

U.S. Crude Oil and Natural Gas Production in Federal and Non-Federal Areas

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Summary

In 2012, oil prices ranged from \$80 to \$110 per barrel (West Texas Intermediate spot price) and remain high in early 2013. Congress is faced with proposals designed to increase domestic energy supply, enhance security, and/or amend the requirements of environmental statutes. A key question in this discussion is how much oil and gas is produced each year and how much of that comes from federal and non-federal areas. On non-federal lands, there were modest fluctuations in oil production from fiscal years (FY) 2008-2010, then a significant increase from FY2010 to FY2012 increasing total U.S. oil production by about 1.1 million barrels per day over FY2007 production levels. All of the increase from FY2007 to FY2012 took place on non-federal lands, and the federal share of total U.S. crude oil production fell by about seven percentage points.

Natural gas prices, on the other hand, have remained low for the past several years, allowing gas to become much more competitive with coal for power generation. The shale gas boom has resulted in rising supplies of natural gas. Overall, U.S. natural gas production rose by four trillion cubic feet (tcf) or 20% since 2007, while production on federal lands (onshore and offshore) fell by about 23% and production on non-federal lands grew by 40%. The big shale gas plays are primarily on non-federal lands and are attracting a significant portion of investment for natural gas development.

The number of producing acres may or may not be a function of how many acres are leased, and the amount of acres leased may or may not correlate to the amount of production, but in recent years, some members of Congress have proposed a \$4/acre lease fee for non-producing leases. This proposal grew out of the efforts to open more public land and water (offshore) for oil and gas drilling and development when gasoline prices spiked in 2006-2008. Some in Congress noted that there were many leases they believed were not being developed in a timely fashion, while at the same time, others in Congress were pushing for greater access to areas off-limits (such as the Arctic National Wildlife Refuge (ANWR) and areas under a leasing moratoria offshore). Higher rents for offshore leases were imposed by the Secretary of the Interior in 2009 to discourage holding unused leases and to move more leases into production if possible.

Another major issue that the 113th Congress may seek to address is streamlining the processing of applications for permits to drill (APDs). Some members contend that this would be one way to help boost energy production on federal lands. After a lease has been obtained, either competitively or non-competitively, an application for a permit to drill (APD) must be approved for each oil and gas well. Despite the new timeline for review (under the Energy Policy Act of 2005, P.L. 109-58), it took an average of 307 days for all parties to process (approve or deny) an APD in 2011, up from an average of 218 days in 2006. The difference, however, is that in 2006 it took the BLM an average of 127 days to process an APD, while in 2011 it took BLM 71 days. In 2006, the industry took an average of 91 days to complete an APD, but in 2011, industry took 236 days. The BLM stated in its FY2012 and FY2013 budget justifications that overall processing times per APD have increased because of the complexity of the process.

Contents

Introduction	1
U.S. Crude Oil Production: Federal and Non-Federal Areas (Fiscal Year)	1
U.S. Natural Gas Production: Federal and Non-Federal Areas (Fiscal Year)	3
EIA Projections	5
Oil and Natural Gas Lease Data for Federal Lands	
Producing Acres	6
Applications for Permits to Drill (APDs)	
Streamline Pilot	9
Concerns	9
Conclusions	10

Figures

Figure 1. U.S. Oil and Lease Condensat	e Production: Federal and Non-Federal Areas,
FY2007-2012	
Figure 2. U.S. Natural Gas Production:	Federal and Non-Federal Areas FY2007-FY20124

Tables

Table 1. U.S. Crude Oil Production: Federal and Non-Federal Areas FY2007-FY2012	2
Table 2. U.S. Natural Gas Production: Federal and Non-Federal Areas FY2007-FY2012	4
Table 3. EIA Oil Production Projections	5
Table 4. EIA Natural Gas Production Projections	5
Table 5. Oil and Gas Lease Data for Federal Lands, 2012	6
Table 6. Onshore Drilling Permits (FY2006-FY2011)	8

Contacts

Author Contact Information

Introduction¹

In 2012, oil prices ranged from \$80 to \$110 per barrel (West Texas Intermediate spot price) and remain high (above \$90/barrel) in early 2013. A number of proposals designed to increase domestic energy supply, enhance security, and/or amend the requirements of environmental statutes are before the 113th Congress. A key question in this discussion is how much oil and gas is produced in the United States each year and how much of that comes from federal versus non-federal areas. Oil production has fluctuated on both federal and non-federal lands over the past five fiscal years. On non-federal lands, there were modest fluctuations in oil production from fiscal years (FY) 2008-2010, then a larger increase from FY2010 to FY2012, increasing total U.S. oil production by about 1.1 million barrels per day over FY2007 production levels. All of the increased production from FY2007 to FY2012 took place on non-federal lands, causing the federal share of total U.S. crude oil production to fall by about seven percentage points (see **Table 1**).

Natural gas prices, on the other hand, have remained low for the past several years, allowing gas to become much more competitive with coal for power generation. The shale gas boom has resulted in rising supplies of natural gas. Overall, U.S. natural gas production rose by four trillion cubic feet (tcf) or 20% since 2007, while production on federal lands (onshore and offshore) fell by about 33% and production on non-federal lands grew by 40% (see **Table 2**). The big shale gas plays are primarily on non-federal lands and are attracting a significant portion of investment for natural gas development.

This report examines U.S. oil and natural gas production data for federal and non-federal areas with an emphasis on the past six years of production.²

U.S. Crude Oil Production: Federal and Non-Federal Areas (Fiscal Year)

Oil production has fluctuated widely between FY2007 and FY2012, yielding different results when comparing various years. For example, when comparing fiscal year 2010 with 2007, growth in the federal share of production was about 82% of the total. On federal lands, there was an increase in production from FY2008-FY2009 and another increase in FY2010, but then declines in FY2011 and FY2012, which brought production below FY2007 production levels. Historically, according to the Department of the Interior (DOI) data, crude oil production on federal lands was consistently under 20% of total U.S. production until the late 1990s when annual production surged on federal lands (primarily offshore) rising to over 30% in the early 2000s and reaching a high point of about 37% in FY2010.³ As a result of recent production increases on non-federal

¹ For a broader analysis of offshore oil and gas leasing and resources, please see CRS Report R40645, U.S. Offshore Oil and Gas Resources: Prospects and Processes, by Marc Humphries and Robert Pirog.

² For more information on U.S. oil development, see CRS Report R40872, U.S. Fossil Fuel Resources: Terminology, Reporting, and Summary, by Carl E. Behrens, Michael Ratner, and Carol Glover; CRS Report R41132, Outer Continental Shelf Moratoria on Oil and Gas Development, by Curry L. Hagerty; and CRS Report R40237, Federal Lands Managed by the Bureau of Land Management (BLM) and the Forest Service (FS): Issues in the 111th Congress, coordinated by Ross W. Gorte and Carol Hardy Vincent.

³ The early data 1980 and 1990s was taken from annual Mineral Revenue reports. The data used at that time were (continued...)

lands, a question is raised as to whether non-federal lands will regain a more dominant position of roughly 80%-85% of total U.S. crude oil production. The fact remains, however, that there are 5.3 billion barrels of proved oil reserves located on federal acreage onshore and another 5.6 billion barrels of proved reserves offshore (nearly all in the Gulf of Mexico). Taken together, U.S. federal oil reserves equal about 43% of all U.S. crude oil reserves, which are estimated at 25.2 billion barrels, according to the Energy Information Administration (EIA). Proved oil reserves are amounts accessible under current policy, prices, and technology.

Crude oil production on federal lands is likely to continue to make a significant contribution to the U.S energy supply picture and could remain consistently higher than previous decades, but still fall as a percent of total U.S. production, if production on non-federal lands continues to rise at a faster rate.

There is however, continued interest among some in Congress to open more federal lands for oil and gas development (e.g., the Arctic National Wildlife Refuge (ANWR) and areas offshore) and increase the speed of the permitting process. But having more lands accessible may not translate into higher levels of production on federal lands, as industry seeks out the most promising prospects and highest returns.

(Barreis per day)					
Fiscal Year	U.S. Total	Non-Federal	Total Federal (% of U.S. Total)	Federal Offshore	Federal Onshore
2012	6,208,200	4,580,800	l,627,400 (26)	1,295,900	331,500
2011	5,565,000	3,850,000	1,715,000 (31)	1,408,200	306,800
2010	5,442,600	3,453,600	l,989,000 (36.5)	1,693,200	295,800
2009	5,219,300	3,487,800	1,731,500 (33)	1,443,800	287,700
2008	5,001,100	3,450,400	1,550,700 (31)	1,265,800	284,900
2007	5,083,400	3,387,500	l,695,900 (33)	1,408,200	287,700

Table 1. U.S. Crude Oil Production: Federal and Non-Federal Areas FY2007-FY2012

(Barrols por day)

Source: Federal data obtained from ONRR Statistics, http://www.onrr.gov (using sales year data).

Notes: U.S. Fiscal Year Total data derived from EIA production data as a percent of total U.S. fiscal year production in Appendix A of EIA publication Sales of Fossil Fuels Produced from Federal and Indian Lands FY2003-FY2011, March 2012. The federal production data is consistent with BLM and BOEM statements about onshore and offshore federal production levels as percent of total U.S. crude oil production. 2012 U.S. Total data obtained from EIA Monthly Energy Review, February 2013.

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accounting data which are considered by the Office of Natural Resources Revenue as not very reliable. The more useful production volume data provided by ONRR now are based on fiscal year sales data.

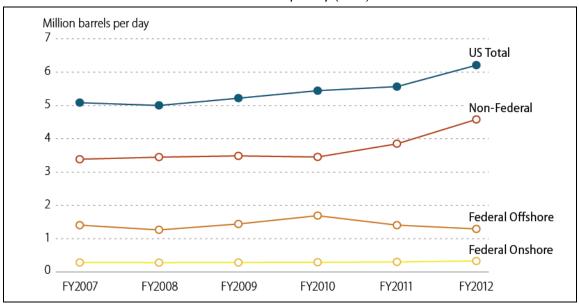


Figure 1. U.S. Oil and Lease Condensate Production: Federal and Non-Federal Areas, FY2007-2012

Million barrels per day (Mb/d)

Source: Federal data obtained from ONRR Statistics, http://www.onrr.gov (using sales year data). Figure created by CRS.

U.S. Natural Gas Production: Federal and Non-Federal Areas (Fiscal Year)

Natural gas production in the United States overall has increased each year since 2007, while production on federal lands has remained static or declined each year over the same period. Much of the decline can be attributed to offshore production falling by over 50%. Onshore production declines were less dramatic. Federal natural gas production has fluctuated from around 30% of total U.S. production for much of the 1980s through the early 2000s (34% of U.S. total in 2003), after which there began a steady decline through 2012.⁴ This picture of natural gas production is much different than that of federal crude oil in that federal natural gas had accounted for a much larger portion of total U.S. natural gas over that past few decades.

Any increase in production of natural gas on federal lands is likely to be easily outpaced by increases on non-federal lands, particularly because shale plays are primarily situated on non-federal lands and is where most of the growth in production is projected to occur.

Dry gas proved reserves were estimated at about 305 tcf by the EIA, of which the federal share is about 28% (69 tcf onshore; 16 tcf offshore). Nearly all of the offshore proved reserves are located in the Central and Western Gulf of Mexico.

⁴ U.S. natural gas production fell from about 7 trillion cubic feet in FY2003 to about 4.3 trillion cubic feet in FY2012.

Fiscal Year	U.S. Total	Non-Federal	Total Federal (% of U.S. Total)	Federal Offshore	Federal Onshore
2012	24,493	20,242	4,251 (17.7)	1,330	2,921
2011	23,587	18,978	4,609 (19.5)	1,654	2,955
2010	22,012	16,846	5,166 (23.5)	2,098	3,068
2009	21,609	16,233	5,376 (24.9)	2,206	3,170
2008	21,007	15,460	5,547 (26.4)	2,496	3,05 I
2007	19,959	14,415	5,544 (27.8)	2,709	2,835

Table 2. U.S. Natural Gas Production: Federal and Non-Federal Areas FY2007-FY2012

Source: Federal data obtained from ONRR Statistics, http://www.onrr.gov (using sales year data).

Notes: U.S. Fiscal Year Total data derived from EIA production data as a percent of total U.S. fiscal year production in Appendix A of EIA publication Sales of Fossil Fuels Produced from Federal and Indian Lands FY2003-FY2011, March 2012. The federal production data is consistent with BLM and BOEM statements about onshore and offshore federal production levels as percent of total U.S. crude oil production. 2012 U.S. Total data obtained from EIA Monthly Energy Review, February 2013.

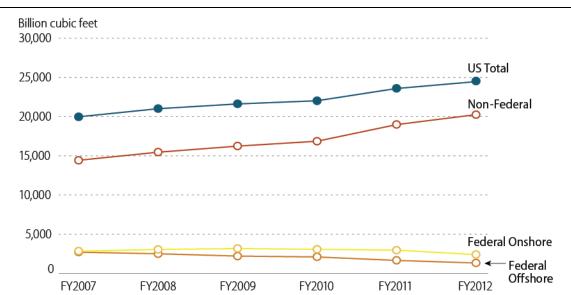


Figure 2. U.S. Natural Gas Production: Federal and Non-Federal Areas FY2007-FY2012

Source: Federal data obtained from ONRR Statistics, http://www.onrr.gov (using sales year data). Figure created by CRS.

EIA Projections

While short-term EIA estimates show oil production continuing to decline in federal offshore areas, their longer-term estimates show a slight increase in federal offshore oil production overall, from 1.3 mb/d in 2012 to 1.4-1.8 mb/d in 2040.⁵ Overall, the EIA projects U.S. oil production to rise from 5.59 mb/d in 2011 to about 6.13 mb/d by 2040 after reaching 6.7 mb/d in 2025.⁶ According to these estimates, offshore production in 2040 could range from 23% to 29% of total U.S. crude oil production. (See **Table 3**.)

Offshore natural gas production is projected to reverse a years-long decline in 2015, rising to 2.8 tcf annual production in 2040. Even though these projections are in calendar years 2.8 tcf is still very likely a doubling of current offshore production (provided in fiscal years in the earlier sections of this report) but would only account for an 8.4% share of total U.S. production in 2040. (See **Table 4**.)

Table 3. EIA Oil Production Projections

Year	U.S. Offshore	U.S. Total
2025	n/a	6.70
2040	1.4-1.8	6.13

Source: EIA 2013 Early Release projections Annual Energy Outlook, February 2013.

Table 4. EIA Natural Gas Production Projections

(t	rillion cubic feet per yea	r)
Year	U.S. Offshore	U.S. Total
2025	n/a	28.65
2040	2.8	33.21

Source: EIA 2013 Early Release Annual Energy Outlook, February 2013

Oil and Natural Gas Lease Data for Federal Lands

Currently, there are 113 million acres of onshore federal lands open and accessible for oil and gas development and about 166 million acres off-limits or inaccessible.⁷ The Bureau of Land

⁵ EIA, Early Release, Annual Energy Outlook, February 2013.

⁶ Ibid.

⁷ U.S. Depts. of the Interior, of Agriculture, and of Energy, *Inventory of Onshore Federal Oil and Natural Gas Resources and Restrictions to Their Development (Phase III)*, May 2008, available on the BLM website at http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/EPCA_III.html.

The availability of public lands for oil and gas leasing can be divided into three categories: lands open under standard lease terms, open to leasing with restrictions, and closed to leasing. Areas are closed to leasing pursuant to land withdrawals or other mechanisms. Much of this withdrawn land consists of wilderness areas, national parks and monuments, and other unique and environmentally sensitive areas that are unlikely to ever be reopened to oil and gas (continued...)

Management (BLM) is seeking to lease in areas where they anticipate fewer legal challenges and according to the BLM, they are addressing public concerns prior to a lease sale at a higher rate than in the past. In 2012, 56% of the onshore acreage under federal lease and 45% of federal onshore leases were not in production. Offshore, most of the 1.7 billion acres of federal water are no longer under leasing and development moratoria. The current five-year leasing program has lease sales scheduled in Western and Central Gulf of Mexico (GOM) and parts of Alaska.⁸ In the offshore areas, 72% of the acreage is leased and 75% of the leases are not in production.

According to the Bureau of Land Management (BLM) and the Bureau of Ocean Energy Management (BOEM), there are approximately 72.8 million acres of oil and gas leases in federal areas (onshore and offshore). About 37.0 million acres are located onshore and an additional 35.8 million acres are located offshore. Approximately 11.1 million federal acres onshore and about 6.6 million federal acres offshore are producing commercial volumes. (See **Table 5**.)

Table 5. On and Gas Lease Data for Federal Lands, 2012		
	Onshore	Offshore
Acreage under lease	37.0 million acres	35.8 million acres
Acreage with approved exploration or development plan (i.e., acreage in production or exploration)	16.3 million acres	10.1 million acres
Leased acres producing	11.1 million acres	6.6 million acres
Leased acres not in production or exploration	20.8 million acres	25.7 million acres
Number of Leases	49,213	6,621
Producing Leases (or with approved DOCD) ^a	27,300	1,611

Table 5. Oil and Gas Lease Data for Federal Lands, 2012

Source: DOI, Oil and Gas Utilization—Onshore and Offshore, Report to the President, May 2012.

a. A DOCD is a Development Operations Coordination Document that must be submitted for approval to BOEM before development activities begin.

Producing Acres

The number of producing acres may or may not be a function of how many acres are leased, and the amount of acres leased may or may not correlate to the amount of production, but it is beyond the scope of this report to examine that issue thoroughly. In recent years, some members of Congress have proposed a \$4/acre lease fee for non-producing leases. This proposal grew out of the efforts to open more public land and water (offshore) for oil and gas drilling and development when gasoline prices spiked in 2006-2008. Some in Congress noted that there were many leases they believed were not being developed in a timely manner, while at the same time, others in Congress were advocating greater access to areas off-limits (such as ANWR and areas under leasing moratoria offshore). Higher rents for offshore leases were imposed by the Secretary of the Interior in 2009 to discourage holding unused leases and to move more leases into production if

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leasing. Some lands are closed to leasing pending land use planning or NEPA compliance, while other areas are closed because of federal land management decisions on endangered species habitat or historical sites. Some of those restricted areas may be opened by future administrative decisions.

⁸ The Eastern GOM is under a leasing moratoria until 2022 under the Gulf of Mexico Energy Security Act and the North Aleutian Basin of Alaska was withdrawn from leasing under an executive order by the current Administration.

possible. The escalation in rents are significant over time as they rise from \$7/acre to \$28/acre (in year-8 forward) in water depths less than 200 meters and increase from \$11/acre to \$44/acre (in year-8 forward) in water depths between 200 and 400 meters. However, there was no similar escalation for onshore leases, as they remain \$1.50/acre for years 1-5, then rise to \$2/acre thereafter.⁹ A non-producing fee or an escalation of rents may not increase production but may reduce the ratio of producing leases to active leases. Thus, there might be fewer "idle" leases and acreage not in production or exploration. The BLM can re-lease acreage that has been relinquished or passed over at a future lease sale.

Applications for Permits to Drill (APDs)

Another major issue that the 113th Congress may address is streamlining the processing of applications for permits to drill (APDs). Some members contend that this would be one way to help boost energy production on federal lands. After a lease has been obtained, either competitively or noncompetitively, an application for a permit to drill must be approved for each oil and gas well. As noted in the Mineral Leasing Act, Section 226 (g), "no permit to drill on an oil and gas lease issued under this chapter may be granted without the analysis and approval by the Secretary concerned of a plan of operations covering proposed surface-disturbing activities within the lease area." The application form (APD form 3160-3) must include, among other things, a drilling plan, a surface use plan, and evidence of bond/surety coverage. The surface use plan should contain information on drillpad location, pad construction, the method for containment and waste disposal, and plans for surface reclamation.¹⁰

Prior to the Energy Policy Act of 2005 (P.L. 109-58, EPACT '05) a major concern that prompted the streamlining of permits debate was the lengthy timetable to process an APD. The BLM attributed the longer timelines to the rewriting of outdated Resource Management Plans (RMPs). There were several RMPs revised over the past decade. Leading up to the provisions in EPACT '05 that would attempt to streamline the permitting process, the BLM announced, in April 2003, new strategies to expedite the APD process. The new strategies included processing and conducting environmental analyses on multiple permit applications with similar characteristics, implementing geographic area development planning for an oil or gas field or an area within a field, establishing a standard operating practice agreement that identifies surface and drilling practices by oil and gas operators, allowing for a block survey of cultural resources, promoting consistent procedures, and revising relevant BLM manuals.¹¹ EPACT '05 Section 366 (Deadline for Consideration of Application for Permits) provided a new timeline for BLM to process APDs.¹²

⁹ DOI, Oil and Gas Lease Utilization, Onshore and Offshore, Updated Report to the President, May 2012, p.18.

¹⁰ U.S. Department of the Interior, Bureau of Land Management (BLM), *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development*, The Gold Book, Fourth Edition-Revised 2007, p. 8.

¹¹ DOI/BLM Instruction Memorandum No. 2003-152, Application for Permit to Drill Process Improvement#1-Comprehensive Strategies, April 14, 2003.

¹² Within 10 days of receiving the application from the operator, BLM shall notify the operator as to whether the application is complete and also schedule a site visit. If the application is not complete, the operator then has 45 days to submit additional information to BLM to complete the application or the application is returned to the operator. Within 30 days of receiving a completed application the BLM will approve or defer the application. If deferred, the operator has up to two years to take specified actions to complete the application or face the possibility of being denied a permit.

While the current Administration processed more APDs than it received from 2009-2011, it received far fewer applications over that period than the previous Administration had received from 2006-2008. As the number of pending applications has fallen steadily since 2008, the ratio of APDs pending to APDs processed was higher than during the period 2006-2008. In addition, there are 7,000 approved APDs that are not in the exploration or production stages (approved but not drilled).¹³ The BLM expected to process more than 5,000 APDs in each of the fiscal years 2012 and 2013.

Fiscal Year	APDs Received	APDs Processed	APDs Pending
2011	4,278	5,200	4,309
2010	4,251	5,237	4,603
2009	5,257	5,306	5,589
2008	7,884	7,846	5,638
2007	8,370	8,964	5,600
2006	10,492	8,854	6,194

Table 6. Onshore Drilling Permits (FY2006-FY2011)

Source: U.S. Department of the Interior, Oil and Gas Utilization, Onshore and Offshore, May 2012

Despite the new timeline for review, it took an average of 307 days for all parties to process (approve or deny) an APD in 2011, up from an average of 218 days in 2006.¹⁴ The difference however, is that in 2006 it took the BLM an average of 127 days to process an APD, while in 2011 it took BLM 71 days. In 2006, the industry took an average of 91 days to complete an APD, but in 2011, the industry took 236 days. Thus, since 2006, it took the BLM 56 fewer days to process APDs, while it took the industry145 days longer to submit a completed application.¹⁵ The BLM stated in its FY2012 and FY2013 budget justifications that overall processing times per APD have increased because of the complexity of the process.

Some critics of this lengthy timeframe highlight the relatively speedy process for permit processing on private lands. However, crude oil development on federal lands takes place in a wholly different regulatory framework than that of oil development on private lands.¹⁶ State agencies permit drilling activity on private lands within their state, with some approving permits within ten business days of submission. This faster approval rate does not necessarily diminish the additional work required by the state to address other state requirements. But oftentimes, some surface management issues are negotiated between the oil producer and the individual

¹³ U.S Department of the Interior, *Oil and Gas Lease Utilization, Onshore and Offshore, Updated Report to the President*, May 2012, p. 14.

¹⁴ Bureau of Land Management, "Average Application for Permit to Drill (APD) Approval Timeframes: FY2005-FY2012," http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/statistics/apd_chart.html.

¹⁵ Ibid.

¹⁶ Under the Federal Land Policy and Management Act (FLPMA), Resource Management Plans or Land Use Plans (43 USC 1712) are required for tracts or areas of public lands prior to development. The Bureau of Land Management (BLM) must consider environmental impacts during land-use planning when RMPs are developed and implemented. RMPs can cover large areas, often hundreds of thousands of acres across multiple counties. Through the land-use planning process, the BLM determines which lands with oil and gas potential will be made available for leasing.

land/mineral owner. A private versus federal permitting regime does not lend itself to an "applesto-apples" comparison.

Streamline Pilot

EPACT '05 also included a provision to initiate and fund (funding authorized through FY2015) a pilot program at seven BLM field offices in an effort to streamline the permitting process for oil and gas leases on federal lands. Results from the pilot project were published according to the timetable required by EPACT '05 (within three years after enactment). The conclusion was that the pilot made a difference in improving the processing times for APDs at the pilot offices overall and increased the number of environmental inspections. The BLM noted that the National Environmental Policy Act (NEPA) processing time for APDs and rights of way (ROW) applications fell from 81 to 61 days or roughly 25% due to "colocation" of agency staff. BLM reported that the number of environmental inspections went up by 78% from FY2006 to FY2007.¹⁷ However, the BLM reported mixed results at the specific field offices. While some of the offices processed more permits in 2007 than they did in 2005, all the pilot sites reported more completed environmental inspections.¹⁸

Concerns

A number of concerns may arise in the oil and gas leasing process that could delay or prevent oil and gas development from taking place, or might account for the relatively large number of leases held in non-producing status. It should be noted that many leases expire without exploration or production ever occurring.

Below is a list of often-cited issues which, individually or in combination, are used to explain why more leases are not producing.

- Rig or equipment availability, particularly offshore;
- High capital costs;
- Skilled labor shortages;
- Leases in the development cycle (e.g., conducting environmental reviews, permitting, or exploring) but not producing;
- Legal challenges that might delay or prevent development;
- No commercial discovery on a lease tract;
- Holding leases (because of the lack of capital or as "speculators") to sell or "farm out" at a later date;
- Ability to secure extensions on non-producing leases; and
- Securing and being able to hold large number of lease tracts, often contiguous, to maximize return on their investment;

¹⁷ Bureau of Land Management, BLM Year Two Report, Section 365 of EPACT 2005 Pilot Project to Improve Federal Permit Coordination, February 2008.

¹⁸ Ibid.

• The potential for inadequate coordination between the Department of the Interior's lease management and regulatory agencies (Bureau of Ocean Energy Management and Bureau of Safety and Environmental Enforcement) and other federal agencies to ensure protection of federal areas encompassing coastal and marine sanctuaries.

Conclusions

There are substantial oil and natural gas reserves and resource potential in federal areas, many of which are already accessible. Production from these areas will likely continue to make a significant contribution to the U.S. energy supply picture, but any rise in production, as projected by the EIA, will be outpaced by faster rising production in non-federal areas. A more efficient permitting process may be an added incentive for the industry to invest in developing federal resources, which may allow for some oil and gas to come onstream sooner, but in general, the regulatory framework for developing resources on federal lands will likely remain more involved and time-consuming than that on private land.

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