



DELAWARE AUDUBON SOCIETY

Chapter of National Audubon

Box 1713, Wilmington, Delaware 19899

302-428-3959

www.delawareaudubon.org

DELAWARE AUDUBON

STATEMENT ON OFFSHORE WIND ENERGY

JANUARY 2007

(Revised 02-04-07)

Delaware Audubon was incorporated in Delaware as a non-profit organization in 1977 and is a statewide chapter of the National Audubon Society. The Audubon Society is dedicated to developing a better appreciation of our natural environment and working for species and habitat protection and conservation. Delaware Audubon consists of almost 1,500 members throughout the state advocating on a wide range of environmental issues and sponsoring programs, field trips and school education. Our focus is on protection of the Delaware Bay and the Coastal Zone. The following represents the organization's position on offshore wind energy. This statement should be considered in conjunction with the organization's Wind Energy Policy.

The Delaware Audubon Society recognizes that higher fuel prices and national security concerns have stimulated interest in alternative sources of energy, including renewables such as wind power. Our organization has long supported energy conservation and the use of renewable sources of energy. It is extremely important, however, that great thought and consideration be given to the social, economic and environmental impacts associated with all energy options, including renewable sources of energy.

When wind energy is compared with traditional fossil-fuel energy sources such as coal, the advantages are quite remarkable. Even with the emissions control requirements recently promulgated by the Department of Natural Resources and Environmental Control (DNREC), which have been challenged by owners of fossil fuel-fired facilities, coal-fired power plants will still rank as one of the largest sources of pollution in the state. Currently, coal-fired power plants account for over half of the electrical energy production in the U.S. According to a 2005 report issued by the U.S. Public Interest Research Group titled "Pollution on the Rise: Local Trends in Power Plant Pollution," burning coal is a leading cause of smog, acid rain, global warming, and air toxics. In an average year, a typical coal plant generates:

COAL-FIRED POWER PLANTS

Air Emissions

- 3,700,000 tons of carbon dioxide (CO₂), the primary human cause of global warming--as much carbon dioxide as cutting down 161 million trees.
- 10,000 tons of sulfur dioxide (SO₂), which causes acid rain that damages forests, lakes, and buildings, and forms small airborne particles that can penetrate deep into lungs.
- 500 tons of small airborne particles, which can cause chronic bronchitis, aggravated asthma, and premature death, as well as haze obstructing visibility. The State of Delaware is in non-attainment with the fine particulate standards.
- 10,200 tons of nitrogen oxide (NO_x), as much as would be emitted by half a million late-model cars. NO_x leads to formation of ozone (smog), which inflames the lungs, burning through lung tissue making people more susceptible to respiratory illness. The State of Delaware is in non-attainment with the ozone standard.
- 720 tons of carbon monoxide (CO), which causes headaches and places additional stress on people with heart disease.
- 220 tons of hydrocarbons, volatile organic compounds (VOC), which form ozone.
- 170 pounds of mercury, where just 1/70th of a teaspoon deposited on a 25-acre lake can make the fish unsafe to eat.
- 225 pounds of arsenic, which will cause cancer in one out of 100 people who drink water containing 50 parts per billion.
- 114 pounds of lead, 4 pounds of cadmium, other toxic heavy metals, and trace amounts of uranium.

While the IGCC technology proposed by NRG will have a reduced emissions profile and NRG may choose to shut down one or more of its four existing units rather than retrofit them with pollution controls, the facility will still have substantially greater air emissions than a comparable amount of wind energy, which has ZERO emissions.

Solid Waste

Waste created by a typical 500-megawatt coal plant includes more than 125,000 tons of ash and 193,000 tons of sludge from the smokestack scrubber each year. Nationally, more than 75% of this waste is disposed of in unlined, unmonitored onsite landfills and surface impoundments.

STATEMENT ON OFFSHORE WIND ENERGY

Toxic substances in the waste -- including arsenic, mercury, chromium, and cadmium -- can contaminate drinking water supplies and damage vital human organs and the nervous system. One study found that one out of every 100 children who drink groundwater contaminated with arsenic from coal power plant wastes were at risk of developing cancer. Ecosystems too have been damaged -- sometimes severely or permanently -- by the disposal of coal plant waste.

Cooling Water Systems

Once the 2.2 billion gallons of water have cycled through the coal-fired power plant, they are released back into the lake, river, or ocean. This water is hotter (by up to 20-25° F) than the water that receives it. This "thermal pollution" can decrease fertility and increase heart rates in fish. Typically, power plants also add chlorine or other toxic chemicals to their cooling water to decrease algae growth. These chemicals are also discharged back into the environment.

A typical 500-megawatt coal-fired power plant draws about 2.2 billion gallons of water each year from nearby water bodies, such as lakes, rivers, or oceans, to create steam for turning its turbines. This is enough water to support a city of approximately 250,000 people.

When this water is drawn into the power plant, an estimated 21 million fish eggs, fish larvae, and juvenile fish also come along with it -- and that's the average for a single species in just one year. In addition, EPA estimates that up to 1.5 million adult fish a year may become trapped against the intake structures. Many of these fish are injured or die in the process.

Waste Heat

Much of the heat produced from burning coal is wasted. A typical coal power plant uses only 33-35% of the coal's heat to produce electricity. The majority of the heat is released into the atmosphere or absorbed by the cooling water.

Coal Mining

About 60% of U.S. coal is stripped from the earth in surface mines; the rest comes from underground mines. Surface coal mining may dramatically alter the landscape. Coal companies throughout Appalachia often remove entire mountaintops to expose the coal below. The wastes are generally dumped in valleys and streams causing significant environmental damage.

In West Virginia, more than 300,000 acres of hardwood forests (an area half the size of the entire State of Rhode Island) and 1,000 miles of streams have been destroyed by this practice.

Underground mining is one of the most hazardous of occupations, killing and injuring many in accidents, and causing chronic health problems.

Coal Transportation

A typical coal plant requires 40 railroad cars to supply 1.4 million tons in a year; or 14,600 railroad cars a year. Railroad locomotives, which rely on diesel fuel, emit nearly 1 million tons of nitrogen oxide (NOx) and 52,000 tons of coarse and small particles in the United States. Coal dust blowing from coal trains contributes particulate matter to the air.

Coal Storage

Coal burned by power plants is typically stored onsite in uncovered piles. Dust blown from coal piles irritates the lungs and often settles on nearby houses and yards. Rainfall creates runoff from coal piles. This runoff contains pollutants that can contaminate land and water.

GLOBAL CLIMATE CHANGE

IPCC Releases Comprehensive Assessment of Global Climate Change
Friday, February 2, 2007 from **World Resources Institute** *Earth Trends*

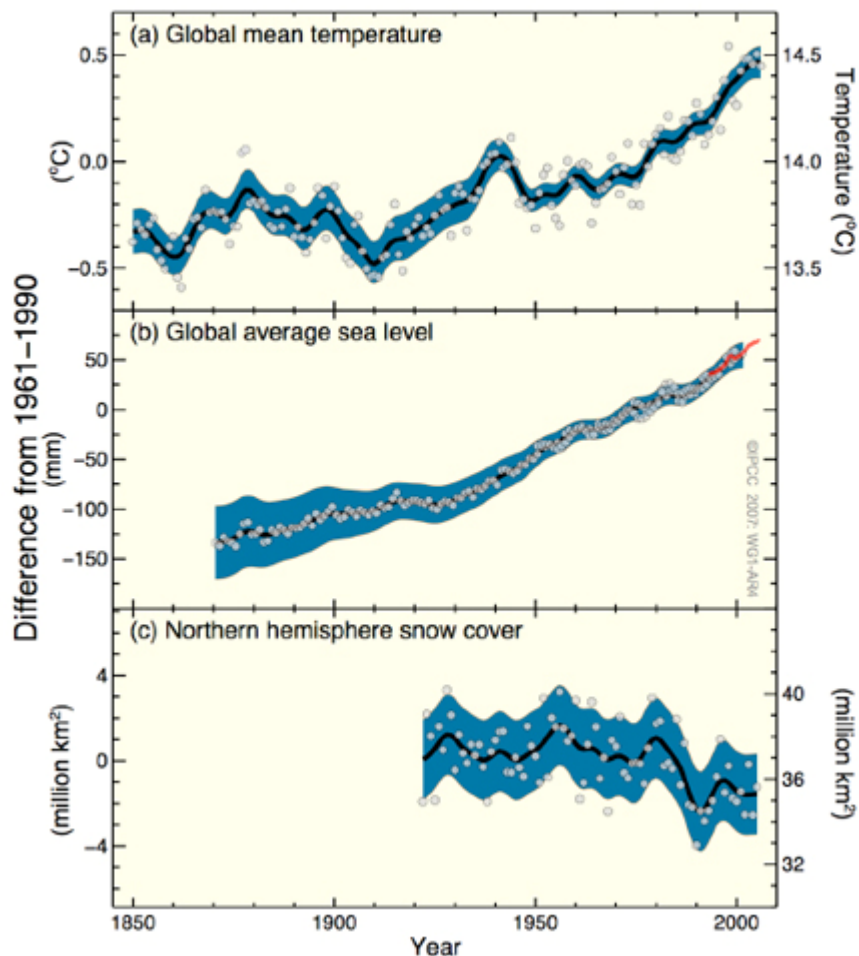
Scientists from over 130 countries now agree with *90 percent certainty that global warming is the result of human activities**. Released today by the [Intergovernmental Panel on Climate Change](#) (IPCC), volume one of the Fourth Assessment Report (AR4) is the first comprehensive global appraisal of climate change since 2001. The AR4 reflects major advances in climate modeling and data collection compared to the [IPCC's third report](#), resulting in more precise predictions at a higher level of confidence.

** Emphasis added. Burning of fossil fuels is the largest source of carbon emissions to the atmosphere.*

The Intergovernmental Panel on Climate Change

The IPCC was formed in 1988 by the [United Nations Environment Programme](#) (UNEP) and the [World Meteorological Organization](#) (WMO) to address growing concerns about potential global warming. Through the collaboration of thousands of international scientists and governments, the IPCC objectively assesses scientific, technical and socio-economic information and publishes its landmark Assessment Reports, released every five to six years. The AR4, titled [Climate Change 2007](#), will be released in four phases throughout 2007, representing a six-year evaluation of the most up-to-date and peer-reviewed scientific literature available worldwide. The second volume, reporting on climate impacts and adaptation, will be launched on April 6.

Changes in Temperature, Sea Level and Northern Hemisphere Snow Cover



Source: IPCC, 2007. *Climate Change 2007: The Physical Science Basis, Summary for Policymakers*

Major Findings

The first volume of the AR4, *The Physical Science Basis*, describes observed past climate trends, makes future predictions, and assesses progress in understanding the human contribution to climate change. The report uses terminology of "very likely" and "likely" to reflect a 90 percent and 66 percent likelihood of occurrence respectively. A few of the major findings include:

- [Average surface temperature](#) has increased by 0.74°C since 1906, with 11 of the past 12 years ranking among the 12 warmest since modern records began in 1850. Arctic temperatures have increased at nearly twice the global average rate.

STATEMENT ON OFFSHORE WIND ENERGY

- Global temperatures will "likely" increase by 2 to 4.5°C (3.6 to 8.1°F) if [atmospheric concentrations of greenhouse gases](#) double from pre-industrial levels (280 ppm in 1750 versus 379 ppm today). Scientists are over 99 percent certain that most land areas will experience warmer and more frequent hot days and nights.
- Sea level will "likely" rise by 28 to 58 centimeters by the end of the century due to thermal expansion and glacier melt. This prediction is narrower than the range of 9 to 88 centimeters predicted by the 2001 report.
- Upward trends in extreme hot weather are "very likely" to continue, leading to more intense and longer lasting droughts over a larger geographic area.
- It is "likely" that the observed increase in intense tropical cyclone activity will continue through the 21st century.

Urgent Action Needed

Observed changes in the atmosphere, oceans, and ice caps show undeniably that the world is warming. Furthermore, the AR4 predicts that these trends will continue for centuries, even if we are able to control global greenhouse gas emissions. This does not imply, however, that nothing can be done--the extent and severity of the impact will greatly depend on the speed with which both preventative and remedial actions are taken.

WIND ENERGY

Wind power generates electricity with

- No air emissions
- No impacts or energy consumption from mining, transporting, or storing fuel
- No cooling water impacts
- No greenhouse gases
- No water pollution
- No wastes

Wind power can reduce pollution generated by fossil fuels, such as coal, oil, and gas. The offshore wind energy project recently proposed in response to a request from Delmarva Power would supply enough energy for 130,000 homes in Delaware.

Some people don't like the way wind turbines look. Others find them visually appealing. A few wind projects have harmed some birds. And some pollution is produced when wind turbines are manufactured and installed, as with any energy option.

Avian Impacts – Lessons Learned

Some wind energy projects have resulted in the death of birds and bats. One of these is the well-known Altamont Pass wind farm located in a major bird flyway in northern

STATEMENT ON OFFSHORE WIND ENERGY

California. This wind energy farm was built in the 1970's in response to the Arab Oil Embargo and the resulting energy shortage. According to the Center for Biological Diversity (CBD), wind turbines at the Altamont Pass Wind Resource Area (APWRA) kill more birds of prey than any other wind facility in North America, due to their location on a major bird migratory route in an area with high concentrations of raptors, including the highest density of breeding golden eagles in the world.

Research by raptor experts for the California Energy Commission (CEC) indicates that each year, Altamont Pass wind turbines kill an estimated 881 to 1,300 birds of prey, including more than 75 golden eagles, several hundred red-tailed hawks, several hundred burrowing owls, and hundreds of additional raptors including American kestrels, great horned owls, ferruginous hawks, and barn owls. These kills of over 40 different bird species are in violation of federal and state wildlife protection laws such as the Bald Eagle and Golden Eagle Protection Act, Migratory Bird Treaty Act, and several California Fish and Game Code provisions. A fact sheet prepared by CBD on the Altamont Pass bird kill issue can be found at:

<http://www.biologicaldiversity.org/swcbd/Programs/bdes/altamont/factsheet.pdf>

No real consideration was given to the impacts of the Altamont Pass wind energy facility when it was sited in the late 1970's. This experience continues to serve as a constant reminder to the wind energy industry of the importance of proper siting. Although the Center for Biological Diversity is concerned about the impacts of wind turbine on birds, such as those at the Altamont Pass Wind Resource Area, they do believe that we can have wind energy without decimating imperiled wildlife populations.

According to the Center, "There is scientific consensus that the industrialized world's addiction to fossil fuels is causing irreversible climate change, altering ecosystems, and destroying biodiversity. Conservationists support the development of clean energy as an alternative to fossil fuel power plants, but impacts to wildlife should be reduced wherever possible. Potential sites for new wind energy projects should be reviewed for bird abundance, migration and use patterns, and wind farms should be designed and operated to prevent or minimize bird mortality. Where existing wind energy facilities are having adverse impacts on birds, as at Altamont Pass, these impacts should be fully mitigated."

Similarly, Delaware Audubon believes that impacts from wind energy facilities can be minimized through proper siting and operation. Both the National Audubon Society and Delaware Audubon have adopted a policy on wind energy to address the issue of avian impacts. A copy of that policy is attached and can be found at:

http://www.delawareaudubon.org/action/wind_power_policy.pdf

DANISH OFFSHORE WIND REPORT

A recent report (November 2006) issued by the Danish government (Danish Energy Authority and the Forest and Nature Agency) and two European energy companies,

STATEMENT ON OFFSHORE WIND ENERGY

DONG Energy and Vattenfall, assessing impacts from 2 offshore wind farms concluded that:

“ Danish experience from the past 15 years shows that offshore wind farms, if placed right, can be engineered and operated without significant damage to the marine environment and vulnerable species.

“The comprehensive environmental monitoring programmes of Horns Rev Offshore Wind Farm and Nysted Offshore Wind Farm confirm that, under the right conditions, even big wind energy farms pose low risks to birds, mammals and fish, even though there will be changes in the living conditions of some species by an increase in habitat heterogeneity.

“The monitoring also showed that appropriate siting of offshore wind farms is an essential precondition for ensuring limited impact on nature and the environment, and that careful spatial planning is necessary to avoid damaging cumulative impacts.

“Due consideration to limiting the impacts on nature together with positive attitudes towards offshore wind farms in local communities and challenging energy policy objectives at national and international levels mean that prospects look bright for future offshore expansion.”

With regard to avian impacts specifically, the monitoring program showed that:

“Hazards presented to birds by the construction of the Horns Rev and Nysted wind farms include barriers to movement, habitat loss and collision risks. Radar, infra-red video monitoring and visual observations confirmed that most of the more numerous species showed avoidance responses to both wind farms.

“Slightly extended migration distances are unlikely to have consequences for any species. Neither site lies close to nesting areas to affect reproduction. Post-construction studies showed almost complete absence of divers and scoters within the Horns Rev Offshore Wind Farm and significant reductions in long-tailed duck densities within the Nysted Offshore Wind Farm. Other species showed no significant change or occurred in too few numbers to permit statistical analysis.

“Of 235,000 common eiders passing Nysted each autumn, predicted collision rates were 0.02% (45 birds). This low magnitude was confirmed by the fact that no collisions were observed by infra-red monitoring.

“Whilst unlikely to have major effects on the overall populations involved, assessing the cumulative effects of these and other developments remains a future challenge.”

A copy of the Danish report can be found at:

http://www.ens.dk/graphics/Publikationer/Havvindmoeller/havvindmoellebog_nov_2006_skrm.pdf

DELAWAREANS SUPPORT WIND POWER

In a recent survey released by University of Delaware researchers, a representative sample of Delaware residents expressed strong support for offshore wind power. When asked to select from a variety of energy sources that could help the state increase energy supply, more than 90 percent of the respondents chose the offshore wind power option as the preferred energy source, even if that meant paying up to \$30 more per month for their electric service.

Fewer than 10 percent supported expanding coal or natural gas sources.

A copy of the complete report can be found at: <http://www.ocean.udel.edu/windpower>

NRG's PROPOSED IGCC FACILITY

NRG is proposing to construct a new coal plant at their Indian River site using Integrated Gasification Combined Cycle (IGCC) technology. This technology subjects the coal to high temperatures and pressures thus driving off volatile gases. The gas is then used as fuel to fire the boilers, much like a natural gas fired plant. This technology has the capability to burn the fuel more cleanly, since the impurities can be removed from the gas before it is combusted.

The IGCC technology can effectively reduce emissions of SO_x, particulates and mercury. Removal of some CO₂, a greenhouse gas that contributes to global warming, can also be accomplished. According to NRG, the technology is "capable" of removing 60 to 65 percent of the CO₂ produced, although NRG has not publicly committed to CO₂ removal and sequestration. NRG also is on record as opposing the efforts of seven New England and Mid-Atlantic States to regulate greenhouse gas emissions through the Regional Greenhouse Gas Initiative (RGGI).

Ironically, NRG issued a press release on January 11, 2007 in which President and CEO David Crane stated, "Taking steps to reduce carbon dioxide concentrations in the earth's atmosphere is a moral imperative. The power generation sector, in particular, has a massive responsibility to lead in the reduction of greenhouse gases and collectively work toward the establishment of a pragmatic and realistic carbon regime." In this case, NRG's actions belie their public statements.

NRG has also been caught in a contradiction in their public statements on wind energy. On July 14, 2006 NRG completed its acquisition of Padoma Wind Power, a leading wind energy development company. Again, Mr. Crane is quoted as saying, "We believe renewable energy has an important and growing role to play alongside fossil fuel-fired generation in meeting the Nation's electricity requirements." Yet, in a full-page ad that ran in the Cape Gazette on December 19, 2006, NRG claimed that they support wind

STATEMENT ON OFFSHORE WIND ENERGY

power, but it really doesn't work when you need it most. Either NRG made a huge business mistake when it acquired Padoma, or they incorrectly expressed their views on the importance of wind energy in the national energy mix. They can't be walking both sides of the street on this issue. Delaware Audubon also questions why a company that proclaims to be concerned about impacts on the environment would legally challenge new emission standards recently promulgated by DNREC.

TIME FOR BIG DECISIONS

In a column that appeared in the Brandywine Community News on January 19, 2007 and appears on his web site, State Treasurer Jack Markell offers a very well reasoned and articulate argument for selecting wind power as Delaware's preferred energy choice. He points out that carbon controls and carbon "taxes" are being given serious consideration by key members of the new Congress. These requirements will translate into significant new costs for fossil fuel-fired power plants that will be passed along to Delaware ratepayers.

The Public Service Commission regulates investor-owned utilities. They recently ordered Delmarva Power to review bids from a variety of in-state power suppliers with the goal of selecting a cost effective, environmentally friendly, long-term electric generating power source. The Treasurer believes that the Electric Utility Retail Customer Supply Act (EURCSA), passed by the Delaware General Assembly in April 2006, requires Delmarva to consider cost effectiveness, price stability and environmental impacts in evaluating proposal. Three potential projects are being considered; NRG's 580 MW IGCC power plant, Conectiv's 380 MW natural gas-fired plant, and Bluewater Wind's 600 MW offshore wind energy project. The cost of electricity from the two fossil fuel-fired proposals will be affected by carbon requirements imposed under a national program or by the state, which is participating in RGGI.

The Treasurer argues quite persuasively that "all of us seek the lowest prices; at the same time, EURCSA specifically mentions the importance of price stability. Focusing on price stability would better ensure long-term savings for Delaware ratepayers, . . ."

Under EURCSA, on or before February 28, 2007, the Public Service Commission, the State Energy Office (located in DNREC), the Director of the Office of Management and Budget and the Controller General will evaluate and may approve of one or more of the proposed projects. State Treasurer Markell recommends that these decision makers "strongly consider the importance of price stability, new technology, and reductions in environmental impacts (especially greenhouse gas emissions). They should take a long-term view of cost-effectiveness, considering not only today's business environment but also the business environment in which these facilities will operate during their entire functioning life."

STATEMENT ON OFFSHORE WIND ENERGY

Given the pace of global warming, some scientists believe we have around 40 to 50 years to reduce our contributions of greenhouse gases to the atmosphere and avoid large-scale impacts of climate change and sea level rise. Energy decisions we make today will have a direct effect on our ability to address this problem. Glacial melting in the Arctic and in Greenland is accelerating at a rate that few expected. If the ice mass that covers Greenland melts, sea levels will rise by nearly 20 feet, reducing the land mass of Delaware by one-third and inundating low-lying coastal areas.

We have a huge stake in this decision. We can set an example for the rest of the country by selecting the one energy option that provides the greatest long-term financial and environmental benefits. Wind energy is not a futuristic, niche technology. Large-scale onshore and offshore wind energy farms have been in operation for many years. Denmark leads the world in offshore wind and they plan to add even more wind energy capacity.

- ✓ Wind energy is a technology for today.
- ✓ Wind energy is clean.
- ✓ Wind energy does not generate massive amounts of wastes like coal-fired power plants, including those using IGCC technology.
- ✓ Wind energy generates **NO** greenhouse gases that contribute to global climate change and sea level rise.
- ✓ The price of wind energy does not fluctuate like coal and natural gas.
- ✓ Wind energy does not require the devastation of hundreds of thousand of acres of land and the pollution of hundreds of miles of streams that result from mountain top mining in West Virginia or vast strip mines out west.
- ✓ Wind energy doesn't need to be transported thousands of miles by truck or train.
- ✓ Wind energy helps diversify the nation's energy mix.

CONCLUSION

Delaware Audubon encourages you to support the wind energy option as the only reasonable, cost-effective and environmentally beneficial alternative. It is absolutely essential that you contact the agencies and officials who will be deciding our energy future to let them know you want pollution-free wind power.

Please send your comments in support of the offshore wind energy proposal to the following individuals:

Jennifer Davis, Director
Office of Management and Budget
Haslet Armory
122 William Penn Street
Dover, DE 19901
Tel: 302.739.4206

Arnetta McRae, Chair
Delaware Public Service Commission
861 Silver Lake Boulevard
Canon Bldg Suite 100
Dover, DE 19904
Tel: 302.739.4247

STATEMENT ON OFFSHORE WIND ENERGY

Jennifer.Davis@state.de.us

Charlie Smisson, Director
Delaware Energy Office
146 South Governors Ave
Dover, DE 19904
Tel: 302.739.1530
Charlie.Smisson@state.de.us

cc: John Hughes, Secretary
Department of Natural Resources
89 Kings Highway
Dover, DE 19901
Tel: 302.739.9000

Attn: Bruce Burcat, Executive Director
Bruce.Burcat@state.de.us

Joann Conaway, PSC Commissioner
Jaymes Lester, PSC Commissioner
J. Dallas Winslow, PSC Commissioner
Jeffrey Clark, PSC Commissioner

Russell T. Larson, Controller General
Delaware General Assembly
Legislative Hall
Dover, DE 19901
Tel: 302.744.4200
Russell.Larson@state.de.us

You should also write to the Governor and your state elected representatives.

Governor Ruth Ann Minner
Tatnall Building
William Penn St. 2nd Floor
Dover, DE 19901
Tel: 302.739.4101
Leeann.Walling@state.de.us

Additional information:

Delaware Audubon: www.delawareaudubon.org

American Wind Energy Association: <http://www.awea.org/>