

The Honorable Bev Perdue Governor of North Carolina
Office of the Governor
20301 Mail Service Center
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March 24, 2011

Dear Governor Perdue:

The Southern Alliance for Clean Energy is a regional organization that promotes responsible energy choices that create climate change solutions and ensure clean, safe and healthy communities throughout the Southeast. We welcome this opportunity to engage in a thoughtful offshore energy discussion and we would like to thank you for your willingness to discuss offshore energy. SACE would like to voice our support for offshore wind energy while urging a moratorium on offshore oil or natural gas development.

North Carolina Offshore Wind Potential

While no offshore wind farms have been built in the U.S., several proposed wind farms are in the advanced stages of the permitting process. Most of the proposed projects are in states north of North Carolina; however, North Carolina arguably has the best shallow water offshore wind resource in the entire country.¹

The National Renewable Energy Lab has estimated that North Carolina contains approximately 297 gigawatts of potential offshore wind energy capacity. NREL estimates that North Carolina could generate nearly seven times the amount of electricity it currently generates from offshore wind.² If even a small portion of North Carolina's full potential were developed, the state and country would reap great economic and environmental benefits.

Offshore Wind Energy Around the World

Offshore wind energy isn't a new idea. Currently, nearly 3 gigawatts of offshore wind farms are operational in Europe. A single gigawatt of offshore wind energy can generate as much electricity as consumed by about 305,000 average-sized homes annually. Europe plans on installing 150 gigawatts of offshore wind energy by 2030, which would provide between 13% and 18% of that continent's electricity demand.³ Based on these projections, some 293,000 manufacturing, installation, operations and maintenance jobs could be created in the offshore wind industry in Europe by 2030. Aside from Europe, China is the only other place in the world where offshore wind farms are currently operational.⁴

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Offshore Wind Energy Environmental Benefits are Significant

With offshore wind electricity generation, there is no air pollution, no risk of a catastrophic accident, no water consumption and no mining operations. Yes, there are impacts to manufacturing a wind turbine and installing it; however, these are minimal compared to generating electricity from coal, natural gas or nuclear power.⁵

When measuring the benefits of offshore wind energy, it is very important to consider the alternatives and the negative impacts those have.

- Coal-fired power plants emit smog and haze-forming air pollution, toxins like mercury, a potent neurotoxin that can end up in the fish we eat, and carbon dioxide the primary global warming pollutant. Coal plants also have waste storage issues with residual coal ash that is currently pending classification as a hazardous waste.⁶
- Nuclear power plants can pose radioactive risks to nearby communities.
- Natural gas, coal and nuclear power plants consume vast amounts of water and require mining or drilling operations to supply their fuel lines.⁷

In addition to supplanting dirtier sources of energy, offshore wind farms may provide artificial reef sites. Some European studies suggest offshore wind farms act as habitat for fish and other wildlife, and may actually improve the ecosystem.⁸ More research must be completed to determine the total ecosystem impact from offshore wind turbines.

Offshore Wind Energy Would Create Thousands of Jobs

Another benefit offshore wind energy provides is job creation. According to a study by the National Renewable Energy Lab, each megawatt of offshore wind energy capacity built in the U.S. will create more than 20 direct (immediate) jobs, based on European data. Offshore wind farms have been operational in Europe for nearly 20 years, and 19,000 people are already employed in the offshore wind industry in that continent, including manufacturing.⁹

If just one percent of North Carolina's offshore wind potential was developed, more than 2,400 permanent operations and maintenance (O&M) jobs would be created locally and more than 62,000 job years would be required to manufacture and install the turbines.¹⁰ If a primary goal of this administration is bringing jobs to North Carolina, offshore wind is a solution.

Offshore Wind Energy Could Be a Source of State Revenue

In addition to job creation and the environmental benefits of offshore wind energy, the state could receive additional revenue from offshore wind development. Unlike oil and natural gas development, states are currently allowed to collect revenue from federal lands offshore, so long as the wind farms are within a certain distance from shore. If a portion of a project is within six nautical miles of North Carolina's coast, even if the geographic epicenter of the project is up to 15 miles away, the state could collect 27 percent of the revenue collected from the Bureau of Ocean Energy, Management and

Regulation.¹¹ About 20 percent, or nearly 45 gigawatts of offshore wind energy capacity resides three to twelve nautical miles off North Carolina.¹² While it is unlikely this resource would be fully developed, this represents a huge resource that the state could collect revenue from.

Negative Impacts from Offshore Wind Farms are Minimal or Can Be Mitigated

Despite all the positive benefits from offshore wind farms, there are some concerns that need to be researched and evaluated. For example, a marine resource assessment must be conducted off North Carolina to collect additional data on the marine environment. Even with additional data and mitigation efforts, some areas may not be suitable for offshore wind farm development. Those areas should be identified to aide potential developers and prevent user conflict.

Birds

One of the biggest concerns with wind farms is their impact on avian populations. While some birds will undoubtedly hit and killed by wind turbines, it is important to put these fatalities into context of the alternatives. One peer reviewed scientific paper estimated bird deaths from fossil fuel, nuclear and wind power generation sources.¹³ The study found that on average, fossil fuel power plants kill 13 times more than wind power does, per unit of electricity generation. Meaning that for each kilowatt-hour of electric generation, fossil fuel power plants are 13 times worse than wind farms for avian impacts. The estimate means that wind farms killed approximately seven thousand birds in the United States in 2006 and fossil-fueled power plants killed about 14.5 million. Looking beyond energy generation finds power plants are not the top source of avian mortality. The top two killers of wild birds in the U.S. are buildings and house cats.¹⁴

Fishing

An impact that needs to be researched is the implications on marine fish populations near offshore wind farms and fishing. European studies suggest that offshore wind turbines serve as hard structure in an otherwise structure-less area and support a variety of fish species.¹⁵ However, some studies show fish may just be aggregating near turbines and not necessarily providing additive habitat. Similar studies question the benefits of artificial reefs.¹⁶

Tourism

Another question raised by offshore wind farms is their effect on local tourism. Tourism, a multi-million dollar industry in North Carolina, may stand to benefit from offshore wind development. Preliminary research shows that wind farms may actually increase local tourism.

- In Denmark, where offshore wind farms have been operational for decades, the farms are tourist destinations and boat trips are available to visit the turbines.
- A study by the University of Delaware polled beachgoers in that state. The study found that more people were interested in seeing the wind turbines than would be deterred by them.¹⁷

- Offshore wind farms may also provide recreational sites for fishing or SCUBA diving.¹⁸

However, research specific to North Carolina's shore should be conducted prior to development to gauge potential impact on local tourism and identify areas that would be least intrusive to tourists visiting the Outer Banks.

Recommendations on Offshore Wind

In order to promote offshore wind energy, The Southern Alliance for Clean Energy makes the following recommendations:

1) North Carolina should proactively recruit offshore wind energy developers and wind turbine manufacturers. Several states have created loan and grant programs to bring offshore wind development, and job creation, to their respective coasts. In addition to loan programs, tax credits for project development and manufacturers of clean energy technology should also be included in a financial package. The North Carolina Renewable Energy Equipment Manufacturer Tax Credit is a good start; however, extending and increasing this credit, or making it reimbursable would make it even more attractive. The North Carolina Department of Commerce should identify and pursue potential offshore wind energy developers and wind turbine manufacturers that could locate their facilities in the state.

2) North Carolina should conduct additional research to pre-identify areas offshore that are best suited for offshore wind energy development. This type of analysis should build off of the already successful work completed by the University of North Carolina Chapel Hill that identified offshore wind energy areas; however, more data are necessary. Conducting a siting analysis similar to what New Jersey has done would help distinguish North Carolina apart from other states and provide potential developers with a sense of certainty that the state is serious about developing its resource.

3) North Carolina should evaluate the impacts and mitigation strategies for offshore wind energy development. Public concerns over birds, tourism, fishing and visual effects need to be addressed to ensure proper siting and public acceptance.

North Carolina and Offshore Oil and Gas Development

The Deepwater Horizon oil rig explosion on April 20th, 2010 should provide a vivid image to the citizens of North Carolina that offshore oil and natural gas drilling is a dangerous prospect for the state. The economic and environmental tolls from the Gulf oil disaster are still being tallied, and we may never know the full extent of the damage we have caused because of our addiction to oil. North Carolina should devote time and resources to developing clean energy resources, like offshore wind energy, instead of focusing on the miniscule oil and natural gas resources offshore.¹⁹ Why risk North Carolina's coastal tourism economy that creates thousands of jobs and generates millions of dollars for the state?²⁰ Why sacrifice miles of breathtaking coastline and put our natural resources in harms way for a resource that will do nothing for energy independence.²¹

Environmental Impacts of Oil and Natural Gas Development

The Southern Alliance for Clean Energy would like to challenge North Carolina, along with the rest of the Atlantic coast, to fully weigh the impacts of offshore oil and natural gas development when determining whether or not to allow those resources to be extracted.

The Deepwater Horizon oil explosion was not an isolated incident. The Bureau of Ocean Energy Management, Regulation and Enforcement, the National Oceanic and Atmospheric Administration and the National Response Center all keep statistics and data on offshore oil spills, and every year, hundreds of oil spills are reported. A few of these spills can be tracked to their source, but many go unreported and unsolved.²²

Seismic Study Impacts

Aside from accidental discharge from offshore rigs, each step in the process of oil and natural gas exploration, development, extraction and processing causes damage to the marine environment and threatens another Deepwater Horizon disaster. Should North Carolina decide to allow offshore oil and natural gas development off the coast, the first step in development is a thorough geologic and geographic (G&G) study of the seabed to determine amount and location of potential oil and gas resources. These G&G studies collect data by having ships traverse thousands of miles of ocean in a systematic way with seismic tests.²³

Seismic geologic and geographic studies use air cannons that emit extremely loud noises to penetrate deep into the seabed.²⁴ These sounds bounce back from the seafloor and below to a collection system onboard a ship. Far from being benign, these loud noises have been shown to cause marine mammals, like whales, dolphins and seals, distress and even deafness if the wildlife are too close.²⁵ Many marine mammals and even fish rely on sound to navigate, hunt and mate. Conducting a seismic testing scheme off North Carolina would do harm to the marine environment, and there is no guarantee of finding oil or natural gas resources.

Exploratory Impacts

If the seismic tests identify estimates for offshore oil and natural gas, then private developers may become interested in exploring North Carolina's coast. While seismic testing can provide a rough estimate for oil and natural gas resources, drilling must occur in order to determine if the resources actually exist. The Deepwater Horizon oil rig was an exploratory rig and was meant to only drill wells to find out if the oil and gas resources existed. The rig found both oil and natural gas, and it was an uncontrollable release of natural gas that ultimately caused the rig to explode. The worst environmental disaster in American history occurred even before actual oil production even began.

During the drilling process thousands of pounds of chemicals and mud are forced down the drilling apparatus to ensure the drill bit does not overheat. These drilling muds are not the mud that you and I played with as a child, but a chemically synthetic concoction created in a lab. Some of these chemicals are known carcinogens.²⁶ Many companies do not release the exact ingredients or ratios of their drilling mud chemicals. In an attempt to stop the offshore oil spill, BP has conducted a "top kill" procedure – pumping nearly 2.1 million gallons of drilling mud into the well. This quantity of drilling mud has never been used at such a depth to stop a blown-out well. BOEMRE routinely collects data from offshore oil rigs regarding this mud. Commonly called "synthetic-based fluid" (SBF), any loss of SBF's over 50 barrels are reported to BOEMRE as "significant pollution incidents." In 2009 alone, over 25,000 gallons of SBF's were accidentally discharged from normal offshore operations.²⁷ Even during normal operations, use of drilling mud is regulated due to toxicity concerns.

Deepwater Horizon was a dynamically positioned semisubmersible oil rig, meaning that it could be moved from place to place under its own power. The rig was not tied to the ocean floor, but instead it used engines just like a ship to stay in place. Operation of the rig consumed in excess of 10,000 gallons of diesel fuel every day, emitting air pollutants like sulfur dioxide, nitrous oxides and carbon dioxide. Deepwater Horizon contained 700,000 gallons of diesel onboard at the time of the explosion. These exploratory rigs are just that: exploration devices. Up to this point in the oil and gas development process, no oil or natural gas have been produced, provided, supplied or sold in any fashion that would reduce our dependence on foreign oil.

Extraction and Transportation Impacts

Had Deepwater Horizon completed its job, it would have capped the well, and another rig would have moved over the Macondo well head to extract the oil and natural gas. In the Gulf of Mexico, there are thousands of miles of pipeline infrastructure that have been built up over decades of oil and gas development. It is likely the Macondo well would have been connected to an already existing pipeline in order to transport the oil to shore. Existing pipeline infrastructure reduces the impact of installing new pipe; however, as these pipes age, the risk of a rupture becomes very real. During the Gulf oil disaster, an oil pipeline ruptured spilling nearly one million gallons of oil in Michigan²⁸ and in September, a natural gas pipeline exploded and killed eight people in California.²⁹

Here in North Carolina, where extensive pipeline infrastructure do not exist, oil and natural gas companies will have two choices: either develop the pipeline infrastructure to transport oil and gas to shore, or collect oil and gas offshore in large tankers. Pipelines would ensure that the oil and gas are brought to North Carolina, potentially creating an onshore industrial zone including processing and refining infrastructure similar to what exists in coastal Louisiana. If the pipeline infrastructure isn't created, the oil and gas could be shipped anywhere, away from the state. However, shipping oil and natural gas in tankers comes with its own set of hazards and risks. During the Deepwater Horizon accident, you may recall that the Exxon Valdez oil tanker spill was frequently the measuring stick for how disastrous of an accident it was. After the ruptured Macondo well was capped, the Gulf Disaster is estimated to have released nearly 20 times more oil than the Exxon Valdez spill.³⁰

In order to transport natural gas from offshore via tanker, one option may be to cool and liquefy the natural gas. These liquid natural gas tankers, or LNG tankers, require special LNG ports to re-gasify the natural gas when it arrives at port. LNG tankers, and the LNG ports may represent a huge risk to local communities should a catastrophic accident occur, or provide enticing targets for terrorist attacks.³¹

End-use Impacts

Many of these scenarios are worst-case scenarios; however, they must be weighed against what the state will be getting out of developing its oil and natural gas resources. At the bare minimum, assuming the oil and gas is safely extracted, brought to shore, processed and refined, oil and natural gas end-use, typically burning these products to extract energy, is a harmful environmental activity.

Petroleum, or oil, is typically broken down into many different products like gasoline for our cars, kerosene for jets, or diesel for trucks, trains and ships. In the United States, transportation represents approximately a third of the country's greenhouse gas emissions, primarily in the form of carbon dioxide.³² Carbon dioxide is a leading pollutant in anthropogenic climate change. Sea level rise from climate change poses significant risks to North Carolina's coastline and coastal residents.

Natural gas is used in a variety of industries including electricity production, transportation and as a chemical feedstock. When burned, natural gas also produces carbon dioxide, a potent greenhouse gas. In addition to climate change, carbon dioxide harms our oceans by acidifying the water.³³ Increased levels of carbon dioxide lowers the pH level of the oceans globally. Unless significant curtailment of carbon dioxide occurs, scientists estimate that the ocean's pH levels will drop to levels unseen in the geologic record for the past 300 million years.³⁴ Similar to dropping a tooth in a can of Coca-Cola, wildlife like plankton and shellfish lose calcium at such a rate that their shells become brittle and they can become more susceptible to predation and sickness.³⁵ Ocean acidification is the osteoporosis of the oceans, and burning oil and natural gas only exacerbates this problem.

Impacts to Tourism

No doubt, developing oil and natural gas resources off of North Carolina's coast will create jobs. However, many jobs and many billions of dollars of state revenue rely on a clean coast, free from the risks associated with seismic testing, exploration, drilling, production and refineries.

According to North Carolina State University, tourism is North Carolina's largest service industry.³⁶ According to the North Carolina Department of Commerce, in 2005:

- Total domestic expenditures saw an increase of 7.3 percent to \$14.2 billion, up from \$13.3 billion in 2004.
- The travel and tourism industry employs more than 185,000 North Carolinians.
- The tourism industry generated a total of more than \$2.3 billion in tax revenues, including \$1.1 billion in federal taxes.
- State tax revenue totaled more than \$747 million through state sales and excise taxes, and taxes on personal and corporate income.
- More than \$461 million in local taxes were generated from sales and property tax revenue from travel-generated and travel-supported businesses.

This task force and the state needs to evaluate not if, but how these jobs and sources of revenue are going to be impacted by oil and natural gas development. Particularly with tourism, even the perception by tourists of spoiled or oiled beaches can deter vacationers as was clearly experienced with the Gulf oil disaster. Many Gulf communities saw a precipitous decline in tourism during the summer months while the Deepwater Horizon oil spill was occurring even if those communities had not been impacted directly by the oil spill.³⁷

Impacts to Fishing

In addition to the robust tourism industry, North Carolina's fishing industry would also be impacted should an oil spill occur. According to the North Carolina Department of Natural Resources, in 2001, \$88 million dollars worth of finfish and shellfish were landed in North Carolina by nearly 4,000 commercial fishermen. Fishing may be impacted by oil and natural gas development from seismic studies scaring away finfish, drilling muds contaminating areas nearby, or an accidental oil spill closing off large swaths of the fishery. The National Oceanic and Atmospheric Administration closed huge portions of the Gulf of Mexico to fishing activities during and after the Deepwater Horizon disaster. To date, still over 1,000 square miles of the Gulf of Mexico are closed to all fishing, and another 4,200 square miles are closed to the shrimping industry. The impacts to the Gulf of Mexico from the Deepwater Horizon oil spill are likely to be felt for many years because juvenile fish and fish eggs are particularly sensitive to oil's toxic properties.

Impacts to Military Operations

Aside from the private sector jobs that will be impacted by offshore oil and natural gas development, military operations may be negatively impacted as well. One particularly important activity for military training is munitions and live ordinance fire. Oil and natural gas rigs could limit the amount of these activities because even a slight

miscalculation from a military vessel could put the lives of the oilmen on rigs at risk, and potentially catastrophically damage an oil rig.

North Carolina is split by two Navy, Marine and Air Force operations areas: the Virginia Area Operating Area and the Cherry Point Operating Area. These areas help train America's military to maintain our sea and air power. The eastern Gulf of Mexico, off the Western coast of Florida has been spared by oil and natural gas development for the most part, due to national security concerns as that area is used for military training, similar to the activities occurring off North Carolina. No oil or gas development is currently allowed to occur within approximately 125 miles westward of Florida's shore to protect our national security interests.

Reported Benefits of Offshore Oil and Natural Gas Are Insignificant

Overall, the identified risks of offshore oil and natural gas development, including the environmental impacts, the risks to the tourism and fishing industries and national security concerns, need to be weighed against the reported benefits of development.

Resource Potential is Insignificant

Many of the reported benefits of offshore oil and natural gas development are solely based on there being a large resource. If there is a small offshore oil and natural gas resource, the reported benefits, like energy independence, job creation and revenue generation are proportionally insignificant.

At \$110 per barrel, the Bureau of Ocean Energy Management, Regulation and Enforcement estimates that the economically extractable resource potential for the Mid-Atlantic, including North Carolina, Virginia, Maryland and Delaware, is approximately 1.15 billion barrels of oil and about 8.56 trillion cubic feet of natural gas from between 3 nautical miles to 200 nautical miles from shore.³⁸

To put the amount of oil potential into context, the U.S. consumes approximately 20 million barrels of oil a day, making the 1.15 billion barrels of oil worth about 58 days of U.S. oil demand. The natural gas resource off North Carolina could supply approximately four and a half months of U.S. natural gas demand.³⁹ In the grand scheme of energy supply, North Carolina's oil and natural gas offshore resources are minimal at best. We must ask, is this worth the risk?

Drilling Offshore North Carolina Will Not Make Us Energy Independent

Arguments that opening up more offshore areas would make the U.S. energy independent are flat wrong. We consume too much oil for our small resource to make a dent. Currently, approximately 10 percent of the U.S.'s total oil supply comes from offshore oil drilling in the Gulf of Mexico. A study completed by the Department of Energy estimates that even if all of the Pacific and Atlantic oceans, including North Carolina's small contribution, were open for development, the U.S. would still be mostly dependent on imports for our crude oil, and gasoline prices may be reduced by three cents beginning in 2030.⁴⁰ According to the study, even then, gasoline would cost

around \$4 per gallon. We need to solve our transportation fuel issues elsewhere than oil and gas resources to satisfy our energy requirements.

Job Potential is Insignificant

Even if the resource estimates from the Bureau of Ocean Energy Management, Regulation and Enforcement are incorrect, and much more oil exists than reported, the number of jobs estimated to be created are insignificant. A study completed by the American Petroleum Industry, one of the oil industry's top lobbying organizations⁴¹, estimated job creation from developing offshore areas for oil and gas production. API's estimate assumes that the official government estimate is three times too low – so they increase the estimated offshore oil resource by 300 percent for the entire Atlantic Ocean.

Even with API's fuzzy math, big oil's lobbying arm estimates that the total direct job creation from developing all of the Atlantic coast would be approximately 9,000 jobs in the year 2030.⁴² Already, North Carolina's tourism industry employs more than 20 times more people than what API estimates opening the entire Atlantic Ocean to drilling would create. If API uses the actual governmental figure for how little oil exists in the Atlantic, their estimated direct job creation drops to less than 3,900 – or fewer jobs than North Carolina's commercial fishery employs. It should be clear that these figures, as presented by the oil industry, represent a best case scenario for job creation on the entire East Coast and therefore the benefits are even smaller for North Carolina.

Potential for State Revenue is Non-Existent

The American Petroleum Institute goes further and estimates the total benefit to governmental revenue of their 300 percent higher oil and natural gas resource scenario. It should be clear that these figures, as presented by the oil industry, represent a best case scenario for revenue creation on the entire East Coast and are only for federal revenue. Even if North Carolina were to allow oil and natural gas development off its coast, it would not receive any of these revenue collected by the federal government.

Conclusions and Recommendations

The risks of offshore oil and natural gas development outweigh the reported benefits. In assessing whether or not North Carolina should allow offshore oil and gas development, this panel must evaluate the worst case scenarios associated with the oil and gas industry to a level on par with the Deepwater Horizon disaster. The environmental, economic and national security implications of allowing petroleum production off North Carolina clearly outweigh any reported benefits by the oil industry. Offshore oil drilling will not make us energy independent, will not create many jobs and will not be a Golden Goose for state budgets. The Southern Alliance for Clean Energy recommends to this panel and Governor Perdue that the state not allow offshore oil or offshore natural gas development and strongly recommends that proposed seismic testing be cancelled.

Based on North Carolina's great offshore wind energy resource, as well as the benefits of developing offshore wind farms, the Southern Alliance for Clean Energy recommends that Governor Perdue and this panel work to urgently promote and develop offshore renewable energy. Offshore wind energy, without the risks that fossil fuel development poses to the health and vitality of Coastal North Carolina, has more benefits than costs, and is preferred over developing the miniscule offshore oil or natural gas resource. With proper siting, studies and incentives, offshore wind energy can generate numerous jobs as well as provide an opportunity for North Carolina to become a leader in a clean energy future.

Sincerely,

Simon Mahan
Renewable Energy Manager
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