

Wind Energy Production Farms Feasibility Committee
209 Gressette Office Building
Columbia, SC
April 20, 2009
1:00 PM – 4:00 PM

I. Introductions

II. Legislative Intent of the Committee

III. Review and Discussion of Draft Outline for the Report

IV. Presentations:

Wind Industry Overview – Mr. Roger Schonewald, GE

Overview of Wind Energy Studies in South Carolina – Ms. Elizabeth Kress
and Mr. Eric Boessneck, Santee Cooper

Refining South Carolina Coastal Ocean Wind Resource Potential: Direct
measurements and model groundtruthing – Dr. Paul Gayes, Burroughs and
Chapin Center for Marine and Wetland Studies, Coastal Carolina University

Wind Studies using Sodar Technology in South Carolina – Dr. Thomas
French, Savannah River National Laboratory

Offshore Wind Regulatory Task Force – Ms. Catherine Vanden Houten, SC
Energy Office

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Wind Energy Production Farms Feasibility Study Committee Meeting #1
Minutes
April 20, 2009, 1:00 – 4:00 PM
209 Gressette Office Building
Columbia, SC 29201

I. Introductions

Hamilton Davis, Coastal Conservation League
John Boyd, Haynesworth, Sinkler, Boyd, P.A.
Roger Schonewald, GE Energy in Greenville, SC
Robert Leitner, Director of SC Institute for Energy Studies, Clemson University
Nelson Hardwick, District 106, South Carolina House of Representatives
Paul Campbell, South Carolina Senate, Berkeley County
Earl Hunter, Commissioner of SCDHEC
Mac Toole, SC House of Representatives, Lexington County
Paul Agnew, SC House of Representatives
John Clark, Director of SC Energy Office
Erika Myers, SC Energy Office
Amy Lawrence, SC Energy Office
Catherine Vanden Houten, SC Energy Office

II. Legislative Intent of the Committee

John Clark:

Committee should look at how suitable SC is for wind energy production farms on land and offshore.

Grant Awarded to SCEO for \$500,000 to help SC:

1. Study how coastal energy could be transmitted to users from offshore onto land and into the grid
2. Study wind, wave, and tidal energy that would be used for a pilot offshore wind project in state waters (within three miles of shore)
3. Establish a coastal clean energy taskforce to study the regulatory barriers for offshore energy generation.

III. Review and Discussion of Draft Outline for the Report

Erika Myers discussed her role as the staff representative of the committee and her responsibility to bring together the committee report. An outline of the report was distributed and the committee was asked to provide comments or suggestions.

IV. Presentations:

Wind Industry Overview – Mr. Roger Schonewald, GE

A few thoughts relative to the wind industry: the wind industry has grown substantially, and GE is largest supplier of wind turbines in the US. There is substantial wind in the central part of the US and parts of California. There is not as much wind in SC until you get to the shore. To get to 20% wind energy by 2030 (1% currently) it will take a committed effort. This would mean using wind energy in a meaningful way and jobs. Wind

turbines are more expensive offshore than onshore, and it will take more wind and greater capacity factor to make it economically attractive. Largest wind turbines (wingspan of over 100 m) are larger than wingspan of a 747 at 65 m; it takes a special effort to get wind turbines in place. There is a tall pole, and quite a bit of weight on top of the pole, like mounting an M1 tank on top of a pole and making sure it is structurally sound. It works by capturing the wind energy as the blades rotate which turn the rotor to produce electricity. GE is in Greenville with about 3,000 employees. There are many opportunities to create more jobs with the growing wind business. Offshore there is need for transportation of the equipment and need for specialized manufacturers. It requires infrastructure, equipment and expertise.

(Inaudible question) – Mr. Schonewald answers: wind turbines will end up being larger offshore to be the most economically efficient. In US wind turbines are generally 1.5 MW, but are more powerful in Europe.

(Inaudible question) – Europe has been pushed into offshore wind turbines more than the US because of limited land.

(Multiple inaudible questions and comments) – Wind turbines have been placed offshore to see how they will perform and to better understand their potential.

Overview of Wind Energy Studies in South Carolina – Ms. Elizabeth Kress and Mr. Eric Boessneck, Santee Cooper

Elizabeth Kress—Work that has been done so far includes a wind mapping study to produce wind maps that everybody uses shows there is not utility-scale land-based wind in SC. SE Regional Offshore Wind Symposium with GA and NC went very well and demonstrated interest to federal government. We got hard data to correlate with wind maps, at the height of the wind turbine. We then developed Sodar for offshore use, and the Wind for Schools program. We have done an extensive study of offshore wind potential. We are farther along than most states. Physical oceanography shows that SC has a shallow coast going very far out. Environmental impacts appear to be acceptable, though bird migration, whale breeding grounds, and turtles may be affected and need to be studied. Navigation fairways, aviation areas, sand borrow areas, wrecks and obstacles out in the ocean, reefs, special fish management zones, dredge dump sites, fish habitat areas, shellfish harvest areas and habitats of certain species are places you can't put turbines. There are some feasible zones for wind turbines. The master's thesis of Jennifer Banks at Clemson University showed how the regulatory process would need to be coordinated.

Further work needed: We need to study how to integrate power into the grid. In order to design foundation for turbines, you need to understand environmental factors such as waves, currents and tides—this data will be useful for other forms of renewable offshore energy. Transmission studies are being done by Clemson. Buoy study of the Palmetto Winds Research Project is to understand how buoys are laid out. Key issues for wind power are policy uncertainty, citing, transmission and operational impacts. We still need to get more information about permit application for anemometer, port refurbishment, what will it take to support offshore wind, public outreach and education, workforce development, economic development, and everything related to the environmental impact study. Accounting for nonmonetary value is also difficult until carbon credit value is determined.

Eric Boessneck—Offshore winds in SC are Class 5 meaning they are sufficient for wind turbines. Fifty meter towers have been deployed at various sites along the coast to obtain data and analyze it. Georgetown has great access to coastal winds 5.7 or 5.8 m/s, but that is not strong enough to support large-scale wind turbine development. Winds are not high enough along the coast for large-scale wind turbines. 8 to 8.5 m/s are necessary for large-scale wind turbines. Offshore winds are much stronger than winds even half a mile inland and are at least at speeds of 8 m/s. Buoys are being installed within the next few weeks at different distances perpendicular to the coast to get a recommendation of where to put offshore platforms. These will take readings for a full year. Sodar technology is useful but has not been validated offshore—it emits a chirp in the atmosphere which bounces off air particles and reads wind speed and direction. Lidar uses laser and is more accurate. There is not much of a resource on the coast. The real resource is offshore.

Refining South Carolina Coastal Ocean Wind Resource Potential: Direct measurements and model groundtruthing – Dr. Paul Gayes, Burroughs and Chapin Center for Marine and Wetland Studies, Coastal Carolina University

The Grand Strand area has shallow waters and high demand for electricity, making it a good location for offshore wind turbines. Just to the North of the Winyah Bay entrance is where CCU is trying to stay because there is a great deal of information on substrate and the seafloor. The main issue is to determine exactly how offshore you need to go to find the best location for a wind turbine. In order to get the most accurate measurements, there is a need to measure wind speeds at hub height. The key data set for industry to make their decision is information at hub height. Expect to have a good idea of what distance out to sea is best after gathering six months of data.

(10 Minute Recess)

Wind Studies using Sodar Technology in South Carolina – Dr. Thomas French, Savannah River National Laboratory

Wind is non-dispatchable and weather-dependent. The utilities that use wind have to predict the weather. The SRNL project is to accelerate the acceptance of Sodar as bankable and to accept Sodar numbers instead of needing a wind tower and anemometer. Ultimately want to do wind farm design, project financing, and be able to forecast the wind with remote stations. Velocity of wind speed cubed directly correlates to power. Ground cover and topography affect power. Wind speed at the tip of the blade at the top is different than wind speed at the tip of the blade at the bottom. Power generation begins at 4 m/s. Above 200 ft. is FAA space which increases the cost of towers. Sodar is a vertical beam going up that gets reflected and gets all sorts of data about wind; it has a solar panel and a satellite phone. Sodar is good for up to 200 m and it can slice the wind column. Sodar is going to be tested against anemometers to make sure it is accurate. Distribution of wind speed must be measured at wind farm sites, and Sodar is appealing because it is much easier to move around than towers.

Offshore Wind Regulatory Task Force – Ms. Catherine Vanden Houten, SC Energy Office

Regulatory Task Force is intended to overcome barriers, and to make sure our goals are grounded in reality and the actual needs of the state. Goals of the grant received are to develop a 80MW offshore wind pilot project, and initial research of wave and tidal energy applications. The initial meeting determined that the task force would be comprised of the regulatory working group, the scientific and technical advisory group and possibly a public outreach working group (Members of the task group are presented). The SCEO would like to address controversy and objections from the public. The first meeting of the task force will be in May. The final report is tentatively in 2011 and the SCEO is in the early stages of this effort.

V. Selection of Committee Chair

John Boyd nominated Senator Paul Campbell to be the committee Chair. Nelson Hardwick seconded and made a motion to close nominations. All in favor.

VI. Schedule Future Meetings

The schedule and timeline for the committee are as follows:

July 13, 2009 - focus on economic development opportunities.

September 21, 2009 – focus on environmental impacts

October 12, 2009 – Public comment period in Georgetown

December 7, 2009 – Synopsis of hearings and focus on final report

January 1, 2009 – deadline to submit final report to the SC General Assembly

VII. Other Discussion Items

We need to make sure we don't negatively impact tourism in the Grand Strand.
(Inaudible questions).

Will distribute and post presentations and minutes of the meeting online and in July a committee member requested the next meeting include discussions about wind farms projects in other parts of the country.

VIII. Adjourn

Minutes Approved Unanimously by the Committee on Monday, July 13th