OFFSHORE ENERGY BY THE NUMBERS

An Economic Analysis of Offshore Drilling and Wind Energy in the Atlantic

ANDREW MENAQUALE January 2015

OCEANA | Protecting the World's Oceans

EXECUTIVE SUMMARY

The oil industry has been pushing to expand offshore drilling to the Atlantic Ocean. The industry claims that opening the Atlantic to drilling will lead the United States towards energy independence, generate millions of dollars in revenue for states, and create thousands of jobs in the process.[1] However, many of the arguments made about the benefits of offshore drilling do not stand up to scrutiny, and the benefits of offshore wind prove to be greater and available over a longer period of time.

For instance, the oil and gas resources that industry claims will contribute to domestic energy independence would not be extracted until 2026 at the earliest, based on industry's own estimates.[2] This is due to the extensive time it takes to survey proposed areas, conduct exploratory drilling, and build a massive network of infrastructure necessary to conduct large-scale drilling. In addition, industry includes oil and gas resources that are not economically feasible to extract, incorporates inaccurate resources multipliers, and assumes a non-existent revenue-sharing system. All of these assumptions result in exaggerated job creation figures. The industry itself projects that the overwhelming bulk of the jobs promised will not be created for at least another decade,[3] mainly because commercial production would not begin until 2026.

Additionally, the industry and some offshore drilling proponents argue that states will benefit from funding that would come from a revenue-sharing system that currently does not exist.[4] As a result, the revenue figures promised are not guaranteed. At the same time, if the U.S. moves forward with the expansion of offshore drilling, there could likely be very real and detrimental impacts to the environment and coastal economies.[5, 6, 7, 8]

On the other hand, developing even a modest amount of available offshore wind resources would be a far better strategy to lead the U.S. toward energy independence, while generating hundreds of thousands of new jobs. Unlike offshore drilling, offshore wind provides power directly to coastal communities without resulting in pollution, carbon dioxide emissions or spills.

The oil industry's estimates are often based on unrealistic assumptions about the job growth potential of developing oil and gas. This report compares economically recoverable oil and gas development to conservative estimates of offshore wind development to allow an "apples-to-apples" comparison of the energy and jobs that could be created by each.

KEY FINDINGS

- A modest and gradual development of offshore wind on the East Coast could generate up to 143 gigawatts of power over the next 20 years, which is enough to power over 115 million households;
- In the next 20 years, offshore wind could create about 91,000 more jobs than offshore drilling, which is about double the job creation potential;
- Based on government estimates, if all of the economically recoverable offshore oil and gas in the Atlantic Outer Continental Shelf (OCS) were extracted and used, oil demand would only be met for 132 days and gas demand would only be met for 283 days, at current consumption rates;
- For comparison purposes, the energy created by 20 years of offshore wind in the Atlantic could produce five billion barrels of oil equivalents (BOE) more than that of all the economically recoverable oil and gas in the same area;
- In just 13 years of producing energy, offshore wind could generate more energy than could be provided by all of the economically recoverable offshore oil and gas resources;
- Along the Atlantic coast, nearly 1.4 million jobs and over $95 billion in Gross Domestic Product (GDP) rely on healthy ocean ecosystems, mainly through fishing, tourism and recreation;
- Offshore wind offers more environmental benefits and fewer detrimental environmental impacts than offshore drilling;
- In all seven states where offshore drilling is proposed, offshore wind could produce more jobs than offshore drilling; and
- North Carolina has the highest wind resource and job creation potential of any state in the targeted offshore drilling zone on the Atlantic coast.

A modest development of our domestic offshore wind resource would offer benefits that cannot be matched by offshore drilling. Offshore wind has the potential to generate more jobs, produce more power, and lead to a higher degree of energy independence than offshore drilling for oil and gas. In addition, offshore winds blow strongest during the day and at other times of peak demand, providing a critical clean energy power source to the grid when it is needed the most. Perhaps most importantly, however, offshore wind development could help the U.S. transition away from fossil fuels and toward clean and renewable energy, a necessary shift given the widespread adverse impacts of offshore drilling, including those related to climate change.

The oil and gas industry advocates strongly for more drilling in undeveloped areas, promising strong benefits for job creation and energy development. This report provides a realistic picture of what offshore drilling could provide for the East Coast by comparing the oil and gas industry's projections to similar projections for what could instead be provided by offshore wind. We demonstrate here that the development of offshore wind benefits the economy, coastal communities and the environment more than the development of offshore oil and gas resources in the same region. Specifically, wind could create more than twice as many jobs, and in 20 years, it could produce more than twice the energy, as measured in billions of barrels of oil equivalent (BOE), as would offshore drilling (Tables 1 and 2).

Table 1: Offshore Wind Produces about Twice the Energy as Offshore Drilling

RANK BY OFFSHORE WIND POTENTIAL	STATE	GIGAWATTS (GW) OF OFFSHORE WIND POTENTIAL	BOE (Bbbl)* IN OFFSHORE WIND IN 20 YEARS**	BOE (Bbbl)* FROM OFFSHORE OIL AND GAS***
1	North Carolina	31.7	2.50	1.97
2	South Carolina	21.0	1.66	0.19
3	Florida	16.4	1.30	0.05
4	New Jersey	15.8	1.25	0.19
5	Massachusetts	14.5	1.15	0.52
6	New York	11.6	0.92	0.32
7	Virginia	11.3	0.90	0.92
8	Georgia	10.5	0.83	0.04
9	Maryland	4.7	0.37	0.25
10	Rhode Island	2.7	0.21	0.44
11	Delaware	1.7	0.13	0.23
12	Maine	1.2	0.09	0.33
13	New Hampshire	0.1	0.01	0.31
14	Connecticut	0.0	0.00	0.35
	Total**	**143.1**	**11.31**	**6.11**

Source: Oceana and DOI *BOE (Bbbl) stands for billions of barrels of oil equivalent.* ** Represents BOE (Bbbl) from 20 years of offshore wind.*
*** Represents all economically recoverable oil and gas.* **** Numbers may vary due to rounding.*

Table 2: Offshore Wind Creates about Twice the Jobs as Offshore Drilling

STATE	PROJECT LIFETIME JOBS CREATED FROM OFFSHORE WIND*	PROJECT LIFETIME JOBS CREATED FROM OFFSHORE DRILLING*
North Carolina	48,145	23,238
South Carolina	33,638	12,914
Florida	28,317	3,828
New Jersey	22,212	3,476
Massachusetts	22,834	5,612
New York	15,954	5,720
Virginia	15,456	10,295
Georgia	16,910	1,944
Maryland	7,049	2,906
Rhode Island	4,019	2,457
Delaware	2,032	1,490
Maine	1,840	3,012
New Hampshire	234	1,051
Connecticut	0	2,916
Pennsylvania	-	3,306
Other U.S. States	-	43,516
Total	**218,640**	**127,682**

Source: Oceana * Numbers may vary slightly due to rounding.*

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ACKNOWLEDGEMENTS

The author would like to thank the following individuals who helped with this report: *Jacqueline Savitz, Claire Douglass, Dustin Cranor, Charlotte Grubb, Amelia Vorpahl, Courtney Owen and Connor Whitley.*

INTRODUCTION

Along the Atlantic coast, healthy oceans support hundreds of thousands of jobs and generate billions of dollars in revenue.[9] Tourism, recreation and fishing, as well as the ancillary markets they support, are major drivers of coastal economies. Without them, billions of dollars in revenue and hundreds of thousands of jobs would be lost. If fisheries are managed properly and coastlines are protected continuously, these coastal jobs can be sustained for generations to come. However, even if offshore drilling could be conducted safely, which the industry has not yet proven, a significant portion of the jobs created from opening the Atlantic Ocean to drilling would not exist for at least 10 years, and the consequences of potential spills could last generations.[10] Furthermore, when the oil and gas run out, so do the jobs.

It is important that developments along our coasts are made in ways that are compatible with existing ocean resources. The 2010 Gulf of Mexico BP oil spill disaster shows how the fishing and tourism industries can be devastated by just one accident.[11, 12, 13, 14] In the three years following the Gulf catastrophe (2011-2013), the Bureau of Safety and Environmental Enforcement (BSEE) reported that offshore drilling accounted for a total of 765 injuries, 10 deaths, 15 losses of well control, 348 fires/explosions and 11 spills of over 50 barrels.[15] Those numbers only account for current drilling, which only takes place in the Gulf of Mexico and offshore California. These figures would likely be higher if the Atlantic Ocean were opened for oil and gas production, due in part to an increased number of offshore rigs. In addition, three-quarters of the oil and gas production in the Atlantic would come from deep water projects,[16] which take place in harsher and more challenging conditions than shallow water drilling.

Every five years, the federal government prepares a plan for the OCS Oil and Gas Leasing Program. It is now preparing its five-year plan for the years 2017-2022. In June 2014, BOEM published a Request for Information, representing the first step in the process for the leasing program. To maintain compliance with the National Environmental Policy Act (NEPA), BOEM will also be preparing an Environmental Impact Statement for this five-year plan.

In contrast, in May 2014, the Department of Energy (DOE) announced that three companies will receive as much as $47 million each for Offshore Wind Advanced Technology Demonstration Projects in Virginia, New Jersey and Oregon. Additionally, there are much larger Wind Energy Areas[17] where industrial-scale wind production is set to take place. Preparations for offshore wind development in the Atlantic have surpassed those for offshore drilling. Nearly 500,000 acres have already been leased in the Atlantic for offshore wind projects, with another 740,000 acres to be leased by early 2015, meaning over 1.2 million acres should be leased by 2015 for the development of offshore wind resources.[18]

Despite these advances, the U.S. still lags behind the rest of the developed world in clean energy production. Approximately 7 gigawatts (GW) of offshore wind has been installed worldwide, mostly in the United Kingdom, Denmark, Belgium, Germany and China. To put it in perspective, 7 GWs is the equivalent of roughly 34 average-sized, coal-fired power plants.[19] In Europe, construction and maintenance of offshore wind facilities supported 58,000 jobs alone in 2012, and offshore wind jobs are expected to grow to 191,000 by 2020.[20] Asian countries are making major investments in offshore wind energy as well. As of July 2013, only 420 megawatts of offshore wind has been installed in Asia, but there could be as much as 35 GW installed in Asian waters by 2020. [21]

Given the lack of development in the U.S., developers pursuing offshore wind are taking the lead in protecting the environment during installation. The most significant area of environmental concern for offshore wind occurs during the construction phase, when pile driving and increased vessel traffic could affect marine mammals.[22] In response, offshore wind developers and conservation organizations have signed

It is time for the U.S. to use the lessons learned from more than 20 years of offshore wind development internationally and apply them to generating clean, renewable energy off our coasts.

OFFSHORE DRILLING DISASTERS (2011-2013)

In the three years following the Gulf catastrophe, offshore drilling accounted for a total of:

- 765 injuries
- 10 deaths
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- 348 fires/explosions
- 11 spills of over 50 barrels

agreements[23, 24] outlining additional mitigation measures that protect marine mammals. These mitigation measures are more stringent than government regulations.

Nonetheless, these developments for our domestic energy production place the U.S. at a critical juncture in offshore energy development. Should the U.S. continue with the polluting ways of the past by opening new offshore areas to oil and gas drilling, or should this country opt for a clean energy future by developing its renewable resources such as offshore wind power? It is time for the U.S. to use the lessons learned from offshore drilling accidents domestically and the more than 20 years of offshore wind development abroad. We should apply both sets of lessons to the future by generating clean, renewable energy off our coasts.

EXTRACTING OFFSHORE RESOURCES

FINDING RESOURCES: THE THREATS OF SEISMIC AIRGUNS

The first step towards offshore drilling is searching for the oil and gas deposits located off the coast. Companies tow seismic airguns behind ships that shoot loud blasts of compressed air, which travel through the water and then penetrate deep into the seabed. The sound from these blasts then returns to the surface, providing information about the location and potential quantity of oil and gas deposits based off of the geological and geophysical structure. Airguns release intense pulses of sound that can go off every 10 seconds, 24 hours a day, for days to weeks on end. These blasts create one of the loudest human-generated noises in the ocean today.[25]

For marine animals, including many endangered and threatened species that rely on hearing for their survival, seismic testing may cause serious harm. Injuries from airgun use to marine mammals can include temporary and permanent hearing loss, abandonment of habitat, and disruption of mating, feeding and migration, among others.

Whales and dolphins rely on sound to communicate, navigate and feed, which inextricably links their ability to hear to their survival. Loud blasts from seismic airguns inhibit their ability to perform these critical life functions, which could have dire consequences for these vulnerable creatures. BOEM estimates that seismic surveys in the Atlantic could injure about 138,000 marine mammals such as whales and dolphins and disturb vital activities for as many as 13.5 million more.[26]

One marine mammal that is particularly vulnerable to seismic airguns is the critically endangered North Atlantic right whale. Right whales are slow moving and very sensitive to sound, with populations that are already decimated due to previous whaling activities and ongoing ship strikes. With only about 450 individuals of the species left worldwide, loud noise from seismic blasting could impede the recovery of this critically endangered mammal.

The use of airguns also carries with it the potential to startle and harm fish populations. Seismic testing has been correlated with body malformations, development delays and death of shellfish, as well as increased mortality in larval fish.[27] Of concern to fishers is the associated decline in catch rates near seismic blasting. Documented catch rate declines range from 40-60 percent, depending upon the fishery and gear type.[28] In addition, another study found higher fish populations outside a seismic shooting area, indicating a long-term effect of seismic activity that scared fish away from these sound sources.[29] While the economic impacts of this decline remain largely unstudied, one study has suggested that the catch rate decline seen in the rockfish fishery along the central California coast, linked to seismic testing, could be extrapolated to an economic decline of 50 percent in fishery profits.[30] Impacts of airguns, particularly on commercially valuable

A CLOSER LOOK: NORTH ATLANTIC RIGHT WHALE CRITICAL HABITAT

- Right whale critical habitats include the Massachusetts coast and along the southern Georgia and northern Florida coasts.
- North Atlantic right whales are critically endangered, with only an estimated 450 left. Their population has been historically depleted due to commercial whaling, ship strikes and fishing gear entanglements.
- While right whales are found all along the East Coast, they tend to calve in the winter in coastal waters off the southeastern United States.
- Right whales feed on zooplankton by skimming the surface of the water, a practice unlike other baleen whales.
- The right whale is the official state marine mammal of Georgia, and the only great whale native to Georgia waters.

fish species, could have devastating results for coastal communities. For individuals that rely on healthy oceans, such as those employed in the fishing and tourism industries, seismic testing could compromise their livelihoods. All of these harmful effects would occur before drilling actually begins, meaning even this first step in the process of offshore drilling could bring dangerous risks.

QUANTIFYING RESOURCES: THE ATLANTIC OFFSHORE REGION CONTAINS VERY LITTLE OIL AND GAS

The Atlantic has minimal fossil fuel resources compared to other regions used or being considered for domestic oil and gas production. The area targeted for production, referred to as the Atlantic OCS, contains less than 4 percent of the nation's total oil reserves and less than 3 percent of the nation's gas reserves.[31, 32] These small numbers also include the Northern Atlantic OCS, where neither the federal government nor individual states are currently engaged in advancing offshore drilling. Nonetheless, the Gulf of Mexico offshore region alone has more than 10 times the amount of oil and nearly six times the amount of gas as the entire Atlantic offshore region.[33, 34, 35]

Additionally, complete extraction of these resources would do little to ensure long-term domestic energy security. Even if all of the technically recoverable oil and gas reserves were extracted from the Atlantic region – including from the North Atlantic where offshore drilling remains largely untargeted – and used in the United States, domestic consumption of oil would be met for only about 250 days, and domestic consumption of gas would be met for only about 526 days. However, it is likely that just over half of the technically recoverable oil and gas is even economically viable to develop,[36] meaning oil consumption could actually only be met for 132 days and gas consumption for only 283 days.

ASSESSING RESOURCES: THE USE OF ECONOMICALLY RECOVERABLE RESOURCES

Offshore Oil and Gas

The benefits of producing offshore oil and gas have been grossly inflated in previous studies[37] by:

- Including oil and gas resources in their analysis that are not economically feasible to extract;
- Incorporating inaccurate multipliers; and
- Assuming a non-existent revenue-sharing system in the Atlantic.

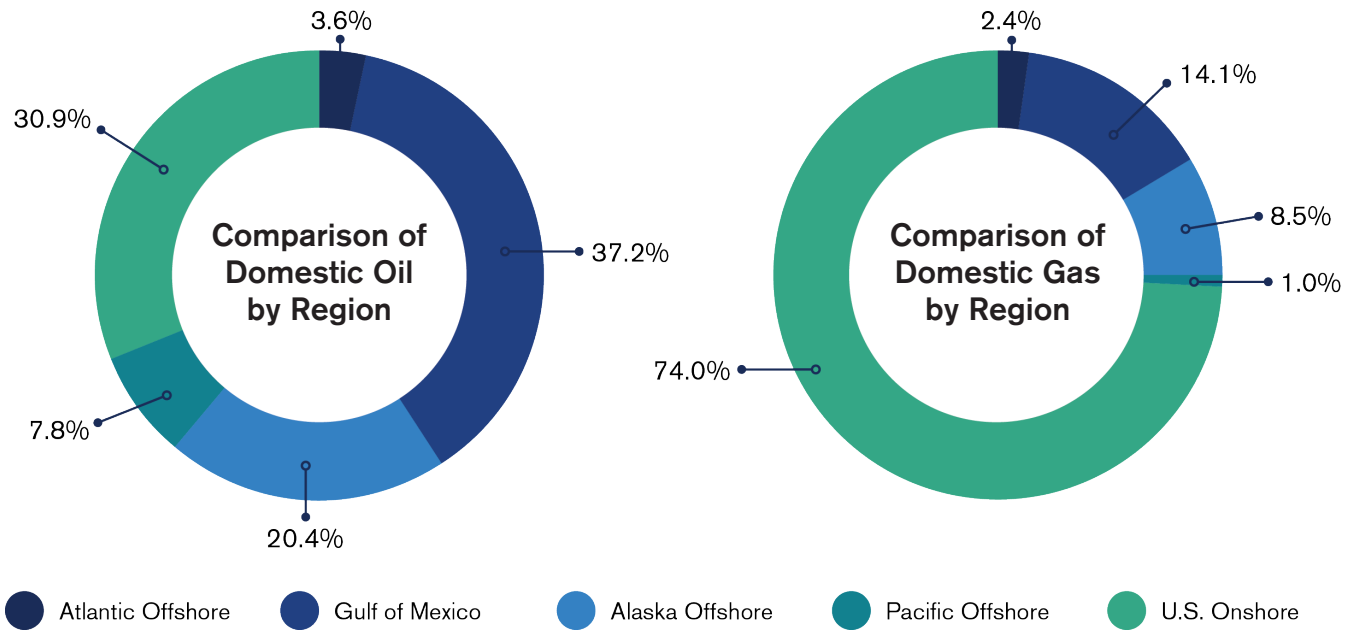
The Atlantic OCS…contains less than 4 percent of the nation's total oil reserves and less than 3 percent of the nation's gas reserves.

First, while the oil and gas industry often argues that jobs will be created by opening the Atlantic to offshore drilling, the analysis is misleading. One assumption in particular leads to an inflated estimate of production and jobs, and that is the use of technically recoverable resources, which are defined as resources that can be produced today with current technology.[38] A portion of these resources are not likely to be fully developed due to the inability of industry to extract them profitably because of various economic factors. In fact, due to prices for oil and gas, only about half of the technically recoverable resources in the Atlantic are likely to be "economically recoverable."[39] Therefore, focus should only be on the resources that can be profitably recovered. Using technically recoverable resources to estimate benefits is misleading, and the resulting predicted economic benefits are therefore exaggerated.

Table 3: The Atlantic Provides a Small Fraction of U.S. Oil and Gas

	OIL*		GAS**	
REGION	TOTAL (Bbbl)	% OF TOTAL	TOTAL (Tcf)	% OF TOTAL
Atlantic Offshore	4.72	3.6%	37.51	2.4%
Gulf of Mexico Offshore	48.4	37.2%	219.5	14.1%
Alaska Offshore	26.61	20.4%	131.5	8.5%
Pacific Offshore	10.2	7.8%	16.1	1.0%
U.S. Onshore	40.3	30.9%	1149	74.0%
TOTAL	130.23	100.0%***	1553.61	100.0%

*Source: DOI *Bbbl = billion barrels **Tcf = trillion cubic feet *** Numbers may not add up to 100% due to rounding*



Another way in which the amount of oil and gas reserves is artificially inflated is through the drilling industry's use of a resource multiplier that more than doubles the oil and gas estimate.[40] This multiplier is derived from areas rich in offshore fossil fuel resources and is used to inflate the government's resource estimates. However, these sites are not representative of the Atlantic offshore region, which makes the incorporation of such an arbitrary multiplier unsuitable for estimating oil and gas resources.

Previous projections have also overinflated their estimates by assuming a revenue-sharing scheme for payments on bonus bids, rents and royalties.[41] However, states along the Atlantic coast are not provided revenue-sharing under current law. In fact, current law holds that any oil and gas development off the coasts of these states is administered by the federal government, specifically BOEM.[42] In addition, industry estimates assume no cap when sharing revenues,[43] whereas the Gulf of Mexico Energy Security Act contains a cap of $500 million per year for Gulf states.[44] Individually, these assumptions produce unrealistic results, and when combined, these assumptions represent gross exaggerations of the economic benefits to states derived from offshore drilling.

Given these exaggerations, this report still relies on the most recent government and industry estimates for resource and job creation potential, all of which have come out less than a year before the publishing of this report.

The benefits of producing offshore oil and gas have been grossly inflated in previous studies.

Offshore Wind

In order to create a reasonable alternative, this report focuses on portions of wind resources that can be feasibly developed. The maximum resource potential, outlined by the National Renewable Energy Lab,[45] for offshore wind in the Atlantic was not used for a number of reasons. Coastal areas within three nautical miles were excluded from our estimates due to viewshed objections to wind farms and minimizing conflict of competing uses. Offshore areas with water depths over 60 meters were excluded because the technology for deepwater wind farms is only in the development phase. In a matter of years the wind production in deeper waters could be much greater. After these two major exclusions, half of the remaining area was excluded from wind production due to other ocean uses, such as fishing, recreation, vessel traffic, etc. To obtain capacity factors of the turbines, we used previous empirical averages of wind farm performance based on academic and government studies. The estimates are conservative considering future turbine capacity factors are set to be much higher than current operational turbines.[46] In addition, a 15 percent reduction in total output capacity was incorporated at the end to account for transmission losses and wake effects, which is in line with industry standards.[47] In fact, of all of the technically recoverable wind resources, this report only incorporates less than 10 percent of the total. Nonetheless, given these massive reductions from the upper bound of wind potential, the benefits of offshore wind resources significantly outperform those of offshore oil and gas.[48]

Because the entirety of offshore wind turbines available would not be installed immediately, the assumption of a modest and gradual buildup of offshore wind was used in this report. Given the previously described limitations on offshore wind

resources, full potential of offshore wind would not be realized until the 10th year of the projection, after which constant production would ensue.

In order to use the same energy metric, offshore wind produced during certain time periods (i.e., 10 years or 20 years) was converted to barrels of oil equivalent (BOE) to compare these resources to offshore oil and gas resources.[49, 50]

ECONOMIC ANALYSES

ANALYSIS OF ENTIRE ATLANTIC REGION

What's at Stake?

Fourteen states comprise the Atlantic OCS region: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia and Florida. The GDP from the Atlantic's living resources, which includes fishing, hatcheries, aquaculture, seafood processing and seafood markets, is valued at roughly $4.6 billion. These industries support about 64,000 jobs.[51] GDP from ocean-based tourism and recreation in the region totals nearly $91 billion, and this sector supports about 1.3 million jobs.[52]

The fishing, tourism and recreation industries are responsible for nearly 1.4 million jobs in Atlantic coast states and over $95 billion in GDP.[53] We recognize that while offshore drilling can cause a loss of GDP and jobs, it would not cause a complete loss. However, it is important to understand the magnitude of the contribution made by these two sectors.

Which Energy Source Creates More Jobs?

A modest and gradual development of offshore wind could create about 91,000 additional jobs along the Atlantic coast, which is 71 percent more than could be created by offshore oil and gas drilling over the project lifetime. This means that offshore wind has the potential to create about twice as many jobs as offshore drilling.

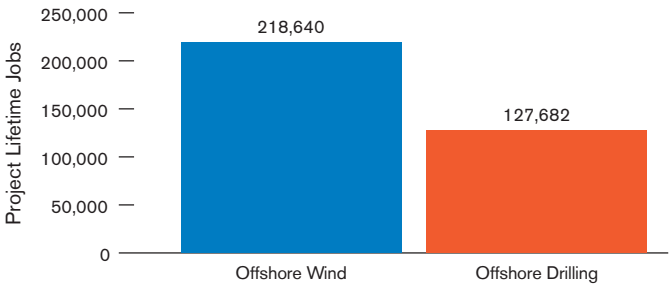
These additional job numbers understate the true difference since oil and gas resources are finite, and offshore wind will never run out. In short, when oil and gas runs out, so do the jobs. On the other hand, wind can keep on generating power and jobs well into the future. Our projections show the number of jobs that could be created by 2035; however, many more could be supported even after that date. In addition, offshore wind supplies electricity to areas near the production site. This benefits coastal communities and feeds major cities on the East Coast, including the more than 53 million people who will live in counties bordering the Atlantic Ocean by 2015.[54] Offshore drilling, however, exports oil

Table 4: Jobs and GDP in Fisheries, Tourism and Recreation Along the Atlantic Coast

	FISHERIES, AQUACULTURE & SEAFOOD MARKETS		TOURISM & RECREATION	
STATES	JOBS	GDP	JOBS	GDP
Maine	10,323	$338,643,543	42,110	$2,199,356,585
New Hampshire	730	$68,209,788	8,157	$450,317,178
Massachusetts	11,159	$1,303,502,494	86,233	$5,810,179,122
Rhode Island	1,024	$80,191,176	43,614	$2,814,933,379
Connecticut	11,355	$142,518,183	43,997	$2,567,381,161
New York	4,746	$382,012,517	348,941	$17,559,892,340
New Jersey	3,213	$181,906,509	112,153	$5,922,570,339
Delaware	452	$23,201,936	23,150	$977,177,771
Maryland	4,358	$203,804,670	85,424	$5,225,481,061
Virginia	4,953	$1,093,656,995	86,139	$3,884,430,575
North Carolina	4,313	$237,789,005	46,236	$1,953,315,354
South Carolina	1,049	$14,755,947	78,180	$4,375,125,233
Georgia	1,267	$114,225,227	19,389	$991,369,238
Florida	4,570	$404,081,038	276,025	$36,165,310,758
TOTAL*	63,513	$4,588,499,027	1,299,748	$90,896,840,093

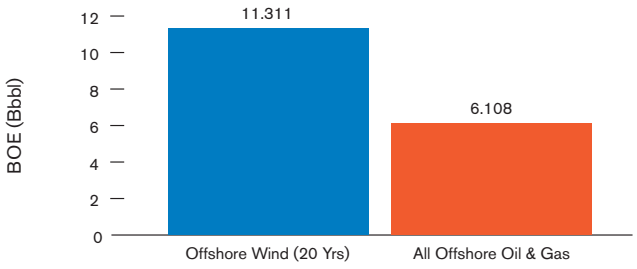
Source: Oceana using U.S. Census Bureau and NOAA data **Numbers may vary slightly due to rounding.*

Figure 4: Offshore Wind Creates More Jobs than Offshore Drilling in the Atlantic Region



Source: Oceana

Figure 5: Offshore Wind Creates More Energy than Offshore Drilling in the Entire Atlantic Region



Source: Oceana

and gas away from the coast and often outside the United States. Further, developing offshore wind comes without the threat of a catastrophic oil spill and helps curb greenhouse gas emissions.

Which Energy Source is Better for Energy Independence?

BOEM estimates that the Atlantic offshore area contains about 11.4 billion BOE of technically recoverable resource, including 4.72 billion barrels of oil and 37.51 trillion cubic feet of gas.[55] If the economically recoverable portion of these fossil fuel resources in the entire Atlantic OCS were extracted and used this year, the region would be able to meet the United States' demand for oil for 132 days and gas for 283 days, at current consumption rates. In addition, there would be no oil and gas production until 2026 at the earliest based on the industry's own projections.[56]

Offshore wind in the Atlantic would lead to greater energy independence because it would continue producing power long after the finite oil and gas deposits in the Atlantic OCS run dry. It would take only 13 years of offshore wind production to generate more energy than that produced by all of the economically recoverable offshore oil and gas. Furthermore, offshore wind could generate the equivalent of about 5.2 billion barrels more of oil in 20 years than the entire endowment of economically recoverable oil and gas.

Offshore wind could create about 91,000 additional jobs along the Atlantic coast…than could be created of by offshore oil and gas drilling over the project lifetime.

ATLANTIC PLANNING AREAS

What's at Stake?

Fishing, tourism and recreation industries in the North Atlantic Planning Area are responsible for roughly 728,000 jobs in these Atlantic Coast states and about $40 billion in GDP.[57] In the Mid-Atlantic Planning Area, these sectors support over 255,000 jobs and nearly $13.6 billion in GDP. Furthermore, the South Atlantic Planning Area supports over 381,000 jobs in these sectors and nearly $42.1 billion in GDP. We recognize that while offshore drilling can cause a loss of GDP and jobs, it would not cause a complete loss. However, it is important to understand the magnitude of the contribution made by these two sectors.

Which Energy Source Creates More Jobs?

Developing economically recoverable offshore wind resources would create more jobs in each region than those that would be created by extracting all of the economically recoverable offshore oil and gas resources. A modest and gradual development of offshore wind could create about 43,000 additional jobs in the North Atlantic region, which is a 177 percent increase over the number of jobs that could be created by offshore oil and gas drilling over the project lifetime. This means that offshore wind has the potential to create nearly three times as many jobs as offshore drilling. In the Mid-Atlantic region, offshore wind could create about 35,000 more jobs than offshore drilling. This represents a near doubling of the job creation potential. The South Atlantic region could provide about 60,000 more jobs through offshore wind as compared to offshore drilling, or more than four times the job creation potential.

These additional job numbers understate the true difference, since oil and gas resources are finite, and offshore wind will never run out. In short, when oil and gas runs out, so do the jobs. The wind, on the other hand, would keep on generating power, and jobs would continue to be supported by promoting offshore wind. Our projections show the number

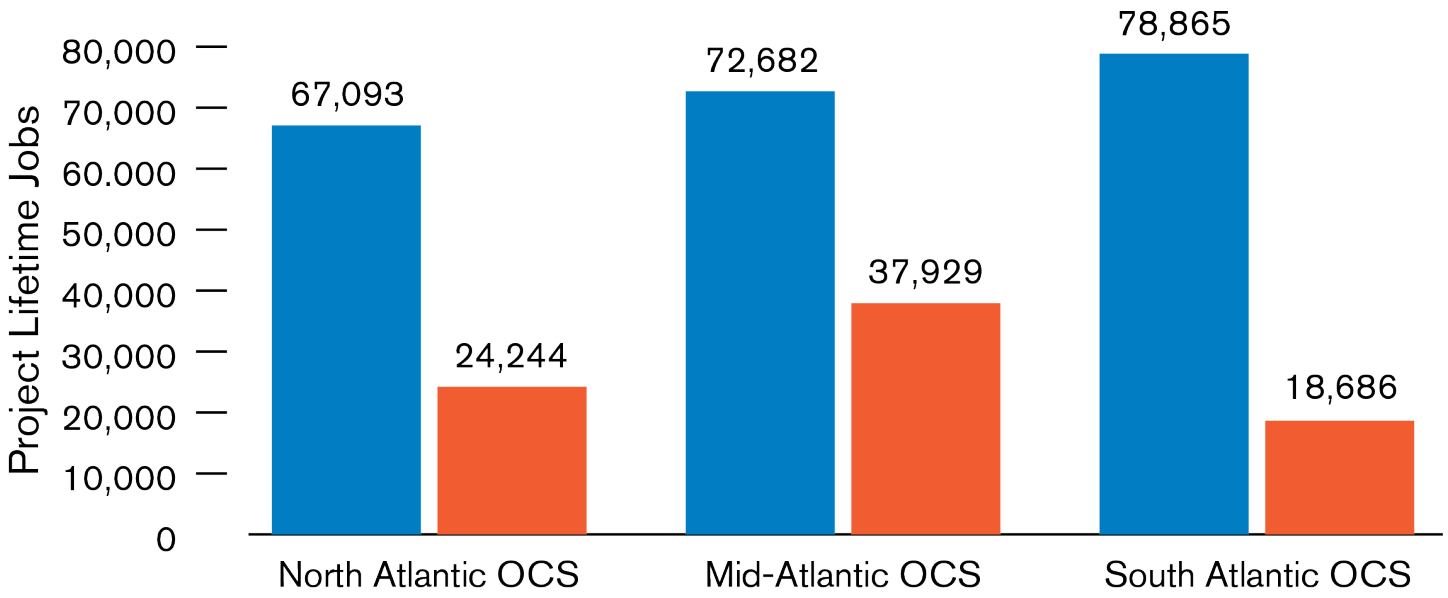
Table 5: Jobs and GDP in Fisheries, Tourism and Recreation in Each Planning Area

		JOBS		GDP	
REGION	STATES	LIVING RESOURCES	TOURISM & RECREATION	LIVING RESOURCES	TOURISM & RECREATION
Northern Atlantic OCS	Maine	10,323	42,110	$338,643,543	$2,199,356,585
	New Hampshire	730	8,157	$68,209,788	$450,317,178
	Massachusetts	11,159	86,233	$1,303,502,494	$5,810,179,122
	Connecticut	1,024	43,614	$80,191,176	$2,814,933,379
	Rhode Island	11,355	43,997	$142,518,183	$2,567,381,161
	New York	4,746	348,941	$382,012,517	$17,559,892,340
	New Jersey	3,213	112,153	$181,906,509	$5,922,570,339
Mid-Atlantic OCS	Delaware	452	23,150	$23,201,936	$977,177,771
	Maryland	4,358	85,424	$203,804,670	$5,225,481,061
	Virginia	4,953	86,139	$1,093,656,995	$3,884,430,575
	North Carolina	4,313	46,236	$237,789,005	$1,953,315,354
South Atlantic OCS	South Carolina	1,049	78,180	$14,755,947	$4,375,125,233
	Georgia	1,267	19,389	$114,225,227	$991,369,238
	Florida	4,570	276,025	$404,081,038	$36,165,310,758

Source: Oceana using Census Bureau and NOAA data

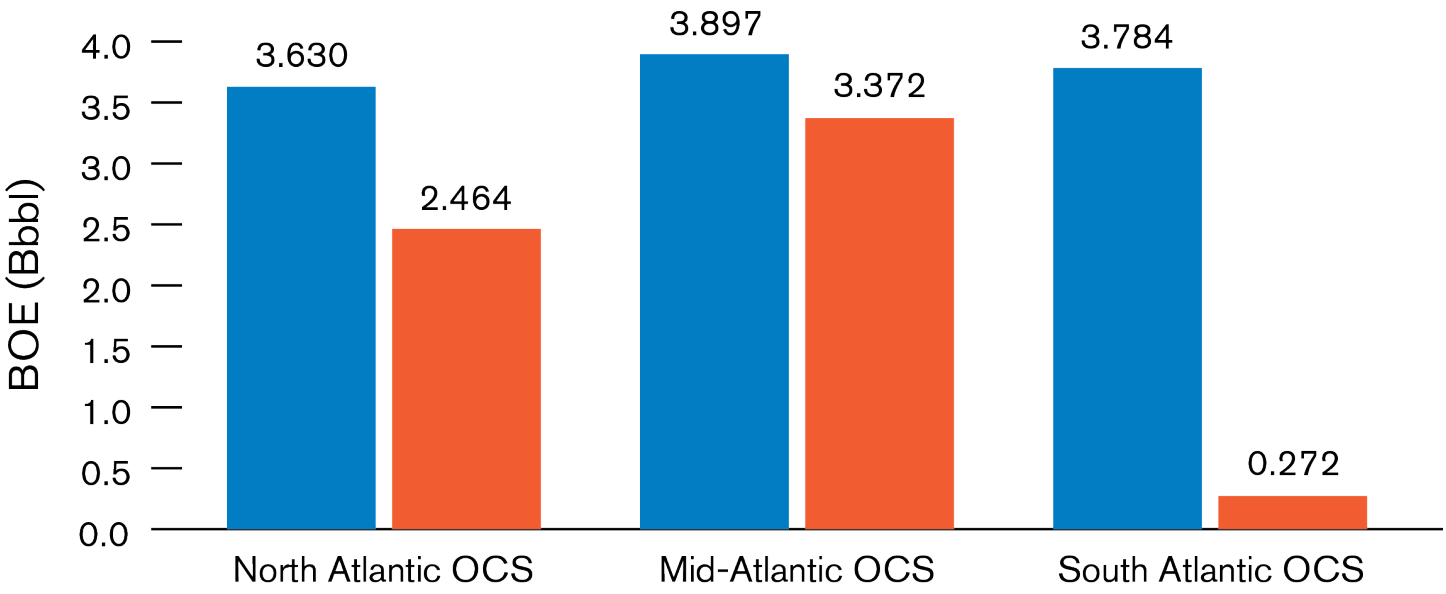
of jobs that could be created by 2035; however, many more would be supported even after that date. In addition, offshore wind supplies electricity to areas near where it is produced, benefiting coastal communities, and feeding major cities on the East Coast. In 2015, over 31 million people will live in coastal counties bordering the Atlantic Ocean in the North Atlantic region, along with nearly 12 million in the Mid-Atlantic and over 11 million in the South Atlantic.[58] Offshore drilling, on the other hand, exports oil and gas away from the coast and often outside the United States. Further, developing offshore wind comes without the threat of a catastrophic oil spill and helps curb greenhouse gas emissions.

Figure 7: Offshore Wind Creates More Jobs than Offshore Drilling in Each Planning Area



Source: Oceana

Figure 8: Offshore Wind Produces More Energy than Offshore Drilling in Each Planning Area



Source: Oceana

Which Energy Source is Better for Energy Independence?

BOEM estimates that the North Atlantic offshore area contains about 3.88 billion BOE of technically recoverable resource, with the Mid-Atlantic region containing 6.58 BOE and the South Atlantic region with 0.94 BOE.[59]

Table 6: Total BOE* of Oil and Gas in Each Planning Area**

PLANNING AREA	OIL (Bbbl)	GAS (Tcf)	BOE (Bbbl)
North Atlantic	1.75	11.94	3.88
Mid-Atlantic	2.42	23.38	6.58
South Atlantic	0.55	2.18	0.94

Source: DOI

**BOE refers to the equivalent amount of energy found in a barrel of crude oil in order to compare oil and natural gas in one energy metric.*
*** Mean Undiscovered Technically Recoverable Resources*

If the economically recoverable portion of these fossil fuel resources was extracted and used this year, the North Atlantic region would be able to meet the demand for oil for 59 days and gas for 106 days, at current consumption rates. The Mid-Atlantic has enough economically recoverable oil to meet demand for 66 days and gas for 168 days. Finally, the South Atlantic region contains enough economically recoverable oil to meet demand for 8 days and gas for 16 days. Even worse, there would be no oil and gas production until 2026 at the earliest based on industry's own projections.[60]

Offshore wind in the Atlantic region would lead to greater energy independence because offshore wind would continue producing power long after the finite oil and gas deposits in the Atlantic OCS run dry. In the North Atlantic region, it would take only 15 years of offshore wind production to generate more energy than contained in all of the economically recoverable offshore oil and gas. In the Mid-Atlantic region, the energy derived from a gradual and modest development of offshore wind would surpass all of the economically recoverable oil and gas in 18 years. In the South Atlantic region, it would take only five years of offshore wind to produce more energy than that contained in the entire endowment of economically recoverable oil and gas.

Table 7: Offshore Wind Creates More Jobs than Offshore Drilling*

REGION	OFFSHORE WIND JOBS	OFFSHORE DRILLING JOBS[61]	ADDITIONAL JOBS FROM OFFSHORE WIND COMPARED TO OFFSHORE DRILLING	NUMBER OF TIMES MORE JOBS FROM OFFSHORE WIND THAN OFFSHORE DRILLING
North Atlantic	67,093	24,244	42,849	2.8x
Mid-Atlantic	72,682	37,929	34,753	1.9x
South Atlantic	78,865	18,686	60,179	4.2x

Source: Oceana **Numbers may vary slightly due to rounding.*

Table 8: Offshore Wind Creates More Energy than Offshore Drilling in Each Region

REGION	BOE (Bbbl) FROM OFFSHORE WIND IN 20 YEARS	BOE (Bbbl) FROM OFFSHORE DRILLING	ADDITIONAL BOE (Bbbl) FROM 20 YEARS OF OFFSHORE WIND AS COMPARED TO OFFSHORE DRILLING	NUMBER OF TIMES MORE BOE (Bbbl) THAT WOULD BE PRODUCED FROM OFFSHORE WIND THAN OFFSHORE DRILLING
North Atlantic	3.630	2.464	1.166	1.5x
Mid-Atlantic	3.897	3.373	0.525	1.2x
South Atlantic	3.784	0.272	3.512	13.9x

Source: Oceana

REGIONAL SUMMARIES

All three planning areas have significant existing uses for the oceans, amounting to hundreds of thousands of jobs and billions of dollars in GDP, which could be threatened by oil and gas exploration and drilling. In addition, these regions could create about 138,000 more jobs through developing offshore wind than would be created by offshore drilling, with the biggest employment gains taking place in the South Atlantic region. Each region could create more than twice the jobs from offshore wind than offshore drilling. All three regions would benefit from greater amounts of energy generated from offshore wind than offshore drilling. The South Atlantic region would receive the biggest gains.

ANALYSIS OF STATES IN SEISMIC 'BLAST ZONE'

FLORIDA

What's at Stake?

Florida has more coastline than any other state in the continental United States. Additionally, Florida's beaches and marine resources support prosperous coastal economies. The GDP from Eastern Florida's living resources, which includes fishing, hatcheries, aquaculture, seafood processing and seafood markets, is valued at over $400 million.[62] GDP from ocean-based tourism and recreation in the state totals roughly $36.2 billion.[63]

Table 9: Florida Jobs in Fisheries, Tourism, and Recreation

276,025 jobs in ocean-based tourism & recreation[64]

4,570 jobs in fisheries, aquaculture & seafood markets[65]

Source: Oceana using Census Bureau and NOAA data

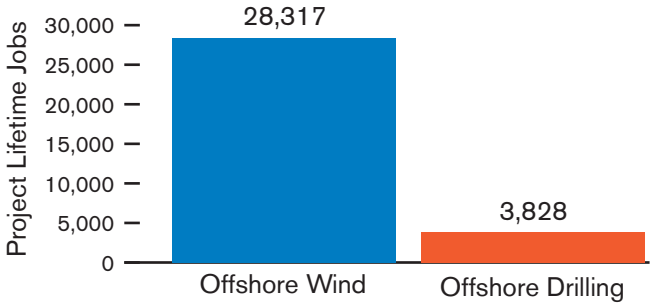
Fishing, tourism and recreation support about 281,000 jobs and generate over $36.6 billion in GDP in Florida.[66] We recognize that while offshore drilling can cause a loss of GDP and jobs, it would not cause a complete loss. However, it is important to understand the magnitude of the contribution made by these two sectors.

Which Energy Source Creates More Jobs?

Developing economically recoverable offshore wind resources would create more jobs on Florida's Atlantic coast than those that would be created by extracting all of the economically recoverable offshore oil and gas resources. A modest and gradual development of offshore wind could create over 24,000 additional jobs, or a 640 percent increase over the jobs created by offshore oil and gas drilling over the project lifetime. This means that offshore wind has the potential to create over seven times as many jobs in Florida as offshore drilling.

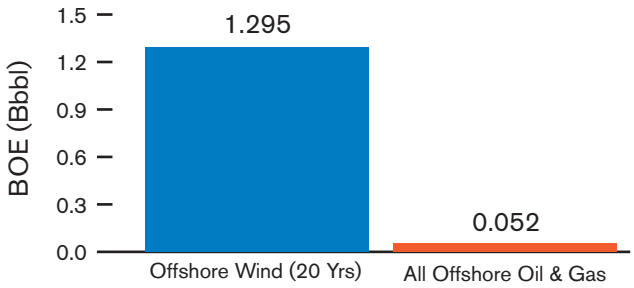
These additional job numbers understate the true difference, since oil and gas resources are finite, and offshore wind will never run out. In short, when oil and gas runs out, so do the jobs.

Figure 9: Offshore Wind Creates More Jobs than Offshore Drilling in Florida



Source: Oceana

Figure 10: Offshore Wind Creates More Energy than Offshore Drilling in Florida



Source: Oceana

Wind, on the other hand, can keep on generating power and jobs well into the future. Our projections show the number of jobs that could be created by 2035; however, many more would be supported even after that date. In addition, offshore wind supplies electricity to areas near where it is produced, benefiting coastal communities and feeding major cities on the East Coast, including over 9 million people who will live in coastal counties bordering the Atlantic Ocean in Florida by 2015.[67] Offshore drilling, however, exports oil and gas away from the coast and often outside the United States. Further, developing offshore wind comes without the threat of a catastrophic oil spill and helps curb greenhouse gas emissions.

Which Energy Source is Better for Energy Independence?

Florida's offshore oil and gas reserves are insignificant in comparison to the enormous potential of offshore wind in the state. If the economically recoverable portion of the fossil fuel resources located off Florida's shores were extracted and used this year, the region would be able to meet the demand for both oil and gas for less than two days, at current consumption rates. In addition, there would be no oil and gas production until 2026 at the earliest based on the industry's own projections.[68]

Offshore wind in Florida would lead to greater energy independence because it would continue producing power long after the finite oil and gas deposits in the Atlantic Ocean run dry. It would take only four years of offshore wind production to generate more energy than that contained in all of the economically recoverable offshore oil and gas.

[In Florida], offshore wind has the potential to create over seven times as many jobs as offshore drilling.

Furthermore, offshore wind would generate the equivalent of about 1.24 billion barrels more oil in 20 years than the entire state's endowment of economically recoverable oil and gas.

Oil and gas reserves extracted off the coast of Florida would not stay in the state to be used for electricity or gasoline by its residents. These commodities are bought and sold on a world market, dictated by a world price. On the other hand, offshore

A CLOSER LOOK: FLORIDA

- Florida's northeast coast is a popular tourist destination for its pristine beaches and world class golf courses, including the cities of Jacksonville Beach, Palm Coast, Daytona Beach and Cocoa Beach.
- Saint Augustine, the country's oldest city, is known for its historical landmarks and beautiful coast.
- Canaveral National Seashore Park is situated offshore as a haven for diverse wildlife, including sea turtle nesting sites along its beaches.
- Eastern Florida boasts large catches of commercially valuable species, including shrimp, swordfish, blue crab, mackerel, lobster, snapper and grouper.
- Florida State University's Center for Ocean-Atmospheric Prediction Studies has conducted preliminary studies indicating that offshore winds can produce cost-effective electricity for the state.

wind energy provides power directly to where it is generated. Therefore, wind turbines offshore of Florida would directly provide the state's coastal communities with electricity. Unlike oil and gas, which will eventually run out, offshore wind produces clean and renewable power without the risk of a catastrophic oil spill.

GEORGIA

What's at Stake?

Georgia has a beautiful coast, spanning over 100 miles, which supports a thriving commercial fishing industry, whale and dolphin watching, resorts and recreational fishing. The GDP from Georgia's living resources, which includes fishing, hatcheries, aquaculture, seafood processing and seafood markets, is valued at over $114 million.[69] GDP from ocean-based tourism and recreation in the state totals over $991 million.[70]

Table 10: Georgia Jobs in Fisheries, Tourism and Recreation

19,389	jobs in ocean-based tourism & recreation[71]
1,267	jobs in fisheries, aquaculture & seafood markets[72]

Source: Oceana using Census Bureau and NOAA data

Fishing, tourism and recreation support roughly 21,000 jobs and generate over $1.1 billion in GDP in Georgia.[73] We recognize that while offshore drilling can cause a loss of GDP and jobs, it would not cause a complete loss. However, it is important to understand the magnitude of the contribution made by these two sectors.

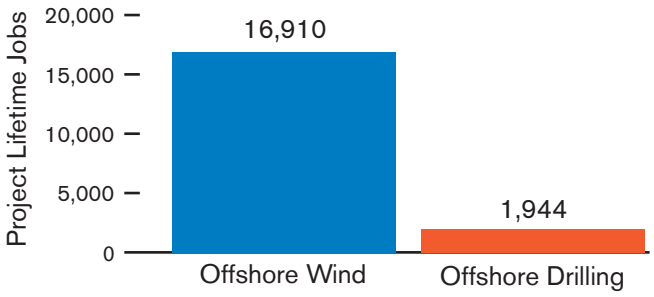
Which Energy Source Creates More Jobs?

Developing the economically recoverable offshore wind resources would create more jobs in Georgia than those that would be created by extracting all of the economically recoverable offshore oil and gas resources. A modest and gradual development of offshore wind could create about 15,000 additional jobs in Georgia, or a 770 percent increase over the jobs created by offshore oil and gas drilling over the project lifetime. This means that offshore wind has the potential to create nearly nine times as many jobs in Georgia as offshore drilling.

These additional job numbers understate the true difference, since oil and gas resources are finite, and offshore wind will never run out. In short, when oil and gas runs out, so do the jobs.

Wind, on the other hand, can keep on generating power and jobs well into the future. Our projections show the number of jobs that could be created by 2035; however, many more would be supported even after that date. In addition, offshore

Figure 11: Offshore Wind Creates More Jobs than Offshore Drilling in Georgia



Source: Oceana

wind supplies electricity to areas near where it is produced, benefiting coastal communities and feeding major cities on the East Coast, including over half a million people who will live in coastal counties bordering the Atlantic Ocean in Georgia by 2015.[74] Offshore drilling, however, exports oil and gas away from the coast and often outside the United States. Further, developing offshore wind comes without the threat of a catastrophic oil spill and helps curb greenhouse gas emissions.

[In Georgia], offshore wind has the potential to create nearly nine times as many jobs as offshore drilling.

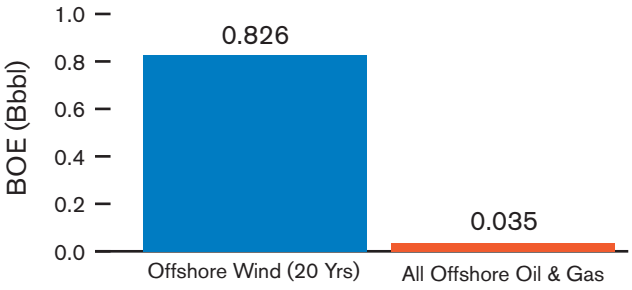
A CLOSER LOOK: GEORGIA

- With architecture from the 1700s, historical landmarks and cobblestone streets, Savannah remains a popular tourist destination along Georgia's Atlantic coast.
- Georgia's Barrier Islands, including Tybee, St. Simon's, Jekyll and Cumberland Islands, attract tourists and residents alike due to their sandy beaches and unique wildlife parks.
- Okefenokee National Wildlife Refuge is home to a variety of wildlife, including approximately 10,000 alligators in its swamps.
- Georgia boasts large catches of commercially valuable species, including shrimp, blue crab, clams and conchs.
- In April 2014, BOEM announced it will conduct an environmental assessment for offshore wind development in Georgia.

Which Energy Source is Better for Energy Independence?

Georgia's offshore oil and gas reserves are insignificant in comparison to the enormous potential of offshore wind in the state. If the economically recoverable portion of these fossil fuel resources located offshore Georgia were extracted and used this year, the region would be able to meet the demand for both oil and gas for one day, at current consumption rates. In addition, there would be no oil and gas production until 2026 at the earliest based on industry's own projections.[75]

Figure 12: Offshore Wind Creates More Energy than Offshore Drilling in Georgia



Source: Oceana

Offshore wind in Georgia would lead to greater energy independence because offshore wind would continue producing power long after the finite oil and gas deposits in the Atlantic Ocean run dry. It would take only four years of offshore wind production to generate more energy than that contained in all of the economically recoverable offshore oil and gas. Furthermore, offshore wind would generate the equivalent of about 0.79 billion barrels more of oil in 20 years than the entire state's endowment of economically recoverable oil and gas.

Oil and gas reserves extracted off the coast of Georgia do not stay in the state to be used for electricity or gasoline by its residents. These commodities are bought and sold on a world market, dictated by a world price. On the other hand, offshore wind energy provides power directly to where it is generated. Therefore, wind turbines offshore of Georgia would directly provide this state's coastal communities with electricity. Unlike oil and gas, which will eventually run out, offshore wind produces clean and renewable power without the risk of a catastrophic oil spill.

SOUTH CAROLINA

What's at Stake?

South Carolina's white sandy beaches and coastal towns are critical for the state's economy, recreation and culture. The GDP from South Carolina's living resources, which includes fishing, hatcheries, aquaculture, seafood processing and seafood markets, is valued at roughly $15 million.[76] GDP from ocean-based tourism and recreation in the state totals about $4.4 billion.[77]

Table 11: South Carolina Jobs in Fisheries, Tourism and Recreation

78,180	jobs in ocean-based tourism & recreation[78]
1,049	jobs in fisheries, aquaculture & seafood markets[79]

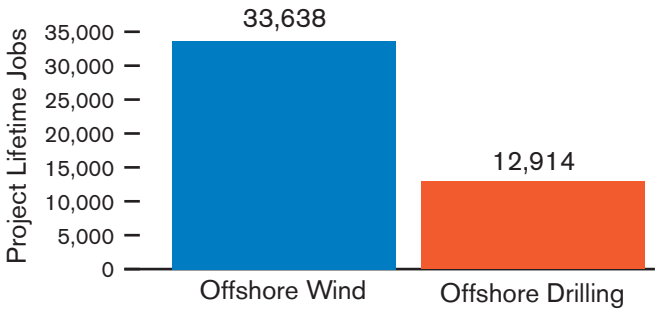
Source: Oceana using Census Bureau and NOAA data

Fishing, tourism and recreation support nearly 79,000 jobs and generate over $4.4 billion in GDP in South Carolina.[80] We recognize that while offshore drilling can cause a loss of GDP and jobs, it would not cause a complete loss. However, it is important to understand the magnitude of the contribution made by these two sectors.

A CLOSER LOOK: SOUTH CAROLINA

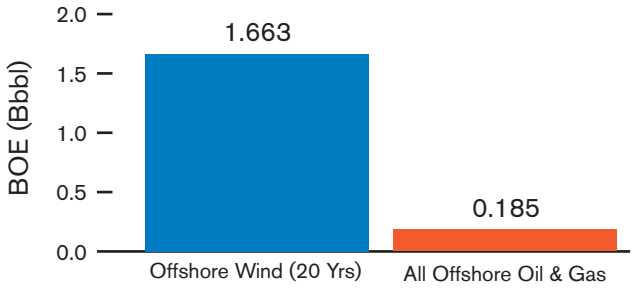
- Popular tourist destinations of Charleston, Hilton Head and Myrtle Beach bring in billions of dollars every year due to their pristine beaches, quality restaurants and whale watching industry.
- Charleston's tourism industry alone added $3.58 billion to the economy in 2012.
- South Carolina boasts large catches of commercially valuable species, including shrimp, blue crab, oysters, snapper and swordfish.
- North Charleston is home to Clemson University's South Carolina Electric and Gas Energy Innovation Center, representing the world's most advanced wind-turbine drivetrain testing facility.

Figure 13: Offshore Wind Creates More Jobs than Offshore Drilling in South Carolina



Source: Oceana

Figure 14: Offshore Wind Creates More Energy than Offshore Drilling in South Carolina



Source: Oceana

Which Energy Source Creates More Jobs?

Developing economically recoverable offshore wind resources would create more jobs in South Carolina than those created by extracting all of the economically recoverable offshore oil and gas resources. A modest and gradual development of offshore wind could create about 21,000 additional jobs, or a 161 percent increase over the jobs created by offshore oil and gas drilling over the project lifetime. This means that offshore wind has the potential to create nearly three times as many jobs in South Carolina as offshore drilling.

These additional job numbers understate the true difference, since oil and gas resources are finite, and offshore wind will never run out. In short, when oil and gas runs out, so do the jobs.

Wind, on the other hand, can keep on generating power and jobs well into the future. Our projections show the number of jobs that could be created by 2035; however, many more would be supported even after that date. In addition, offshore wind supplies electricity to areas near where it is produced. This benefits coastal communities and feeds major cities on the East Coast, including over one million people who will live in coastal counties bordering the Atlantic Ocean in South Carolina by 2015.[81] Offshore oil drilling, however, exports oil and gas away from the coast and often outside the United States. Further, developing offshore wind comes without the threat of a catastrophic oil spill and helps curb greenhouse gas emissions.

Which Energy Source is Better for Energy Independence?

South Carolina's offshore oil and gas reserves are insignificant in comparison to the enormous potential of offshore wind in the state. If the economically recoverable portion of these fossil fuel resources located offshore South Carolina were extracted and used this year, the region would be able to meet the demand for both oil and gas for six days, at current consumption rates. In addition, there would be no oil and gas production until 2026 at the earliest based on industry's own projections.[82]

Offshore wind in South Carolina would lead to greater energy independence because offshore wind would continue producing power long after the finite oil and gas deposits in the Atlantic Ocean run dry. It would take only six years of offshore wind production to generate more energy than that contained in all of the economically recoverable offshore oil and gas. Offshore wind would generate the equivalent of about 1.48 billion barrels more oil in 20 years than the entire state's endowment of economically recoverable oil and gas.

It would take only six years of offshore wind production [in South Carolina] to generate more energy than that contained in all of the economically recoverable offshore oil and gas.

Oil and gas reserves extracted off the coast of South Carolina do not stay in the state to be used for electricity or gasoline by its residents. These commodities are bought and sold on a world market, dictated by a world price. On the other hand, offshore wind energy provides power directly to where it is generated. Therefore, wind turbines offshore of South Carolina would directly provide this state's coastal communities with electricity. Unlike oil and gas, which will eventually run out, offshore wind produces clean and renewable power without the risk of a catastrophic oil spill.

NORTH CAROLINA

What's at Stake?

North Carolina's abundant ocean resources are a major tourist attraction, especially the Outer Banks, a long, narrow strip of barrier islands covering nearly the entirety of North Carolina's coast. The GDP from North Carolina's living resources, which includes fishing, hatcheries, aquaculture, seafood processing and seafood markets, is valued at roughly $238 million.[83] GDP from ocean-based tourism and recreation in the state totals about $1.9 billion.[84]

Table 12: North Carolina Jobs in Fisheries, Tourism and Recreation

46,236	jobs in ocean-based tourism & recreation[85]
4,313	jobs in fisheries, aquaculture & seafood markets[86]

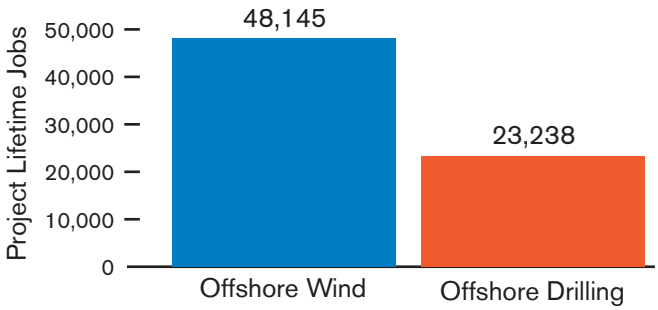
Source: Oceana using Census Bureau and NOAA data

Fishing, tourism and recreation support roughly 51,000 jobs and generate nearly $2.2 billion in GDP in North Carolina.[87] We recognize that while offshore drilling can cause a loss of GDP and jobs, it would not cause a complete loss. However, it is important to understand the magnitude of the contribution made by these two sectors.

Which Energy Source Creates More Jobs?

Developing economically recoverable offshore wind resources would create more jobs in North Carolina than those created by extracting all of the economically recoverable offshore oil and gas resources. A modest and gradual development of offshore wind could create about 25,000 additional jobs in North Carolina, or a 107 percent increase over the jobs created by offshore oil and gas drilling over the project lifetime. This means that offshore wind has the potential to create more than twice the jobs in North Carolina as offshore drilling.

Figure 15: Offshore Wind Creates More Jobs than Offshore Drilling in North Carolina



Source: Oceana

These additional job numbers understate the true difference, since oil and gas resources are finite, and offshore wind will never run out. In short, when oil and gas runs out, so do the jobs.

Wind, on the other hand, can keep on generating power and jobs well into the future. Our projections show the number of jobs that could be created by 2035; however, many more would be supported even after that date. In addition, offshore wind supplies electricity to areas near where it is produced. This benefits coastal communities and feeds major cities on the East Coast, including to over one million people who will live in coastal counties bordering the Atlantic Ocean in North Carolina by 2015.[88] Offshore drilling, on the other hand, exports oil and gas away from the coast and often outside the United States. Further, developing offshore wind comes without the threat of a catastrophic oil spill and helps curb greenhouse gas emissions.

Which Energy Source is Better for Energy Independence?

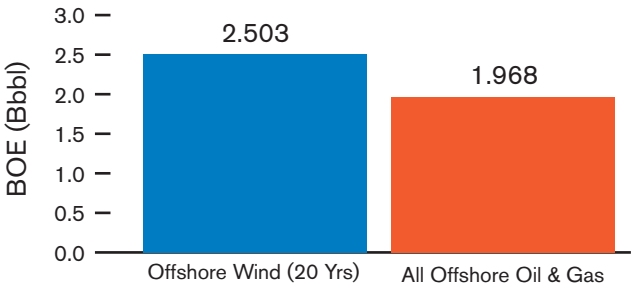
North Carolina's offshore oil and gas reserves are insignificant in comparison to the enormous potential of offshore wind in the state. If the economically recoverable portion of these fossil fuel resources located offshore North Carolina were extracted and

A CLOSER LOOK: NORTH CAROLINA

- North Carolina is known for its spectacular beaches, especially along the popular Outer Banks.
- Cape Hatteras is home to America's tallest lighthouse, which offers great views of North Carolina's coastline.
- Kure Beach Pier is the oldest fishing pier on the Atlantic coast, where locals often fish for their dinner.
- Thirty-five golf courses line the Brunswick Islands, earning the nickname "North Carolina's Golf Coast."
- North Carolina boasts large catches of commercially valuable species, including blue crab, shrimp, flounder, tuna, croaker and clams.
- In August 2014, BOEM identified three Wind Energy Areas offshore North Carolina, totaling over 300,000 acres that are set for the development of offshore wind resources.

used this year, the region would be able to meet the demand for oil for 38 days and gas for 98 days, at current consumption rates. In addition, there would be no oil and gas production until 2026 at the earliest based on industry's own projections.[89]

Figure 16: Offshore Wind Creates More Energy than Offshore Drilling in North Carolina



Source: Oceana

Offshore wind in North Carolina would lead to greater energy independence because offshore wind would continue producing power long after the finite oil and gas deposits in the Atlantic Ocean run dry. It would take about 17 years of offshore wind production to generate more energy than that contained in all of the economically recoverable offshore oil and gas. Offshore wind would generate the equivalent of over half a billion barrels more of oil in 20 years than the entire state's endowment of economically recoverable oil and gas.

Oil and gas reserves extracted off the coast of North Carolina do not stay in the state to be used for electricity or gasoline by its residents. These commodities are bought and sold on a world market, dictated by a world price. On the other hand, offshore wind energy provides power directly to where it is generated. Therefore, wind turbines off North Carolina's shores would directly provide this state's coastal communities with electricity. Unlike oil and gas, which will eventually run out, offshore wind produces clean and renewable power without the risk of a catastrophic oil spill.

VIRGINIA

What's at Stake?

From the Eastern Shore to Virginia Beach, to the ports of Hampton and Norfolk, Virginia has over 3,000 miles of coastline and is home to thousands who make their living on the shore. The GDP from Virginia's living resources, which includes fishing, hatcheries, aquaculture, seafood processing and seafood markets, is valued at roughly $1.1 billion.[90] GDP from ocean-based tourism and recreation in the state totals about $3.9 billion.[91]

Table 13: Virginia Jobs in Fisheries, Tourism and Recreation

86,139	jobs in ocean-based tourism & recreation[92]
4,953	jobs in fisheries, aquaculture & seafood markets[93]

Source: Oceana using Census Bureau and NOAA data

Fishing, tourism and recreation support over 91,000 jobs and generate nearly $5 billion in GDP in Virginia.[94] We recognize that while offshore drilling can cause a loss of GDP and jobs, it would not cause a complete loss. However, it is important to understand the magnitude of the contribution made by these two sectors.

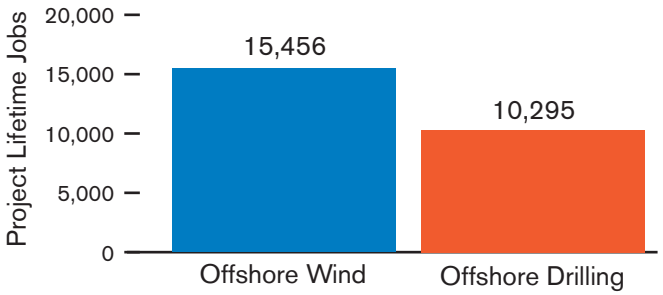
Which Energy Source Creates More Jobs?

Developing the economically recoverable offshore wind resources would create more jobs in Virginia than those that would be created by extracting all of the economically recoverable offshore oil and gas resources. A modest and gradual development of offshore wind could create over 5,000 additional jobs in Virginia, or a 50 percent increase

A CLOSER LOOK: VIRGINIA

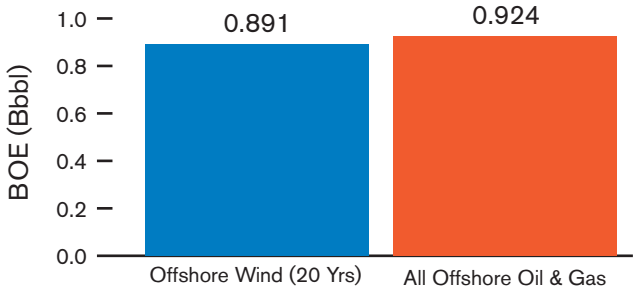
- Virginia Beach, known for its beautiful scenery and moderate climate, hosts the East Coast Surfing Championships, which is the second-longest running surfing contest in the world and draws over 100,000 tourists to the oceanfront each year.
- Kiptopeke State Park and Back Bay National Wildlife Refuge both fall along the migration path of many bird species and are a birder's dream.
- The Hampton Roads region, including Norfolk, Newport News and Virginia Beach, contains four Fortune 500 companies and includes several large military bases.
- Virginia boasts large catches of commercially valuable species, including sea scallops, menhaden, blue crab, flounder and croaker.
- Virginia is the only state that was awarded a DOE grant for an offshore wind demonstration project and also held commercial lease for an offshore wind farm. Both sites are located offshore Virginia Beach.

Figure 17: Offshore Wind Creates More Jobs than Offshore Drilling in Virginia



Source: Oceana

Figure 18: Offshore Wind Creates About as Much Energy as Offshore Drilling in Virginia



Source: Oceana

over the jobs created by offshore oil and gas drilling over the project lifetime. This means that offshore wind has the potential to create 1.5 times as many jobs in Virginia as offshore drilling.

These additional job numbers understate the true difference, since oil and gas resources are finite, and offshore wind will never run out. In short, when oil and gas runs out, so do the jobs.

Wind, on the other hand, can keep on generating power and jobs well into the future. Our projections show the number of jobs that could be created by 2035; however, many more would be supported even after that date. In addition, offshore wind supplies electricity to areas near where it is produced. This benefits coastal communities and feeds major cities on the East Coast, including over five million people who will live in coastal counties bordering the Atlantic Ocean in Virginia by 2015.[95] Offshore drilling, on the other hand, exports oil and gas away from the coast and often outside the United States. Further, developing offshore wind comes without the threat of a catastrophic oil spill and helps curb greenhouse gas emissions.

Which Energy Source is Better for Energy Independence?

Virginia's offshore oil and gas reserves are insignificant in comparison to the enormous potential of offshore wind in the state. If the economically recoverable portion of these fossil fuel resources located offshore Virginia were extracted and used this year, the region would be able to meet the demand for oil for 18 days and gas for 46 days, at current consumption rates. In addition, there would be no oil and gas production until 2026 at the earliest based on industry's own projections.[96]

Offshore wind in Virginia would lead to greater energy independence because offshore wind would continue producing power long after the finite oil and gas deposits in the Atlantic Ocean run dry. It would take about 21 years of offshore wind production to generate more energy than that contained in all of the economically recoverable offshore oil and gas. Offshore wind would generate nearly the equivalent of as many barrels of oil in 20 years as the entire state's endowment of economically recoverable oil and gas.

Oil and gas reserves extracted off the coast of Virginia do not stay in the state to be used for electricity or gasoline by its residents. These commodities are bought and sold on a world market, dictated by a world price. On the other hand, offshore wind energy provides power directly to where it is generated. Therefore, wind turbines offshore of Virginia would directly provide the state's coastal communities with electricity. Unlike oil and gas, which will eventually run out, offshore wind produces clean and renewable power without the risk of a catastrophic oil spill.

MARYLAND

What's at Stake?

Maryland is a state that depends on the ocean and is famous for its blue crabs. Sixteen of its 23 counties border tidal water, for a total of 4,431 miles. The GDP from Maryland's living resources, which includes fishing, hatcheries, aquaculture, seafood processing and seafood markets, is valued at over $200 million.[97] GDP from ocean-based tourism and recreation in the state totals over $5.2 billion.[98]

Table 14: Maryland Jobs in Fisheries, Tourism and Recreation

85,424	jobs in ocean-based tourism & recreation[99]
4,358	jobs in fisheries, aquaculture & seafood markets[100]

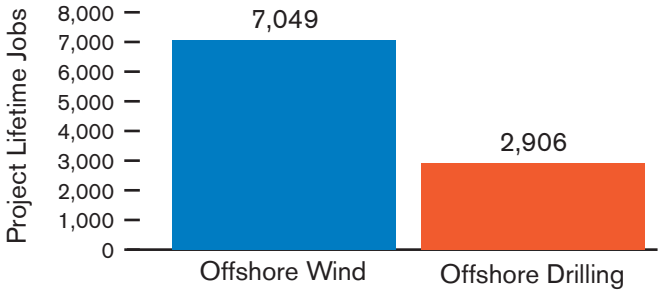
Source: Oceana using Census Bureau and NOAA data

Fishing, tourism and recreation support about 90,000 jobs and generate over $5.4 billion in GDP in Maryland.[101] We recognize that while offshore drilling can cause a loss of GDP and jobs, it would not cause a complete loss. However, it is important to understand the magnitude of the contribution made by these two sectors.

Which Energy Source Creates More Jobs?

Developing economically recoverable offshore wind resources would create more jobs in Maryland than those created by extracting all of the economically recoverable offshore oil and gas resources. A modest and gradual development of offshore wind could create over 4,000 additional jobs in Maryland, or a 143 percent increase over the jobs created by offshore oil and gas drilling over the project lifetime. This means that offshore wind has the potential to create about 2.5 times as many jobs in Maryland as offshore drilling.

Figure 19: Offshore Wind Creates More Jobs than Offshore Drilling in Maryland



Source: Oceana

These additional job numbers understate the true difference, since oil and gas resources are finite, and offshore wind will never run out. In short, when oil and gas runs out, so do the jobs.

[In Maryland] offshore wind has the potential to create about 2.5 times the jobs as offshore drilling.

Wind, on the other hand, can keep on generating power and jobs well into the future. Our projections show the number of jobs that could be created by 2035; however, many more would be supported even after that date. In addition, offshore wind supplies electricity to areas near where it is produced. This benefits coastal communities and feeds major cities on the East Coast, including over four million people who will live in coastal counties bordering the Atlantic Ocean in Maryland by 2015.[102] Offshore drilling, however, exports oil and gas away from the coast and often outside the United States. Further, developing offshore wind comes without the threat of a catastrophic oil spill and helps curb greenhouse gas emissions.

Which Energy Source is Better for Energy Independence?

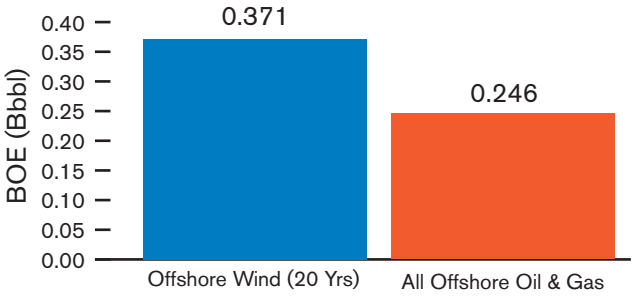
Maryland's offshore oil and gas reserves are insignificant in comparison to the enormous potential of offshore wind in the state. If the economically recoverable portion of fossil fuel resources located offshore of Maryland were extracted and used this year, the region would be able to meet the demand for oil for five days and gas for 12 days, at current consumption rates. In addition, there would be no oil and gas production until 2026 at the earliest based on industry's own projections.[103]

Offshore wind in Maryland would lead to greater energy independence because offshore wind would continue producing power long after the finite oil and gas deposits in the Atlantic Ocean run dry. It would take about 15 years of offshore wind production to generate more energy than that contained in all of the economically recoverable offshore oil and gas. Offshore wind would generate the equivalent of about 0.13 billion barrels more of oil in 20 years than the entire state's endowment of economically recoverable oil and gas.

A CLOSER LOOK: MARYLAND

- Tourists flock to Assateague State Park to swim, surf, camp and kayak. Assateague Island is home to wild horses and great fishing.
- Both tourists and locals alike enjoy Maryland's famous crab cakes, made with Maryland's unique Old Bay seasoning.
- The capital city of Annapolis is a beautiful historic town right on the Chesapeake Bay, where tourists enjoy museums, shopping and restaurants.
- The Maryland Eastern Shore includes Ocean City, a popular beach destination during Maryland's hot summer months. This area also includes seafood festivals, water festivals, boating races and fishing tournaments, which are all popular tourist attractions.
- Maryland boasts large catches of commercially valuable species, including blue crab, striped bass, clams, white perch and menhaden.
- In August 2014, Maryland held two lease sales for the development of offshore wind, located 10 nautical miles offshore Ocean City.

Figure 20: Offshore Wind Creates More Energy than Offshore Drilling in Maryland



Source: Oceana

Oil and gas reserves extracted off the coast of Maryland do not stay in the state to be used for electricity or gasoline by its residents. These commodities are bought and sold on a world market, dictated by a world price. On the other hand, offshore wind energy provides power directly to where it is generated. Therefore, wind turbines offshore of Maryland would directly provide this state's coastal communities with electricity. Unlike oil and gas, which will eventually run out, offshore wind produces clean and renewable power without the risk of a catastrophic oil spill.

DELAWARE

What's at Stake?

Each of Delaware's counties has considerable coastline. The GDP from Delaware's living resources, which includes fishing, hatcheries, aquaculture, seafood processing and seafood markets, is valued at over $23 million.[104] GDP from ocean-based tourism and recreation in the state totals over $977 million.[105]

Table 15: Delaware Jobs in Fisheries, Tourism and Recreation

23,150	jobs in ocean-based tourism & recreation[106]
452	jobs in fisheries, aquaculture & seafood markets[107]

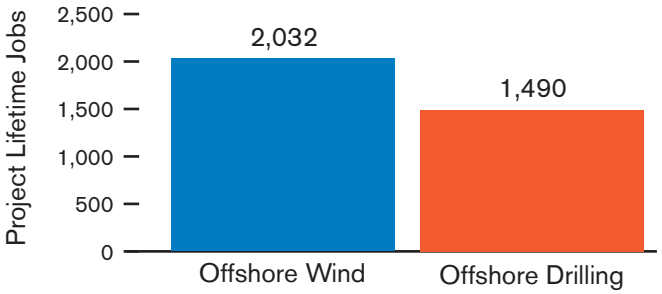
Source: Oceana using Census Bureau and NOAA data

Fishing, tourism and recreation support about 24,000 jobs and generate over $1 billion in GDP in Delaware.[108] We recognize that while offshore drilling can cause a loss of GDP and jobs, it would not cause a complete loss. However, it is important to understand the magnitude of the contribution made by these two sectors.

Which Energy Source Creates More Jobs?

Developing economically recoverable offshore wind resources would create more jobs in Delaware than those that would be created by extracting all of the economically recoverable offshore oil and gas resources. A modest and gradual development of offshore wind could create over 500 additional jobs in Delaware, or a 36 percent increase over the jobs created by offshore oil and gas drilling over the project lifetime. This means that offshore wind has the potential to create over 1.5 times as many jobs in Delaware as offshore drilling.

Figure 21: Offshore Wind Creates More Jobs than Offshore Drilling in Delaware



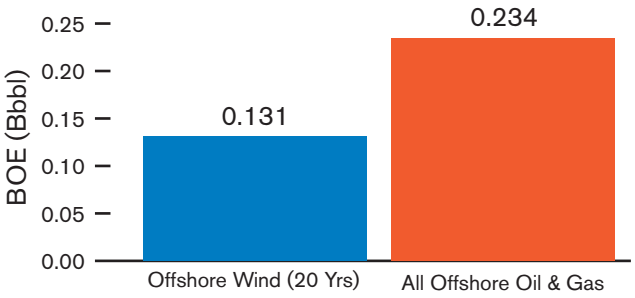
Source: Oceana

These additional job numbers understate the true difference, since oil and gas resources are finite, and offshore wind will never run out. In short, when oil and gas runs out, so do the jobs.

Wind, on the other hand, can keep on generating power and jobs well into the future. Our projections show the number of jobs that could be created by 2035; however, many more would be supported even after that date. In addition, offshore wind supplies electricity to areas near where it is produced. This benefits coastal communities and feeds major cities on the East Coast, including the nearly one million people who will live in coastal counties bordering the Atlantic Ocean in Delaware by 2015.[109] Offshore drilling, on the other hand, exports oil and gas away from the coast and often outside the United States. Further, developing offshore wind comes without the threat of a catastrophic oil spill and helps curb greenhouse gas emissions.

[In Delaware], offshore wind has the potential to create over 1.5 times as many jobs as offshore drilling.

Figure 22: Offshore Wind Creates About as Much Energy as Offshore Drilling in Delaware



Source: Oceana

Which Energy Source is Better for Energy Independence?

Delaware's offshore oil and gas reserves are insignificant in comparison to the enormous potential of offshore wind in the state. If the economically recoverable portion of these fossil fuel resources located offshore Delaware were extracted and used this year, the region would be able to meet the demand for oil for five days and gas for 12 days, at current consumption rates. In addition, there would be no oil and gas production until 2026 at the earliest based on industry's own projections.[110]

Offshore wind in Delaware would lead to greater energy independence because offshore wind would continue producing power long after the finite oil and gas deposits in the Atlantic Ocean run dry. It would take about 32 years of offshore wind production to generate more energy than that contained in all of the economically recoverable offshore oil and gas.

Oil and gas reserves extracted off the coast of Delaware do not stay in the state to be used for electricity or gasoline by its residents. These commodities are bought and sold on a world market, dictated by a world price. On the other hand, offshore wind energy provides power directly to where it is generated. Therefore, wind turbines offshore of Delaware would directly provide this state's coastal communities with electricity. Unlike oil and gas, which will eventually run out, offshore wind produces clean and renewable power without the risk of a catastrophic oil spill.

A CLOSER LOOK: DELAWARE

- Delaware is well known for its beautiful beaches, like Bethany and Rehoboth Beach. Along the Rehoboth boardwalk, tourists and locals alike enjoy all-you-can-eat fresh crabs and vinegar French Fries.
- Tourists frequent historic Lewes considered the "First Town in the First State."
- Delaware boasts large catches of commercially valuable species, including blue crab, striped bass and eastern oyster.

STATE SUMMARIES

All seven states in the "blast zone" have significant existing uses of the oceans, amounting to hundreds of thousands of jobs and billions of dollars in GDP, which could be threatened by oil and gas exploration and drilling. In addition, these states could create about 95,000 more jobs through offshore wind development than could be created by offshore drilling, with the biggest employment gains taking place in North Carolina, Florida and South Carolina. Finally, nearly all seven states would benefit from greater amounts of energy generated from offshore wind than offshore drilling, with the greatest energy gains taking place in the same three states.

Table 16: Jobs and GDP in Fishing, Tourism and Recreation in States

STATE	OCEAN-BASED JOBS (FISHERIES, TOURISM & RECREATION)	OCEAN-BASED GDP (FISHERIES, TOURISM & RECREATION)
Florida	280,595	$36,569,391,796
Georgia	20,657	$1,105,594,464
South Carolina	79,229	$4,389,881,180
North Carolina	50,549	$2,191,104,359
Virginia	91,092	$4,978,087,571
Maryland	89,782	$5,429,285,731
Delaware	23,602	$1,000,379,707

Source: Oceana using Census Bureau and NOAA data

Table 17: Offshore Wind Creates More Jobs than Offshore Drilling in All States

STATE	OFFSHORE WIND JOBS	OFFSHORE DRILLING JOBS	ADDITIONAL JOBS FROM OFFSHORE WIND COMPARED TO OFFSHORE DRILLING	NUMBER OF TIMES MORE JOBS FROM OFFSHORE WIND THAN OFFSHORE DRILLING
Florida	28,317	3,828	24,489	7.4x
Georgia	16,910	1,944	14,966	8.7x
South Carolina	33,638	12,914	20,724	2.6x
North Carolina	48,145	23,238	24,907	2.1x
Virginia	15,456	10,295	5,161	1.5x
Maryland	7,049	2,906	4,143	2.4x
Delaware	2,032	1,490	542	1.4x

Source: Oceana

Table 18: Offshore Wind Creates More Energy than Offshore Drilling in Nearly All States

STATE	BOE (Bbbl) FROM OFFSHORE WIND IN 20 YEARS	BOE (Bbbl) FROM OFFSHORE DRILLING	ADDITIONAL BOE (Bbbl) FROM 20 YEARS OF OFFSHORE WIND AS COMPARED TO OFFSHORE DRILLING	NUMBER OF TIMES MORE BOE (Bbbl) THAT WOULD BE PRODUCED FROM OFFSHORE WIND THAN OFFSHORE DRILLING
Florida	1.295	0.052	1.243	24.9x
Georgia	0.826	0.035	0.791	23.6x
South Carolina	1.663	0.185	1.478	9.0x
North Carolina	2.503	1.967	0.535	1.3x
Virginia	0.891	0.924	-0.033	1.0x
Maryland	0.371	0.246	0.125	1.5x
Delaware	0.131	0.234	-0.103	0.6x

Source: Oceana

RECOMMENDATIONS

MOVING AWAY FROM OUR OIL AND GAS DEPENDENCE

- Eliminate federal subsidies for fossil fuels and redirect these funds to renewable energies and energy efficiency programs.
- Congress and the Obama administration should stop the expansion of offshore oil and gas production to prevent future spills and minimize competition for resources and expertise that will slow the development of offshore wind energy. Specifically, President Obama and the Department of the Interior (DOI) should keep the Atlantic Ocean out of the 2017-2022 Five Year Plan for Oil and Gas Leasing.
- The Obama administration, specifically DOI, should prohibit seismic testing in the Atlantic Ocean because it threatens marine life and coastal economies. If seismic surveys do occur, the Bureau of Ocean Energy Management (BOEM) should require the following measures: make seismic data publically available, require alternative technologies for seismic surveys like marine vibroseis, and create large "no activity zones" for sensitive habitats and species.
- DOI should prioritize leasing of installation vessels for offshore wind turbine construction so that it is not impeded by offshore oil and natural gas development.

DEVELOPING A RENEWABLE ENERGY FUTURE

- Encourage the development of renewable resources, such as wind and solar energy.
- Congress should pass legislation extending the Investment Tax Credit for offshore wind energy projects for at least 10 years.
- The administration, specifically the Department of Energy, should increase and make permanent the Innovative Technology Loan Guarantee Program for opening, expanding or modernizing facilities to manufacture offshore wind turbine components and extend this program to turbine installation vessel manufacturing.
- State and federal governments should implement policy mechanisms that increase the long-term demand for and supply of renewable energy, such as a robust Renewable Electricity Standard or feed-in tariff, Production and Investment Tax Credits and Loan Guarantee programs for renewable energy projects and technology manufacturers and training programs.
- Congress should pass legislation that accelerates the electrification of the transportation fleet through incentives to automobile manufacturers and purchasers and by building the needed infrastructure such as charging stations to allow maximal use of this new technology.

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ABBREVIATIONS

Bbbl	Billion barrels of oil
BOE	Barrel of Oil Equivalent
BOEM	Bureau of Ocean Energy Management
BSEE	Bureau of Safety and Environmental Enforcement
DOE	Department of Energy
DOI	Department of the Interior
GDP	Gross Domestic Product
GW	Gigawatt
NEPA	National Environmental Policy Act
OCS	Outer Continental Shelf
Tcf	Trillion cubic feet