

## Chapter 4 Energy from Fossil Fuels

### Introduction

As manager of one-fifth of the nation's landmass and 1.7 billion acres offshore, the U.S. Department of the Interior (DOI or Interior) has the resources to help the country produce more conventional energy at home.

Fossil fuels continue to be a major component of our Nation's energy portfolio. The United States spends hundreds of billions of dollars each year to buy oil to power our country.<sup>19</sup> Dependence on foreign oil is a concern for our national security, our environment and our economy. Even as the Nation responded to the Deepwater Horizon oil spill in the Gulf of Mexico, total U.S. crude oil production was higher in 2010 than in any year since 2003. U.S. natural gas production is also increasing; withdrawals totaled 29.7 tcf (trillion cubic feet) in FY 2012, surpassing FY 2011 production by 6 percent. These are the highest levels of U.S. production since FY 2001, when withdrawals totaled 24.5 tcf. Overall, oil imports have fallen by 9 percent since 2008, and net imports as a share of total consumption have declined from approximately 60 percent over 2004 - 2008 to approximately 41 percent in 2012.

Public lands are a source of fossil fuel energy resources, and the public receives a return on assets developed under Interior management. The values for these commodities are reflected by their prices in well developed markets, though market prices do not reflect all of the costs and benefits associated with resource exploration, development, production, and use.

- Value added: \$131 B;
- Economic contribution: \$230 B;
- Employment supported: 1.2 M.

### Background – Oil, Gas, and Coal Leasing

#### *Oil and Gas Leasing*

Federal onshore oil and gas resources are managed by the Bureau of Land Management (BLM), and offshore federal oil and gas resources are managed by the Bureau of Ocean Energy Management (BOEM) and regulated by the Bureau of Safety and Environmental Enforcement (BSEE). Leasing on Native American lands is approved by the Bureau of Indian Affairs (BIA).

Onshore and offshore leases are awarded to oil and gas companies using competitive bonus-bid auctions. Winning bidders pay the bonus bid, a per-acre rent prior to first production, and royalties once production begins. There are some differences between the onshore and offshore leasing processes:

- Onshore, parcels are nominated for leasing by interested parties. Parcels identified by BLM as available for leasing are then sold at a competitive auction using an oral bidding process. For two years after a parcel is not sold at a competitive auction, the BLM offers it "over-the-counter" on a non-competitive basis, in accordance with statute.

<sup>19</sup> See EIA's Annual Energy Review, <http://www.eia.gov/totalenergy/data/annual/showtext.cfm?t=ptb0520>.  
Chapter 4 Energy from Fossil Fuels

- Offshore, BOEM identifies available acres using public comment and publishes a five-year

leasing program. Leases are then sold using a sealed bid auction where the highest qualified bidder is awarded the lease (following a thorough fair market value evaluation). The 2012-2017 oil and gas leasing program continues to make available more than 75 percent of undiscovered technically recoverable oil and gas estimated to be on the OCS.<sup>20</sup>

- Parcels on tribal land are nominated for leasing by a mineral owner, a mineral development company or a tribe by passage of a resolution. Leases are then awarded via competitive auction or negotiation between Indian mineral owner and an interested party. The BIA approves the lease and BLM issues the drilling permit.<sup>21</sup>

## Oil Spill Response Planning

During FY 2012, BSEE approved the Oil Spill Response Plan (OSRP) for Shell Gulf of Mexico, Inc.'s operations in the Chukchi and Beaufort Seas. Also in FY 2012, Interior coordinated exercises and emergency response planning by U.S. agencies in the Arctic; expanded scientific work, information collection and data sharing among agencies, industry, and research institutions to inform Arctic planning; and undertook long-term, landscape-scale planning for

Oil and gas royalty rates vary, depending on whether the production is off- or onshore. The onshore rate is typically 12.5%; the offshore rate can range from 12.5% to 18.75%. Some Oil and gas revenues (bonus bids, annual rents, and royalties) are shared with states.

### Coal Leasing

BLM has responsibility for coal leasing on approximately 570 million acres where the coal mineral estate is owned by the Federal Government. The surface estate of these lands could be controlled by BLM, the United States Forest Service, private land owners, state land owners, or other Federal agencies. Public lands are available for coal leasing only after the lands have been evaluated through the BLM's multiple-use planning process. In areas where development of coal resources may conflict with the protection and management of other resources or public land uses, the BLM may identify mitigating measures. Coal on federal land is primarily leased competitively in the following manner<sup>22</sup>:

- (1) By regional leasing, where the BLM selects tracts within a region for competitive sale,<sup>23</sup> or
- (2) By application, where the public nominates a particular tract of coal for competitive sale.

<sup>20</sup> For additional details see: <http://www.boem.gov/5-year/2012-2017/>.

<sup>21</sup> For additional details see <http://www.bia.gov/cs/groups/xraca/documents/text/idc-020740.pdf>.

<sup>22</sup> Coal leases may be issued non-competitively through a preference right lease application and/or a modification to an existing lease.

<sup>23</sup> There have been no regional lease sales in recent history.

Prior to a sale of a coal lease, the BLM calculates a “fair market value” of the coal, and accepts sealed bids, which are publicly announced during the sale. The lease is awarded for the highest eligible bid that meets or exceeds the estimated fair market value, and the winner pays, at a minimum, the first year's annual rental payment and one-fifth of the amount bid, the first of five installments guaranteed by bond.

Coal royalties are shared on a 50-50 basis with the state where the coal was mined. The shared revenues include bonus bids, annual rental revenues of \$3 per acre, and royalties of 12.5% of the value of surface-mined coal (8% for subsurface).

## Leasing Statistics, Outputs and Price Trends

### *Leasing and Permitting Statistics*

Offshore Oil and Gas: In FY 2012, BOEM held two lease sales in the Gulf of Mexico. Lease Sale 218 was completed on December 14, 2011. This sale resulted in over 1 million acres being leased in the Western Gulf of Mexico Planning Area and about \$325 million in bonus bids. Lease Sale 216/222 was held on June 20, 2012 offering over 39 million acres in the Central Gulf of Mexico Planning Area. This sale resulted in 2.4 million acres being leased and about \$1.7 billion in bonus bids. Funds from the accepted high bids will be distributed to the general fund of the U. S. Treasury, shared with the affected states, and set aside for special uses that benefit all 50 states.

In FY 2012, BSEE approved 476 permits for deepwater drilling and 443 permits for shallow water drilling on the OCS.

Onshore Oil and Gas: Oil and gas companies nominated 5.9 million acres of public minerals for leasing in 2012, up from 4.5 million acres the year before. The BLM held 30 onshore oil and gas lease sales in 2012 offering 2,064 parcels of land covering nearly 4.7 million acres. Over three-quarters of those parcels were sold: 1,554 parcels covering nearly 1.4 million acres, and generating about \$261 million in bonus and rental revenue for American taxpayers. This was a 9 percent increase in lease sale revenue over 2011, following a strong year in which leasing reform helped to lower protests and increase revenue from onshore oil and gas lease sales on public lands.

In FY 2012, the BLM processed 5,861 applications for permits to drill (APDs) on Federal and Indian lands. In 2013 and 2014, BLM expects to process more than 5,000 APDs annually.

Coal: In FY 2012 the BLM held 9 coal lease sales, of which 6 were successful, covering 15,390 acres, with a total accepted bonus bid of \$1.55 billion. This was a substantial increase over FY 2011, when BLM sold a total of 8 Federal coal leases (across all categories) covering 6,463 acres for \$347 million in bonus bids.

### *Crude Oil – Output and Prices*

Figure 4-1 presents on and offshore federal oil royalty bearing production and prices from October 2006 to July 2012. Interior currently manages about 38 million acres of the Outer Continental Shelf (OCS) under active lease (of which 6.5 million acres are producing); that management includes safety and environmental enforcement. Total oil sales volumes from Federal and Indian lands, including the Federal OCS, increased from 575 million bbl in FY 2008 to 736 million bbl in FY 2010, and then decreased to 626

million bbl in FY 2012.<sup>24</sup> Production from Federal and Indian lands makes up approximately 27 percent of total domestic production. In FY2012, BOEM and BSEE oversaw the federal offshore production of almost 474 million barrels of oil, which accounts for approximately 76 percent of crude oil production from Federal and Indian lands. The remaining 24 percent is from an onshore sales volume of 152 million barrels on Federal and Indian lands.

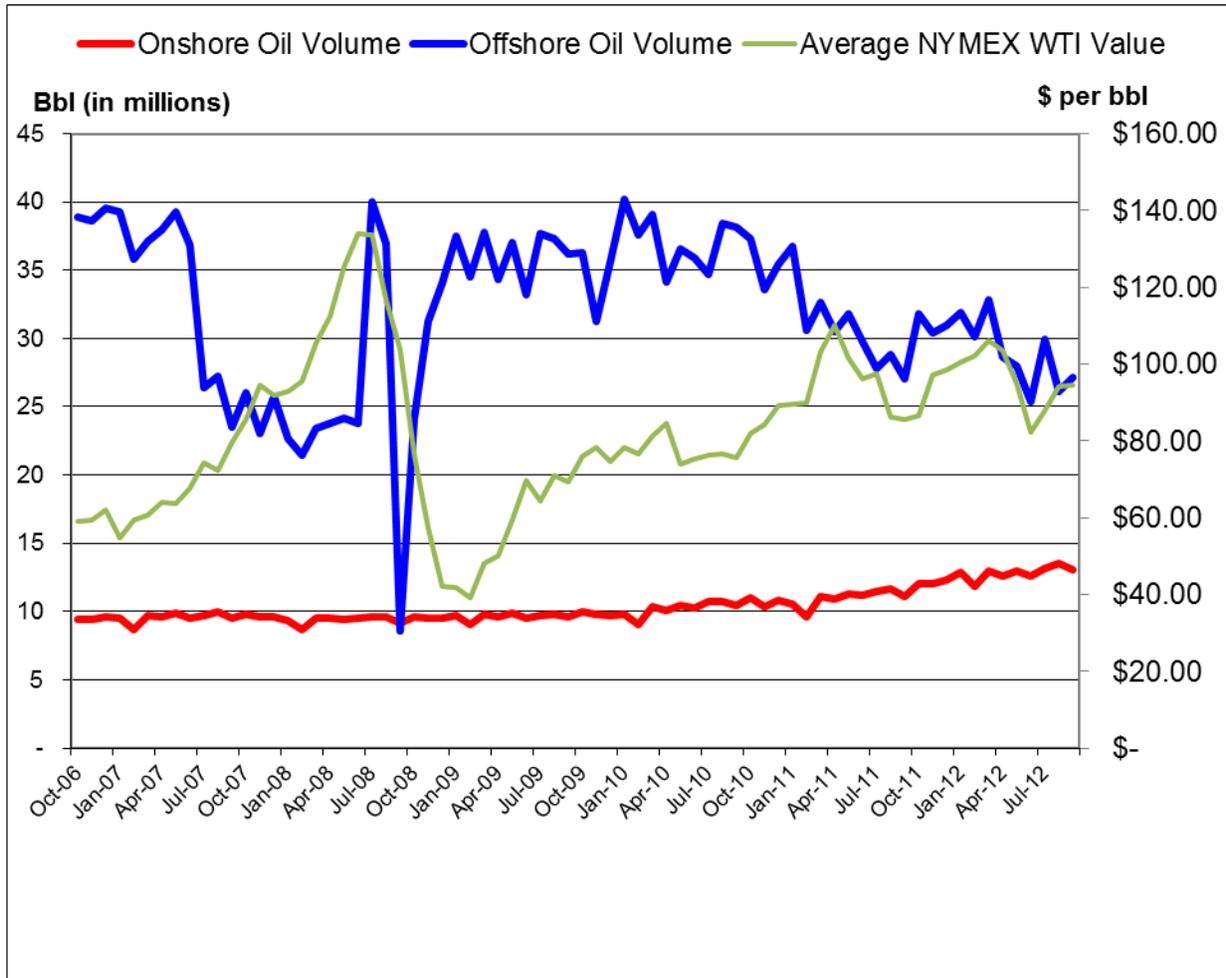


Figure 4-1. Federal Royalty-Bearing Oil Production and Price, FY 2007-FY2012

Source: ONRR data; EIA data.

<sup>24</sup> The Office of Natural Resources Revenue (ONRR) collects data on sales volumes for purposes of assessing royalty payments. The sales data are a proxy for marketed production volumes. Total sales volumes include royalty and non royalty bearing volumes.

As shown in Table 4-1, FY 2012 average prices for crude oil and petroleum products were five to ten percent above 2011 averages.

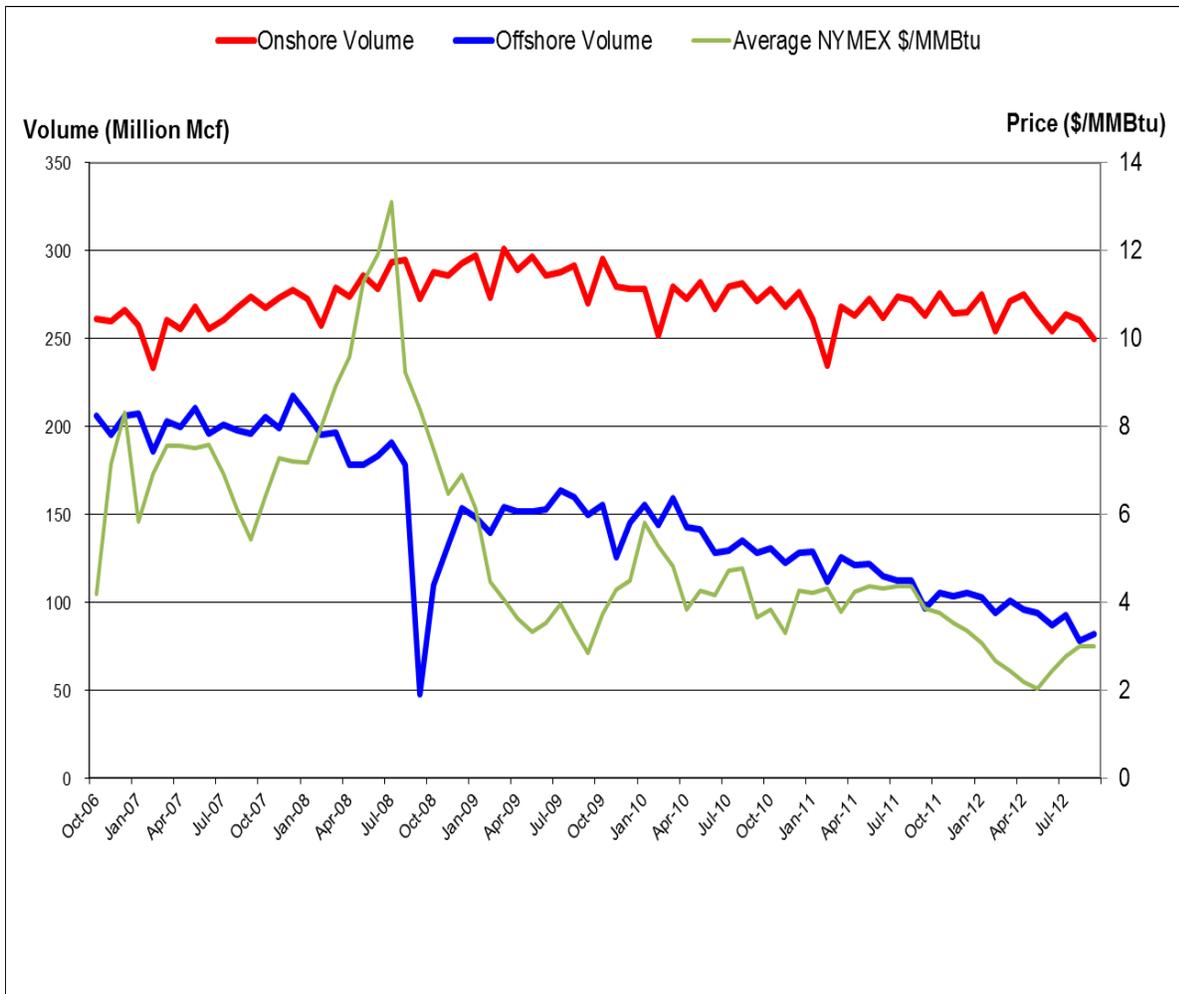
**Table 4-1. Oil and Gas Product Prices (2002-2012)**

<b>FY</b>	<b>Crude Oil (\$/bbl)</b>	<b>Conventional Gasoline (\$/gal)</b>	<b>No 2 Heating Oil (\$/gal)</b>	<b>Residential Natural Gas (\$/mcf)</b>
2002	23.12	0.66	0.63	8.50
2003	28.22	0.85	0.83	10.16
2004	34.54	1.08	0.98	11.28
2005	51.24	1.49	1.53	12.68
2006	64.45	1.84	1.83	14.93
2007	65.25	1.86	1.83	14.03
2008	105.32	2.71	3.02	15.58
2009	56.50	1.48	1.61	13.61
2010	76.55	1.98	2.03	12.86
2011	105.53	2.64	2.79	12.64
2012	111.48	2.81	3.00	12.23

Source: EIA data.

### ***Natural Gas – Output and Prices***

Total U.S. natural gas production has set new records every year since 2007. In FY 2012 the Nation produced an estimated 29 trillion cubic feet, a 14% increase over FY 2008, largely due to shale gas resources. Figure 4-2 shows Federal on- and offshore royalty bearing gas production and prices over 2006-2012. EIA and ONRR data indicate that Federal sales account for 19 percent of total domestic production for FY 2012. Natural gas sales volumes from Federal and Indian lands have decreased each year since FY 2003, when Federal sales accounted for a record 34 percent of U.S. production (EIA 2012; ONRR 2012). This trend reflects declining gas production from the Federal OCS, as development has moved from the gas-prone shelf to the richer oil-prone deep waters of the Gulf of Mexico. As federal production offshore has declined, however, the production from onshore Federal lands has been generally growing since 2003. In FY 2003 production of processed and unprocessed gas was about 1.9 trillion cubic feet (tcf) onshore and 4.2 tcf offshore. By FY 2012, onshore production had grown to 2.4 tcf, while offshore production was only 1.3 tcf. Over the past several years natural gas prices have been in the range of \$3-4 per mmBtu.

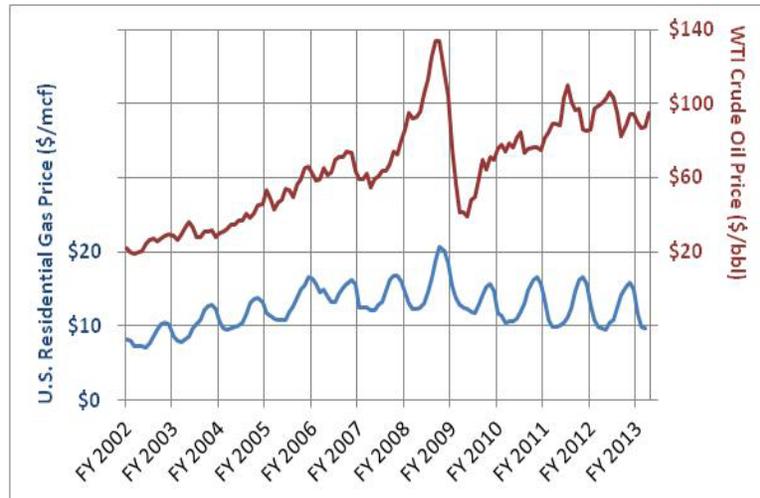


**Figure 4-2. Federal Natural Gas Royalty-Bearing Production and Price, 2006-2012**

Source: ONRR data; EIA data.

Over this same period, Federal gas production (onshore and offshore combined) has accounted for a falling proportion of total U.S. marketed production. Policies that pertain directly to leasing and production activities on Federal and Indian lands are only one among the many factors that are reflected in the production data. The rapid increase in natural gas production from shale resources, found largely outside the Federal lands, over the last 5 years has significantly reduced natural gas prices and the relative attractiveness of non-shale natural gas resources, including those on Federal and Indian lands.

As shown in Figure 4-3, monthly averages of the 2012 natural gas price cycle were at or below their 2011 levels.



**Figure 4-3. U.S. Residential Natural Gas Price, FY 2002 – FY 2012**

Source: EIA data.

### **Coal – Output and Prices**

Figure 4-4 shows federal coal production and prices from October 2006-September 2011. NYMEX coal futures for coal from the Powder River Basin averaged \$8.78 per ton in 2012, with a minimum of \$6.75 and max of \$12.24 per ton. Coal production from Federal and Indian lands has remained steady over the past 4 years decreasing slightly from 508 million tons in FY 2008 to 461 million tons in FY 2012. Despite a decrease in U.S. coal production from FY 2011 to FY 2012, the federal sales share of U.S. coal production remained unchanged at 43%. In their latest forecasts, EIA predicts that Interior’s share of coal production will decrease through 2020 but increase thereafter (EIA 2013 AEO). Since 2006 coal prices (in nominal terms) for federal coal produced in Wyoming and Montana have been in the range of \$10-13 per ton; prices for coal produced in other states has ranged from \$30-40 per ton. Prices for coal declined at the beginning of 2012 and remained below the average levels of 2011.

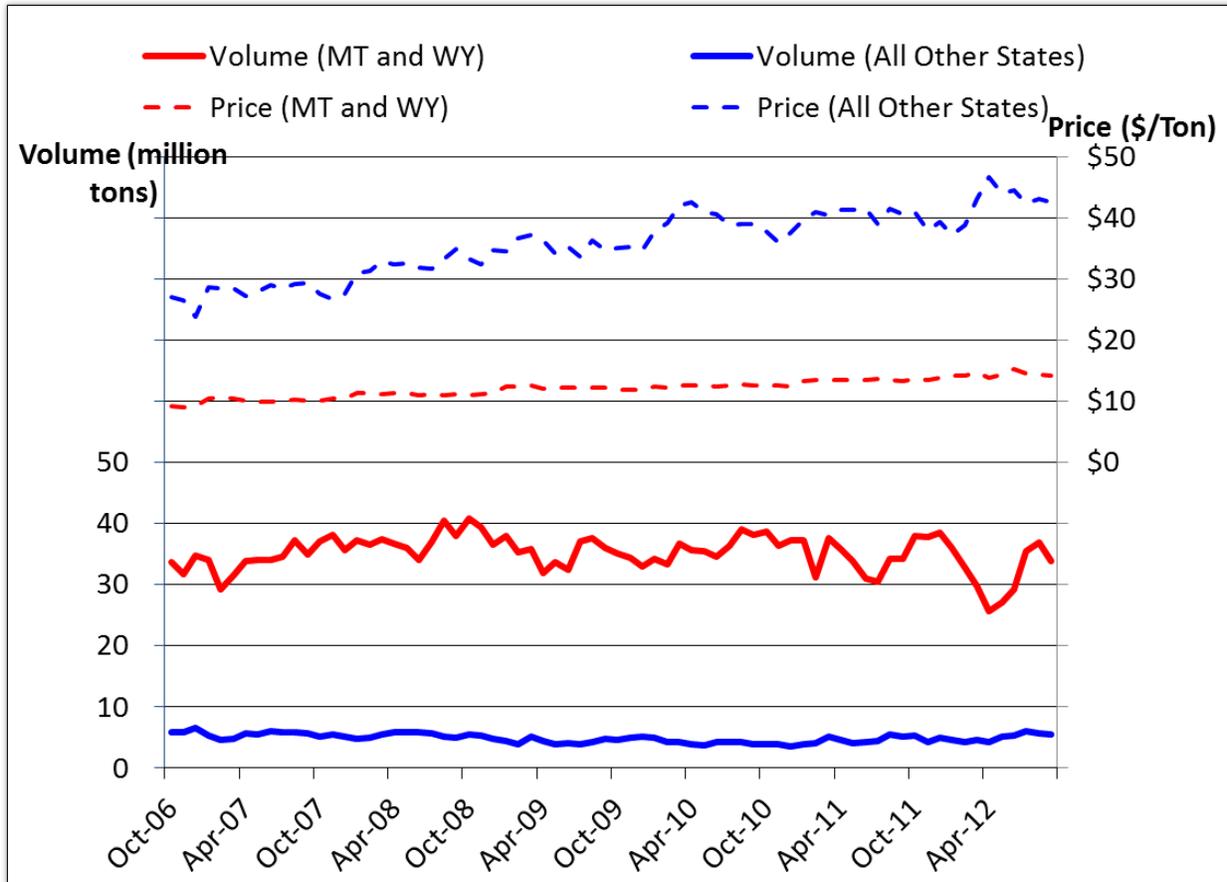


Figure 4-4. Federal Coal Volumes and Prices

Source: ONRR data; EIA data.

### Royalties

In FY 2012, Interior collected a total of \$11.6 billion in mineral receipts, including royalties, rents and bonuses. \$11.4 billion<sup>25</sup> was related to oil, gas and coal production on public lands, tribal lands, and Federal offshore areas – an increase of \$0.8 billion over the previous year. These receipts are disbursed among Federal, State, and tribal governments.

### Economic Contributions

Economic contributions arise in the following manner. Leases on federal lands are sold. These sales generate bonus bids and rents prior to exploration, development, and production. These revenues are transferred from companies to ONRR, and then to Treasury, States, Tribes. Companies pursue exploration and development and in the course of doing so employ labor and capital. Assuming minerals are discovered in economic quantities, the companies then produce salable minerals. Production involves hiring labor and capital; royalty revenues are subsequently transferred from producers to

<sup>25</sup> The remaining \$0.2 billion is made up of receipts on various resources leased on Federal lands including but not limited to copper, lead and sand/gravel.

ONRR, and then to Treasury, States, and Tribes. Reclamation activities are undertaken concurrently with production or when production ceases. These activities also require labor and capital, and may enhance various nonmarket goods and services.

This report has developed national and state-level estimates of value added, economic contributions, and employment estimates for on- and offshore federal and Indian oil, gas and coal production. The state-level estimates are presented in Appendix 2. State-by-State Information; the national-level estimates for FY 2012 are as follows:

- Offshore oil and gas production contributed an estimated \$122 billion in total output, over \$59 billion in value added (approximately 0.4% of total U.S. GDP) and supported 732,000 domestic jobs (approximately 0.6% of all U.S. employment).
- Onshore oil and gas production resulted in an estimated total output of about \$76.9 billion in total output, about \$49.2 billion in value added, and supported approximately 360,000 jobs (approximately 0.3% of all U.S. employment).
- Coal production resulted in total output of about \$16.9 billion, about \$10.3 billion in value added, and supported approximately 80,000 jobs (approximately 0.06% of all U.S. employment).

### **Economic Values**

The oil, gas, and coal, produced from Interior lands is, in general, sold in competitive markets and the market value of these resources can be reasonably assumed to reflect their economic value and their opportunity costs. However, where external costs are associated with the development, production, and use of these resources, market prices do not fully reflect opportunity costs. For example, in considering whether an area could be leased for oil and gas development the market value of the extractable oil and gas can be reported in monetary terms. However, external factors to this decision, such as the effects of exploration, development and extraction on air and water quality, recreation opportunities, wildlife habitat, or energy security cannot be easily accounted for in dollar terms. Various regulations and other requirements including bonds, mitigation and reclamation help to minimize adverse environmental impacts and internalize some of the external costs.