The Economic Benefits of Increasing U.S. Access to Offshore Oil and Natural Gas Resources in the Atlantic

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Section 1 – Key Findings and Executive Summary

1.1 - Key Findings

This report quantifies the significant potential benefits to the U.S. economy that would stem from opening the Atlantic outer continental shelf to oil and natural gas exploration. Federal offshore lease sales under existing U.S. law would be expected to lead to high levels of offshore oil and natural gas activity. This activity would require large amounts of investment and operational spending by oil and gas operators, an estimated $195 billion cumulative between 2017 and 2035, which would be primarily spent inside the U.S. and the Atlantic coast states. If seismic activity were to begin in 2017 and lease sales in 2018, first production could be expected as early as 2026.

By 2035, offshore oil and natural gas development could produce an incremental 1.3 million barrels of oil equivalent per day (MMboe/d), generate nearly 280,000 jobs, contribute up to $23.5 billion per year to the U.S. economy, and generate $51 billion in cumulative government revenue (Table 1), Most of the benefits would be accrued to states along the east coast (Table 2) but the economic impacts would be felt throughout the U.S. The amount of revenue accrued to state governments would be dependent on legislated federal/state sharing agreements.[1]

Table 1: Projected Economic Impacts[2] due to Atlantic OCS Offshore Oil and Natural Gas Exploration and Production

	2020	2025	2035	Cumulative 2017 to 2035
Capital Investment and Spending ($Millions)	$685	$6,924	$19,994	$194,531
Employment	11,391	78,098	279,562	n/a
Contributions to Economy - GDP ($Millions)	$1,008	$6,408	$23,428	$199,201
Federal / State Government Revenue ($millions)	$603	$644	$12,191	$51,464
Natural Gas and Oil Production (MMboe/d)	-	-	1.3	2,000

Source: Quest Offshore Resources, Inc.

Table 2: Projected Economic Impacts - Atlantic Coast Region Only due to Atlantic OCS Offshore Oil and Natural Gas Exploration

	2020	2025	2035	Cumulative 2017 to 2035
Capital Investment and Spending ($Millions)	$302	$2,618	$13,974	$109,413
Employment	6,057	37,751	215,612	n/a
Contributions to Economy – GDP ($Millions)	$530	$3,066	$17,929	$130,331
State Government Revenue Only ($Millions)	$226	$242	$4,571	$19,299

Source: Quest Offshore Resources, Inc.

[1] Assumes a 37.5/62.5 percent state / federal revenue sharing

[2] All spending, contributions to economy, and government revenues are constant 2012 dollars

1.2 - Executive Summary

The offshore oil and natural gas industry within the United States is a significant contributor to employment, the national economy, government revenues, and domestic energy production. Current offshore oil and gas production in the U.S. is essentially limited to the Central, Western and a small amount of the eastern Gulf of Mexico with limited additional legacy production off Alaska and California. Total offshore oil and natural gas production in federal waters was a combined 1.87 million barrels of oil equivalent per day as of June of 2013 or 9 percent of U.S. production.

Approximately 85 percent of acreage in federal offshore waters is inaccessible to offshore oil and natural gas development, either through lack of federal lease sales or outright moratoriums. Oil and gas development off the Atlantic coast has been restricted since the 1980's. Only 51 exploratory wells were drilled in the 1970s and 1980s, mainly in shallow water. A lease sale off the coast of Virginia was planned for 2011, but was subsequently canceled. No lease sales in the Atlantic Outer Continental Shelf (OCS) are currently scheduled. The next five-year plan of OCS lease sales, yet to be released, would start in 2017.

While there have been no recent seismic surveys or exploratory wells in the Atlantic OCS, an updated reserve analysis based on historic information was released by the Bureau of Ocean Energy Management (BOEM) in 2011. The BOEM report identified and estimated resources in ten unique geologic plays. The BOEM resource estimates served as the foundation for the reserve and production models of this report.

This report constructs a scenario of oil and natural gas development in the Atlantic OCS, based on the resource potential of the area, geologic analogs, and the full value chain of oil and natural gas development and production. It quantifies the capital and other investments projected to be undertaken by the oil and natural gas industry, identifies linkages to the oil and gas supply chain and supporting industries at both the state and national levels, estimates both job creation and contributions to economies associated with oil and natural gas development, as well as government revenues due to lease bids, rents and production royalties. The report relies on Quest Offshore Resources, Inc. (Quest) proprietary database[3] on the offshore oil and natural gas supply chain.

Leasing

This study assumes that leasing will begin in the Mid and South-Atlantic OCS in 2018 coinciding with the beginning of the next BOEM five year leasing program. Leasing in the North Atlantic OCS is assumed to start two years later. According to the study's analysis, demand from operators for Atlantic OCS leases would parallel the strength of historic lease sales within other OCS regions. Leasing in 2018, taking place only in the Mid and South Atlantic planning areas is projected at around 350 leases sold, with leasing activity expected to peak at around 480 leases sold per year.

[3] See Appendix 7.1 "Overview of Quest Offshore Data"

Projects

Offshore project development is the key factor in oil and natural gas production. It is also the main factor in the capital and operational expenditures that lead to increases in employment and economic activity. Offshore projects are complex, requiring a multitude of diverse engineers, contractors, and equipment suppliers working over a number of years prior to the start of production. For the purposes of this study, offshore project development was generalized into six project types based on project size and water depth. This study estimates that if there were regular lease sales and no regulatory restraints to development, 69 projects would begin oil and natural gas production in the Atlantic OCS between 2017 and 2035, of which 52 would be deepwater projects and 17 would be shallow water projects.

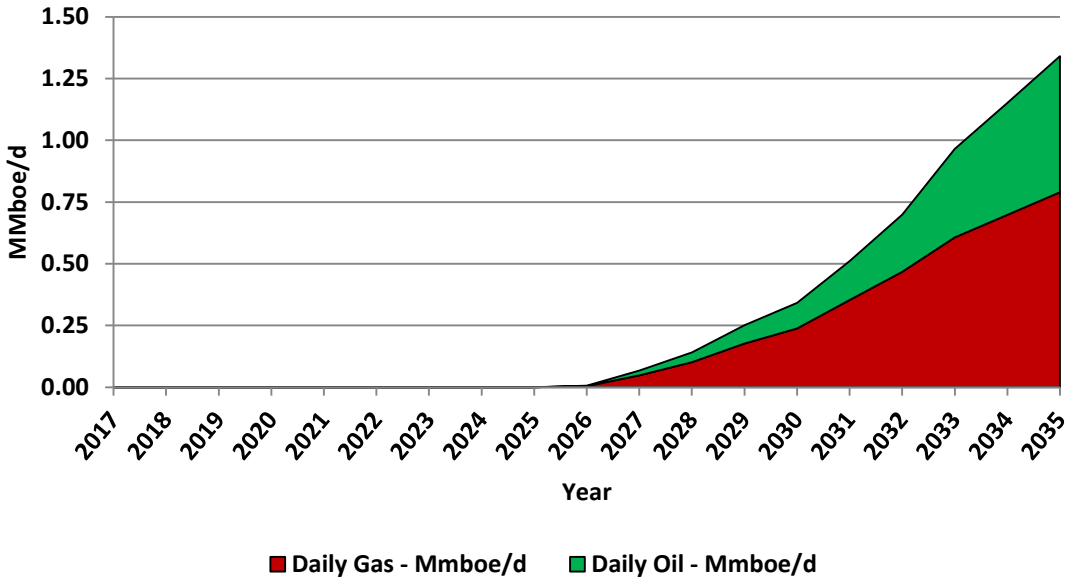
Drilling

Drilling is the key activity both to discover oil and natural gas resources as well as to prepare them for production. Drilling activity in the Atlantic OCS would be expected to be robust upon the opening of the Atlantic OCS to offshore oil and gas exploration and production. Atlantic OCS drilling would be expected to begin in 2019, with an average of 30 wells drilled annually from 2017 to 2035 mostly in deepwater. In the last five years of the forecast (2031-2035) an average of 66 wells would be expected to be drilled annually as the number of active projects grows and the need for development wells increase.

Oil and Natural Gas Production

Atlantic OCS development would lead to an increase in domestic energy production. The first oil and natural gas production in the Atlantic OCS is projected to start in 2026, given the scenarios' leasing assumptions. Initial annual production would be just over 6 thousand barrels of oil equivalent per day (BOED); by the second year production is projected to increase to over 65 thousand BOED. Production is projected to reach 1.34 million BOED by 2035, approximately 40 percent of which is expected to be oil at 550 thousand BOED, and 60 percent natural gas at 790 thousand barrels of oil equivalent (or 4.6 billion cubic feet) per day. Production from deepwater projects is expected to account for 75 percent of production in 2035, compared to 25 percent of production for shallow water fields. (Figure 1)

Figure 1: Projected Atlantic OCS Oil and Natural Gas Production by Type and Year



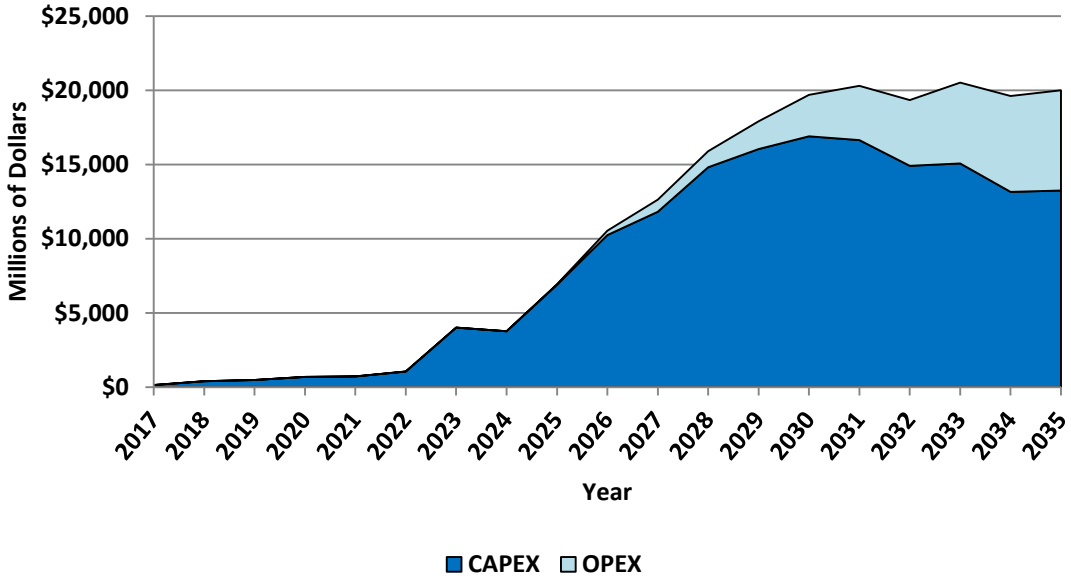
Source: Quest Offshore Resources, Inc.

Spending

Spending is divided into eight main categories in the report, with each category representing one general activity type required to find, develop, and produce an offshore oil and natural gas project. Although each activity category is required to develop an offshore oil and natural gas project, certain categories have a more substantial impact on overall spending such as drilling, operational expenditures, engineering, manufacturing and fabrication of platforms and equipment. For example, drilling spending from 2017 to 2035 is projected to average over $2.3 billion per year, while geological and geophysical spending averages only around $430 million per year.

Total cumulative spending from 2017 to 2035 is projected at nearly $200 billion. Spending is expected to grow throughout the forecast period from an average of $480 million during the first five years of initial leasing, seismic, and exploratory drilling to just under $20 billion per year in 2035. Spending on offshore oil and natural gas projects is normally divided into capital and operational spending. Capital spending primarily consists of investments in drilling, equipment used to develop offshore projects and engineering. Total capital spending on offshore oil and natural gas developments in the Atlantic OCS is expected to be over $160 billion from 2017 to 2035. (Figure 2)

Figure 2: Projected Atlantic OCS Oil and Natural Gas Exploration and Production Spending



Source: Quest Offshore Resources, Inc.

Cumulative operational expenditures (OPEX), which occur after a well's initial production, are projected at over $33.5 billion over the same time period.

The supply chain required to develop an offshore oil and natural gas project is incredibly complex, with suppliers located throughout the country and often the world. Certain activities, such as specialized manufacturing of equipment components often take place far from the area of exploration and production, while other work must take place within the region. Especially in an area that is new to oil and gas development, a significant amount of spending on fabrication and manufacturing normally takes place outside the region due to the undeveloped nature of the local supply chain and knowledge base.

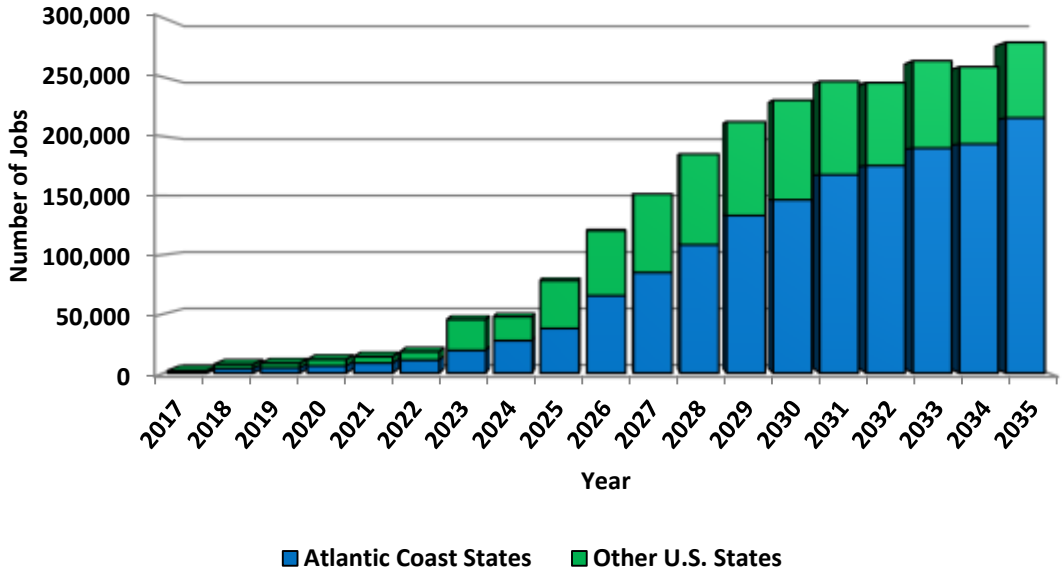
Overtime, suppliers of offshore oil and natural gas equipment begin to produce a more significant share of equipment locally. In an area with the high-tech manufacturing capabilities, knowledge base, and extensive maritime infrastructure of the Atlantic coast states, this trend would be expected to continue. This study projects that the percentage of spending that will take place in the Atlantic coast states will progress from 48 percent in the first five years of activity to 64 percent in the last five years. Spending in the Atlantic coast states is projected to vary based on the location of the individual states relative to offshore oil and natural gas reserves, projects, and production; as well as the makeup of the individual state's economies.

Employment

Atlantic OCS oil and natural gas development is expected to lead to significant employment gains, both along the east coast and nationally. Employment impacts are expected to grow throughout the forecast period, with total incremental U.S. employment reaching nearly 280 thousand jobs by

2035.[4] Total Atlantic coast employment in 2035 is projected to reach over 215 thousand jobs with employment spread across the region. States outside the region are projected to see employment gains of nearly 65 thousand jobs in 2035. The largest employment impact of Atlantic OCS oil and natural gas activity is projected in the Mid-Atlantic states of North and South Carolina and Virginia. North Atlantic states such as Massachusetts, Maine, and New York are all also projected to see employment increases of at least 10 thousand jobs by 2035. The share of incremental employment within the Atlantic coast region is anticipated to steadily grow as the proportion of goods and services that are supplied locally increases. (Figure 3)

Figure 3: Projected Employment Increase Due to Atlantic OCS Oil and Natural Gas Development



Source: Quest Offshore Resources, Inc.

The resulting impact of Atlantic OCS development upon the economy will be widespread among industries. Industries which are directly involved in oil and natural gas activities such as the mining sector (which includes oil and gas development), manufacturing, professional, scientific, and technical services (engineering), and construction (installation) are expected to see the largest employment effects with a combined 125 thousand jobs in 2035. Of that total, employment in the oil and gas sector is projected to be 45 thousand jobs. By 2035, the manufacturing sector which includes businesses that manufacture and fabricate oil and gas equipment, platforms and otherwise produce the goods required to develop oil and natural gas fields is projected at around 30 thousand jobs, of which over 20 thousand of these jobs are expected in the Atlantic coast states. The professional, scientific, and technical service sector, which includes engineering employment, is expected to see employment in excess of 32 thousand additional jobs. Employment in the construction sector which includes offshore installation employment is projected to be around 19 thousand jobs in 2035.

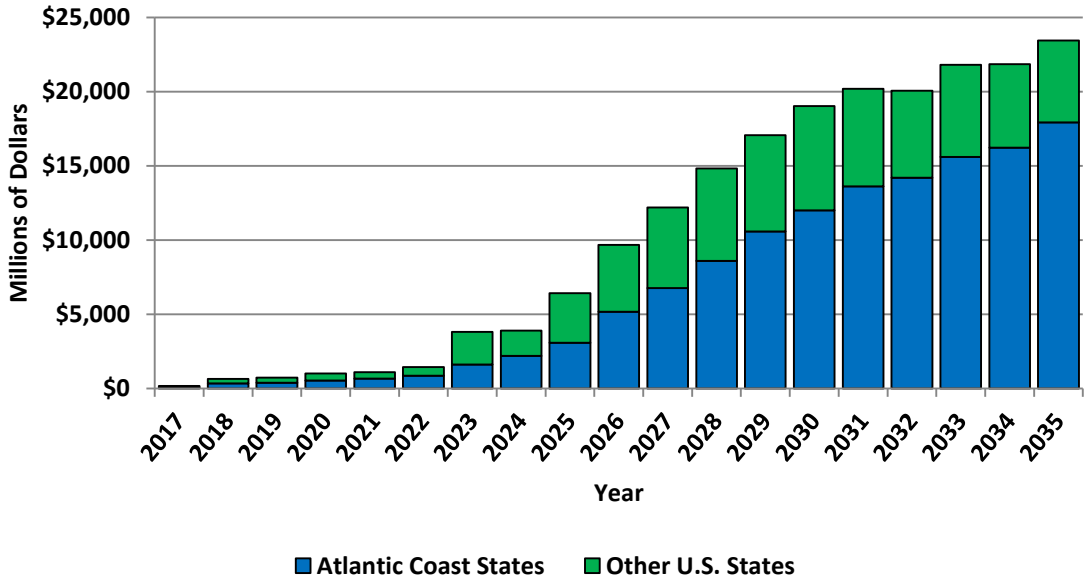
[4] Includes total supported jobs; direct, indirect, and induced. See section 3.4.

Sectors not directly related to oil and gas development or the supply chain will also see impacts, mainly due to a general increase of income in the economy. Retail sector employment is projected to increase by over 20 thousand jobs in 2035 due to Atlantic OCS development. Health care and social assistance could increase by nearly 19 thousand jobs, administrative and waste management services by over 18 thousand jobs, food services and drinking places by over 13 thousand jobs, and finance and insurance, and real estate, rental, and leasing are both projected to see the creation of over 11 thousand jobs in each sector by 2035.

Contributions to the Economy and Government Revenues

Spending by the oil and gas industry, as well as the impact of increased revenues to state governments is expected to lead to a significant increase of the nation's GDP. Total contributions to the economy are projected to be nearly $23.5 billion per year in 2035, with roughly 75 percent of the total expected impact to occur in Atlantic coast states and 25 percent in the rest of the U.S. The largest contributions to states' economies are expected to be seen in the Mid-Atlantic states of North Carolina, South Carolina, and Virginia as well as North Atlantic states such as Massachusetts, New York and Maine. (Figure 4)

Figure 4: Projected Contributions to States' Economies Due to Atlantic OCS Oil and Gas Development

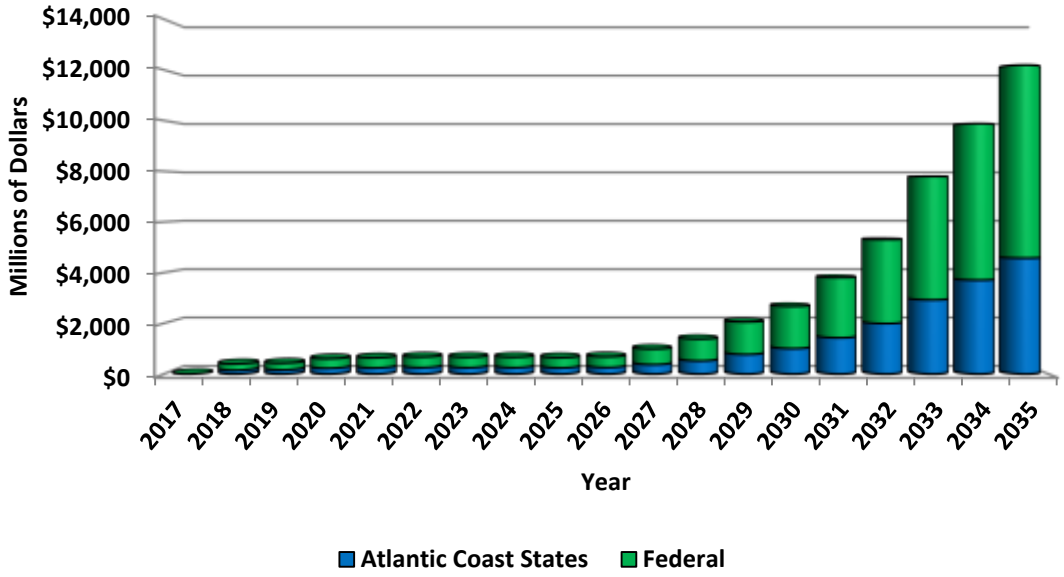


Source: Quest Offshore Resources, Inc.

Atlantic OCS oil and natural gas development has the potential to significantly increase government revenue from royalties, bonus bids, and rents on leases, a cumulative $51 billion from 2017 to 2035. Total government revenues are projected to reach over $12 billion dollars per year in 2035 and are projected to grow beyond the forecast. The majority of cumulative revenues are from royalties on produced oil and natural gas at $40 billion, leasing bonus bids are projected to account for around $9 billion, while rental income from offshore blocks is expected to account for a cumulative amount of $2 billion. This report assumes that associated government revenue is split 37.5 percent to the coastal

states and 62.5 percent to the Federal government. This is similar to the arrangement in the Gulf of Mexico without an associated cap on state government revenue. Actual revenue proportion going to state governments, if any, would be determined by future legislation. Combined state revenues for the Atlantic coast states would reach approximately $4.5 billion per year by 2035, given that assumption. (Figure 5)

Figure 5: Projected Government Revenues due to Atlantic OCS Oil and Gas Development



Source: Quest Offshore Resources, Inc.

State Results

Although the impacts of Atlantic OCS oil and natural gas development would be felt nationwide, the majority of the employment, economic, and revenue effects of increased access benefits would be expected to go to the states along the east coast. Although some states such as the Carolinas, Virginia, Massachusetts, New York and Maine are expected to see larger benefits, the effects of offshore oil and natural gas activity are expected to be felt all along the Atlantic coast. Each state is expected to see annual spending by the industry of over $100 million dollars per year by 2028, with spending continuing to increase on average through 2035. Each state is also expected to see between three thousand five hundred and 55 thousand jobs created by 2035, and contributions to their economies ranging from $315 million to over $4 billion per year. Additionally, state governments have the potential to receive large increases in revenues if state/Federal revenue sharing legislation is enacted. A 37.5 percent sharing agreement would produce cumulative state government revenues of $330 million to $4 billion. (Table 3)

Table 3: Projected Spending, Employment, Contributions to Economy and Government Revenue by State

State	2017-2035 Cumulative Spending ($Millions)	2035 Employment	2035 Contributions to Economy ($Millions/year)	2017-2035 Cumulative State Government Revenue ($Millions)
North Carolina	$26,439	55,422	$4,081	$3,989
South Carolina	$15,572	35,569	$2,730	$3,728
Virginia	$14,214	24,979	$2,177	$1,874
Massachusetts	$8,164	14,814	$1,365	$1,411
New York	$9,637	12,345	$1,250	$869
Maine	$3,892	10,305	$840	$879
Florida	$3,998	9,222	$694	$1,057
Rhode Island	$3,485	8,499	$771	$1,198
Connecticut	$4,371	8,169	$776	$929
New Jersey	$4,984	8,340	$785	$515
Maryland	$4,159	7,236	$632	$499
Pennsylvania	$4,050	7,227	$619	$330
Georgia	$2,076	5,088	$426	$702
Delaware	$2,430	4,790	$466	$475
New Hampshire	$1,942	3,608	$317	$843
Other U.S. States	$58,320	63,950	$5,498	$0
Totals	$194,531	279,562	$23,428	$19,299

Source: Quest Offshore Resources, Inc.

Allowing access to the Atlantic OCS for oil and natural gas exploration and production activities would increase employment, economic activity, and government revenues over the long-term with comparatively little additional spending required by federal and state governments. The nation as a whole, but especially the Atlantic coast states would likely see large employment increases, increased economic activity and increased government revenue as well as increased domestic oil and natural gas production, increasing the nation's energy security.