheranalysis/ongr.html Annual Energy Outlook pdf document http://tonto.eia.doe.gov/ftproot/forecasting/0383(2007).pdf

[7] National Petroleum Council, 2007, "Facing the Hard Truths About Energy – A Comprehensive View to 2030 of Global Oil and Gas," Topic 7: Global Access to Oil and Gas, NPC, Washington, DC. www.npc.org

[8] National Petroleum Council, 1999 and 2003 North American gas market studies and accompanying reports, www.npc.org

that were not previously anticipated. This increased understanding tends to lead to higher assessments of potential.

Upstream technologies are also constantly improving. For example, the seismic data used decades ago to evaluate the potential from the Atlantic OCS does not compare in quality to modern seismic. The collection of modern seismic data would result in a much better understanding of the subsurface, and hence an improved resource assessment. In addition to providing better information for the assessment, new technologies for drilling and production might reduce costs and allow the development of some of the more marginal resources that would not have previously been economic.

Since industry has not been allowed to explore the Atlantic OCS, Pacific OCS, and Eastern Gulf of Mexico for decades, assessments of remaining potential have largely been "frozen in time." The MMS Atlantic assessment has changed little since the 1980s and the Pacific OCS assessment has been relatively unchanged. The assessments of these areas stand in contrast to that of the developed portion of the Western and Central Gulf of Mexico, which has seen large increases in assessed volumes, with substantial increases even within the past few years. A big reason for this is that new concepts and new play trends are being discovered – trends that were not conceptualized in prior assessments. Such trends are the result of geologic understanding that only comes through extensive exploration.

1.3 Objectives of Study

The primary objective of the study was to evaluate the restricted resources in the offshore and onshore Lower-48 and ANWR Coastal Plain and to estimate the quantities of future oil and gas production that may be possible if offshore moratoria were removed and if onshore access restrictions were reduced.

Another objective of the study was to evaluate the potential economic impact on the U.S. economy of developing these resources. Such impact would result from industry spending of billions of dollars for capital and operating expenditures to develop and produce the resources, and the resulting direct and indirect impact on U.S. economic activity.

1.4 Approach to Study

The approach used in the analysis was to develop resource base descriptions of the off-limits areas based upon the MMS and USGS assessments including published middle (mean) assessments for each area for oil and gas resources. In addition, an alternative, higher resource base was developed for the OCS areas, representing a more optimistic case. The concept of the more optimistic case is based upon the history of USGS/MMS assessments as discussed above. For each of the two resource base assumptions, there is a corresponding field size distribution.

The model used for the analysis is the ICF Land Access Production Impact Model (LAPIM). The model is used to evaluate oil and gas production and economic impacts of Federal land

access policies. LAPIM covers the Alaskan National Wildlife Refuge (ANWR), Pacific OCS, Eastern Gulf of Mexico OCS, the Atlantic OCS and Federal lands in Rocky Mountain States.

To develop the production forecasts, a set of assumptions was developed for each area including:

- Start year for initial leasing
- Start of exploration relative to leasing year
- Start of first field's production
- Time period between additional new field starts`
- Production profiles of different field sizes
- Economic assumptions such as taxes, royalty rate, overhead, etc.

The forecasting approach typically uses a Monte Carlo sampling method to determine the sequence of field discovery. Each area is characterized by a distribution of undiscovered field sizes. For example, some undiscovered fields may be one billion barrel oil fields, while some fields may be 50 or 100 million barrels. The distribution is a function of the geologic characteristics, but typically in a distribution there are a few very large accumulations and many smaller accumulations present.

In terms of discovery sequence, an optimistic scenario is for the largest field to be found first, followed by successively smaller fields until the resource is developed. The approach used in the current study for the OCS does not assume that the largest field is found first. Rather, it uses the Monte Carlo modeling approach to statistically estimate alternative discovery sequences which are then averaged. The larger fields have a higher probability of being found first, so the largest field is among the first group of fields expected to be found, but not necessarily the first field.

For the ANWR forecast, we assume that the largest field is found first. The rationale for this area is that the geology and structures are more well known, and it is a much smaller area, so that it is much more likely that the largest field would be found first. This was also the approach used by EIA in their study.

To evaluate the economic impact on the U.S., the commercially available IMPLAN model was used. Private sector economic impacts were evaluated for each area in terms of economic output, employment, and total value added. These categories were further evaluated in terms of direct, indirect, and induced activity

"Direct output" as modeled here represents the value of the domestic goods and services purchased by the direct capital and operating expenditures for oil and gas industry

operations. "Indirect output" represents the value of goods and services needed to support the creation of the goods and services purchased by those direct expenditures. "Induced output" is the amount of economic output coming from the spending of employee compensation and other household earnings of people involved in the direct and indirect activity. "Value Added" is the amount of economic value added by each industry and is the difference between each industry's output and the cost of goods and services which that industry purchases. The sum of all value added by all industries is the contribution to Gross Domestic Product.

Government sector impacts are summarized in terms of tax and royalty revenue from each geographic area. Industry revenues and expenditures are detailed through 2030 and summary information is provided for the post-2030 period. The industry expenditures were modeled as part of the overall forecasting effort.

The EIA 2008 Annual Energy Outlook oil and gas price forecasts were used in the analysis. For drilling costs, the 2006 API Joint Association Survey was the primary data source. Another source of cost data was the 2003 NPC study, and assumptions used in that study were adjusted to current costs.

1.5 History of Oil and Gas Assessments and Implications

The MMS periodically assesses the discovered and undiscovered oil and gas resources of the Outer Continental Shelf and the USGS assesses the onshore and state waters.

- The Atlantic, Pacific, and Gulf of Mexico regions have been assessed by either USGS or MMS since 1975. The most recent assessment was in 2006. [9] [10] **Figure 1** and **Figure 2** present these assessments for oil and gas.

- For both oil and gas assessments, the Gulf of Mexico assessment has increased greatly through time. For oil, the assessment has increased from 15 billion barrels to 72 billion barrels, a factor of 4.8. For gas, the assessment has increased from 184 Tcf to 443 Tcf, a factor of 2.4.

- The Pacific oil assessment increased from the original 6 billion barrels to 13 billion barrels, but has been static since 1996. The Pacific gas assessment increased from 5 to 21 Tcf, and has also been static since 1996.

[9] U.S. Minerals Management Service, 2006,"Assessment of Undiscovered Technically Recoverable Oil and Gas Resources of the Nation's Outer Continental Shelf," MMS Fact Sheet RED-2006-01b, February, 2006. http://www.mms.gov/revaldiv/RedNatAssessment.htm

[10] U.S. Minerals Management Service, 2006, "Report to Congress: Comprehensive Inventory of U.S. Oil and Natural Gas Resources – Energy Policy Act of 2005 Section 357," [no report number], February, 2006. http://www.mms.gov/revaldiv/RedNatAssessment.htm

- The Atlantic oil assessment has been essentially unchanged since 1975, varying from 3 to 6 billion barrels, while the gas assessment has increased from 10 to 37 Tcf. The 2006 Atlantic assessment increased from 28 to 37 Tcf. MMS has stated that this increase was the result of the exploration history off of Eastern Canada, which has similar geology.

Figure 1 History of MMS Oil Assessments

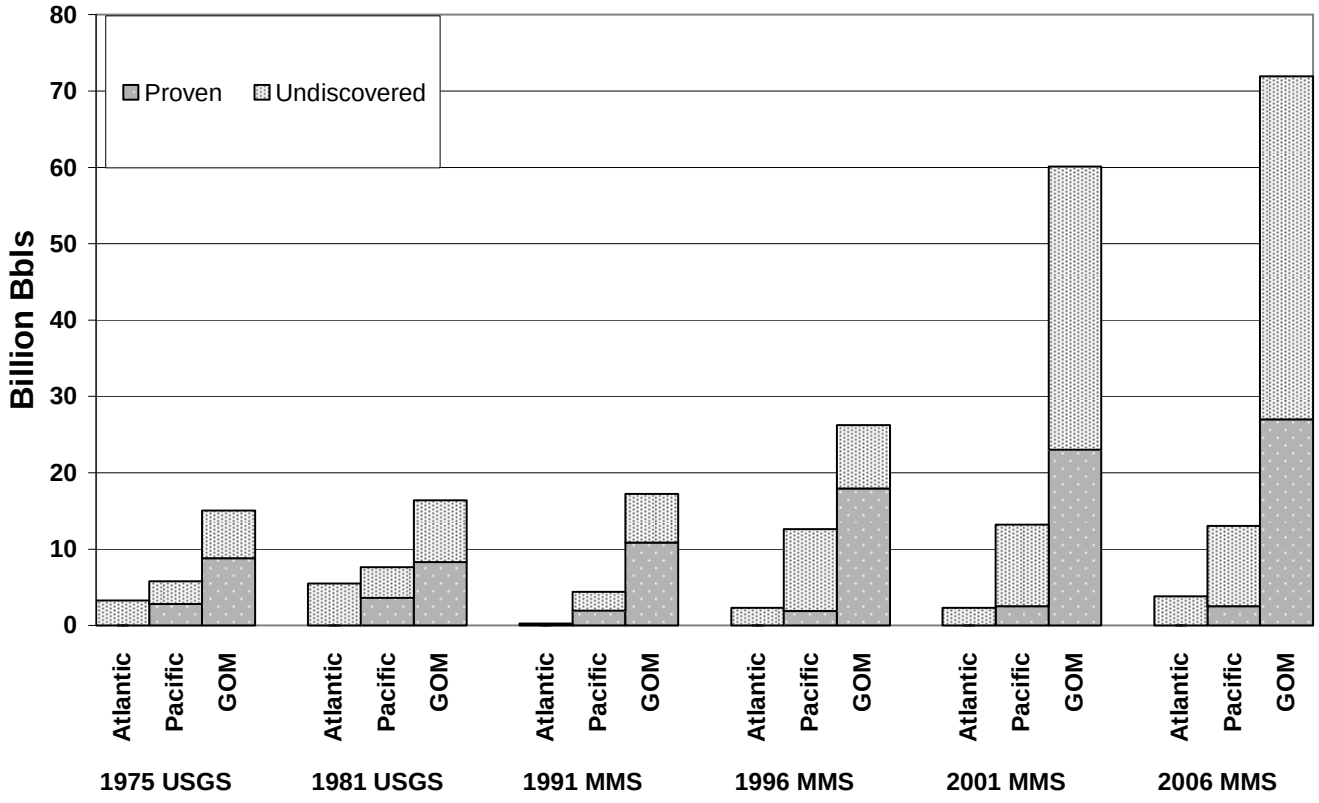
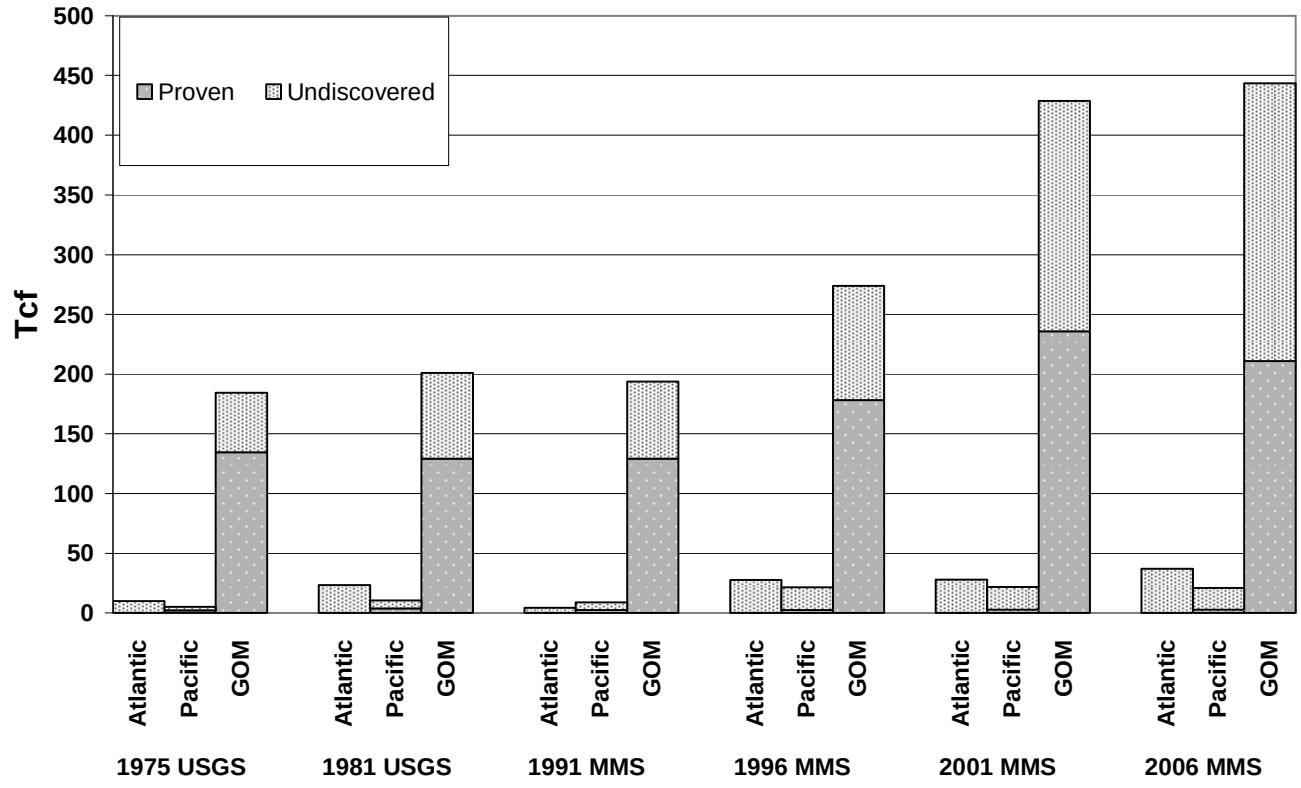


Figure 2 History of MMS Lower-48 Gas Assessments



1.6 Summary of Resource Base Cases

Table 3 summarizes the middle and "alternative" resource bases used in the study.

- The middle resource base is the mean USGS/MMS assessment. The alternative resource base was developed using ratios developed from the analysis of historical assessments.

- The Rockies region was evaluated differently. The total assessment shown of 21 billion barrels of oil and 291 Tcf of gas is based upon the EIA assumptions for the Annual Energy Outlook, which is primarily based upon USGS, but is not identical.

- Of the total Rockies resources, there is a "no access portion," as estimated in the 2008 EPCA study. In the current study, we assume that a portion of the no access resource is opened to development. The details are described in the chapter on the Rockies. The assumed new access resource of 320 mmb and 8.4 Tcf is shown on the last row.

Table 3 Summary of Middle and Alternative Oil and Gas Resource Cases

		Oil (billion bbls)		Gas (Tcf)	
		Middle	Alternative	Middle	Alternative
OCS Areas Under Moratoria					
	Atlantic	3.8	18.0	37.0	89.0
	Pacific	10.4	26.0	18.0	44.0
	Eastern Gulf of Mexico	4.0	19.0	22.2	53.0
	total	**18.2**	**63.0**	**77.2**	**186.0**
ANWR		**10.60**	**16.40**	**8.60**	**18.20**
Rockies	total resource	20.5		291.0	
	No access resource - current restrictions	0.97		25.60	
	No access resource - reduced restrictions	0.65		17.20	
	Difference = new access resource assumed	**0.32**		**8.40**	
Sum of all moratoria and off-limits resources		**29.12**	**79.72**	**94.20**	**212.60**

Note: The Rockies resource shown here is based upon the EIA Annual Energy Outlook. The no access portion of the Rockies is estimated from the recent EPCA study by BLM and USGS. The Rockies resource for new access is based upon opening one-half of the resources in EPCA categories 2 - 4 (see Rockies chapter).

1.7 Production Results

- **Table 4** summarizes the production results for the middle and alternative resource cases. Results are presented for the years 2010, 2020, and 2030. Production volumes shown are those annual and daily volumes estimated to be produced should there be access to these areas as modeled here.

- **Table 5** shows the 2008 Annual Energy Outlook projection of US crude oil supply (domestic production plus imports) and the projection of domestic production and net US imports. Also shown in the table is the AEO's projection of total US natural gas supply, domestic production, and net natural gas imports.

- **Table 6** shows oil and natural gas production results for the middle and alternative resource cases as a percentage of the AEO's projected total U.S. supply, domestic production, and net imports of each commodity.

Middle Resource Base

- In the middle resource case, OCS oil production from new access in 2030 is 286,000 barrels of oil per day (bopd). ANWR oil production is 812,000 bopd, and new Rockies production is 35,000 bopd. New access OCS gas production is 1,230 million cubic feet per day (MMcfd), ANWR gas production is 627 MMcfd, and new access Rockies production is 677 MMcfd.

- For the middle resource, total new oil production in 2030 is 1,134,000 bopd and incremental gas production is 2,534 MMcfd.

- The additional oil production represents 6.8% of total US crude oil supply projected in the 2008 AEO, 20.2% of domestic oil production, and 10.3% of net oil imports for the year 2030.

- The additional natural gas production represents 4.1% of total projected US natural gas supply, 4.7 percent of domestic production, and and 29.1% of net gas imports in 2030.

Alternative Resource Base

- In the alternative resource case, OCS oil production from new access in 2030 is 900,000 bopd. ANWR oil production is 1,090,000 bopd, and new Rockies production is 35,000 bopd. New access OCS gas production is 2,940 MMcfd, ANWR gas production is 1,726 MMcfd, and new access Rockies production is 677 MMcfd.

- For the alternative resource, total new oil production in 2030 is 2,025,000 bopd and new gas production is 5,342 MMcfd.

- The additional oil production in the Alternate Case represents 12.2% of total 2030 US crude oil supply, 36.2% of domestic production, and 18.4% of net oil imports projected in the 2008 AEO.

- The Alternative Case's additional natural gas production represents 8.6% of total US natural gas supply, 10.0% of domestic production, and 61.3% of net gas imports projected for 2030.

Table 4 Production Impact of Improved Access in Annual and Daily Volumes - OCS, ANWR and Rockies

1. Middle Resource Base

		Oil		Gas	
		Th. Bbls per Year	Th. BOPD	Bcf per Year	MMcfd
Total	2010	118	0	4	11
	2020	237,738	651	426	1,167
	2030	413,799	1,134	925	2,534
	cumul. thru 2030	4,443,000		9,182	

2. Alternative Resource Base

		Oil		Gas	
		Th. Bbls per Year	Th. BOPD	Bcf per Year	MMcfd
Total	2010	118	0	4	11
	2020	412,820	1,131	652	1,786
	2030	739,283	2,025	1,950	5,342
	cumul. thru 2030	7,912,000		16,145	

Table 5 2008 AEO Projection of US Crude Oil and Natural Gas Markets

	Crude Oil (Th. BOPD)			Natural Gas (MMcfd)		
	Total Supply	Domestic Production	Net Imports	Total Supply	Domestic Production	Net Imports
2010	15,530	5,930	9,600	63,562	53,014	10,548
2020	15,980	6,230	9,750	63,781	54,055	9,726
2030	16,630	5,600	11,030	62,137	53,425	8,712

Table 6 Production Impact of Increased Access as Percent of Markets - OCS, ANWR and Rockies

1. Middle Resource Base

		Production Increase as Percent of US:					
		Crude Oil Supply	Domestic Oil Prod.	Crude Oil Imports	Natural Gas Supply	Domestic Gas Prod.	Natural Gas Imports
Total	2010	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
	2020	4.1%	10.5%	6.7%	1.8%	2.2%	12.0%
	2030	6.8%	20.2%	10.3%	4.1%	4.7%	29.1%

2. Alternative Resource Base

		Production Increase as Percent of US:					
		Crude Oil Supply	Domestic Oil Prod.	Crude Oil Imports	Natural Gas Supply	Domestic Gas Prod.	Natural Gas Imports
Total	2010	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
	2020	7.1%	18.2%	11.6%	2.8%	3.3%	18.4%
	2030	12.2%	36.2%	18.4%	8.6%	10.0%	61.3%

1.8 Private and Government Sector Economic Impact Analysis Results

Private Sector Impacts

- **Table 7** is a summary of private sector economic impacts in the year 2030 assuming the middle resource base, and **Table 8** presents the results for the alternative resources.

- The IMPLAN model was used to estimate the additional economic activity that would be expected from expanded access to the five areas under study. The three OCS areas are combined on this table.

- The lower portion of the table summarizes the impacts on economic output, employment and value added. Value added is the sum of labor income, proprietors income, other property type income, and indirect business taxes.

- Economic impacts are shown for direct, indirect, and induced activity.

- The total impact in 2030 (just that year) including direct, indirect, and induced is $23 billion and 114,000 jobs for the middle resource and $32 billion and 161,000 jobs for the alternative resource.

Government Sector Impacts

- **Tables 9 and 10** summarize the government revenues from the OCS, ANWR, and Rockies under the two resource scenarios. Government revenues include those of federal, state, and local governments. Categories of revenue include royalties, severance taxes, property taxes, income taxes and lease bonuses.

- In 2030, additional government revenues are $11 billion in the middle resource case and $23 billion in the alternative resource case. Cumulative revenues to 2030 range from $94 billion to $194 billion.

- Much of the oil and gas production from the studied areas would take place after 2030. Assuming that oil and gas prices in the post-2030 period are the same as the 2030 in the AEO Reference Case (Lower-48 average crude oil price is $60.59/bbl and average natural gas is $6.45/MMBtu), then all-time cumulative government revenues will range from $547 to $1,695 billion.

Table 7 Private Sector Economic Impact - Middle Resource Case - 2030

OCS

	Direct	Indirect	Induced	Total
Output (Million 2006$)	3,348	2,086	2,570	8,005
Employment (Number of Jobs)	10,090	10,184	18,806	39,079
Total Value Added (Million 2006$)	1,912	1,059	1,403	4,374

ANWR

	Direct	Indirect	Induced	Total
Output (Million 2006$)	5,031	3,464	3,885	12,379
Employment (Number of Jobs)	17,188	16,810	28,423	62,420
Total Value Added (Million 2006$)	2,763	1,692	2,120	6,575

Rockies

	Direct	Indirect	Induced	Total
Output (Million 2006$)	1,020	798	760	2,579
Employment (Number of Jobs)	2,906	3,848	5,564	12,318
Total Value Added (Million 2006$)	512	379	415	1,306

Total

	Direct	Indirect	Induced	Total
Output (Million 2006$)	9,400	6,348	7,215	22,964
Employment (Number of Jobs)	30,184	30,841	52,792	113,817
Total Value Added (Million 2006$)	5,187	3,129	3,938	12,254

Table 8 Private Sector Economic Impact - Alternative Resource Case – 2030

OCS

	Direct	Indirect	Induced	Total
Output (Million 2006$)	6,214	4,055	4,919	15,188
Employment (Number of Jobs)	19,991	20,533	35,993	76,517
Total Value Added (Million 2006$)	3,461	2,076	2,685	8,222

ANWR

	Direct	Indirect	Induced	Total
Output (Million 2006$)	5,743	3,848	4,468	14,059
Employment (Number of Jobs)	20,404	18,708	32,689	71,801
Total Value Added (Million 2006$)	3,208	1,892	2,438	7,539

Rockies

	Direct	Indirect	Induced	Total
Output (Million 2006$)	1,020	798	760	2,579
Employment (Number of Jobs)	2,906	3,848	5,564	12,318
Total Value Added (Million 2006$)	512	379	415	1,306

Total

	Direct	Indirect	Induced	Total
Output (Million 2006$)	12,978	8,701	10,148	31,827
Employment (Number of Jobs)	43,302	43,089	74,245	160,636
Total Value Added (Million 2006$)	7,181	4,347	5,538	17,066

Table 9 Government Revenues - Middle Resource Case

Middle Resource Case
Million 2006$

	2010	2015	2020	2025	2030	Sum to 2030	post - 2030	All Time Sum
OCS	-19	-314	1,279	2,457	3,535	27,874	333,268	361,142
ANWR	0	-482	2,235	5,623	7,273	60,614	103,390	164,004
Rockies	3	78	233	437	615	5,534	16,302	21,835
Total	-16	-718	3,747	8,517	11,423	94,022	452,960	546,981

Table 10 Government Revenues – Alternative Resource Case

Alternative Resource Case
Million 2006$

	2010	2015	2020	2025	2030	Sum to 2030	post - 2030	All Time Sum
OCS	-19	-144	3,808	7,812	11,743	92,299	1,293,971	1,386,271
ANWR	0	-686	3,768	9,730	10,845	96,352	190,902	287,255
Rockies	3	78	233	437	615	5,534	16,302	21,835
Total	-16	-751	7,808	17,980	23,204	194,185	1,501,176	1,695,361

2 OUTER CONTINENTAL SHELF (OCS) IMPACT ANALYSIS

2.1 Oil and Gas Resources in OCS Moratoria Areas and Resource Base Assumptions

- In 2006, the MMS published assessments of the undiscovered oil and gas resources in moratoria areas of the Atlantic, Pacific, and Eastern Gulf of Mexico. [11]

- These volumes are presented in **Table 11**.

- **Table 12** summarizes the OCS oil and gas resource base assumptions for the current study. For each moratoria area there are two resource base cases: the middle case of the MMS representing their mean, and a higher alternative resource estimate developed for the current study.

- The alternative higher resource estimate is based upon the knowledge that resource assessments often increase through time, as occurred in the Gulf of Mexico. The oil assessment increase in the Gulf of Mexico since 1975 was a factor of 4.8 and the gas assessments increased by a factor of 2.4. These ratios were applied to the current mean assessment of each off-limits area. An exception was the Pacific OCS, for which the gas ratio of 2.4 was used. The rationale here is that significantly more is known about that area due to historic development off Southern California.

[11] U.S. Minerals Management Service, 2006, "Report to Congress: Comprehensive Inventory of U.S. Oil and Natural Gas Resources – Energy Policy Act of 2005 Section 357," [no report number], February, 2006. http://www.mms.gov/revaldiv/RedNatAssessment.htm

Table 11 MMS Oil and Gas Assessment of Moratoria Areas

Billion barrels and Tcf

	Undiscovered Oil Total	Undiscovered No Access Oil	% No Access	Undiscovered Gas Total	Undiscovered No Access Gas	% No Access
Atlantic	3.8	3.8	100%	37.0	37.0	100%
Pacific	10.5	10.4	99%	18.3	18.0	98%
GoM	44.9	4.0	9%	232.5	22.2	10%
L-48 OCS	59.2	18.2	31%	287.8	77.2	27%

Table 12 OCS Resource Base Scenarios for Moratoria Areas

	Low	Mid	High	Ratio to Mid for Alternative Resource Using Historical GOM Assessments	**Alternative Resource**
Oil - BB					
Atlantic	**1**	**4**	**8**	**4.8**	**18**
Pacific	**8**	**11**	**14**	**2.4**	**26**
GOM Total	41	45	49		
EGOM (old boundaries, total resource)		6			
EGOM (old bound. No access)		**4**		**4.8**	**19**
EGOM (new boundaries, total)	3	4	6		
OCS Total No Access (Atl., Pac., EGOM)	**9**	**18**	**22**		**63**

Notes: Growth in GOM oil assessment was 4.8X since 1975; GOM factor not used for Pacific Offshore. For that region, the gas factor was used. GOM gas factor since 1975 was 2.4.

Gas - TCF					
Atlantic	**14**	**37**	**67**	**2.4**	**89**
Pacific	**13**	**18**	**24**	**2.4**	**44**
GOM Total	219	233	249		
EGOM (old boundaries, total resource)		32			
EGOM (old bound. No access)		**22**		**2.4**	**53**
EGOM (new boundaries, total)	18	22	26		
OSC Total No Access (Atl., Pac., EGOM)	**28**	**78**	**91**		**186**

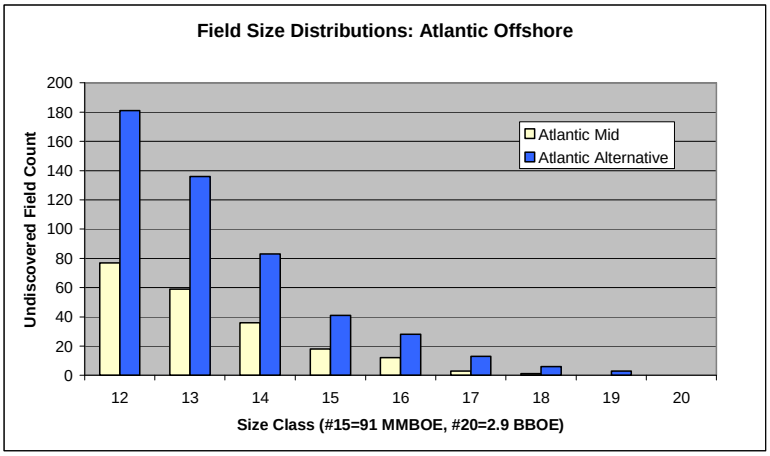
2.2 Field Size Distributions for OCS Moratoria Areas

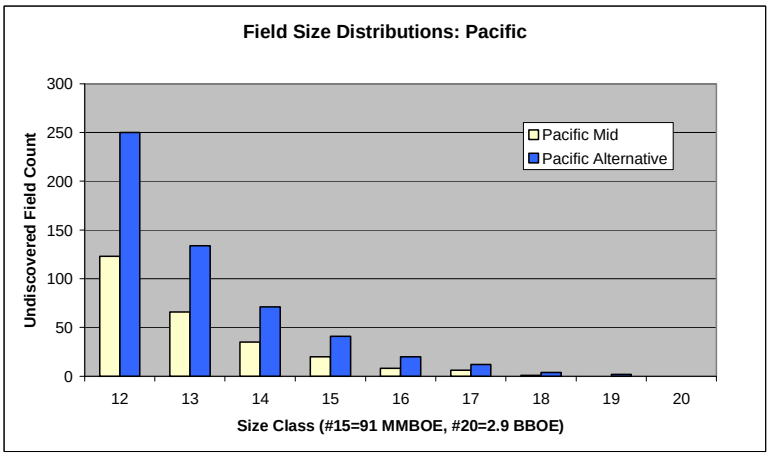
- Each of the resource base scenarios is represented by a distribution of undiscovered fields by USGS field size class.

- These distributions are shown graphically for the OCS moratoria areas in **Figure 3** and in table form in **Table 13**.

- The field size classes shown range from size class 12 to size class 20. For perspective, a class 12 field is 11 million barrels of oil equivalent, and a class 20 field is 2.92 billion barrels of oil equivalent. Each size class is twice as large as the next smaller class. Thus, a class 19 field is one half the size of a class 20 field, or 1.46 billion boe. All of the field size values are shown in **Table 13**.

Figure 3 Field Size Distributions for OCS Moratoria





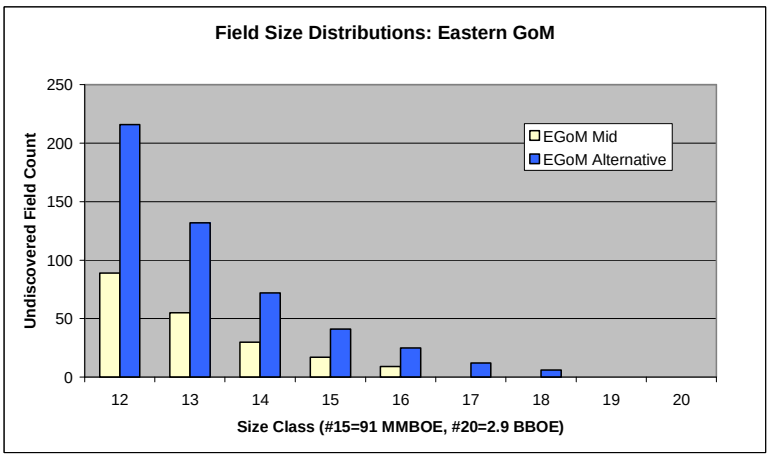


Table 13 Field Size Distributions for OCS Moratoria

Size Class	MMBOE Per Field	Eastern GoM Middle	Eastern GoM Alternative	Atlantic Offshore Middle	Atlantic Offshore Alternative	Pacific Offshore Middle	Pacific Offshore Alternative
12	11.41	89.0	216.0	77.0	181.0	123.0	250.0
13	22.82	55.0	132.0	59.0	136.0	66.0	134.0
14	45.64	30.0	72.0	36.0	83.0	35.0	71.0
15	91.28	17.0	41.0	18.0	41.0	20.0	41.0
16	182.55	9.0	25.0	12.0	28.0	8.0	20.0
17	365.11	0.0	12.0	3.0	13.0	6.0	12.0
18	730.21	0.0	6.0	1.0	6.0	1.0	4.0
19	1,460.43	0.0	0.0	0.0	3.0	0.0	2.0
20	2,920.86	0.0	0.0	0.0	0.0	0.0	0.0
	Field Count	758.0	1,800.0	680.0	1,616.0	3,081.0	6,260.0
	MMBOE	7,907	28,412	10,571	33,805	14,197	33,814

2.3 Setup of Cases for the OCS

Table 14 presents the setup in the ICF Land Access Production Impact Model for the OCS areas.

- Each of the columns represents one of the areas under study.
- Across the top is the input row indicating whether the discovery sequence is randomized.
- Assumptions include when leasing starts, start of exploration, start of production, and the number of months between new field startups.
- Leasing is assumed to begin in 2010. Exploration begins 12 months later. The startup of the first field's production depends on the area and ranges from 3 to 5 years after exploration begins. The Eastern Gulf of Mexico is expected to have the shortest lead time.
- Gas production is generally allowed to start around 2014-2016.
- Other assumptions include exploration success rate, field production profiles, tax rates, royalty rates, and income tax rates. The overhead rate is also specified, as is the real, after tax discount rate for economic analysis.
- The lower portion of the table specifies the resource base volumes for the middle and alternative resources.

Table 14 OCS Setup in the Land Access Production Impact Model

Randomize Discovery Sequence of Fields	**TRUE**	**TRUE**	**TRUE**
Name of Case	**Version 9**		

	Eastern GoM	Atlantic Offshore	Pacific Offshore
Start of leasing year	**2010**	**2010**	**2010**
Start of exploration (months after leasing)	**12**	**12**	**12**
Start of first field's production (months after exploration begins)	**36**	**60**	**60**
Field development spacing (months between new field start ups)	**24**	**24**	**24**
First Year Gas Production is Allowed	**2014**	**2016**	**2016**
Exploration Success Rate (developed fields / NFW well)	**10%**	**10%**	**10%**
Development Well Success Rate	**95%**	**95%**	**95%**
Years to Reach Production Plateau (1 billion BOE field)	**4**	**4**	**4**
Years at Plateau (1 billion BOE field)	**6**	**6**	**6**
Decline Rate (1 billion BOE field)	**10%**	**10%**	**10%**
Severance Tax	**0.0%**	**0.0%**	**0.0%**
Royalty	**16.7%**	**16.7%**	**16.7%**
Property Taxes (annual %)	**0.0%**	**0.0%**	**0.0%**
Overhead Rate on Capital Expenditures	**16.0%**	**16.0%**	**16.0%**
Overhead Rate on O&M Expenditures	**16.0%**	**16.0%**	**16.0%**
Real, After-Tax Discount Rate	**12.0%**	**12.0%**	**12.0%**
Marginal Income Tax Rate	**37.0%**	**37.0%**	**37.0%**
Resource Base Inputs			
Middle Oil (billion barrels)	**4.00**	**4.00**	**11.00**
Alternative Oil (billion barrels)	**19.00**	**18.00**	**26.00**
Middle Gas (Tcf)	**22.00**	**37.00**	**18.00**
Alternative Gas (Tcf)	**53.00**	**89.00**	**44.00**
Middle Billion BOE (oil + gas)	7.91	10.57	14.20
Alternative Billion BOE (oil + gas)	28.41	33.81	33.81

2.4 Production Results for OCS Moratoria Areas

- **Figures 4 and 5** present the production results for OCS moratoria areas, for both middle and alternative resource cases.

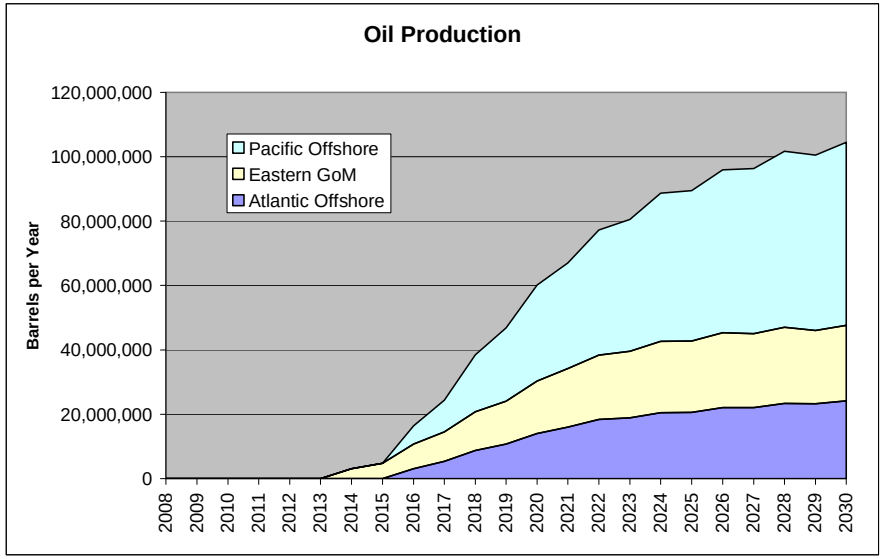
- In the middle resource case, new OCS oil production from the moratoria areas reaches 104 million barrels per year or about 286,000 bopd. For gas, production reaches 449 bcf per year or 1.23 bcf per day.

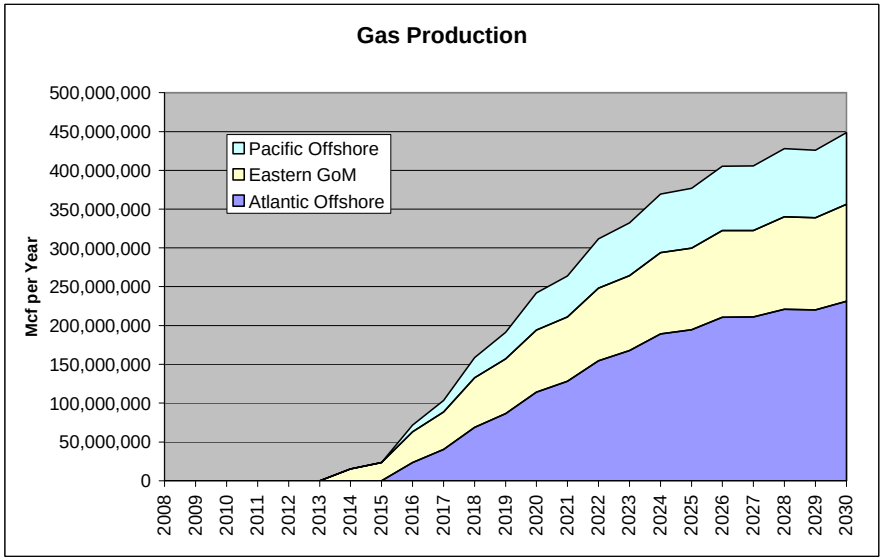
- In the alternative case, new OCS oil production is 328 million barrels or 900,000 bopd and new gas production is 1,073 bcf or 2.94 bcf per day.

- The table at the bottom of each figure lists the oil and gas resources assumed, the total quantity of oil and gas produced through 2030, the peak production rate, and the peak annual production expressed as a percentage of the resource base.

- The peak production rate is not necessary the same as the 2030 rate.

Figure 4 OCS Production Results – Middle Resource

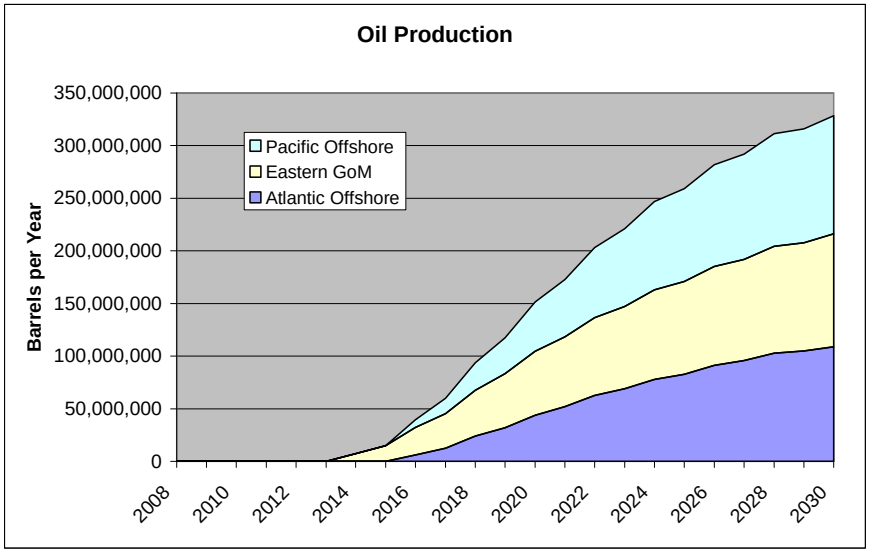


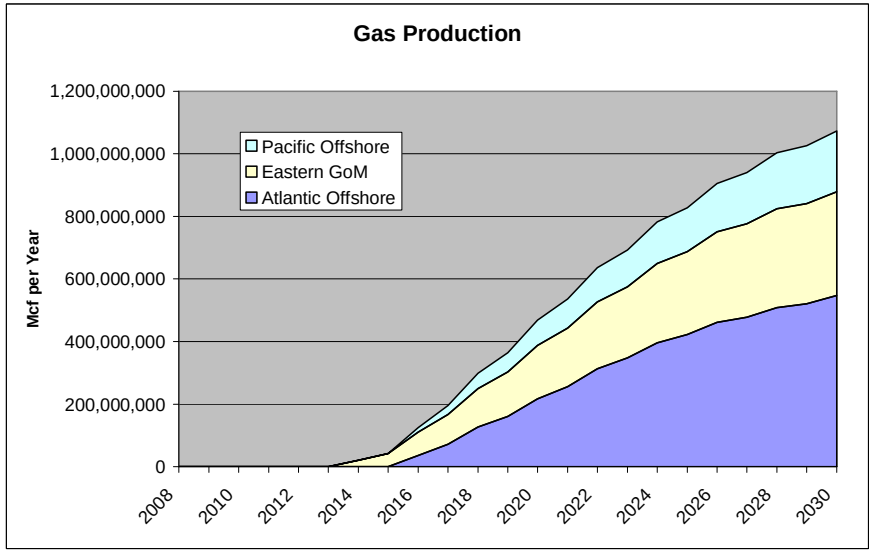


	Billion Barrels Prod. thru 2030	Resource Base (Billion Barrels)	Percent of RB Produced by 2030	Peak Production in BOPD	Peak Annual Production as % of RB
Atlantic Offshore	0.3	4.0	6%	66,266	0.6%
Eastern GoM	0.3	4.0	7%	64,568	0.6%
Pacific Offshore	0.6	11.0	5%	155,645	0.5%
ALL	1.1	19.0	6%	286,190	0.5%

	TCF Production thru 2030	Resource Base (Tcf)	Percent of RB Produced by 2030	Peak Production in Bcfd	Peak Annual Production as % of RB
Atlantic Offshore	2.3	37.0	6%	0.63	0.6%
Eastern GoM	1.4	22.0	6%	0.34	0.6%
Pacific Offshore	0.9	18.0	5%	0.25	0.5%
ALL	4.6	77.0	6%	1.23	0.6%

Figure 5 OCS Production Results – Alternative Resource Base





	Billion Barrels Prod. thru 2030	Resource Base (Billion Barrels)	Percent of RB Produced by 2030	Peak Production in BOPD	Peak Annual Production as % of RB
Atlantic Offshore	1.0	18.0	5%	298,535	0.6%
Eastern GoM	1.1	19.0	6%	293,843	0.6%
Pacific Offshore	1.0	26.0	4%	307,541	0.4%
ALL	3.1	63.0	5%	899,919	0.5%

	TCF Production thru 2030	Resource Base (Tcf)	Percent of RB Produced by 2030	Peak Production in Bcfd	Peak Annual Production as % of RB
Atlantic Offshore	4.9	89.0	5%	1.50	0.6%
Eastern GoM	3.4	53.0	6%	0.91	0.6%
Pacific Offshore	1.7	44.0	4%	0.53	0.4%
ALL	9.9	186.0	5%	2.94	0.0%

2.5 Private Sector Economic Impact Results for OCS

- **Table 15** presents the details of the IMPLAN economic results for each OCS area in 2030. These values are for private sector expenditures.

- Additional IMPLAN economic results are contained in Appendix D.

Table 15 Private Sector Economic Impact Results OCS Middle Resource -2030

Atlantic

	Direct	Indirect	Induced	Total
Output (Million 2006$)	1,259	789	970	3,017
Employment (Number of Jobs)	3,825	3,857	7,096	14,779
Total Value Added (Million 2006$)	717	400	529	1,646
Labor Income (Million 2006$)	330	241	299	870
Employee Compensation (Million 2006$)	235	197	260	693
Proprietors Income (Million 2006$)	95	43	39	177
Other Property Type Income (Million 2006$)	340	130	181	651
Indirect Business Taxes (Million 2006$)	47	29	49	125

Pacific

	Direct	Indirect	Induced	Total
Output (Million 2006$)	1,259	788	969	3,015
Employment (Number of Jobs)	3,810	3,863	7,089	14,762
Total Value Added (Million 2006$)	717	400	529	1,646
Labor Income (Million 2006$)	329	241	299	869
Employee Compensation (Million 2006$)	234	198	260	691
Proprietors Income (Million 2006$)	95	44	39	178
Other Property Type Income (Million 2006$)	341	130	181	652
Indirect Business Taxes (Million 2006$)	48	29	49	125

Eastern Gulf

	Direct	Indirect	Induced	Total
Output (Million 2006$)	831	510	632	1,972
Employment (Number of Jobs)	2,454	2,464	4,620	9,539
Total Value Added (Million 2006$)	478	258	345	1,081
Labor Income (Million 2006$)	217	155	195	566
Employee Compensation (Million 2006$)	152	126	169	448
Proprietors Income (Million 2006$)	65	28	25	118
Other Property Type Income (Million 2006$)	230	85	118	433
Indirect Business Taxes (Million 2006$)	32	19	32	82

Total OCS

	Direct	Indirect	Induced	Total
Output (Million 2006$)	3,348	2,086	2,570	8,005
Employment (Number of Jobs)	10,090	10,184	18,806	39,079
Total Value Added (Million 2006$)	1,912	1,059	1,403	4,374
Labor Income (Million 2006$)	875	637	793	2,304
Employee Compensation (Million 2006$)	621	521	689	1,832
Proprietors Income (Million 2006$)	254	115	103	473
Other Property Type Income (Million 2006$)	910	346	481	1,737
Indirect Business Taxes (Million 2006$)	127	76	129	333

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3 ANWR IMPACT ANALYSIS

3.1 Oil and Gas Resources in ANWR and Resource Base Assumptions

- The USGS in 1998 assessed the Coastal Plain of ANWR at approximately 10.4 billion barrels of oil, with a range of 5.7 to 16.0 billion barrels (95% and 5%). (**Table 16**).

- Non-associated gas resources had a mean assessment of 3.8 Tcf with a range of 0 to 10.9 Tcf.

- The mean associated gas assessment was 4.8 Tcf. From the oil resource, ICF estimated the associated gas range at 2.6 to 7.3 Tcf. Thus the "total gas" range is 2.6 to 18.2 Tcf.

- The assessment includes both federal and non-federal lands in the 1002 area.

- The field size distribution chart is shown as **Figure 6**.

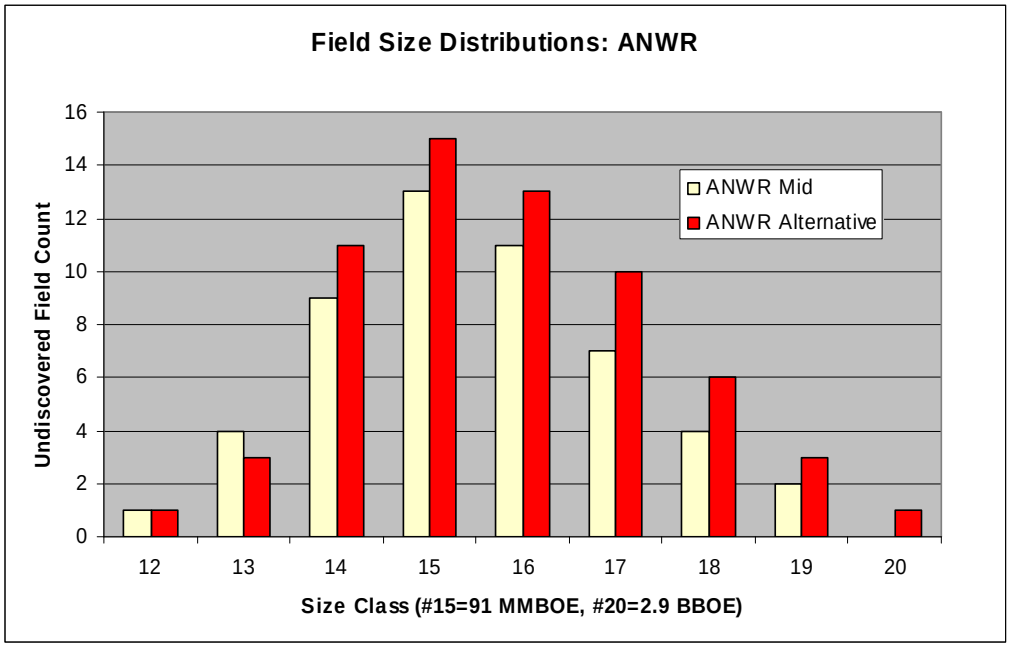
- **Table 17** presents the ANWR resource scenarios used in the current study. For ANWR, the "alternative" resource is set to be equivalent to the USGS high (5%) resource. Model runs were prepared for the middle and alternative cases only. The rationale for not developing an additional higher alternative resource is that the geology and potential of ANWR has generally been well evaluated, especially relative to OCS moratoria areas. In addition, the 1002 area under consideration is very small compared to OCS moratoria areas.

Table 16 USGS ANWR Assessment

Category	Units	Mean	Alternative
Oil Assessment	mmb	10,360	15,960
Nonassoc.	bcf	3,840	10,850
Assoc.	bcf	4,764	*7339*
Nag NGL	mmb	128	*362*
Assoc NGL	mmb	190	*293*
TOTAL MMBOE		**12,118**	**19,664**
Total liquids	mmb	10,678	16,614
Total gas	bcf	8,604	18,189
NAG ngl ratio		33	33
ASSOC ngl ratio		40	40
BOE Breakout			
Oil MMBOE		10,360	15,960
NAG MMBOE		680	1,920
ASSOC MMBOE		843	1,299
NAG NGL MMBOE		95	268
ASSOC NGL MMBOE		141	217
Total MMBOE		12,118	19,664

Note: The ANWR "alternative" resource is equivalent to the USGS high resource.
No separate alternative resource was developed.

Figure 6 Field Size Distribution for ANWR



Note: For ANWR, the "alternative" resource is equivalent to the USGS high resource.

Table 17 ANWR Resource Base Scenarios

	Mid	Alternative
Oil (Total Liquids)- BB		
ANWR	**10.6**	**16.6**
Gas (Total Gas)- TCF		
ANWR	**8.6**	**18.2**

* Note that the USGS high ANWR estimate was used for the "alternative" resource scenarios.

3.2 Setup of Cases for ANWR

Table 18 presents the setup in the ICF Land Access Production Impact Model for ANWR.

- Across the top is the input row indicating whether the discovery sequence is randomized. ANWR is modeled with the largest field found first.
- Assumptions include when leasing starts, start of exploration, start of production, and the number of months between new field startups.
- Leasing is assumed to begin in 2010. Exploration begins 12 months later.
- Gas production starts in 2025.

Table 18 ANWR Case Setup in Land Access Production Model

Randomize Discovery Sequence of Fields	**FALSE**
Name of Case	**Version 9**

	ANWR
Start of leasing year	**2010**
Start of exploration (months after leasing)	**12**
Start of first field's production (months after exploration begins)	**60**
Field development spacing (months between new field start ups)	**24**
First Year Gas Production is Allowed	**2025**
Exploration Success Rate (developed fields / NFW well)	**10%**
Development Well Success Rate	**95%**
Years to Reach Production Plateau (1 billion BOE field)	**4**
Years at Plateau (1 billion BOE field)	**6**
Decline Rate (1 billion BOE field)	**10%**
Severance Tax	**4.0%**
Royalty	**12.5%**
Property Taxes (annual %)	**2.0%**
Overhead Rate on Capital Expenditures	**16.0%**
Overhead Rate on O&M Expenditures	**16.0%**
Real, After-Tax Discount Rate	**12.0%**
Marginal Income Tax Rate	**37.0%**
Resource Base Inputs	
Middle Oil (billion barrels)	**10.60**
Alternative Oil (billion barrels)	**16.60**
Middle Gas (Tcf)	**8.60**
Alternative Gas (Tcf)	**18.20**
Middle Billion BOE (oil + gas)	12.12
Alternative Billion BOE (oil + gas)	19.83

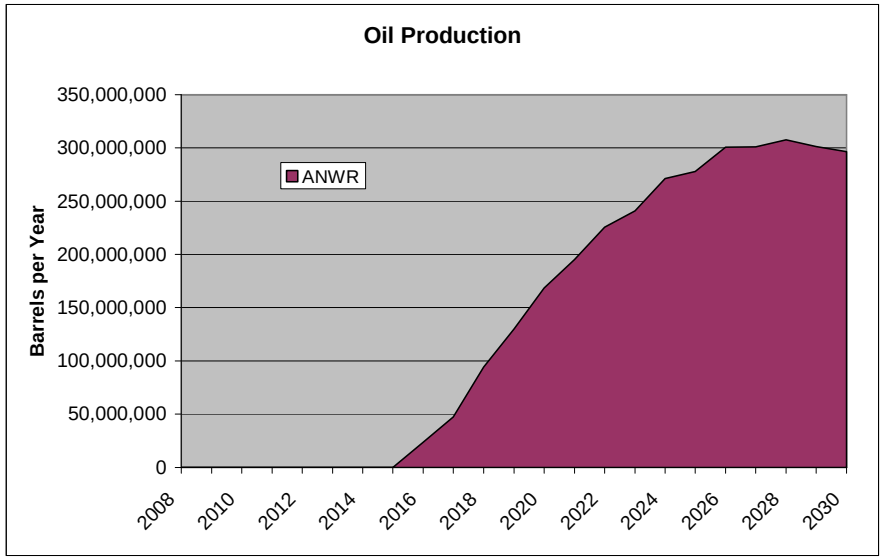
3.3 Production Results for ANWR

- **Figures 7 and 8** present the production forecast results for ANWR in the middle and high resource cases.

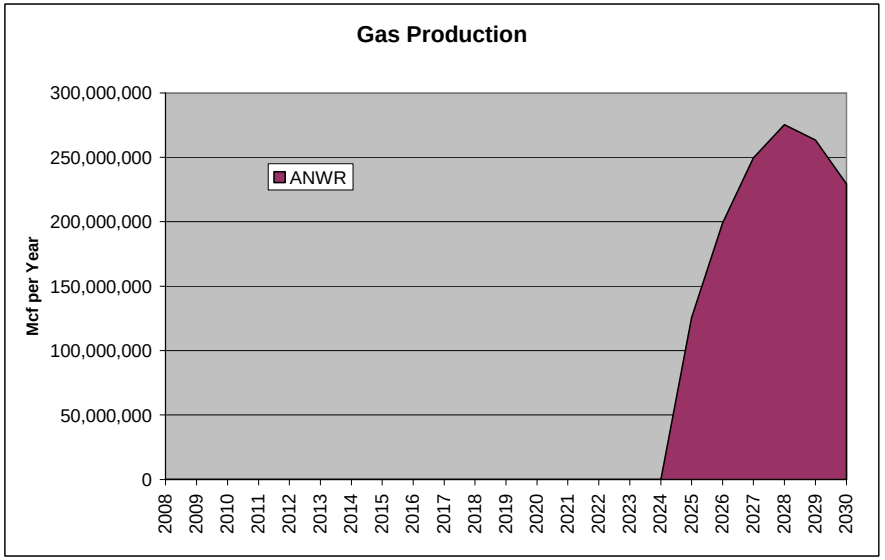
- In the middle case, oil production peaks at 843,000 bopd and is 812,000 bopd in 2030. In the high case, oil production peaks at 1,200,000 bopd and is 1,090,000 bopd in 2030.

- Gas production in the mid case in 2030 is 627 MMcfd and in the high case in 2030 is 1,726 MMcfd.

Figure 7 ANWR Production Results – Middle Resource

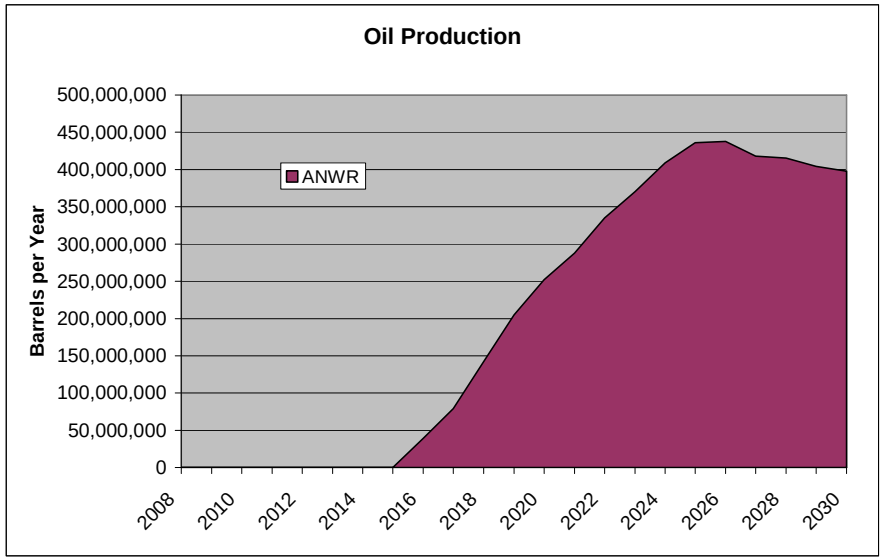


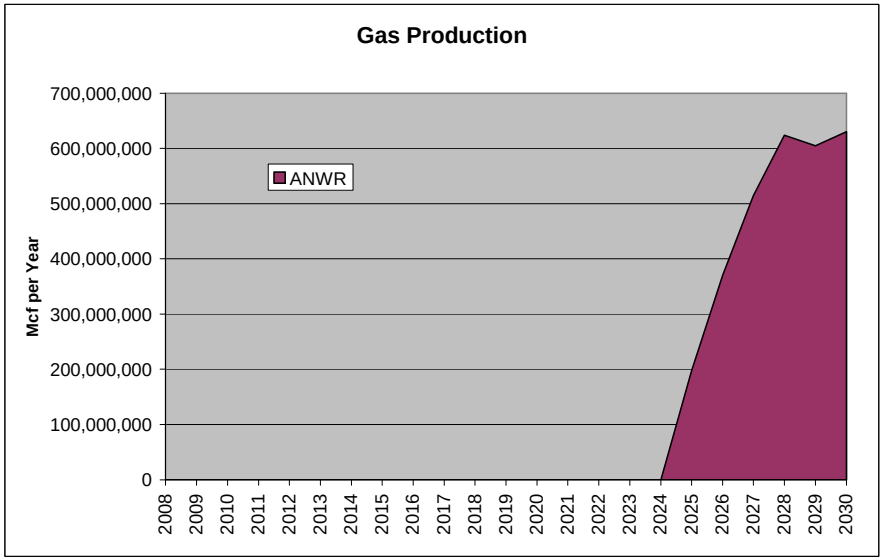
	Billion Barrels Prod. thru 2030	Resource Base (Billion Barrels)	Percent of RB Produced by 2030	Peak Production in BOPD	Peak Annual Production as % of RB
ANWR	3.2	10.6	30%	842,891	2.9%



	TCF Production thru 2030	Resource Base (Tcf)	Percent of RB Produced by 2030	Peak Production in Bcfd	Peak Annual Production as % of RB
ANWR	1.3	8.6	16%	0.75	3.2%

Figure 8 ANWR Production Results – Alternative Resource





	Billion Barrels Prod. thru 2030	Resource Base (Billion Barrels)	Percent of RB Produced by 2030	Peak Production in BOPD	Peak Annual Production as % of RB
ANWR	4.6	16.4	28%	1,199,535	2.7%

	TCF Production thru 2030	Resource Base (Tcf)	Percent of RB Produced by 2030	Peak Production in Bcfd	Peak Annual Production as % of RB
ANWR	2.9	18.2	16%	1.73	3.5%

3.4 Private Sector Economic Impact Results for ANWR

- **Table 19** presents the details of the IMPLAN economic results for ANWR in 2030. These values are for the private sector expenditures.

- Additional IMPLAN results are contained in Appendix D**.**

Table 19 Private Sector Economic Impact Results for ANWR - Middle Resource Case -2030

Middle Case, ANWR, 2030

	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ 5,031	$ 3,464	$ 3,885	$ 12,379
Employment (Number of Jobs)	17,188	16,810	28,423	62,420
Total Value Added (Million 2006$)	$ 2,763	$ 1,692	$ 2,120	$ 6,575
Labor Income (Million 2006$)	$ 1,272	$ 1,022	$ 1,198	$ 3,492
Employee Compensation (Million 2006$)	$ 993	$ 857	$ 1,042	$ 2,893
Proprietors Income (Million 2006$)	$ 279	$ 165	$ 156	$ 600
Other Property Type Income (Million 2006$)	$ 1,294	$ 558	$ 726	$ 2,578
Indirect Business Taxes (Million 2006$)	$ 197	$ 112	$ 196	$ 504

4 ROCKIES PRODUCTION IMPACT ANALYSIS

4.1 Oil and Gas Resources in the Rockies and Resource Base Assumptions

- In 2008, the Department of Interior published a new "EPCA" assessment of onshore access restrictions for the Lower-48 and Alaska. [12]

- The study was compiled by geologic basin and was based upon the USGS resource assessments and extensive access analysis. It included the assessed remaining volumes of oil and gas in each basin, categorized into 9 access categories as shown in **Table 20**. This table shows only the Rocky Mountain basins.

- The second from right column on the table shows the USGS assessed remaining resources for each basin. The USGS gas resource base totals 211Tcf and the oil resource base is 9.7 billion barrels.

- The EPCA "no access" resource was defined as the sum of the first four categories.

- **Table 21** shows the Rockies resource base setup for the current study. The table contains three groupings: the USGS "EPCA" assessment, the EIA Annual Energy Outlook resource base, and the API Policy case assumed for the current study. The USGS case is the actual published resource as shown previously, including the no-access part. The EIA AEO resource base was that published in the 2007 AEO documents, and does not include the no access portion. [13]

[12] U.S. Departments of Interior, Agriculture, and Energy, 2008, "Inventory of Onshore Federal Oil and Natural Gas Resources and Restrictions to Their Development - 2008," Report BLM/WO/GI/-03/002+3100REV08, www.blm.gov

[13] U.S. Energy Information Administration, 2007, "Assumptions of the Annual Energy Outlook 2007," report DOE/EIA 0664 (2007), March 2007. http://tonto.eia.doe.gov/ftproot/forecasting/0554(2007).pdf

- **Table 21** therefore shows an adjusted AEO resource base with the "no access" part from the USGS added back in.

- The "API Policy" resource base used here and shown in the table is derived from the AEO resource base and is determined in the following way: It re-categorizes **one-half of the category 2-4** no-access resource (from USGS/EPCA) into the category of "high cost" resources, and thus makes it available for development. This methodology is the one used in the 2003 NPC Study. [14] For example, looking at **Table 20**, the amount of gas included in category 1 of no access is 8,787 Bcf. The amount of gas in no access categories 2-4 sums to a total of 16,810 Bcf. One-half of the 16,810 Bcf is 8,405 Bcf, which is the amount of gas that is estimated to become accessible for development (shown in the right hand column of **Table 21**).

- A total of 8.4 Tcf of gas and 321 million barrels of oil is estimated to become available to industry for development in this scenario.

[14] National Petroleum Council, 2003, "Balancing Natural Gas Policy – Fueling the Demands of a Growing Economy," NPC, Washington, DC http://www.npc.org

Table 20 USGS Rocky Mountain Oil and Gas Resource and Access Categories

Access to Federal Lands in Rocky Mountain Basins

	Categories	1	2	3	4	5	6	7	8	9	10	11	12	13
Basin	Hydrocarbon Type	No Leasing (Statutory / Executive Order) (NLS)	No Leasing (Administrative) (NLA)	No Leasing (Administrative) Pending Land Use Planning or NEPA Compliance (NLA / LUP)	Leasing, No Surface Occupancy (NSO)	Leasing, Cumulative Timing Limitations (TLs) of >9 Months	Leasing, Cumulative Timing Limitations (TLs) of more than 6 and 9 or fewer months	Leasing, Cumulative Timing Limitations (TLs) of more than 3 and 6 or fewer months	Leasing, Controlled Surface Use (CSU), including Cumulative Timing Limitations of 3 or fewer months	Leasing, Standard Lease Terms (SLTs)	Sum Federal	Sum Non-Federal	Total	Federal Percent
Denver Basin	Gas (BCF)	0	14	1	16	1	5	8	32	10	87	2,635	2,722	3.2%
Montana Thrust Belt	Gas (BCF)	3,687	48	2,042	466	0	11	28	4	22	6,308	2,330	8,638	73.0%
Paradox Basin	Gas (BCF)	198	21	153	26	0	20	173	185	273	1,049	515	1,564	67.1%
Powder River Basin	Gas (BCF)	59	18	588	209	51	2,344	2,933	1,707	1,228	9,137	10,157	19,294	47.4%
San Juan Basin	Gas (BCF)	425	488	1,630	656	0	202	5,844	9,221	6,634	25,100	27,501	52,601	47.7%
Southwestern Wyoming	Gas (BCF)	3,637	2,744	1,046	4,883	230	9,862	21,481	16,142	8,007	68,032	27,101	95,133	71.5%
Uinta-Piceance Basin	Gas (BCF)	759	482	543	459	111	775	3,156	4,738	3,088	14,111	10,903	25,014	56.4%
Williston Basin	Gas (BCF)	6	7	48	151	0	15	68	158	165	618	3,394	4,012	15.4%
Wyoming Thrust Belt	Gas (BCF)	16	18	31	22	10	155	177	138	65	632	1,057	1,689	37.4%
All Rockies	Gas (BCF)	8,787	3,840	6,082	6,888	403	13,389	33,868	32,325	19,492	125,074	85,593	210,667	59.4%
Denver Basin	Oil (MMbbls)	0	1	1	1	0	1	3	7	2	16	307	323	5.0%
Montana Thrust Belt	Oil (MMbbls)	94	2	58	12	0	1	3	0	1	171	178	349	49.0%
Paradox Basin	Oil (MMbbls)	82	7	45	9	0	4	39	52	73	311	138	449	69.3%
Powder River Basin	Oil (MMbbls)	4	0	14	33	8	283	421	310	216	1,289	1,091	2,380	54.2%
San Juan Basin	Oil (MMbbls)	6	4	9	4	0	1	31	59	37	151	214	365	41.4%
Southwestern Wyoming	Oil (MMbbls)	110	95	35	153	6	330	635	502	216	2,082	844	2,926	71.2%
Uinta-Piceance Basin	Oil (MMbbls)	26	7	7	12	4	19	69	126	96	366	221	587	62.4%
Williston Basin	Oil (MMbbls)	3	4	26	90	0	8	41	91	102	365	1,858	2,223	16.4%
Wyoming Thrust Belt	Oil (MMbbls)	3	3	5	4	1	6	8	8	7	45	44	89	50.6%
All Rockies	Oil (MMbbls)	328	123	200	318	19	653	1,250	1,155	750	4,796	4,895	9,691	49.5%

Table 21 Rockies Resource Setup

		USGS Mean				AEO Base Case				API Policy Case				
	Categories													
Basin	Hydrocarbon Type	Base No Access	Base High Cost	Base SLT or Non-Fed	Base Total	Scaled No Access	Scaled High Cost	Scaled SLT or Non-Fed	Scaled Total	Scaled No Access	Scaled High Cost	Scaled SLT or Non-Fed	Scaled Total	Delta No Access
Denver Basin	Gas (BCF)	31	46	2,645	2,722	31	59	3,401	3,491	16	75	3,401	3,491	16
Montana Thrust Belt	Gas (BCF)	6,243	43	2,352	8,638	6,243	155	8,483	14,881	4,965	1,433	8,483	14,881	1,278
Paradox Basin	Gas (BCF)	398	378	788	1,564	398	644	1,344	2,386	298	744	1,344	2,386	100
Powder River Basin	Gas (BCF)	874	7,035	11,385	19,294	874	9,367	15,158	25,399	467	9,774	15,158	25,399	408
San Juan Basin	Gas (BCF)	3,199	15,267	34,135	52,601	3,199	20,663	46,199	70,061	1,812	22,050	46,199	70,061	1,387
Southwestern Wyoming	Gas (BCF)	12,310	47,715	35,108	95,133	12,310	69,666	51,259	133,235	7,974	74,002	51,259	133,235	4,337
Uinta-Piceance Basin	Gas (BCF)	2,243	8,780	13,991	25,014	2,243	12,260	19,536	34,039	1,501	13,002	19,536	34,039	742
Williston Basin	Gas (BCF)	212	241	3,559	4,012	212	323	4,776	5,312	109	426	4,776	5,312	103
Wyoming Thrust Belt	Gas (BCF)	87	480	1,122	1,689	87	643	1,504	2,234	52	679	1,504	2,234	36
All Rockies	Gas (BCF)	25,597	79,985	105,085	210,667	25,597	113,780	151,660	291,037	17,192	122,185	151,660	291,037	8,405
		12.2%	*38.0%*	*49.9%*	*100.0%*	*8.8%*	*39.1%*	*52.1%*	*100.0%*	*5.9%*	*42.0%*	*52.1%*	*100.0%*	
Denver Basin	Oil (MMbbls)	3	11	309	323	3	22	628	654	2	24	628	654	2
Montana Thrust Belt	Oil (MMbbls)	166	4	179	349	166	15	688	869	130	51	688	869	36
Paradox Basin	Oil (MMbbls)	143	95	211	449	143	281	624	1,047	113	311	624	1,047	31
Powder River Basin	Oil (MMbbls)	51	1,022	1,307	2,380	51	2,104	2,690	4,845	28	2,127	2,690	4,845	24
San Juan Basin	Oil (MMbbls)	23	91	251	365	23	196	540	758	15	204	540	758	9
Southwestern Wyoming	Oil (MMbbls)	393	1,473	1,060	2,926	393	3,427	2,466	6,287	252	3,569	2,466	6,287	142
Uinta-Piceance Basin	Oil (MMbbls)	52	218	317	587	52	482	701	1,234	39	495	701	1,234	13
Williston Basin	Oil (MMbbls)	123	140	1,960	2,223	123	299	4,179	4,601	63	359	4,179	4,601	60
Wyoming Thrust Belt	Oil (MMbbls)	15	23	51	89	15	56	124	194	9	62	124	194	6
All Rockies	Oil (MMbbls)	969	3,077	5,645	9,691	969	6,881	12,639	20,489	649	7,202	12,639	20,489	321
		10.0%	*31.8%*	*58.2%*	*100.0%*	*4.7%*	*33.6%*	*61.7%*	*100.0%*	*3.2%*	*35.1%*	*61.7%*	*100.0%*	

AEO has an accessible resource base of 265 Tcf of gas and 19.52 BB of oil in Rockies.

4.2 Production Results for Rockies

- **Figures 9 and 10** show the Rockies production results. There is no alternative case for the Rockies.

- In 2030, oil production resulting from new access is 35,000 bopd and gas production is 677 MMcfd.

Figure 9 Rockies Gas Production Impact

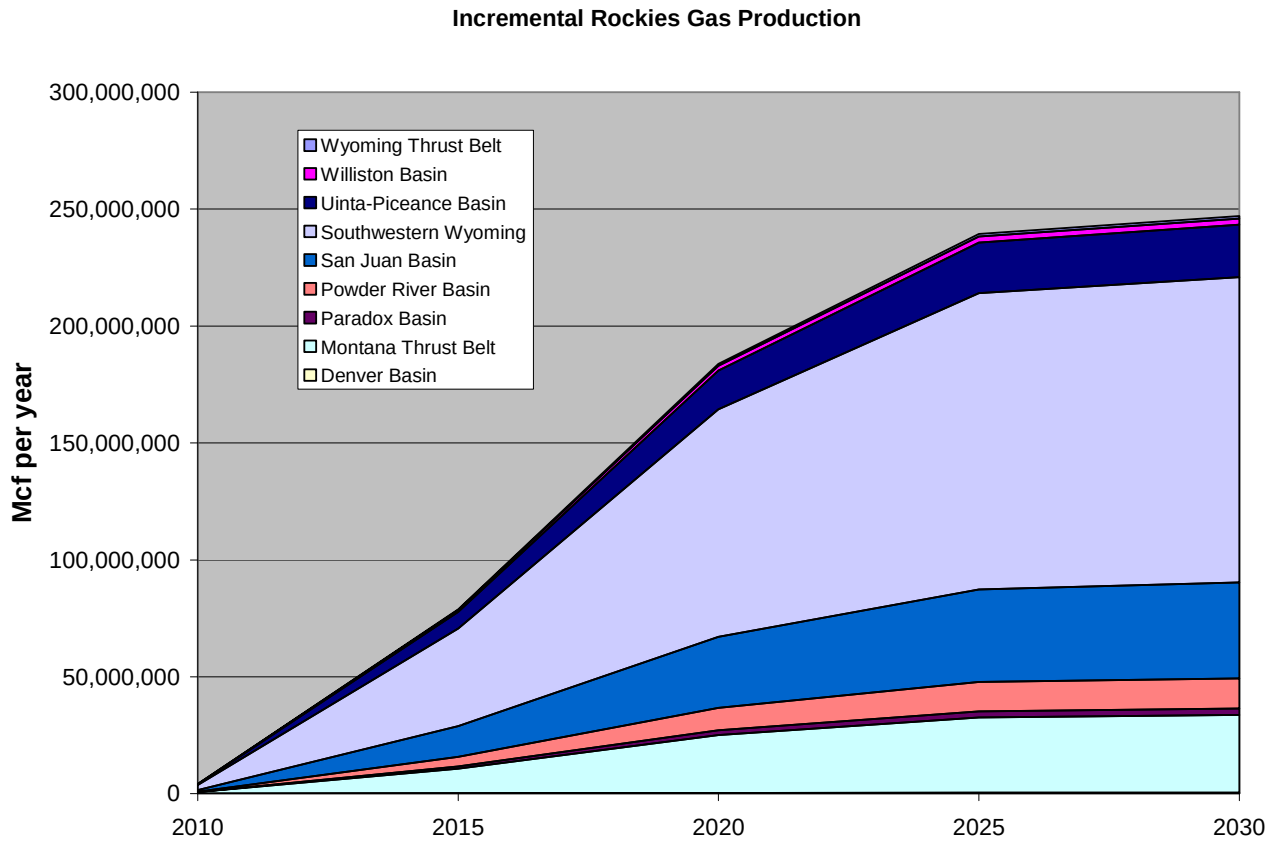
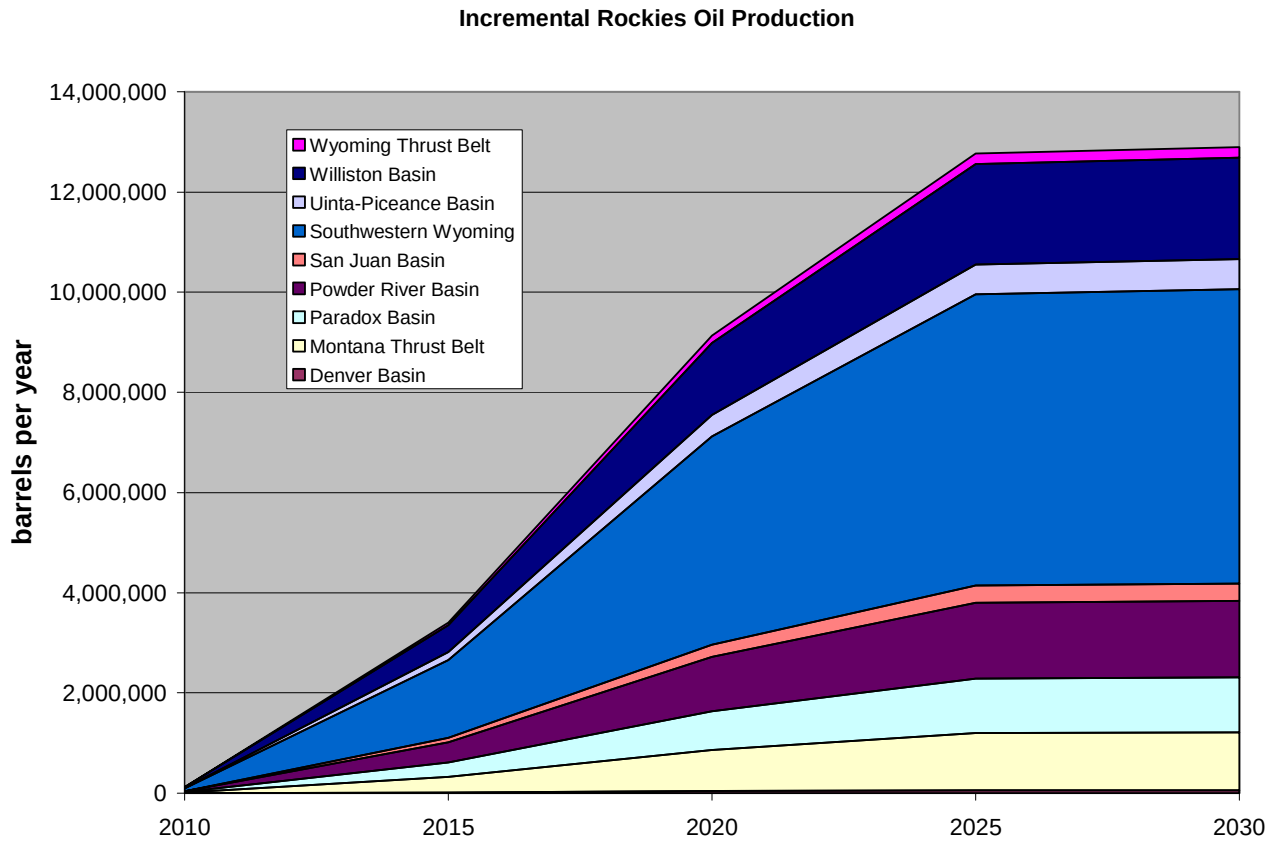


Figure 10 Rockies Oil Production Impact



4.3 Private Sector Economic Impact Results for Rockies

- **Table 22** presents the details of the IMPLAN economic results for the Rockies in 2030. These values are for private sector expenditures.

Table 22 Private Sector Economic Impact Results for Rockies - 2030

	Direct	Indirect	Induced	Total
Output (Million 2006$)	1,020	798	760	2,579
Employment (Number of Jobs)	2,906	3,848	5,564	12,318
Total Value Added (Million 2006$)	512	379	415	1,306
Labor Income (Million 2006$)	215	235	235	685
Employee Compensation (Million 2006$)	179	198	204	581
Proprietors Income (Million 2006$)	36	37	31	104
Other Property Type Income (Million 2006$)	259	119	142	520
Indirect Business Taxes (Million 2006$)	37	25	38	101

5 COMPARISON WITH PUBLISHED STUDIES OF FUTURE GOVERNMENT REVENUES FROM OCS, ANWR, AND ROCKIES

5.1 Introduction

This chapter quantifies the government revenues generated by development of the accessible and inaccessible resources of the OCS, ANWR, and Rockies. The first portion of the analysis summarizes several published forecasts of government revenues from the OCS moratoria and ANWR, and compares these to the current analysis. This is followed by a section evaluating the potential total government revenues from the entire OCS and the federal portion of the Rockies.

Table 23 summarizes the ICF wellhead value and government revenues from the developed "off limits/moratoria" resource, as detailed in Appendix C. The table shows the revenues through 2030, post-2030, and all-time. The upper portion of the table shows revenues from the middle resource base, and the lower portion of the table shows revenues from the alternative resource base. Government revenues from the five off limits areas through 2030 range from $94 billion to $194 billion. All-time government revenues from the off-limits resource range from $547 billion to $1,695 billion.

Table 24 summarizes the MMS OCS assessment of oil and gas for both accessible and moratoria areas. The total OCS undiscovered oil is 86 billion barrels and the total undiscovered gas is 420 Tcf. The moratoria undiscovered oil is 18 billion barrels and the moratoria undiscovered gas is 77 Tcf.

Table 23 Wellhead and Government Revenue for Moratoria and Off-Limits Areas

Developed resource as modeled by ICF; from Appendix C of ICF Report

Billion $

		Wellhead value through 2030	Govt. revenues through 2030	Govt. %	Wellhead value post- 2030	Govt. revenues post- 2030	Govt. %	Wellhead value All Time	Govt. revenues All Time	Govt. %
1. Mean Resource Base										
OCS Moratoria										
	Atlantic	30.8	8.1	26.3%	324.4	106.5	32.8%	355.2	114.6	32.3%
	Pacific	37.8	11.7	31.0%	411.4	150.0	36.5%	449.2	161.7	36.0%
	E GoM	27.1	8.1	29.9%	217.9	76.8	35.2%	245.0	84.9	34.7%
	total	95.7	27.9	29.2%	953.7	333.3	34.9%	1,049.4	361.2	34.4%
ANWR		169.6	60.6	35.7%	421.3	103.4	24.5%	590.9	164.0	27.8%
Rockies		24.2	5.5	22.7%	47.9	16.3	34.0%	72.1	21.8	30.2%
Total		289.5	94.0	32.5%	1,422.9	453.0	31.8%	1,712.4	547.0	31.9%
2. Alternative Resource Base										
OCS Moratoria										
	Atlantic	94.0	32.7	34.8%	1,289.5	466.2	36.2%	1,383.5	498.9	36.1%
	Pacific	69.7	24.4	35.0%	1,120.7	422.7	37.7%	1,190.4	447.1	37.6%
	E GoM	93.6	35.2	37.6%	1,051.3	405.1	38.5%	1,144.9	440.3	38.5%
	total	257.3	92.3	35.9%	3,461.5	1,294.0	37.4%	3,718.8	1,386.3	37.3%
ANWR		248.5	96.4	38.8%	689.5	190.9	27.7%	938.0	287.3	30.6%
Rockies	(same as mid.)	24.2	5.5	22.7%	47.9	16.3	34.0%	72.1	21.8	30.2%
Total		530.0	194.2	36.6%	4,198.9	1,501.2	35.8%	4,728.9	1,695.4	35.9%

Table 24 2006 MMS Mean Assessment of Lower-48 and Alaska OCS – Access and No-Access Resources

	Total Undisc. Oil BB	No Acess Undisc. Oil BB	Access Undisc. Oil BB	Total Undisc. Gas Tcf	No Acess Undisc. Gas Tcf	Access Undisc. Gas Tcf	Total Undisc. Resource B-BOE	No Acess Undisc. Resource B-BOE	Access Undisc. Resource B-BOE
Atlantic	3.82	3.82	0	36.99	36.99	0	10.39	10.39	0.00
Pacific	10.53	10.37	0.16	18.29	18.12	0.17	13.78	13.59	0.19
GoM	44.92	3.98	40.94	232.54	22.16	210.38	86.22	7.92	78.30
Alaska	26.61	0	26.61	132.06	0	132.06	50.06	0.00	50.06
Total	85.88	18.17	67.71	419.88	77.27	342.61	160.45	31.89	128.55
Pacific by Sub Area									
WA-OR		0.4			2.28				
N CAL		2.08			3.58				
C CA		2.31			2.51				
S CA		5.58			9.75				
Total		10.37			18.12				

5.2 Analysis of Revenues from Opening Moratoria and Off-Limits Resources

OCS Moratoria

Table 25 shows our analysis of the September, 2008 CRS study of the OCS moratoria, and compares it to our study.[15] ICF has taken the basic assumptions in the study and tried to reproduce their conclusions using a relatively simple revenue, cost, and tax calculation methodology. The OCS moratoria federal government revenue as published in the CRS study was $542 billion. If one includes an ICF estimate of $282 billion in state government revenues, and a corrected estimate for federal revenues of $492 billion, the adjusted CRS total is $774 billion, which is compared to our value of $360 billion. Most of the difference arises from the fact that the ICF analysis is not for the entire moratoria resource, but just the economic and developed portion (58%). The comparison is as follows:

- Resource Base Included: Both CRS and ICF cover the Lower-48 OCS moratoria. CRS includes crude oil and NGLs in oil fields. ICF includes all NGLs.
- Resource Developed: CRS assumes all of the resource base is developed while ICF includes only the economic resource that is developed and produced.
- Oil prices. The CRS analysis assumed $113 for oil and $10.64 for gas. Their prices and costs are in nominal dollars. ICF assumed the (2006) AEO average values of $66.76 for oil and $6.99 for gas.
- Cost: CRS assumes costs were 69% of total revenues. ICF costs are based on factor costs such as drilling and platforms.
- Lease bonuses: CRS ignored lease bonus revenues. ICF assumed lease bonuses would be $6.6 billion.
- Royalties: CRS used 18.75% and ICF used 16.7%.

[15] Humphries, Marc, 2008, "Possible Federal Revenue Estimates for Oil and Gas Production in Areas Currently Off-Limits (Under Leasing Moratoria or Inaccessible), Congressional Research Service, Sept. 12, 2008.

Table 25 Comparison of Future OCS Moratoria Revenues and Taxes – Current Report vs. September, 2008 CRS Study

		CRS September 12, 2008 (ICF Reproduction)			ICF November 2008 (Simplified Reproduction)		
	Units	Oil & NGLs	Gas	Total	Oil & NGLs	Gas	Total
Undisc. Resources	B-Bbls and TCF	17.6	74.4		19.0	77.0	
	B-BOE	17.6	13.2	30.8	19.0	13.7	32.7
Oil and gas prices	$/bbl and $/MMBtu	$113.00	$10.64		$66.76	$6.99	
Percent of resource developed		100%	100%	100%	57%	61%	58%
Developed resource	B-Bbls and TCF	17.6	74.4		10.77	46.59	
	B-BOE	17.6	13.2	30.84	10.77	8.27	19.05
Revenues from developed resources	billion $	$1,992.2	$791.3	$2,783.5	$719.2	$325.9	$1,045.0
Capital and O&M Cost/unit	$/BOE	$50.64	$50.64	$50.64	$19.99	$19.99	$19.99
Capital and O&M Cost	billion $	$892.8	$668.8	$1,561.6	$215.3	$165.4	$380.7
Bonus paid	**billion $**	**$0.0**	**$0.0**	**$0.0**	**$3.7**	**$2.9**	**$6.6**
Severance tax rate	percent	0.00%	0.00%		0.00%	0.00%	
Severance tax paid	**billion $**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**
Property Taxes	**billion $**	**$0.0**		**$0.0**	**$0.0**	**$0.0**	**$0.0**
Royalty rate	percent	18.75%	18.75%		16.67%	16.67%	
Royalties paid	**billion $**	**$373.5**	**$148.4**	**$521.9**	**$119.9**	**$54.3**	**$174.2**
Income tax rate	percent	36%	36%		37%	37%	
Income tax paid	**billion $**	**$261.31**	**-$9.32**	**$252.0**	**$140.70**	**$38.22**	**$178.9**
Total Government Revenue	**billion $**	**$634.85**	**$139.05**	**$773.9**	**$264.27**	**$95.38**	**$359.6**

Comparison of ICF Reproduction to Published Values ($billions)

	Published Values	Reproduced Values	Published Values	Reproduced Values
Oil/Gas Wellhead Value		$2,783	$1,045	$1,045
Capital and O&M Costs		$1,562	$381	$381
State gov revenue		$282		
Federal gov revenue	$542.2	$492		
All gov revenue		$774	$359	$360
Fed Inc Tax	$282.9	$231		
Federal Royalty	$259.2	$261		
Notes	*CRS assumed 50/50 royalty split between Federal and State governments*		*ICF report for API does not break out Federal versus State revenues.*	
	CRS assumed costs were 69% of revenues. Taxable income is 31% of revenues.			
	Difference in income tax calculations seems to stem from CRS incorrectly applying taxes to royalty volumes.			

- Income Tax Rates: CRS used an average effective Federal Tax rate of 33%. CRS did not use a State tax rate, but ICF assumed a 3% rate for the reproduction. Thus, the total rate was 36%. The ICF methodology is based on an average effective rate of 33% Federal (from DOE's FRS) plus an average state rate of 6%. After accounting for the deductibility of State taxes for Federal tax calculations this come to an effective rate of 37%.

ANWR

ICF has developed a comparison of our ANWR revenue study with the results of two published studies. These are the 2007 Kotchen and Burger study and a June, 2008 CRS study. [16] [17]

Table 26 shows the published studies of the government revenue impacts of ANWR on a comparable basis. As with the OCS, ICF has taken the basic assumptions published in the studies and tried to reproduce their conclusions using a relatively simple revenue, cost, and tax calculation methodology. The ICF reproduction is generally very close to the published results (shown at the bottom of the table) except for the Kotchen and Burger study. The difference may be due to the fact that Kotchen and Burger calculated taxes for each segment of an oil supply curve developed by USGS and then added up the segments whereas the ICF reproduction calculates taxes for the entire resource at once.

The Kotchen and Burger published government revenue total of $161 billion relates to all-time production of about 7 billion barrels at their assumed oil price of $53 per bbl. Wellhead revenues are $374 billion ($53 per bbl times 7 billion barrels).

The major differences among the three studies are as follows:

- Resource Base Included: K&B only includes crude oil. CRS includes crude oil and NGLs in oil fields. ICF includes all NGLs and all gas.

- Resource Developed: CRS assumes all of the resource base is developed while K&B and ICF include only the economic resource that is developed and produced.

- Oil prices. The K&B assumed price was about $53/bbl versus the ICF average price in Alaska (based on the AEO 2008) of $55.26/bbl. The CRS analysis included several oil price cases, from which the $60/bbl is shown here.

[16] Kotchen, M.J. and N.E. Burger, 2007, "Should we Drill in the Arctic National Wildlife Refuge? An Economic Perspective," Energy Policy 35 (2007), pp. 4720-4729.
[17] Lazzari, Salvatore, 2008, "Possible Federal Revenues from Oil Development of ANWR and Nearby Areas," Congressional Research Service, June 23, 2008.

Table 26 Comparison of Revenues and Taxes – ANWR 1002 Area

		Kotchen & Burger May 2007 (ICF Reproduction)			CRS June 23, 2008 (ICF Reproduction of $60/bbl case))			ICF November 2008 (Simplified Reproduction)		
	Units	Crude Oil	Gas	Total	Oil & NGLs	Gas	Total	Oil & NGLs	Gas	Total
Undisc. Resources	B-Bbls and TCF	7.69	0		10.3	0		10.6	8.6	
	B-BOE	7.69	0.00	7.69	10.3	0.00	10.30	10.6	1.53	12.13
Oil and gas prices	$/bbl and $/MMBtu	$53.00			$60.00			$55.26	$2.55	
Percent of resource developed		92%		92%	100%	100%	100%	95%	98%	96%
Developed resource	B-Bbls and TCF	7.06	0.00		10.30	0.00		10.10	8.40	
	B-BOE	7.06	0.00	7.06	10.30	0.00	10.30	10.10	1.49	11.59
Revenues from developed resources	billion $	$374.2	$0.0	$374.2	$618.0	$0.0	$618.0	$558.1	$21.4	$579.5
Capital and O&M Cost/unit	$/BOE	$17.41	$0.00	$17.41	$28.70	$0.00	$28.70	$31.99	$31.99	$31.99
Capital and O&M Cost	billion $	$122.9	$0.0	$122.9	$295.6	$0.0	$295.6	$323.1	$47.7	$370.8
Bonus paid	**billion $**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.6**	**$0.1**	**$0.7**
Severance tax rate	percent	9.90%	9.90%		9.90%	9.90%		9.92%	9.92%	
Severance tax paid	**billion $**	**$30.9**	**$0.0**	**$30.9**	**$53.5**	**$0.0**	**$53.5**	**$48.4**	**$1.9**	**$50.3**
Property Taxes, Conservation Tax	**billion $**	**$0.4**		**$0.4**	**$0.0**		**$0.0**	**$8.6**	**$0.3**	**$8.9**
Royalty rate	percent	16.67%	16.67%		12.50%	12.50%		12.50%	12.50%	
Royalties paid	**billion $**	**$62.4**	**$0.0**	**$62.4**	**$77.3**	**$0.0**	**$77.3**	**$69.8**	**$2.7**	**$72.4**
Income tax rate	percent	38%	38%		36%	36%		37%	37%	
Income tax paid	**billion $**	**$59.91**	**$0.00**	**$59.9**	**$68.97**	**$0.00**	**$69.0**	**$39.82**	**-$11.56**	**$28.3**
Total Government Revenue	**billion $**	**$153.51**	**$0.00**	**$153.5**	**$199.75**	**$0.00**	**$199.8**	**$167.22**	**-$6.60**	**$160.6**

Comparison of ICF Reproduction to Published Values ($billions)

	Published Values	Reproduced Values	Published Values	Reproduced Values	Published Values	Reproduced Values
Oil/Gas Wellhead Value	$374	$374		$618	$580	$580
Capital and O&M Costs	$123	$123		$296	$371	$371
Social benefits	$251	$251		$322		$209
Industry rents	$90	$98		$123		$48
State gov revenue	$37	$36		$108		
Federal gov revenue	$124	$118	$92	$92		
All gov revenue	$161	$154		$200	$161	$161
Fed Inc Tax			$63	$63		
Federal Royalty			$29	$29		

Notes			
	All royalties allocated by K&B to Federal government (this is not correct)	*AK Statehood Act allocates 90% of royalties to state, but CRS assumes 50/50 split.*	*ICF report for API does not break out Federal versus State revenues.*
	Difference between published and reproduced taxes may be due to fact that K&B calculated taxes for different segments of oil supply curves then added them up.	*74% of oil is on Federal land per USGS*	*ICF report for API is the only one among these 3 to include gas*
	K&B concept of "social benefit" excludes time value of money and is therefore not consistent with sound economic theory.	*Some state taxes are implicitly included by CRS in O&M costs.*	

- Cost: K&B used USGS cost curves which average $17.41 per BOE for all capital and O&M cost excluding financing costs and taxes. The CRS methodology was to assume that all costs (including all taxes) constituted 69% of gross revenues. This comes to about $28.70 per BOE for all capital and O&M cost excluding financing costs and taxes. The same value in the ICF study was $31.99.

- Lease bonuses: K&B and CRS ignored lease bonus revenues. ICF assumed lease bonuses would be $700 million.

- Severance Taxes: The explicit or implicit calculations were very similar among the three studies.

- Property taxes: These were not explicitly included in the K&B or CRS studies, although K&B did include a 5 cents/bbl conservation tax. In the CRS methodology the property tax can be considered to be included implicitly in the O&M costs.

- Royalties: K&B used a 1/6 royalty while CRS and ICF used 1/8.

- Income Tax Rates: K&B used a marginal Federal rate of 35% and a State rate of 3% and ignored the fact that State income tax is a deductible for Federal taxes. CRS used an average effective Federal Tax rate of 33%. CRS did not use a State tax rate, but ICF assumed a 3% rate for the reproduction. The ICF methodology is based on an average effective rate of 33% Federal (from DOE's FRS) plus an average state rate of 6%. After accounting for the deductibility of State taxes for Federal tax calculations this come to an effective rate of 37%.

5.3 Analysis of Revenues from Entire OCS and Entire Federal Portion of Rockies

Entire OCS

ICF has evaluated the government revenues from developing the entire OCS of the Lower-48 and Alaska. This analysis is not based on field size distributions or any of the other approaches discussed earlier. It is a simple calculation of the theoretical revenues from the entire resource base. The results of this analysis can be compared to the government revenue estimates of Peterson and Abercrombie.[18] Peterson and Abercrombie published an estimate of $2.6 trillion of government revenue from developing the OCS. ICF concludes that they were including the entire U.S. OCS undiscovered resource base of 86 billion

[18] Wall Street Journal, 2008, "Drilling for Dollars," WSJ editorial, September 12, 2008.

barrels of liquid petroleum and 420 Tcf of natural gas. This includes both access and no access, and it also includes AK.

Table 27 summarizes the OCS, all-time government revenues for the accessible (not the total), OCS resource base. This table represents the portion of the OCS resource base that is not evaluated in our moratoria report. The analysis assumes an AEO oil price of $66.76 per barrel and a gas price of $6.99 per MMBtu. The analysis assumes that 100 percent of the resource in each area is developed. Total government OCS revenues for the accessible resource as shown at the bottom right corner, are $2.35 trillion. When added to the government revenues from opening the no-access portions ($361 billion to $1,386 billion from Table 1), the OCS total is $2.71 to $3.73 trillion of government revenue.

Federal Portion of Rockies

Table 28 shows the revenue impacts of increased Rockies access. The first few columns of the table show the calculation of government revenues from the Rockies areas that could be made available through new policies for Federal Lands. As shown in Table 1, the all-time government revenues that would be generated are approximately $21.8 billion. The middle portion of the table shows the calculation of government revenues from the development of that portion of Federal lands that are currently available (using the AEO resource base, as was done in our study). The total government revenue from that acreage is $397 billion. Thus, the total all time revenue from the current and expanded access on Federal lands is $417 billion.

Table 29 summarizes the all-time government revenue generated from the OCS, ANWR, and Rockies. The potential government revenue from accessible areas is $2,742 billion. The potential revenue from off-limits areas ranges from $547 to $1,695 billion. Total potential revenues range from $3,289 to $4,437 billion.

Table 27 Reproduction of Peterson and Abercrombie OCS Analysis Using ICF Cost and Financial Factors

Main Table Excludes No Access Resource

	Units	GoM Oil	GoM Gas	GoM Total	Pacific Oil	Pacific Gas	Pacific Total	Alaska Oil	Alaska Gas	Alaska Total	Total Oil	Total Gas	Total
Undisc. Resources	B-Bbls and TCF	40.94	210.38		0.16	0.17		26.61	132.06		67.71	342.61	
	B-BOE	40.94	37.36	78.30	0.16	0.03	0.19	26.61	23.45	50.06	67.71	60.84	128.55
Oil and gas prices	$/bbl and $/MMBtu	$66.76	$6.99		$66.76	$6.99		$66.76	$6.99				
All time revenues	billion $	$2,733.2	$1,470.6	$4,203.7	$10.7	$1.2	$11.9	$1,776.5	$923.1	$2,699.6	$4,520.3	$2,394.8	$6,915.2
Percent of resource developed		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Developed resource	B-Bbls and TCF	40.94	210.38		0.16	0.17		26.61	132.06		67.71	342.61	
	B-BOE	40.94	37.36	78.30	0.16	0.03	0.19	26.61	23.45	50.06	67.71	60.84	128.55
Revenues from developed resources	billion $	$2,733.2	$1,470.6	$4,203.7	$10.68	$1.19	$11.87	$1,776.5	$923.1	$2,699.6	$4,520.3	$2,394.8	$6,915.2
Development cost/unit	$/BOE	$13.76	$13.76	$13.76	$13.76	$13.76	$13.76	$13.76	$13.76	$13.76			
Development cost	billion $	$563.3	$514.1	$1,077.4	$2.2	$0.4	$2.6	$366.2	$322.7	$688.9	$931.7	$837.2	$1,768.9
Operating cost/unit	$/BOE	$6.55	$6.55	$6.55	$6.55	$6.55	$6.55	$6.55	$6.55	$6.55			
Operating cost	billion $	$268.2	$244.7	$512.9	$1.0	$0.2	$1.2	$174.3	$153.6	$327.9	$443.5	$398.5	$842.0
Lease bonus/unit	$/BOE	$0.343	$0.343	$0.343	$0.343	$0.343	$0.343	$0.343	$0.343	$0.343			
Bonus paid	**billion $**	**$14.0**	**$12.8**	**$26.9**	**$0.1**	**$0.0**	**$0.1**	**$9.1**	**$8.0**	**$17.2**	**$23.2**	**$20.9**	**$44.1**
Royalty rate	percent	16.67%	16.67%	16.67%	16.67%	16.67%	16.67%	16.67%	16.67%	16.67%			
Royalties paid	**billion $**	**$455.6**	**$245.1**	**$700.8**	**$1.8**	**$0.2**	**$2.0**	**$296.1**	**$153.9**	**$450.0**	**$753.5**	**$399.2**	**$1,152.8**
Income tax rate	percent	37%	37%	37%	37%	37%	37%	37%	37%	37%			
Income tax paid	**billion $**	**$529.84**	**$167.90**	**$697.75**	**$2.07**	**$0.14**	**$2.21**	**$344.38**	**$105.40**	**$449.78**	**$876.3**	**$273.4**	**$1,149.7**
Total Government Revenue	**billion $**	**$999.50**	**$425.86**	**$1,425.36**	**$3.91**	**$0.34**	**$4.25**	**$649.65**	**$267.32**	**$916.97**	**$1,653.06**	**$693.53**	**$2,346.59**

Inaccessible from ICF report: (middle and alternative resource cases) $361 - $1,386

Accessible plus Inaccessible: $2,708 - $3,733

Table 28 Revenues and Taxes – Federal Rockies Lands

		Accessible by New Policies for Federal Lands			Previously Accessible on Federal Lands			Sum		
	Units	Oil & NGLs	Gas	Total	Oil & NGLs	Gas	Total	Oil & NGLs	Gas	Total
Undisc. Resources	B-Bbls and TCF	0.40	9.54		9.05	146.36		9.45	155.90	
	B-BOE	0.40	1.69	2.10	9.05	25.99	35.04	9.45	27.69	37.14
Oil and gas prices	$/bbl and $/MMBtu	$56.15	$5.18		$56.15	$5.18				
Percent of resource developed		100%	100%	100%	100%	100%	100%	100%	100%	100%
Developed resource	B-Bbls and TCF	0.40	9.54		9.05	146.36		9.45	155.90	
	B-BOE	0.40	1.69	2.10	9.05	25.99	35.04	9.45	27.69	37.14
Revenues from developed resources	billion $	$22.7	$49.4	$72.1	$508.1	$757.7	$1,265.8	$530.8	$807.1	$1,337.9
Capital and O&M Cost/unit	$/BOE	$18.10	$18.10	$18.10	$18.10	$18.10	$18.10			
Capital and O&M Cost	billion $	$7.3	$30.7	$38.0	$163.8	$470.4	$634.2	$171.1	$501.1	$672.2
Bonus paid	**billion $**	**$0.1**	**$0.2**	**$0.3**	**$1.3**	**$3.7**	**$4.9**	**$1.3**	**$3.9**	**$5.2**
Severance tax rate	percent	6.00%	6.00%		6.00%	6.00%				
Severance tax paid	**billion $**	**$1.4**	**$3.0**	**$4.3**	**$30.5**	**$45.5**	**$75.9**	**$31.8**	**$48.4**	**$80.3**
Property Taxes	**billion $**	**$0.2**	**$0.8**	**$1.0**	**$4.4**	**$12.6**	**$17.0**	**$4.6**	**$13.4**	**$18.0**
Royalty rate	percent	12.50%	12.50%		12.50%	12.50%				
Royalties paid	**billion $**	**$2.8**	**$6.2**	**$9.0**	**$63.5**	**$94.7**	**$158.2**	**$66.4**	**$100.9**	**$167.2**
Income tax rate	percent	37%	37%		37%	37%				
Income tax paid	**billion $**	**$4.04**	**$3.16**	**$7.2**	**$90.53**	**$48.42**	**$138.9**	**$94.6**	**$51.6**	**$146.1**
Total Government Revenue	**billion $**	**$8.50**	**$13.35**	**$21.9**	**$190.19**	**$204.84**	**$395.0**	**$198.7**	**$218.2**	**$416.9**

Table 29 All-Time Government Revenue from OCS, ANWR, and Rockies

Accessible and Inaccessible Areas

Area	Category	Government Revenues Billion $
OCS	Accessible *	2,347
	Inaccessible (mid./ alternative)	361 - 1,386
	Total	2,708 - 3,733
ANWR	Inaccessible (mid./ alternative)	164 - 287
Rockies	Accessible	395
	Improved Access	22
	Total	417
Total	Accessible *	2,742
	Inaccessible	547 - 1,695
	Total	3,289 - 4,437

* Based on methodology assuming development of entire OCS resource.

APPENDIX A. COMPARISON WITH EIA AND NPC STUDIES

OCS Comparison

- **Figures 11 and 12** compare the OCS access production forecasts of the current study with that of EIA (2007) and NPC (2008). [19] The ICF, EIA and NPC mid cases are all based on the MMS mean resource base estimates.

- For oil, the ICF mid resource case's production forecast is slightly above EIA in 2030. The NPC forecast is the highest at approximately 1 mmb/d in 2025.

- For gas, the ICF mid case is lower than the EIA forecast after 2020. Again, the NPC projection is the highest at 3.7 Bcfd in 2025.

- The ICF alternative resource forecasts for oil and gas are much higher than the corresponding ICF mid case projection, but are still lower than the NPC mid case based on a smaller resource base.

ANWR Comparison

- **Figure 13** compares the ANWR mid resource access forecast of the current study with that of EIA (2008) and NPC. The ICF, EIA and NPC mid cases are all based on the USGS mean resource base estimates.

- For the mid resource, the ICF projection falls between EIA and NPC in 2020 but is higher than both in 2030.

[19] National Petroleum Council, 2007, "Facing the Hard Truths About Energy – A Comprehensive View to 2030 of Global Oil and Gas," Topic 7: Global Access to Oil and Gas, NPC, Washington, DC. www.npc.org

- **Figure 14** compares high resource cases. The ICF, EIA and NPC mid cases are all based on the USGS P5 resource base estimates.

- The ICF high resource forecast is similar to NPC, but somewhat low to the EIA high case in 2030.

Rockies Comparison

- In 2003, the National Petroleum Council carried out a detailed study of land access in the Rockies. The study did not use the EPCA methodology, but a different approach that looked at the probability of various categories of restrictions within a basin. [20]

- The NPC study estimated that changes to access restrictions could potentially yield an additional 24.5 Tcf of gas that is currently considered "no access."

- The NPC modeling indicated that an incremental 500 Bcf per year or 1.37 Bcfd would be expected by 2020 were portions of this volume of gas to become accessible. This compares to the ICF forecast of 250 Bcf per year or 0.68 Bcfd.

- NPC in 2003 did not carry out an oil forecast for improved access in the Rockies.

[20] National Petroleum Council, 2003, North American gas market study and accompanying reports, www.npc.org

Figure 11 Comparison of OCS Access Oil Production Forecasts

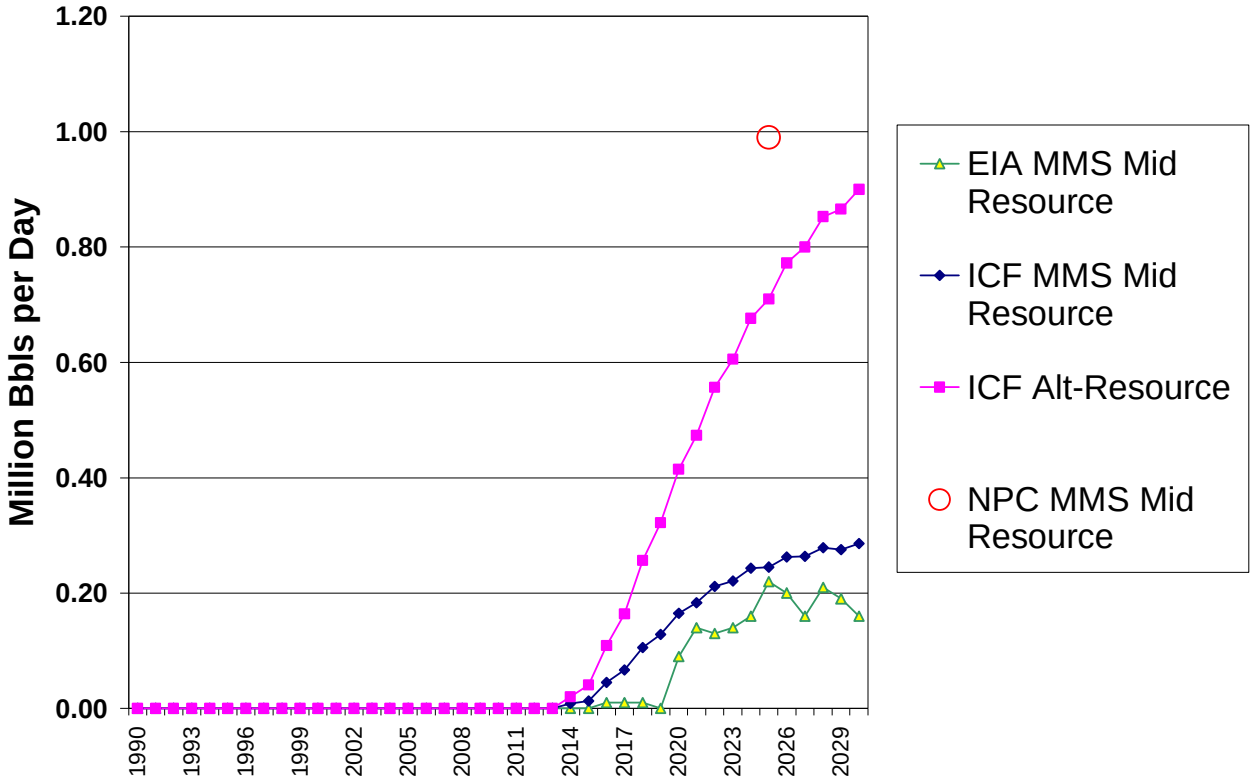


Figure 12 Comparison of OCS Access Gas Production Forecasts

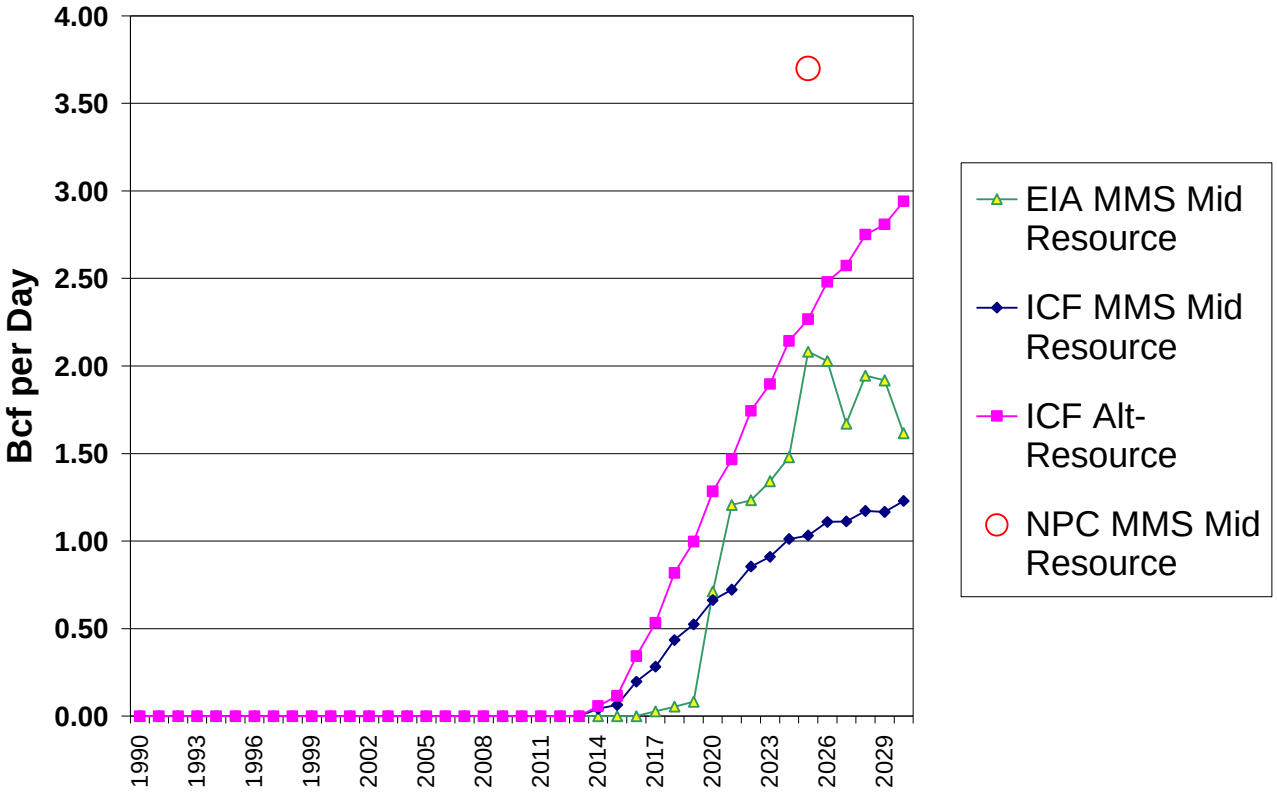


Figure 13 Comparison of OCS, 2008 EIA, and 2007 NPC Mean Resource ANWR Oil Production Forecasts

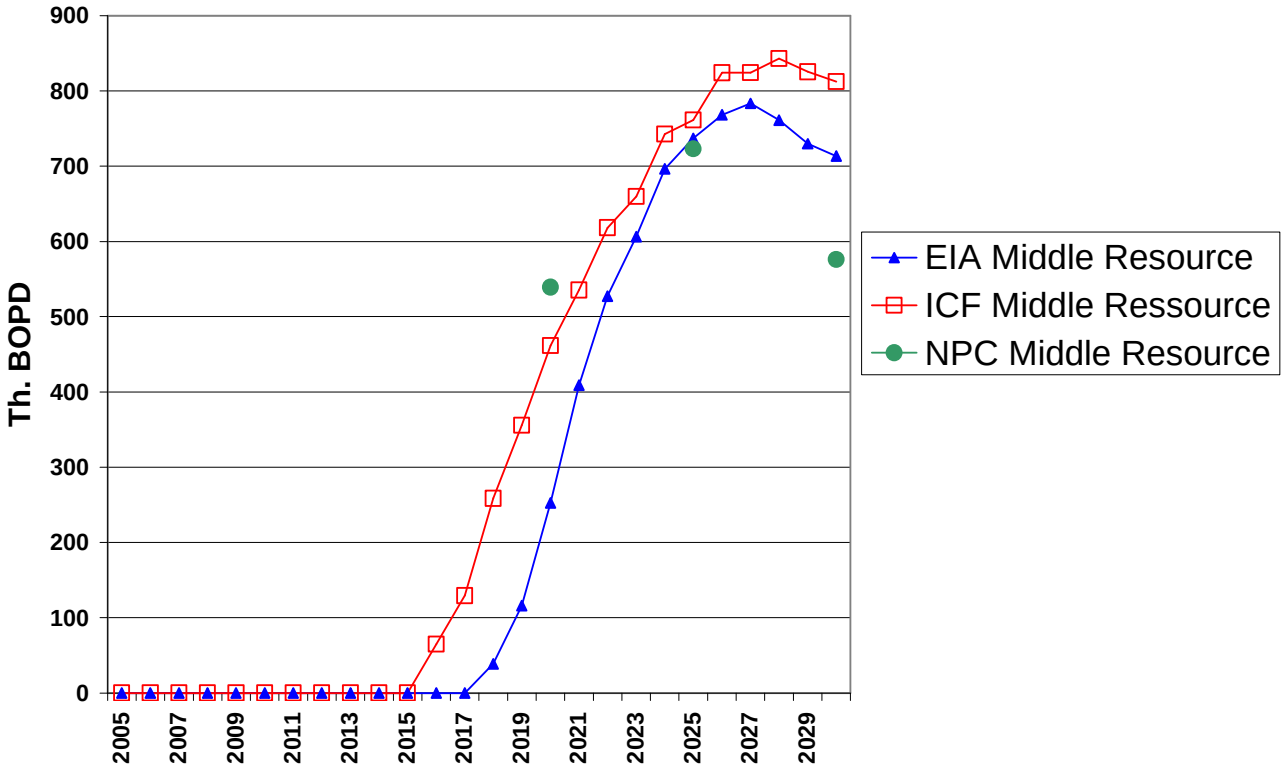
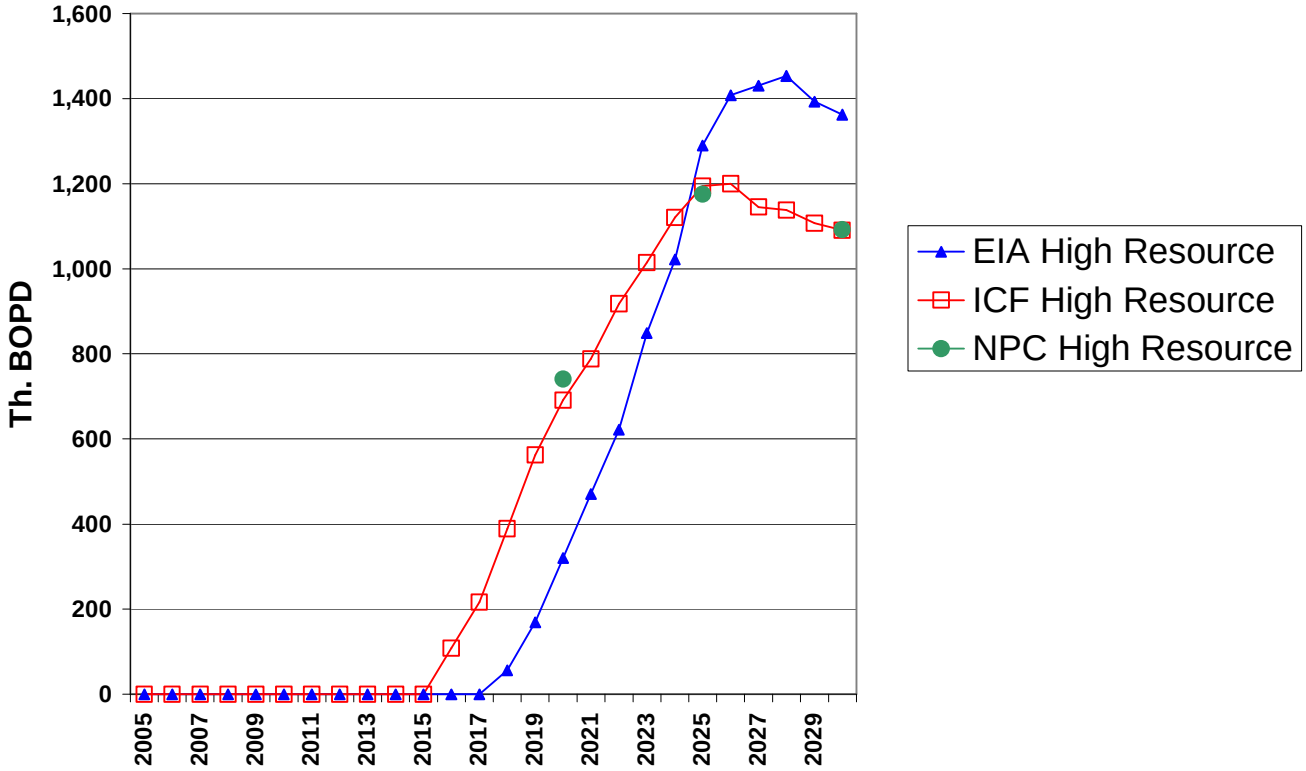


Figure 14 Comparison of ICF High Resource, 2008 EIA High Resource, and 2007 NPC High Resource ANWR Oil Production Forecasts



APPENDIX B. MMS OFFSHORE PRODUCTION LAG CHARTS

- The following charts show statistical data from MMS on the lag between leasing and first production for deepwater oil and gas fields (**Figure 15**) and all fields (**Figure 16**).

Figure 15 MMS Production Lag Chart from 2008 Gulf of Mexico Deepwater Report

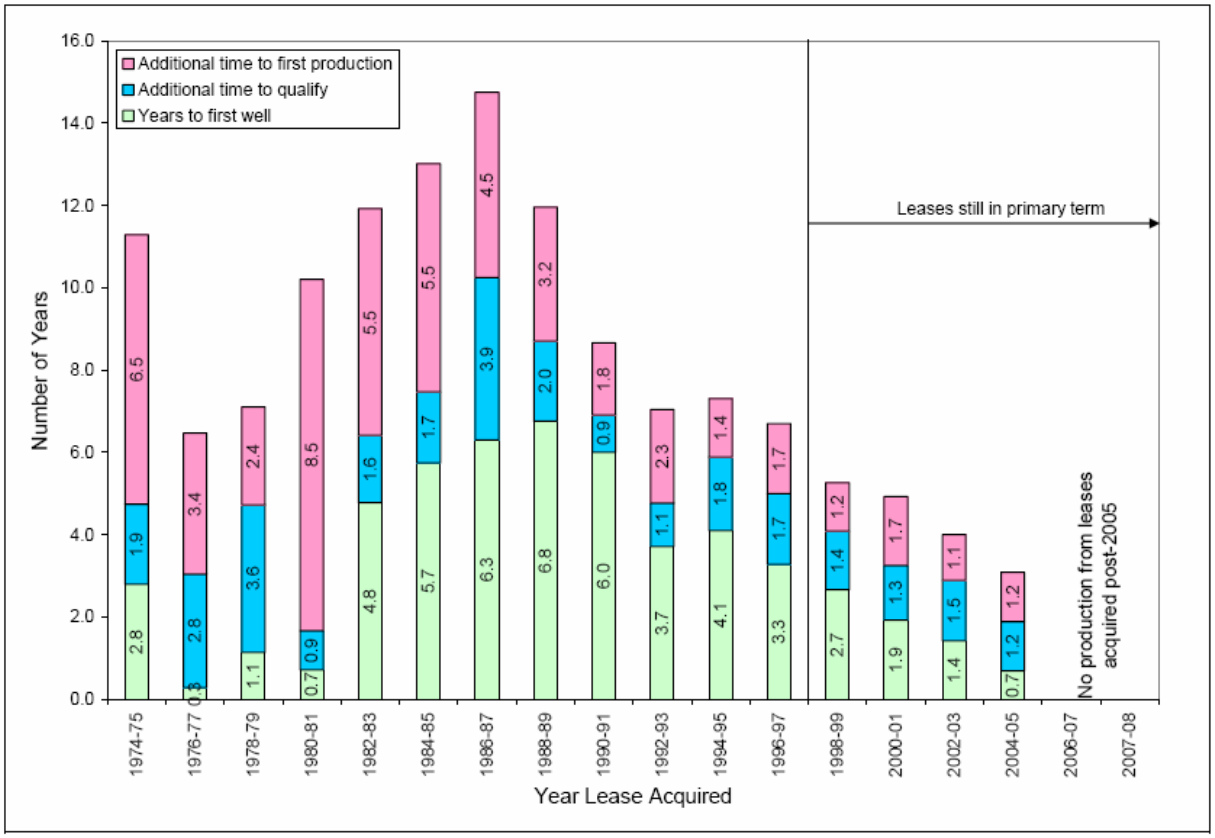


Figure 55. Lag from leasing to first production for producing deepwater fields.

Figure 16 MMS Production Lag Chart by Company Type, Water Depth (Entire Gulf of Mexico)

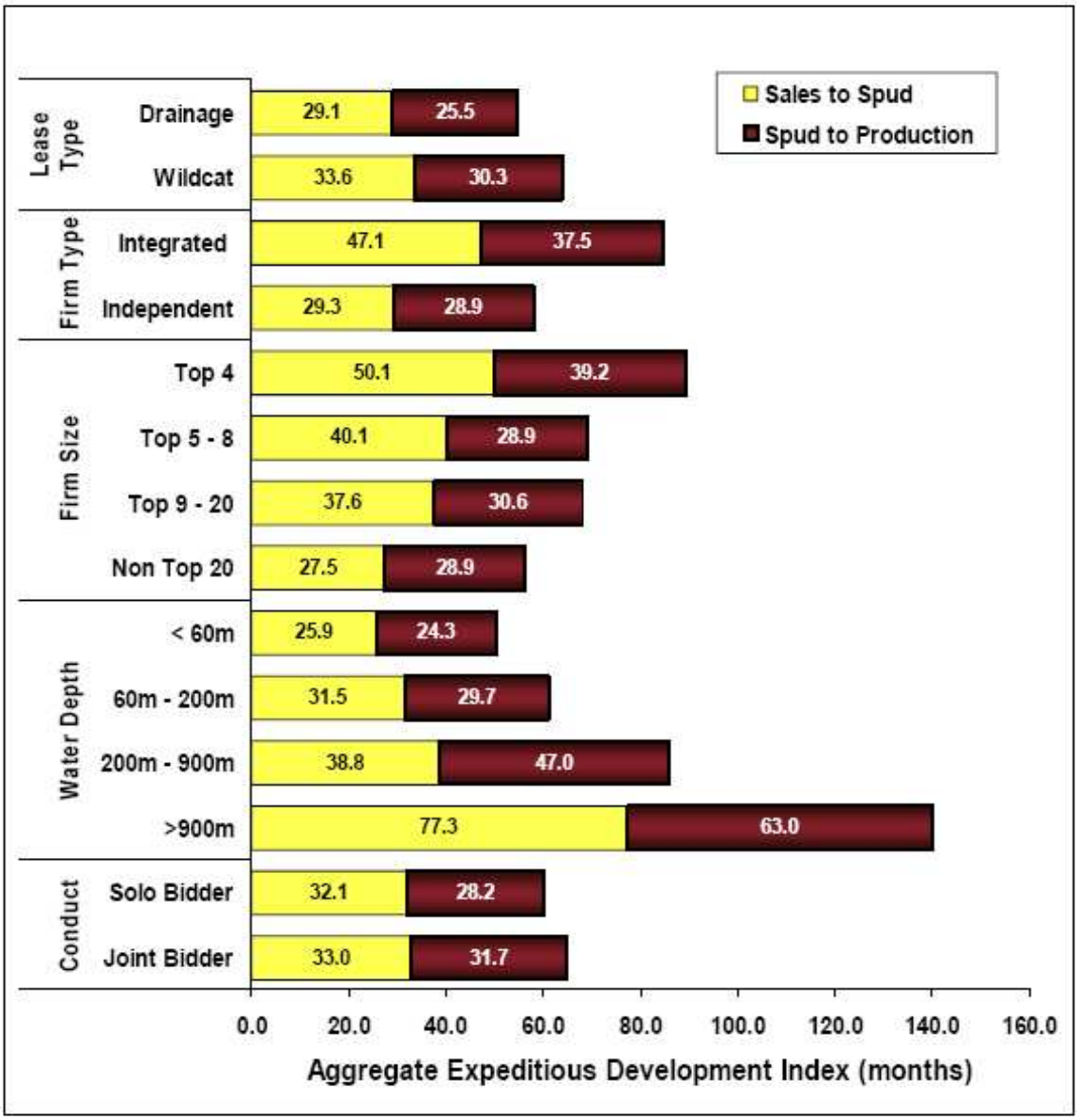


Figure ES.1. Aggregate Expeditious Development Index.

APPENDIX C. INDUSTRY REVENUE AND EXPENDITURE TABLES FOR MIDDLE AND ALTERNATIVE RESOURCE CASES

- **Tables 30 through 38** present the outputs of the model for oil and gas industry expenditures and revenues. **Tables 39 and 40** summarize the results for all five areas combined.

- Each table summarizes the oil and gas revenue that would result from the sale of oil and gas. The tables also indicate revenue streams for royalties, severance taxes, property taxes and income taxes.

- Exploration and development expenditures by industry are broken out into the following categories:

    - exploration
    - lease bonuses
    - geological and geophysical (g&g)
    - development
    - platforms and equipment
    - capital overhead

- The calculations are based on oil and gas prices from the AEO 2008 Reference Case. The post-2030 period prices are assumed to be the same as the year 2030 Reference Case prices (Lower-48 average crude oil price is $60.59/bbl and average natural gas is $6.45/MMBtu),

- Summed across all regions, the all-time cumulative government revenues are $547 billion for the middle resource case and $1,695 billion for the alternative resource base case.

Table 30 ANWR Industry Revenues and Expenditures – Mid Resource

ANWR	2010	2015	2020	2025	2030	Sum to 2030	post - 2030	All Time Sum
Oil Wellhead Value	$0	$0	$8,179,112,886	$14,387,847,202	$16,776,711,960	$166,566,620,503	$402,502,320,032	$569,068,940,535
Gas Wellhead Value	$0	$0	$0	$239,176,181	$597,425,253	$3,048,155,766	$18,820,417,544	$21,868,573,310
All WH Value (Gross Revenues)	$0	$0	$8,179,112,886	$14,627,023,383	$17,374,137,213	$169,614,776,269	$421,322,737,576	$590,937,513,845
Royalties	$0	$0	$1,022,389,111	$1,828,377,923	$2,171,767,152	$21,201,847,034	$52,665,342,197	$73,867,189,231
Severance Taxes	$0	$0	$479,965,211	$1,690,074,171	$2,357,866,504	$18,346,554,486	$32,966,056,284	$51,312,610,770
Property Taxes	$0	$82,877,319	$227,761,462	$243,003,504	$199,782,017	$3,375,317,942	$5,712,543,144	$9,087,861,086
Income Taxes	$0	-$574,511,098	$495,539,062	$1,851,471,317	$2,533,525,128	$17,511,337,376	$11,500,216,587	$29,011,553,963
Lease Bonuses	$0	$9,600,000	$9,600,000	$9,600,000	$9,600,000	$178,560,000	$545,824,252	$724,384,252
All Government Revenue	$0	-$482,033,779	$2,235,254,846	$5,622,526,914	$7,272,540,801	$60,613,616,837	$103,389,982,464	$164,003,599,301
Exploration Expenditures	$0	$305,000,000	$305,000,000	$305,000,000	$305,000,000	$5,673,000,000	$17,341,291,339	$23,014,291,339
G&G Expenses	$0	$7,500,000	$7,500,000	$7,500,000	$7,500,000	$139,500,000	$426,425,197	$565,925,197
Development Expenditures	$0	$2,190,789,474	$2,464,638,158	$2,453,227,796	$1,445,906,790	$36,550,598,145	$48,608,978,770	$85,159,576,915
Platform, Equip. Expend.	$0	$1,303,125,000	$814,453,125	$722,827,148	$509,033,203	$14,273,291,016	$15,629,224,822	$29,902,515,838
Capital Overhead	$0	$610,562,316	$576,190,605	$559,704,791	$364,326,399	$9,090,391,866	$13,208,279,101	$22,298,670,966
Total Capital Expenditures	$0	$4,416,976,789	$4,167,781,888	$4,048,259,736	$2,631,766,392	$65,726,781,026	$95,214,199,229	$160,940,980,255
O&M Expenditures	$0	$0	$1,004,786,413	$1,694,693,482	$2,258,156,244	$20,529,415,331	$166,079,077,775	$186,608,493,106
O&M Overhead	$0	$0	$160,765,826	$271,150,957	$361,304,999	$3,284,706,453	$26,572,652,444	$29,857,358,897
Total O&M Expenditures	$0	$0	$1,165,552,239	$1,965,844,439	$2,619,461,243	$23,814,121,784	$192,651,730,219	$216,465,852,003

Table 31 ANWR Industry Revenues and Expenditures - Alternative Resources

ANWR	2010	2015	2020	2025	2030	Sum to 2030	post - 2030	All Time Sum
Oil Wellhead Value	$0	$0	$12,248,868,717	$22,569,569,016	$22,519,526,708	$241,717,290,685	$650,057,244,782	$891,774,535,467
Gas Wellhead Value	$0	$0	$0	$375,184,921	$1,641,803,917	$6,776,386,233	$39,477,172,999	$46,253,559,233
All WH Value (Gross Revenues)	$0	$0	$12,248,868,717	$22,944,753,937	$24,161,330,625	$248,493,676,918	$689,534,417,782	$938,028,094,699
Royalties	$0	$0	$1,531,108,590	$2,868,094,242	$3,020,166,328	$31,061,709,615	$86,191,802,223	$117,253,511,837
Severance Taxes	$0	$0	$960,625,167	$3,084,860,482	$3,662,862,262	$30,369,920,129	$61,180,558,653	$91,550,478,782
Property Taxes	$0	$128,147,023	$312,138,109	$275,732,880	$212,494,496	$4,235,359,695	$8,766,672,985	$13,002,032,679
Income Taxes	$0	-$823,339,652	$954,146,506	$3,492,142,330	$3,940,017,257	$30,506,849,617	$34,007,893,484	$64,514,743,101
Lease Bonuses	$0	$9,600,000	$9,600,000	$9,600,000	$9,600,000	$178,560,000	$755,526,713	$934,086,713
All Government Revenue	$0	-$685,592,629	$3,767,618,371	$9,730,429,934	$10,845,140,344	$96,352,399,056	$190,902,454,058	$287,254,853,114
Exploration Expenditures	$0	$305,000,000	$305,000,000	$305,000,000	$305,000,000	$5,673,000,000	$24,003,713,287	$29,676,713,287
G&G Expenses	$0	$7,500,000	$7,500,000	$7,500,000	$7,500,000	$139,500,000	$590,255,245	$729,755,245
Development Expenditures	$0	$3,505,263,158	$3,505,263,158	$2,117,763,158	$1,342,714,330	$45,257,203,433	$77,444,210,086	$122,701,413,519
Platform, Equip. Expend.	$0	$1,850,437,500	$1,303,125,000	$416,601,563	$643,945,313	$17,045,390,625	$25,554,483,789	$42,599,874,414
Capital Overhead	$0	$908,448,105	$820,878,105	$457,034,355	$369,401,543	$10,926,984,649	$20,535,710,259	$31,462,694,909
Total Capital Expenditures	$0	$6,576,648,763	$5,941,766,263	$3,303,899,076	$2,668,561,185	$79,042,078,708	$148,128,372,666	$227,170,451,374
O&M Expenditures	$0	$0	$1,403,166,333	$2,369,602,125	$2,861,354,096	$27,712,993,685	$242,620,608,534	$270,333,602,219
O&M Overhead	$0	$0	$224,506,613	$379,136,340	$457,816,655	$4,434,078,990	$38,819,297,365	$43,253,376,355
Total O&M Expenditures	$0	$0	$1,627,672,946	$2,748,738,465	$3,319,170,752	$32,147,072,674	$281,439,905,899	$313,586,978,574

Table 32 Atlantic OCS Industry Revenues and Expenditures – Mid Resource

Atlantic Offshore	2010	2015	2020	2025	2030	Sum to 2030	post - 2030	All Time Sum
Oil Wellhead Value	$0	$0	$824,393,639	$1,308,671,131	$1,677,394,264	$15,977,709,986	$165,397,476,868	$181,375,186,854
Gas Wellhead Value	$0	$0	$702,775,153	$1,265,045,980	$1,647,173,400	$14,783,805,504	$158,996,025,799	$173,779,831,303
All WH Value (Gross Revenues)	$0	$0	$1,527,168,792	$2,573,717,111	$3,324,567,663	$30,761,515,490	$324,393,502,667	$355,155,018,158
Royalties	$0	$0	$254,528,132	$428,952,852	$554,094,611	$5,126,919,248	$54,065,583,778	$59,192,503,026
Severance Taxes	$0	$0	$0	$0	$0	$0	$0	$0
Property Taxes	$0	$0	$0	$0	$0	$0	$0	$0
Income Taxes	$0	-$201,548,173	$78,665,638	$312,112,603	$496,574,791	$2,549,273,594	$50,597,542,898	$53,146,816,492
Lease Bonuses	$0	$25,000,000	$25,000,000	$25,000,000	$25,000,000	$465,000,000	$1,789,478,327	$2,254,478,327
All Government Revenue	$0	-$176,548,173	$358,193,770	$766,065,455	$1,075,669,402	$8,141,192,843	$106,452,605,002	$114,593,797,845
Exploration Expenditures	$0	$342,724,375	$342,724,375	$342,724,375	$342,724,375	$6,374,673,375	$24,531,913,643	$30,906,587,018
G&G Expenses	$0	$9,765,625	$9,765,625	$9,765,625	$9,765,625	$181,640,625	$699,014,971	$880,655,596
Development Expenditures	$0	$157,743,777	$230,864,464	$247,164,590	$217,021,135	$3,585,463,640	$19,497,918,660	$23,083,382,300
Platform, Equip. Expend.	$0	$365,680,835	$347,295,487	$318,892,303	$303,344,171	$5,735,413,170	$25,893,146,796	$31,628,559,966
Capital Overhead	$0	$144,146,338	$152,903,992	$150,967,503	$143,656,849	$2,614,750,530	$11,585,835,583	$14,200,586,113
Total Capital Expenditures	$0	$1,020,060,950	$1,083,553,943	$1,069,514,397	$1,016,512,154	$18,491,941,340	$82,207,829,653	$100,699,770,993
O&M Expenditures	$0	$0	$169,208,682	$274,209,710	$334,791,639	$3,264,603,377	$38,965,851,137	$42,230,454,515
O&M Overhead	$0	$0	$27,073,389	$43,873,554	$53,566,662	$522,336,540	$6,234,536,182	$6,756,872,722
Total O&M Expenditures	$0	$0	$196,282,071	$318,083,264	$388,358,302	$3,786,939,918	$45,200,387,319	$48,987,327,237

Table 33 Atlantic Industry Revenues and Expenditures - Alternative Resource

Atlantic Offshore	2010	2015	2020	2025	2030	Sum to 2030	post - 2030	All Time Sum
Oil Wellhead Value	$0	$0	$2,582,965,092	$5,261,904,308	$7,556,822,260	$62,051,732,747	$858,270,969,031	$920,322,701,777
Gas Wellhead Value	$0	$0	$1,337,082,802	$2,745,954,435	$3,895,907,490	$31,936,895,252	$431,222,115,423	$463,159,010,674
All WH Value (Gross Revenues)	$0	$0	$3,920,047,894	$8,007,858,743	$11,452,729,750	$93,988,627,998	$1,289,493,084,453	$1,383,481,712,452
Royalties	$0	$0	$653,341,316	$1,334,643,124	$1,908,788,292	$15,664,771,333	$214,915,514,076	$230,580,285,409
Severance Taxes	$0	$0	$0	$0	$0	$0	$0	$0
Property Taxes	$0	$0	$0	$0	$0	$0	$0	$0
Income Taxes	$0	-$255,569,160	$544,944,851	$1,533,618,327	$2,446,756,544	$16,527,500,382	$246,632,082,032	$263,159,582,414
Lease Bonuses	$0	$25,000,000	$25,000,000	$25,000,000	$25,000,000	$465,000,000	$4,628,214,286	$5,093,214,286
All Government Revenue	$0	-$230,569,160	$1,223,286,166	$2,893,261,451	$4,380,544,836	$32,657,271,715	$466,175,810,393	$498,833,082,109
Exploration Expenditures	$0	$342,724,375	$342,724,375	$342,724,375	$342,724,375	$6,374,673,375	$63,448,073,938	$69,822,747,313
G&G Expenses	$0	$9,765,625	$9,765,625	$9,765,625	$9,765,625	$181,640,625	$1,807,896,205	$1,989,536,830
Development Expenditures	$0	$317,586,444	$489,655,726	$577,142,436	$463,663,972	$7,736,900,568	$58,893,262,640	$66,630,163,209
Platform, Equip. Expend.	$0	$706,518,879	$709,485,633	$716,174,951	$622,261,263	$11,836,479,216	$77,890,894,146	$89,727,373,362
Capital Overhead	$0	$224,255,252	$252,261,017	$267,329,182	$234,146,438	$4,255,151,005	$33,066,934,594	$37,322,085,600
Total Capital Expenditures	$0	$1,600,850,574	$1,803,892,376	$1,913,136,569	$1,672,561,672	$30,384,844,790	$235,107,061,524	$265,491,906,314
O&M Expenditures	$0	$0	$412,715,707	$788,885,101	$1,048,484,609	$9,200,652,680	$137,473,600,613	$146,674,253,293
O&M Overhead	$0	$0	$66,034,513	$126,221,616	$167,757,538	$1,472,104,429	$21,995,776,098	$23,467,880,527
Total O&M Expenditures	$0	$0	$478,750,220	$915,106,717	$1,216,242,147	$10,672,757,109	$159,469,376,711	$170,142,133,819

Table 34 Pacific OCS Industry Revenues and Expenditures – Mid Resource

Pacific Offshore	2010	2015	2020	2025	2030	Sum to 2030	post - 2030	All Time Sum
Oil Wellhead Value	$0	$0	$1,527,462,468	$2,599,525,914	$3,759,120,764	$32,374,789,378	$349,571,232,986	$381,946,022,364
Gas Wellhead Value	$0	$0	$261,033,681	$449,386,651	$638,612,547	$5,406,208,094	$61,867,856,317	$67,274,064,411
All WH Value (Gross Revenues)	$0	$0	$1,788,496,149	$3,048,912,565	$4,397,733,311	$37,780,997,472	$411,439,089,303	$449,220,086,775
Royalties	$0	$0	$298,082,692	$508,152,094	$732,955,552	$6,296,832,912	$68,573,181,550	$74,870,014,462
Severance Taxes	$0	$0	$0	$0	$0	$0	$0	$0
Property Taxes	$0	$0	$0	$0	$0	$0	$0	$0
Income Taxes	$0	-$198,544,670	$171,662,002	$473,154,986	$837,278,601	$4,893,059,662	$79,595,745,051	$84,488,804,713
Lease Bonuses	$0	$25,000,000	$25,000,000	$25,000,000	$25,000,000	$465,000,000	$1,826,854,779	$2,291,854,779
All Government Revenue	$0	-$173,544,670	$494,744,693	$1,006,307,080	$1,595,234,153	$11,654,892,574	$149,995,781,381	$161,650,673,955
Exploration Expenditures	$0	$358,365,000	$358,365,000	$358,365,000	$358,365,000	$6,665,589,000	$26,187,232,521	$32,852,821,521
G&G Expenses	$0	$9,765,625	$9,765,625	$9,765,625	$9,765,625	$181,640,625	$713,615,148	$895,255,773
Development Expenditures	$0	$131,389,682	$196,578,991	$227,135,048	$197,824,115	$3,148,575,228	$16,783,342,250	$19,931,917,478
Platform, Equip. Expend.	$0	$307,476,743	$284,082,665	$291,882,247	$279,821,275	$4,964,595,601	$21,884,281,845	$26,848,877,446
Capital Overhead	$0	$133,119,528	$139,806,765	$145,943,667	$139,324,162	$2,468,064,073	$10,783,252,247	$13,251,316,320
Total Capital Expenditures	$0	$940,116,579	$988,599,046	$1,033,091,587	$985,100,177	$17,428,464,526	$76,351,724,011	$93,780,188,537
O&M Expenditures	$0	$0	$177,765,826	$285,217,110	$355,516,465	$3,410,845,458	$39,375,455,203	$42,786,300,661
O&M Overhead	$0	$0	$28,442,532	$45,634,738	$56,882,634	$545,735,273	$6,300,072,833	$6,845,808,106
Total O&M Expenditures	$0	$0	$206,208,358	$330,851,848	$412,399,100	$3,956,580,731	$45,675,528,036	$49,632,108,767

Table 35 Pacific OCS Industry Revenues and Expenditures - Alternative Resource

Pacific Offshore	2010	2015	2020	2025	2030	Sum to 2030	post - 2030	All Time Sum
Oil Wellhead Value	$0	$0	$2,393,938,715	$4,910,556,743	$7,427,688,165	$59,404,308,876	$951,680,489,856	$1,011,084,798,731
Gas Wellhead Value	$0	$0	$446,718,337	$812,735,206	$1,344,989,838	$10,280,552,524	$169,006,518,978	$179,287,071,502
All WH Value (Gross Revenues)	$0	$0	$2,840,657,052	$5,723,291,949	$8,772,678,003	$69,684,861,399	$1,120,687,008,834	$1,190,371,870,233
Royalties	$0	$0	$473,442,842	$953,881,992	$1,462,113,000	$11,614,143,567	$186,781,168,139	$198,395,311,706
Severance Taxes	$0	$0	$0	$0	$0	$0	$0	$0
Property Taxes	$0	$0	$0	$0	$0	$0	$0	$0
Income Taxes	$0	-$218,781,588	$384,547,236	$1,098,065,498	$1,944,348,283	$12,356,587,653	$231,925,330,104	$244,281,917,758
Lease Bonuses	$0	$25,000,000	$25,000,000	$25,000,000	$25,000,000	$465,000,000	$4,019,682,642	$4,484,682,642
All Government Revenue	$0	-$193,781,588	$882,990,078	$2,076,947,490	$3,431,461,284	$24,435,731,220	$422,726,180,886	$447,161,912,106
Exploration Expenditures	$0	$358,365,000	$358,365,000	$358,365,000	$358,365,000	$6,665,589,000	$57,620,542,807	$64,286,131,807
G&G Expenses	$0	$9,765,625	$9,765,625	$9,765,625	$9,765,625	$181,640,625	$1,570,188,532	$1,751,829,157
Development Expenditures	$0	$197,902,356	$310,150,762	$373,191,026	$287,254,041	$4,944,874,959	$40,757,127,816	$45,702,002,776
Platform, Equip. Expend.	$0	$425,347,365	$426,899,901	$432,146,774	$407,967,334	$7,154,912,647	$52,751,359,749	$59,906,272,396
Capital Overhead	$0	$162,620,855	$180,829,006	$191,754,948	$174,136,320	$3,105,922,757	$25,075,024,247	$28,180,947,004
Total Capital Expenditures	$0	$1,154,001,202	$1,286,010,293	$1,365,223,373	$1,237,488,319	$22,052,939,988	$177,774,243,151	$199,827,183,140
O&M Expenditures	$0	$0	$282,036,412	$526,635,159	$693,087,435	$6,168,060,014	$103,165,988,961	$109,334,048,975
O&M Overhead	$0	$0	$45,125,826	$84,261,625	$110,893,990	$986,889,602	$16,506,558,234	$17,493,447,836
Total O&M Expenditures	$0	$0	$327,162,237	$610,896,784	$803,981,425	$7,154,949,616	$119,672,547,195	$126,827,496,811

Table 36 Eastern Gulf OCS Industry Revenues and Expenditures – Mid Resource

Eastern GoM	2010	2015	2020	2025	2030	Sum to 2030	post - 2030	All Time Sum
Oil Wellhead Value	$0	$285,663,606	$965,435,402	$1,409,120,531	$1,627,084,663	$18,021,176,008	$140,071,064,483	$158,092,240,491
Gas Wellhead Value	$0	$136,180,340	$492,269,761	$682,045,408	$887,052,386	$9,119,117,050	$77,823,691,600	$86,942,808,651
All WH Value (Gross Revenues)	$0	$421,843,946	$1,457,705,163	$2,091,165,939	$2,514,137,049	$27,140,293,059	$217,894,756,083	$245,035,049,142
Royalties	$0	$70,307,324	$242,950,861	$348,527,657	$419,022,841	$4,523,382,176	$36,315,792,681	$40,839,174,857
Severance Taxes	$0	$0	$0	$0	$0	$0	$0	$0
Property Taxes	$0	$0	$0	$0	$0	$0	$0	$0
Income Taxes	-$38,799,639	-$59,688,277	$158,212,188	$311,518,751	$420,085,672	$3,039,926,366	$38,998,635,816	$42,038,562,183
Lease Bonuses	$20,000,000	$25,000,000	$25,000,000	$25,000,000	$25,000,000	$515,000,000	$1,504,937,500	$2,019,937,500
All Government Revenue	-$18,799,639	$35,619,048	$426,163,049	$685,046,407	$864,108,514	$8,078,308,543	$76,819,365,997	$84,897,674,540
Exploration Expenditures	$197,904,000	$247,380,000	$247,380,000	$247,380,000	$247,380,000	$5,096,028,000	$14,891,657,550	$19,987,685,550
G&G Expenses	$7,812,500	$9,765,625	$9,765,625	$9,765,625	$9,765,625	$201,171,875	$587,866,211	$789,038,086
Development Expenditures	$0	$138,589,389	$171,130,499	$184,077,270	$156,630,284	$2,906,166,466	$12,780,074,825	$15,686,241,290
Platform, Equip. Expend.	$0	$191,573,256	$198,729,854	$186,577,341	$181,991,334	$3,617,386,087	$12,943,875,936	$16,561,262,023
Capital Overhead	$36,114,640	$97,969,323	$104,320,957	$104,448,038	$99,322,759	$1,973,720,388	$6,833,345,923	$8,807,066,312
Total Capital Expenditures	$241,831,140	$685,277,593	$731,326,935	$732,248,274	$695,090,002	$13,794,472,816	$48,036,820,445	$61,831,293,261
O&M Expenditures	$0	$34,934,485	$124,049,714	$169,937,981	$196,095,505	$2,220,913,281	$20,609,568,646	$22,830,481,927
O&M Overhead	$0	$5,589,518	$19,847,954	$27,190,077	$31,375,281	$355,346,125	$3,297,530,983	$3,652,877,108
Total O&M Expenditures	$0	$40,524,002	$143,897,668	$197,128,058	$227,470,785	$2,576,259,406	$23,907,099,629	$26,483,359,036

Table 37 Eastern Gulf OCS Industry Revenues and Expenditures - Alternative Resource

Eastern GoM	2010	2015	2020	2025	2030	Sum to 2030	post - 2030	All Time Sum
Oil Wellhead Value	$0	$886,344,395	$3,587,967,673	$5,602,492,933	$7,438,063,546	$71,691,598,193	$814,193,144,204	$885,884,742,397
Gas Wellhead Value	$0	$248,376,594	$1,045,020,118	$1,723,736,160	$2,355,170,707	$21,930,343,081	$237,130,789,646	$259,061,132,727
All WH Value (Gross Revenues)	$0	$1,134,720,988	$4,632,987,790	$7,326,229,092	$9,793,234,253	$93,621,941,274	$1,051,323,933,851	$1,144,945,875,124
Royalties	$0	$189,120,165	$772,164,632	$1,221,038,182	$1,632,205,709	$15,603,656,879	$175,220,655,642	$190,824,312,521
Severance Taxes	$0	$0	$0	$0	$0	$0	$0	$0
Property Taxes	$0	$0	$0	$0	$0	$0	$0	$0
Income Taxes	-$38,799,639	$66,268,633	$904,829,252	$1,595,442,008	$2,274,188,953	$19,087,797,463	$225,574,102,060	$244,661,899,522
Lease Bonuses	$20,000,000	$25,000,000	$25,000,000	$25,000,000	$25,000,000	$515,000,000	$4,274,572,193	$4,789,572,193
All Government Revenue	-$18,799,639	$280,388,797	$1,701,993,884	$2,841,480,191	$3,931,394,662	$35,206,454,341	$405,069,329,894	$440,275,784,235
Exploration Expenditures	$197,904,000	$247,380,000	$247,380,000	$247,380,000	$247,380,000	$5,096,028,000	$42,297,746,759	$47,393,774,759
G&G Expenses	$7,812,500	$9,765,625	$9,765,625	$9,765,625	$9,765,625	$201,171,875	$1,669,754,763	$1,870,926,638
Development Expenditures	$0	$317,583,840	$356,318,340	$445,247,788	$365,124,844	$6,729,504,917	$45,133,528,901	$51,863,033,818
Platform, Equip. Expend.	$0	$371,444,572	$382,275,443	$386,604,087	$368,456,128	$7,195,703,037	$43,965,481,711	$51,161,184,748
Capital Overhead	$36,114,640	$155,387,846	$163,318,305	$178,239,600	$162,516,256	$3,157,985,253	$21,974,573,492	$25,132,558,745
Total Capital Expenditures	$241,831,140	$1,101,561,883	$1,159,057,714	$1,267,237,101	$1,153,242,853	$22,380,393,082	$155,041,085,626	$177,421,478,708
O&M Expenditures	$0	$90,475,336	$372,805,154	$556,729,460	$695,838,940	$7,132,394,285	$87,795,685,260	$94,928,079,544
O&M Overhead	$0	$14,476,054	$59,648,825	$89,076,714	$111,334,230	$1,141,183,086	$14,047,309,642	$15,188,492,727
Total O&M Expenditures	$0	$104,951,390	$432,453,979	$645,806,174	$807,173,170	$8,273,577,370	$101,842,994,901	$110,116,572,271

Table 38 Rockies Industry Revenues and Expenditures (additional access areas only)

Rockies Sum	2010	2015	2020	2025	2030	Sum to 2030	post - 2030	All Time Sum
Oil Wellhead Value	$8,842,764	$182,360,242	$465,528,983	$687,329,565	$743,078,894	$8,983,072,802	$13,720,256,535	$22,703,329,337
Gas Wellhead Value	$21,070,874	$332,289,202	$787,986,004	$1,122,854,218	$1,345,875,458	$15,230,840,732	$34,169,159,571	$49,400,000,303
All WH Value (Gross Revenues)	$29,913,638	$514,649,444	$1,253,514,987	$1,810,183,783	$2,088,954,352	$24,213,913,534	$47,889,416,106	$72,103,329,640
Royalties	$3,739,205	$64,331,181	$156,689,373	$226,272,973	$261,119,294	$3,026,739,192	$5,986,177,013	$9,012,916,205
Severance Taxes	$1,794,818	$30,878,967	$75,210,899	$108,611,027	$125,337,261	$1,452,834,812	$2,873,364,966	$4,326,199,778
Property Taxes	$1,431,383	$18,123,801	$35,376,257	$37,018,022	$30,070,579	$551,887,851	$465,599,772	$1,017,487,623
Income Taxes	-$5,093,351	-$41,807,003	-$45,850,716	$54,918,538	$190,681,663	$329,266,901	$6,854,721,549	$7,183,988,450
Lease Bonuses	$1,112,340	$6,674,042	$11,123,403	$10,567,233	$8,176,723	$172,782,646	$122,011,950	$294,794,595
All Government Revenue	$2,984,395	$78,200,988	$232,549,217	$437,387,792	$615,385,520	$5,533,511,402	$16,301,875,250	$21,835,386,652
Exploration Expenditures	$4,728,726	$28,372,358	$47,287,263	$44,922,899	$34,760,483	$734,525,064	$518,691,185	$1,253,216,249
G&G Expenses	$667,404	$4,004,425	$6,674,042	$6,340,340	$4,906,034	$103,669,587	$73,207,170	$176,876,757
Development Expenditures	$87,288,071	$523,728,424	$872,880,706	$829,236,671	$641,647,529	$13,558,677,789	$9,574,576,827	$23,133,254,616
Platform, Equip. Expend.	$1,830,185	$10,981,109	$18,301,848	$17,386,756	$13,453,540	$284,287,260	$200,751,891	$485,039,151
Capital Overhead	$15,300,276	$91,801,657	$153,002,762	$145,352,624	$112,471,090	$2,376,630,775	$1,678,278,244	$4,054,909,019
Total Capital Expenditures	$109,814,662	$658,887,972	$1,098,146,621	$1,043,239,290	$807,238,676	$17,057,790,475	$12,045,505,317	$29,103,295,792
O&M Expenditures	$1,819,336	$37,974,712	$108,443,161	$177,295,992	$226,862,054	$2,290,401,558	$5,369,325,607	$7,659,727,165
O&M Overhead	$291,094	$6,075,954	$17,350,906	$28,367,359	$36,297,929	$366,464,249	$859,092,097	$1,225,556,346
Total O&M Expenditures	$2,110,430	$44,050,666	$125,794,067	$205,663,351	$263,159,982	$2,656,865,807	$6,228,417,704	$8,885,283,511

Table 39 Sum of Five Regions - Industry Revenues and Expenditure - Middle Resource

Sum of Five Areas	2010	2015	2020	2025	2030	Sum to 2030	post - 2030	All Time Sum
Oil Wellhead Value	$8,842,764	$468,023,849	$11,961,933,379	$20,392,494,344	$24,583,390,545	$241,923,368,678	$1,071,262,350,905	$1,313,185,719,582
Gas Wellhead Value	$21,070,874	$468,469,542	$2,244,064,599	$3,758,508,438	$5,116,139,044	$47,588,127,147	$351,677,150,831	$399,265,277,978
All WH Value (Gross Revenues)	$29,913,638	$936,493,390	$14,205,997,978	$24,151,002,782	$29,699,529,588	$289,511,495,824	$1,422,939,501,736	$1,712,450,997,560
Royalties	$3,739,205	$134,638,505	$1,974,640,168	$3,340,283,498	$4,138,959,450	$40,175,720,562	$217,606,077,219	$257,781,797,781
Severance Taxes	$1,794,818	$30,878,967	$555,176,111	$1,798,685,198	$2,483,203,765	$19,799,389,298	$35,839,421,250	$55,638,810,548
Property Taxes	$1,431,383	$101,001,120	$263,137,718	$280,021,526	$229,852,596	$3,927,205,794	$6,178,142,916	$10,105,348,709
Income Taxes	-$43,892,990	-$1,076,099,220	$858,228,175	$3,003,176,195	$4,478,145,856	$28,322,863,900	$187,546,861,900	$215,869,725,801
Lease Bonuses	$21,112,340	$91,274,042	$95,723,403	$95,167,233	$92,776,723	$1,796,342,646	$5,789,106,808	$7,585,449,453
All Government Revenue	-$15,815,244	-$718,306,586	$3,746,905,575	$8,517,333,649	$11,422,938,390	$94,021,522,199	$452,959,610,093	$546,981,132,293
Exploration Expenditures	$202,632,726	$1,281,841,733	$1,300,756,638	$1,298,392,274	$1,288,229,858	$24,543,815,439	$83,470,786,237	$108,014,601,676
G&G Expenses	$8,479,904	$40,801,300	$43,470,917	$43,137,215	$41,702,909	$807,622,712	$2,500,128,697	$3,307,751,410
Development Expenditures	$87,288,071	$3,142,240,745	$3,936,092,819	$3,940,841,375	$2,659,029,852	$59,749,481,266	$107,244,891,332	$166,994,372,599
Platform, Equip. Expend.	$1,830,185	$2,178,836,944	$1,662,862,979	$1,537,565,795	$1,287,643,523	$28,874,973,133	$76,551,281,290	$105,426,254,423
Capital Overhead	$51,414,916	$1,077,599,162	$1,126,225,081	$1,106,416,623	$859,101,258	$18,523,557,631	$44,088,991,098	$62,612,548,730
Total Capital Expenditures	$351,645,802	$7,721,319,884	$8,069,408,433	$7,926,353,282	$6,135,707,401	$132,499,450,182	$313,856,078,655	$446,355,528,837
O&M Expenditures	$1,819,336	$72,909,197	$1,584,253,796	$2,601,354,276	$3,371,421,907	$31,716,179,005	$270,399,278,369	$302,115,457,374
O&M Overhead	$291,094	$11,665,472	$253,480,607	$416,216,684	$539,427,505	$5,074,588,641	$43,263,884,539	$48,338,473,180
Total O&M Expenditures	$2,110,430	$84,574,669	$1,837,734,403	$3,017,570,960	$3,910,849,412	$36,790,767,646	$313,663,162,908	$350,453,930,554

Table 40 Sum of Five Regions - Industry Revenues and Expenditures - Alternative Resource

Sum of Five Areas	2010	2015	2020	2025	2030	Sum to 2030	post - 2030	All Time Sum
Oil Wellhead Value	$8,842,764	$1,068,704,637	$21,279,269,179	$39,031,852,565	$45,685,179,573	$443,848,003,302	$3,287,922,104,408	$3,731,770,107,710
Gas Wellhead Value	$21,070,874	$580,665,796	$3,616,807,261	$6,780,464,940	$10,583,747,409	$86,155,017,822	$911,005,756,617	$997,160,774,439
All WH Value (Gross Revenues)	$29,913,638	$1,649,370,433	$24,896,076,441	$45,812,317,505	$56,268,926,982	$530,003,021,124	$4,198,927,861,025	$4,728,930,882,149
Royalties	$3,739,205	$253,451,345	$3,586,746,752	$6,603,930,512	$8,284,392,623	$76,971,020,585	$669,095,317,092	$746,066,337,677
Severance Taxes	$1,794,818	$30,878,967	$1,035,836,067	$3,193,471,509	$3,788,199,523	$31,822,754,941	$64,053,923,620	$95,876,678,561
Property Taxes	$1,431,383	$146,270,824	$347,514,365	$312,750,902	$242,565,075	$4,787,247,546	$9,232,272,757	$14,019,520,303
Income Taxes	-$43,892,990	-$1,273,228,770	$2,742,617,129	$7,774,186,701	$10,795,992,700	$78,808,002,017	$744,994,129,228	$823,802,131,245
Lease Bonuses	$21,112,340	$91,274,042	$95,723,403	$95,167,233	$92,776,723	$1,796,342,646	$13,800,007,784	$15,596,350,429
All Government Revenue	-$15,815,244	-$751,353,592	$7,808,437,717	$17,979,506,858	$23,203,926,645	$194,185,367,735	$1,501,175,650,481	$1,695,361,018,216
Exploration Expenditures	$202,632,726	$1,281,841,733	$1,300,756,638	$1,298,392,274	$1,288,229,858	$24,543,815,439	$187,888,767,976	$212,432,583,414
G&G Expenses	$8,479,904	$40,801,300	$43,470,917	$43,137,215	$41,702,909	$807,622,712	$5,711,301,915	$6,518,924,627
Development Expenditures	$87,288,071	$4,862,064,222	$5,534,268,692	$4,342,581,079	$3,100,404,715	$78,227,161,667	$231,802,706,270	$310,029,867,937
Platform, Equip. Expend.	$1,830,185	$3,364,729,425	$2,840,087,825	$1,968,914,131	$2,056,083,578	$43,516,772,785	$200,362,971,286	$243,879,744,071
Capital Overhead	$51,414,916	$1,542,513,715	$1,570,289,196	$1,239,710,709	$1,052,671,645	$23,822,674,440	$102,330,520,837	$126,153,195,277
Total Capital Expenditures	$351,645,802	$11,091,950,395	$11,288,873,267	$8,892,735,408	$7,539,092,705	$170,918,047,043	$728,096,268,284	$899,014,315,327
O&M Expenditures	$1,819,336	$128,450,049	$2,579,166,766	$4,419,147,836	$5,525,627,134	$52,504,502,221	$576,425,208,975	$628,929,711,196
O&M Overhead	$291,094	$20,552,008	$412,666,683	$707,063,654	$884,100,342	$8,400,720,355	$92,228,033,436	$100,628,753,791
Total O&M Expenditures	$2,110,430	$149,002,056	$2,991,833,448	$5,126,211,490	$6,409,727,476	$60,905,222,576	$668,653,242,411	$729,558,464,987

APPENDIX D. Economic Impact Tables for Middle and Alternative Resource Cases

- **Tables 41 to 43** present the IMPLAN estimates of the economic impacts of private sector oil and gas industry expenditures in the years 2010, 2020 and 2030 under the Middle Resource Case. **Tables 44 to 46** present the same information to the Alternative Case.
- **Tables 47 and 48** present the economic analysis by sector of the economy for the two resource scenarios.

Table 41 Economic Impacts of Private Sector Expenditures – 2010 Middle Resource

Middle Case, ANWR, 2010

	Direct	Indirect	Induced	Total	$/JOB Direct	$/JOB Indirect	$/JOB Induced	$/JOB Total
Output (Million 2006$)	$ -	$ -	$ -	$ -				
Employment (Number of Jobs)	-	-	-	-				
Total Value Added (Million 2006$)	$ -	$ -	$ -	$ -				
Labor Income (Million 2006$)	$ -	$ -	$ -	$ -				
Employee Compensation (Million 2006$)	$ -	$ -	$ -	$ -				
Proprietors Income (Million 2006$)	$ -	$ -	$ -	$ -				
Other Property Type Income (Million 2006$)	$ -	$ -	$ -	$ -				
Indirect Business Taxes (Million 2006$)	$ -	$ -	$ -	$ -				

Middle Case, Atlantic Offshore, 2010

	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ -	$ -	$ -	$ -				
Employment (Number of Jobs)	-	-	-	-				
Total Value Added (Million 2006$)	$ -	$ -	$ -	$ -				
Labor Income (Million 2006$)	$ -	$ -	$ -	$ -				
Employee Compensation (Million 2006$)	$ -	$ -	$ -	$ -				
Proprietors Income (Million 2006$)	$ -	$ -	$ -	$ -				
Other Property Type Income (Million 2006$)	$ -	$ -	$ -	$ -				
Indirect Business Taxes (Million 2006$)	$ -	$ -	$ -	$ -				

Middle Case, Eastern GOM, 2010

	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ 231	$ 114	$ 154	$ 498	468,928	236,305	136,676	237,413
Employment (Number of Jobs)	492	482	1,125	2,099				
Total Value Added (Million 2006$)	$ 145	$ 58	$ 84	$ 287	295,422	120,472	74,588	136,871
Labor Income (Million 2006$)	$ 58	$ 32	$ 47	$ 137	117,087	66,554	42,156	65,318
Employee Compensation (Million 2006$)	$ 33	$ 25	$ 41	$ 100	67,887	52,692	36,658	47,659
Proprietors Income (Million 2006$)	$ 24	$ 7	$ 6	$ 37				
Other Property Type Income (Million 2006$)	$ 77	$ 22	$ 29	$ 127				
Indirect Business Taxes (Million 2006$)	$ 11	$ 4	$ 8	$ 23				

Middle Case, Pacific Offshore, 2010

	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ -	$ -	$ -	$ -				
Employment (Number of Jobs)	-	-	-	-				
Total Value Added (Million 2006$)	$ -	$ -	$ -	$ -				
Labor Income (Million 2006$)	$ -	$ -	$ -	$ -				
Employee Compensation (Million 2006$)	$ -	$ -	$ -	$ -				
Proprietors Income (Million 2006$)	$ -	$ -	$ -	$ -				
Other Property Type Income (Million 2006$)	$ -	$ -	$ -	$ -				
Indirect Business Taxes (Million 2006$)	$ -	$ -	$ -	$ -				

Middle Case, Rockies, 2010

	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ 106	$ 90	$ 78	$ 275	402,281	207,734	136,676	216,163
Employment (Number of Jobs)	264	434	572	1,270				
Total Value Added (Million 2006$)	$ 50	$ 42	$ 43	$ 135	188,958	96,706	74,588	105,920
Labor Income (Million 2006$)	$ 20	$ 26	$ 24	$ 71	75,466	61,065	42,156	55,538
Employee Compensation (Million 2006$)	$ 18	$ 22	$ 21	$ 61	66,483	51,631	36,658	47,971
Proprietors Income (Million 2006$)	$ 2	$ 4	$ 3	$ 10				
Other Property Type Income (Million 2006$)	$ 26	$ 13	$ 15	$ 54				
Indirect Business Taxes (Million 2006$)	$ 4	$ 3	$ 4	$ 10				

Middle Case, Sum of Five Areas, 2010

	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ 337	$ 204	$ 232	$ 773	445,642	222,779	136,676	229,402
Employment (Number of Jobs)	756	916	1,697	3,369				
Total Value Added (Million 2006$)	$ 195	$ 100	$ 127	$ 422	258,225	109,220	74,588	125,203
Labor Income (Million 2006$)	$ 78	$ 59	$ 72	$ 208	102,545	63,955	42,156	61,631
Employee Compensation (Million 2006$)	$ 51	$ 48	$ 62	$ 161	67,396	52,190	36,658	47,777
Proprietors Income (Million 2006$)	$ 27	$ 11	$ 9	$ 47				
Other Property Type Income (Million 2006$)	$ 103	$ 34	$ 43	$ 181				
Indirect Business Taxes (Million 2006$)	$ 14	$ 7	$ 12	$ 33				

Table 42 Economic Impacts of Private Sector Expenditures – 2020 Middle Resource

Middle Case, ANWR, 2020

	Direct	Indirect	Induced	Total	$/JOB Direct	$/JOB Indirect	$/JOB Induced	$/JOB Total
Output (Million 2006$)	$ 5,081	$ 3,944	$ 3,968	$ 12,992	308,938	205,775	136,676	200,992
Employment (Number of Jobs)	16,447	19,166	29,029	64,642				
Total Value Added (Million 2006$)	$ 2,582	$ 1,872	$ 2,165	$ 6,619	157,001	97,658	74,588	102,397
Labor Income (Million 2006$)	$ 1,187	$ 1,162	$ 1,224	$ 3,572	72,162	60,614	42,156	55,263
Employee Compensation (Million 2006$)	$ 977	$ 981	$ 1,064	$ 3,023	59,411	51,209	36,658	46,761
Proprietors Income (Million 2006$)	$ 210	$ 180	$ 160	$ 550				
Other Property Type Income (Million 2006$)	$ 1,222	$ 585	$ 742	$ 2,549				
Indirect Business Taxes (Million 2006$)	$ 173	$ 125	$ 200	$ 498				

Middle Case, Atlantic Offshore, 2020

	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ 1,124	$ 694	$ 857	$ 2,675	334,649	210,555	136,676	206,948
Employment (Number of Jobs)	3,358	3,296	6,271	12,925				
Total Value Added (Million 2006$)	$ 646	$ 346	$ 468	$ 1,460	192,448	105,140	74,588	112,999
Labor Income (Million 2006$)	$ 298	$ 206	$ 264	$ 768	88,627	62,628	42,156	59,449
Employee Compensation (Million 2006$)	$ 210	$ 170	$ 230	$ 610	62,553	51,472	36,658	47,163
Proprietors Income (Million 2006$)	$ 88	$ 37	$ 34	$ 159				
Other Property Type Income (Million 2006$)	$ 307	$ 115	$ 160	$ 583				
Indirect Business Taxes (Million 2006$)	$ 41	$ 25	$ 43	$ 109				

Middle Case, Eastern GOM, 2020

	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ 779	$ 472	$ 587	$ 1,838	344,735	211,240	136,676	209,147
Employment (Number of Jobs)	2,261	2,234	4,294	8,789				
Total Value Added (Million 2006$)	$ 452	$ 237	$ 320	$ 1,009	200,024	106,056	74,588	114,853
Labor Income (Million 2006$)	$ 204	$ 141	$ 181	$ 526	90,389	62,911	42,156	59,838
Employee Compensation (Million 2006$)	$ 142	$ 115	$ 157	$ 414	62,811	51,508	36,658	47,160
Proprietors Income (Million 2006$)	$ 62	$ 25	$ 24	$ 111				
Other Property Type Income (Million 2006$)	$ 218	$ 79	$ 110	$ 407				
Indirect Business Taxes (Million 2006$)	$ 30	$ 17	$ 30	$ 76				

Middle Case, Pacific Offshore, 2020

	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ 1,061	$ 648	$ 803	$ 2,512	341,375	210,453	136,676	208,232
Employment (Number of Jobs)	3,108	3,080	5,878	12,066				
Total Value Added (Million 2006$)	$ 612	$ 325	$ 438	$ 1,376	197,064	105,639	74,588	114,059
Labor Income (Million 2006$)	$ 279	$ 193	$ 248	$ 720	89,683	62,800	42,156	59,667
Employee Compensation (Million 2006$)	$ 194	$ 159	$ 215	$ 568	62,560	51,462	36,658	47,109
Proprietors Income (Million 2006$)	$ 84	$ 35	$ 32	$ 152				
Other Property Type Income (Million 2006$)	$ 294	$ 109	$ 150	$ 552				
Indirect Business Taxes (Million 2006$)	$ 40	$ 23	$ 40	$ 104				

Middle Case, Rockies, 2020

	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ 1,164	$ 958	$ 861	$ 2,983	381,661	207,648	136,676	213,637
Employment (Number of Jobs)	3,049	4,615	6,297	13,961				
Total Value Added (Million 2006$)	$ 560	$ 449	$ 470	$ 1,479	183,786	97,311	74,588	105,946
Labor Income (Million 2006$)	$ 228	$ 282	$ 265	$ 776	74,914	61,061	42,156	55,559
Employee Compensation (Million 2006$)	$ 197	$ 238	$ 231	$ 665	64,520	51,556	36,658	47,668
Proprietors Income (Million 2006$)	$ 32	$ 44	$ 35	$ 110				
Other Property Type Income (Million 2006$)	$ 291	$ 137	$ 161	$ 590				
Indirect Business Taxes (Million 2006$)	$ 40	$ 30	$ 43	$ 114				

Middle Case, Sum of Five Areas, 2020

	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ 9,209	$ 6,716	$ 7,076	$ 23,000	326,293	207,350	136,676	204,663
Employment (Number of Jobs)	28,222	32,391	51,769	112,382				
Total Value Added (Million 2006$)	$ 4,853	$ 3,230	$ 3,861	$ 11,944	171,970	99,708	74,588	106,283
Labor Income (Million 2006$)	$ 2,196	$ 1,984	$ 2,182	$ 6,362	77,807	61,249	42,156	56,612
Employee Compensation (Million 2006$)	$ 1,720	$ 1,663	$ 1,898	$ 5,281	60,956	51,330	36,658	46,989
Proprietors Income (Million 2006$)	$ 476	$ 321	$ 285	$ 1,081				
Other Property Type Income (Million 2006$)	$ 2,333	$ 1,026	$ 1,323	$ 4,681				
Indirect Business Taxes (Million 2006$)	$ 325	$ 220	$ 356	$ 901				

Table 43 Economic Impacts of Private Sector Expenditures – 2030 Middle Resource

Middle Case, ANWR, 2030

	Direct	Indirect	Induced	Total	$/JOB Direct	$/JOB Indirect	$/JOB Induced	$/JOB Total
Output (Million 2006$)	$ 5,031	$ 3,464	$ 3,885	$ 12,379	292,714	206,058	136,676	198,326
Employment (Number of Jobs)	17,188	16,810	28,423	62,420				
Total Value Added (Million 2006$)	$ 2,763	$ 1,692	$ 2,120	$ 6,575	160,762	100,644	74,588	105,333
Labor Income (Million 2006$)	$ 1,272	$ 1,022	$ 1,198	$ 3,492	74,033	60,789	42,156	55,951
Employee Compensation (Million 2006$)	$ 993	$ 857	$ 1,042	$ 2,893	57,788	51,003	36,658	46,340
Proprietors Income (Million 2006$)	$ 279	$ 165	$ 156	$ 600				
Other Property Type Income (Million 2006$)	$ 1,294	$ 558	$ 726	$ 2,578				
Indirect Business Taxes (Million 2006$)	$ 197	$ 112	$ 196	$ 504				

Middle Case, Atlantic Offshore, 2030

	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ 1,259	$ 789	$ 970	$ 3,017	329,039	204,523	136,676	204,177
Employment (Number of Jobs)	3,825	3,857	7,096	14,779				
Total Value Added (Million 2006$)	$ 717	$ 400	$ 529	$ 1,646	187,375	103,680	74,588	111,376
Labor Income (Million 2006$)	$ 330	$ 241	$ 299	$ 870	86,192	62,424	42,156	58,845
Employee Compensation (Million 2006$)	$ 235	$ 197	$ 260	$ 693	61,470	51,170	36,658	46,868
Proprietors Income (Million 2006$)	$ 95	$ 43	$ 39	$ 177				
Other Property Type Income (Million 2006$)	$ 340	$ 130	$ 181	$ 651				
Indirect Business Taxes (Million 2006$)	$ 47	$ 29	$ 49	$ 125				

Middle Case, Eastern GOM, 2030

	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ 831	$ 510	$ 632	$ 1,972	338,511	206,843	136,676	206,733
Employment (Number of Jobs)	2,454	2,464	4,620	9,539				
Total Value Added (Million 2006$)	$ 478	$ 258	$ 345	$ 1,081	194,925	104,827	74,588	113,362
Labor Income (Million 2006$)	$ 217	$ 155	$ 195	$ 566	88,305	62,706	42,156	59,338
Employee Compensation (Million 2006$)	$ 152	$ 126	$ 169	$ 448	62,006	51,287	36,658	46,959
Proprietors Income (Million 2006$)	$ 65	$ 28	$ 25	$ 118				
Other Property Type Income (Million 2006$)	$ 230	$ 85	$ 118	$ 433				
Indirect Business Taxes (Million 2006$)	$ 32	$ 19	$ 32	$ 82				

Middle Case, Pacific Offshore, 2030

	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ 1,259	$ 788	$ 969	$ 3,015	330,393	203,914	136,676	204,270
Employment (Number of Jobs)	3,810	3,863	7,089	14,762				
Total Value Added (Million 2006$)	$ 717	$ 400	$ 529	$ 1,646	188,195	103,683	74,588	111,524
Labor Income (Million 2006$)	$ 329	$ 241	$ 299	$ 869	86,256	62,453	42,156	58,850
Employee Compensation (Million 2006$)	$ 234	$ 198	$ 260	$ 691	61,355	51,137	36,658	46,821
Proprietors Income (Million 2006$)	$ 95	$ 44	$ 39	$ 178				
Other Property Type Income (Million 2006$)	$ 341	$ 130	$ 181	$ 652				
Indirect Business Taxes (Million 2006$)	$ 48	$ 29	$ 49	$ 125				

Middle Case, Rockies, 2030

	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ 1,020	$ 798	$ 760	$ 2,579	351,112	207,490	136,676	209,390
Employment (Number of Jobs)	2,906	3,848	5,564	12,318				
Total Value Added (Million 2006$)	$ 512	$ 379	$ 415	$ 1,306	176,124	98,423	74,588	105,990
Labor Income (Million 2006$)	$ 215	$ 235	$ 235	$ 685	74,097	61,053	42,156	55,595
Employee Compensation (Million 2006$)	$ 179	$ 198	$ 204	$ 581	61,611	51,420	36,658	47,157
Proprietors Income (Million 2006$)	$ 36	$ 37	$ 31	$ 104				
Other Property Type Income (Million 2006$)	$ 259	$ 119	$ 142	$ 520				
Indirect Business Taxes (Million 2006$)	$ 37	$ 25	$ 38	$ 101				

Middle Case, Sum of Five Areas, 2030

	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ 9,400	$ 6,348	$ 7,215	$ 22,964	311,421	205,839	136,676	201,759
Employment (Number of Jobs)	30,184	30,841	52,792	113,817				
Total Value Added (Million 2006$)	$ 5,187	$ 3,129	$ 3,938	$ 12,254	171,855	101,462	74,588	107,665
Labor Income (Million 2006$)	$ 2,363	$ 1,893	$ 2,226	$ 6,482	78,283	61,388	42,156	56,948
Employee Compensation (Million 2006$)	$ 1,793	$ 1,576	$ 1,935	$ 5,305	59,416	51,115	36,658	46,611
Proprietors Income (Million 2006$)	$ 569	$ 317	$ 290	$ 1,177				
Other Property Type Income (Million 2006$)	$ 2,464	$ 1,022	$ 1,349	$ 4,835				
Indirect Business Taxes (Million 2006$)	$ 361	$ 214	$ 363	$ 938				

Table 44 Economic Impacts of Private Sector Expenditures – 2010 Alternative Resource

High Case, ANWR, 2010

	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ -	$ -	$ -	$ -
Employment (Number of Jobs)	-	-	-	-
Total Value Added (Million 2006$)	$ -	$ -	$ -	$ -
Labor Income (Million 2006$)	$ -	$ -	$ -	$ -
Employee Compensation (Million 2006$)	$ -	$ -	$ -	$ -
Proprietors Income (Million 2006$)	$ -	$ -	$ -	$ -
Other Property Type Income (Million 2006$)	$ -	$ -	$ -	$ -
Indirect Business Taxes (Million 2006$)	$ -	$ -	$ -	$ -

$/JOB			
Direct	Indirect	Induced	Total

Alternative Case, Atlantic Offshore, 2010

	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ -	$ -	$ -	$ -
Employment (Number of Jobs)	-	-	-	-
Total Value Added (Million 2006$)	$ -	$ -	$ -	$ -
Labor Income (Million 2006$)	$ -	$ -	$ -	$ -
Employee Compensation (Million 2006$)	$ -	$ -	$ -	$ -
Proprietors Income (Million 2006$)	$ -	$ -	$ -	$ -
Other Property Type Income (Million 2006$)	$ -	$ -	$ -	$ -
Indirect Business Taxes (Million 2006$)	$ -	$ -	$ -	$ -

Direct	Indirect	Induced	Total

Alternative Case, Eastern GOM, 2010

	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ 231	$ 114	$ 154	$ 498
Employment (Number of Jobs)	492	482	1,125	2,099
Total Value Added (Million 2006$)	$ 145	$ 58	$ 84	$ 287
Labor Income (Million 2006$)	$ 58	$ 32	$ 47	$ 137
Employee Compensation (Million 2006$)	$ 33	$ 25	$ 41	$ 100
Proprietors Income (Million 2006$)	$ 24	$ 7	$ 6	$ 37
Other Property Type Income (Million 2006$)	$ 77	$ 22	$ 29	$ 127
Indirect Business Taxes (Million 2006$)	$ 11	$ 4	$ 8	$ 23

Direct	Indirect	Induced	Total
468,928	236,305	136,676	237,413
295,422	120,472	74,588	136,871
117,087	66,554	42,156	65,318
67,887	52,692	36,658	47,659

Alternative Case, Pacific Offshore, 2010

	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ -	$ -	$ -	$ -
Employment (Number of Jobs)	-	-	-	-
Total Value Added (Million 2006$)	$ -	$ -	$ -	$ -
Labor Income (Million 2006$)	$ -	$ -	$ -	$ -
Employee Compensation (Million 2006$)	$ -	$ -	$ -	$ -
Proprietors Income (Million 2006$)	$ -	$ -	$ -	$ -
Other Property Type Income (Million 2006$)	$ -	$ -	$ -	$ -
Indirect Business Taxes (Million 2006$)	$ -	$ -	$ -	$ -

Direct	Indirect	Induced	Total

Alternative Case, Rockies, 2010

	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ 106	$ 90	$ 78	$ 275
Employment (Number of Jobs)	264	434	572	1,270
Total Value Added (Million 2006$)	$ 50	$ 42	$ 43	$ 135
Labor Income (Million 2006$)	$ 20	$ 26	$ 24	$ 71
Employee Compensation (Million 2006$)	$ 18	$ 22	$ 21	$ 61
Proprietors Income (Million 2006$)	$ 2	$ 4	$ 3	$ 10
Other Property Type Income (Million 2006$)	$ 26	$ 13	$ 15	$ 54
Indirect Business Taxes (Million 2006$)	$ 4	$ 3	$ 4	$ 10

Direct	Indirect	Induced	Total
402,281	207,734	136,676	216,163
188,958	96,706	74,588	105,920
75,466	61,065	42,156	55,538
66,483	51,631	36,658	47,971

Alternative Case, Sum of Five Areas, 2010

	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ 337	$ 204	$ 232	$ 773
Employment (Number of Jobs)	756	916	1,697	3,369
Total Value Added (Million 2006$)	$ 195	$ 100	$ 127	$ 422
Labor Income (Million 2006$)	$ 78	$ 59	$ 72	$ 208
Employee Compensation (Million 2006$)	$ 51	$ 48	$ 62	$ 161
Proprietors Income (Million 2006$)	$ 27	$ 11	$ 9	$ 47
Other Property Type Income (Million 2006$)	$ 103	$ 34	$ 43	$ 181
Indirect Business Taxes (Million 2006$)	$ 14	$ 7	$ 12	$ 33

Direct	Indirect	Induced	Total
445,642	222,779	136,676	229,402
258,225	109,220	74,588	125,203
102,545	63,955	42,156	61,631
67,396	52,190	36,658	47,777

Table 45 Economic Impacts of Private Sector Expenditures – 2020 Alternative Resource

High Case, ANWR, 2020

	Direct	Indirect	Induced	Total	$/JOB Direct	$/JOB Indirect	$/JOB Induced	$/JOB Total
Output (Million 2006$)	$ 7,210	$ 5,602	$ 5,679	$ 18,490	300,938	205,444	136,676	199,306
Employment (Number of Jobs)	23,957	27,266	41,548	92,772				
Total Value Added (Million 2006$)	$ 3,666	$ 2,658	$ 3,099	$ 9,423	153,012	97,490	74,588	101,572
Labor Income (Million 2006$)	$ 1,711	$ 1,650	$ 1,752	$ 5,113	71,419	60,530	42,156	55,113
Employee Compensation (Million 2006$)	$ 1,409	$ 1,395	$ 1,523	$ 4,327	58,814	51,159	36,658	46,642
Proprietors Income (Million 2006$)	$ 302	$ 256	$ 228	$ 786				
Other Property Type Income (Million 2006$)	$ 1,713	$ 830	$ 1,062	$ 3,605				
Indirect Business Taxes (Million 2006$)	$ 241	$ 177	$ 286	$ 705				

Alternative Case, Atlantic Offshore, 2020

	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ 1,981	$ 1,276	$ 1,554	$ 4,811	313,902	205,556	136,676	201,391
Employment (Number of Jobs)	6,309	6,209	11,369	23,887				
Total Value Added (Million 2006$)	$ 1,115	$ 637	$ 848	$ 2,600	176,759	102,634	74,588	108,865
Labor Income (Million 2006$)	$ 530	$ 385	$ 479	$ 1,394	83,995	62,026	42,156	58,372
Employee Compensation (Million 2006$)	$ 389	$ 318	$ 417	$ 1,124	61,598	51,234	36,658	47,034
Proprietors Income (Million 2006$)	$ 141	$ 67	$ 63	$ 271				
Other Property Type Income (Million 2006$)	$ 516	$ 207	$ 290	$ 1,013				
Indirect Business Taxes (Million 2006$)	$ 69	$ 46	$ 78	$ 193				

Alternative Case, Eastern GOM, 2020

	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ 1,414	$ 899	$ 1,098	$ 3,411	322,577	203,949	136,676	202,720
Employment (Number of Jobs)	4,382	4,408	8,035	16,826				
Total Value Added (Million 2006$)	$ 800	$ 454	$ 599	$ 1,853	182,452	103,033	74,588	110,134
Labor Income (Million 2006$)	$ 372	$ 274	$ 339	$ 985	84,887	62,244	42,156	58,548
Employee Compensation (Million 2006$)	$ 269	$ 225	$ 295	$ 789	61,396	51,153	36,658	46,899
Proprietors Income (Million 2006$)	$ 103	$ 49	$ 44	$ 196				
Other Property Type Income (Million 2006$)	$ 376	$ 147	$ 205	$ 728				
Indirect Business Taxes (Million 2006$)	$ 52	$ 33	$ 55	$ 140				

Alternative Case, Pacific Offshore, 2020

	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ 1,421	$ 891	$ 1,094	$ 3,406	328,043	207,510	136,676	204,791
Employment (Number of Jobs)	4,330	4,296	8,007	16,633				
Total Value Added (Million 2006$)	$ 810	$ 447	$ 597	$ 1,854	186,988	104,077	74,588	111,467
Labor Income (Million 2006$)	$ 376	$ 268	$ 338	$ 981	86,755	62,417	42,156	59,000
Employee Compensation (Million 2006$)	$ 268	$ 220	$ 294	$ 782	61,993	51,323	36,658	47,042
Proprietors Income (Million 2006$)	$ 107	$ 48	$ 44	$ 199				
Other Property Type Income (Million 2006$)	$ 382	$ 147	$ 205	$ 734				
Indirect Business Taxes (Million 2006$)	$ 52	$ 32	$ 55	$ 139				

Alternative Case, Rockies, 2020

	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ 1,164	$ 958	$ 861	$ 2,983	381,661	207,648	136,676	213,637
Employment (Number of Jobs)	3,049	4,615	6,297	13,961				
Total Value Added (Million 2006$)	$ 560	$ 449	$ 470	$ 1,479	183,786	97,311	74,588	105,946
Labor Income (Million 2006$)	$ 228	$ 282	$ 265	$ 776	74,914	61,061	42,156	55,559
Employee Compensation (Million 2006$)	$ 197	$ 238	$ 231	$ 665	64,520	51,556	36,658	47,668
Proprietors Income (Million 2006$)	$ 32	$ 44	$ 35	$ 110				
Other Property Type Income (Million 2006$)	$ 291	$ 137	$ 161	$ 590				
Indirect Business Taxes (Million 2006$)	$ 40	$ 30	$ 43	$ 114				

Alternative Case, Sum of Five Areas, 2020

	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ 13,188	$ 9,627	$ 10,286	$ 33,101	313,789	205,725	136,676	201,735
Employment (Number of Jobs)	42,028	46,795	75,256	164,079				
Total Value Added (Million 2006$)	$ 6,951	$ 4,646	$ 5,613	$ 17,210	165,380	99,282	74,588	104,887
Labor Income (Million 2006$)	$ 3,217	$ 2,860	$ 3,173	$ 9,249	76,545	61,116	42,156	56,372
Employee Compensation (Million 2006$)	$ 2,532	$ 2,397	$ 2,759	$ 7,688	60,243	51,223	36,658	46,853
Proprietors Income (Million 2006$)	$ 685	$ 463	$ 414	$ 1,562				
Other Property Type Income (Million 2006$)	$ 3,279	$ 1,468	$ 1,923	$ 6,670				
Indirect Business Taxes (Million 2006$)	$ 455	$ 318	$ 518	$ 1,290				

Table 46 Economic Impacts of Private Sector Expenditures – 2030 Alternative Resource

High Case, ANWR, 2030

	Direct	Indirect	Induced	Total	$/JOB Direct	$/JOB Indirect	$/JOB Induced	$/JOB Total
Output (Million 2006$)	$ 5,743	$ 3,848	$ 4,468	$ 14,059	281,467	205,696	136,676	195,805
Employment (Number of Jobs)	20,404	18,708	32,689	71,801				
Total Value Added (Million 2006$)	$ 3,208	$ 1,892	$ 2,438	$ 7,539	157,228	101,159	74,588	104,996
Labor Income (Million 2006$)	$ 1,501	$ 1,136	$ 1,378	$ 4,015	73,584	60,723	42,156	55,925
Employee Compensation (Million 2006$)	$ 1,161	$ 952	$ 1,198	$ 3,311	56,879	50,886	36,658	46,112
Proprietors Income (Million 2006$)	$ 341	$ 184	$ 180	$ 705				
Other Property Type Income (Million 2006$)	$ 1,480	$ 631	$ 835	$ 2,946				
Indirect Business Taxes (Million 2006$)	$ 227	$ 126	$ 225	$ 577				

Alternative Case, Atlantic Offshore, 2030

	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ 2,596	$ 1,710	$ 2,069	$ 6,375	306,197	196,613	136,676	197,289
Employment (Number of Jobs)	8,478	8,697	15,136	32,311				
Total Value Added (Million 2006$)	$ 1,439	$ 875	$ 1,129	$ 3,443	169,716	100,608	74,588	106,552
Labor Income (Million 2006$)	$ 682	$ 537	$ 638	$ 1,857	80,417	61,770	42,156	57,475
Employee Compensation (Million 2006$)	$ 508	$ 442	$ 555	$ 1,505	59,930	50,784	36,658	46,567
Proprietors Income (Million 2006$)	$ 174	$ 96	$ 83	$ 352				
Other Property Type Income (Million 2006$)	$ 663	$ 275	$ 387	$ 1,324				
Indirect Business Taxes (Million 2006$)	$ 95	$ 63	$ 104	$ 262				

Alternative Case, Eastern GOM, 2030

	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ 1,776	$ 1,152	$ 1,399	$ 4,327	314,236	197,750	136,676	199,267
Employment (Number of Jobs)	5,651	5,827	10,238	21,715				
Total Value Added (Million 2006$)	$ 991	$ 591	$ 764	$ 2,346	175,457	101,388	74,588	108,027
Labor Income (Million 2006$)	$ 463	$ 361	$ 432	$ 1,256	81,922	61,984	42,156	57,824
Employee Compensation (Million 2006$)	$ 340	$ 296	$ 375	$ 1,012	60,203	50,842	36,658	46,591
Proprietors Income (Million 2006$)	$ 123	$ 65	$ 56	$ 244				
Other Property Type Income (Million 2006$)	$ 462	$ 187	$ 262	$ 911				
Indirect Business Taxes (Million 2006$)	$ 66	$ 43	$ 70	$ 179				

Alternative Case, Pacific Offshore, 2030

	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ 1,843	$ 1,192	$ 1,451	$ 4,487	314,333	198,427	136,676	199,486
Employment (Number of Jobs)	5,863	6,009	10,619	22,490				
Total Value Added (Million 2006$)	$ 1,031	$ 610	$ 792	$ 2,433	175,875	101,542	74,588	108,193
Labor Income (Million 2006$)	$ 482	$ 373	$ 448	$ 1,302	82,229	61,995	42,156	57,903
Employee Compensation (Million 2006$)	$ 353	$ 306	$ 389	$ 1,048	60,288	50,870	36,658	46,615
Proprietors Income (Million 2006$)	$ 129	$ 67	$ 58	$ 254				
Other Property Type Income (Million 2006$)	$ 480	$ 194	$ 271	$ 945				
Indirect Business Taxes (Million 2006$)	$ 69	$ 44	$ 73	$ 186				

Alternative Case, Rockies, 2030

	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ 1,020	$ 798	$ 760	$ 2,579	351,112	207,490	136,676	209,390
Employment (Number of Jobs)	2,906	3,848	5,564	12,318				
Total Value Added (Million 2006$)	$ 512	$ 379	$ 415	$ 1,306	176,124	98,423	74,588	105,990
Labor Income (Million 2006$)	$ 215	$ 235	$ 235	$ 685	74,097	61,053	42,156	55,595
Employee Compensation (Million 2006$)	$ 179	$ 198	$ 204	$ 581	61,611	51,420	36,658	47,157
Proprietors Income (Million 2006$)	$ 36	$ 37	$ 31	$ 104				
Other Property Type Income (Million 2006$)	$ 259	$ 119	$ 142	$ 520				
Indirect Business Taxes (Million 2006$)	$ 37	$ 25	$ 38	$ 101				

Alternative Case, Sum of Five Areas, 2030

	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Output (Million 2006$)	$ 12,978	$ 8,701	$ 10,148	$ 31,827	299,709	201,934	136,676	198,129
Employment (Number of Jobs)	43,302	43,089	74,245	160,636				
Total Value Added (Million 2006$)	$ 7,181	$ 4,347	$ 5,538	$ 17,066	165,845	100,888	74,588	106,243
Labor Income (Million 2006$)	$ 3,344	$ 2,642	$ 3,130	$ 9,115	77,215	61,312	42,156	56,745
Employee Compensation (Million 2006$)	$ 2,541	$ 2,193	$ 2,722	$ 7,457	58,689	50,905	36,658	46,419
Proprietors Income (Million 2006$)	$ 802	$ 448	$ 408	$ 1,659				
Other Property Type Income (Million 2006$)	$ 3,345	$ 1,405	$ 1,897	$ 6,647				
Indirect Business Taxes (Million 2006$)	$ 493	$ 300	$ 511	$ 1,304				

Table 47 Middle Resource Economic Impacts by Sector -2030

Sector	Direct Output	Indirect Output	Induced Output	Total Output	Direct Employment	Indirect Employment	Induced Employment	Total Employment	Sector Name
19	2,365,348,800	420,458,020	70,585,940	2,856,392,700	3,247	577	97	3,921	Oil and gas extraction
27	1,704,900,660	3,166,714	75,896	1,708,143,430	2,546	5	0	2,551	Drilling oil and gas wells
28	1,815,114,900	64,118,894	1,529,855	1,880,763,900	7,989	282	7	8,278	Support activities for oil and gas operations
142	103,165,493	454,457,680	157,452,150	715,075,310	12	52	18	81	Petroleum refineries
191	256,511,940	24,060,868	920,587	281,493,350	410	38	1	450	Cement manufacturing
205	386,322,980	30,211,706	1,644,698	418,179,370	755	59	3	818	Iron- steel pipe and tube from purchased stee
261	317,378,560	25,619,710	194,584	343,192,860	851	69	1	920	Oil and gas field machinery and equipment
390	0	299,224,490	337,705,180	636,929,670	0	1,645	1,857	3,502	Wholesale trade
393	381,589,690	10,169,980	10,942,385	402,702,096	713	19	20	753	Water transportation
394	133,141,667	108,300,656	70,883,545	312,325,910	1,043	849	556	2,448	Truck transportation
422	28,208,954	181,043,410	160,085,330	369,337,680	68	437	387	892	Telecommunications
427	357,061,140	121,093,650	193,433,620	671,588,480	1,364	463	739	2,566	Insurance carriers
428	709,250	183,597,920	74,978,799	259,286,010	5	1,277	521	1,803	Insurance agencies- brokerages- and related
430	0	117,546,270	190,563,180	308,109,440	0	454	736	1,191	Monetary authorities and depository credit in
431	353,554	203,232,160	380,752,360	584,338,150	2	1,162	2,176	3,340	Real estate
436	0	218,179,580	32,642,843	250,822,430	0	48	7	56	Lessors of nonfinancial intangible assets
437	35,364,667	128,389,745	90,706,616	254,461,050	253	919	649	1,821	Legal services
451	0	382,836,540	111,667,178	494,503,710	0	1,817	530	2,347	Management of companies and enterprises
481	103,043,628	30,091,554	235,706,870	368,841,990	2,018	589	4,616	7,223	Food services and drinking places
509	0	0	530,488,130	530,488,130	0	0	0	0	Owner-occupied dwellings
All Sectors	**9,399,830,406**	**6,348,280,161**	**7,215,392,662**	**22,963,503,565**	**30,184**	**30,841**	**52,792**	**113,817**	

Table 48 Alternative Resource Economic Impacts by Sector -2030

Sector	Direct Output	Indirect Output	Induced Output	Total Output	Direct Employment	Indirect Employment	Induced Employment	Total Employment	Sector Name
19	3,332,010,800	557,316,410	99,270,406	3,988,597,500	4,573	765	136	5,475	Oil and gas extraction
27	1,711,062,630	4,418,580	106,627	1,715,587,810	2,555	7	0	2,562	Drilling oil and gas wells
28	2,499,941,500	89,447,518	2,151,556	2,591,540,600	11,003	394	9	11,406	Support activities for oil and gas operations
30	31,643,100	98,078,447	134,241,650	263,963,200	49	150	206	405	Power generation and supply
31	246,987,734	45,432,280	48,557,294	340,977,330	286	53	56	395	Natural gas distribution
142	114,535,090	563,022,720	221,436,970	898,994,800	13	64	25	102	Petroleum refineries
191	285,785,790	28,754,260	1,294,692	315,834,710	456	46	2	504	Cement manufacturing
203	0	245,027,760	13,766,977	258,794,740	0	275	15	290	Iron and steel mills
205	537,601,610	40,987,188	2,313,065	580,901,870	1,051	80	5	1,136	Iron- steel pipe and tube from purchased stee
261	454,614,890	29,772,918	273,657	484,661,410	1,218	80	1	1,299	Oil and gas field machinery and equipment
357	338,530,600	56,791,624	956,104	396,278,309	1,821	305	5	2,131	Ship building and repairing
390	0	398,257,300	474,940,500	873,197,800	0	2,190	2,611	4,801	Wholesale trade
393	883,433,100	12,014,477	15,389,122	910,836,666	1,652	22	29	1,703	Water transportation
394	145,796,401	138,690,040	99,688,940	384,175,410	1,143	1,087	781	3,011	Truck transportation
397	24	247,941,575	24,330,710	272,272,301	0	2,387	234	2,621	Scenic and sightseeing transportation and sup
422	45,732,172	253,434,940	225,140,220	524,307,360	110	612	544	1,266	Telecommunications
426	0	130,105,840	187,310,980	317,416,810	0	768	1,106	1,875	Securities- commodity contracts- investments
427	584,309,820	203,747,970	272,040,510	1,060,098,260	2,233	779	1,039	4,051	Insurance carriers
428	1,160,647	302,590,710	105,448,407	409,199,800	8	2,104	733	2,846	Insurance agencies- brokerages- and related
430	0	160,070,730	268,003,590	428,074,290	0	619	1,036	1,654	Monetary authorities and depository credit in
431	541,615	287,039,940	535,481,250	823,062,800	3	1,641	3,061	4,704	Real estate
436	0	305,589,790	45,908,131	351,497,920	0	68	10	78	Lessors of nonfinancial intangible assets
437	61,944,968	159,833,160	127,567,617	349,345,810	443	1,144	913	2,500	Legal services
439	155,658,980	155,834,882	51,135,543	362,629,420	1,243	1,245	408	2,896	Architectural and engineering services
451	0	464,826,150	157,046,080	621,872,230	0	2,206	745	2,952	Management of companies and enterprises
465	995,899	0	341,174,410	342,170,310	9	0	3,007	3,016	Offices of physicians- dentists- and other he
467	0	0	339,928,630	339,928,630	0	0	2,958	2,958	Hospitals
481	168,648,830	44,381,517	331,492,500	544,522,800	3,303	869	6,491	10,663	Food services and drinking places
509	0	0	746,065,860	746,065,860	0	0	0	0	Owner-occupied dwellings
All Sectors	**12,977,994,006**	**8,701,078,864**	**10,147,557,436**	**31,826,630,118**	**43,302**	**43,089**	**74,245**	**160,636**	