



STATE OF DELAWARE
**DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL**
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

Office of the
Secretary

Phone: (302) 739-9000
Fax: (302) 739-6242

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TO: Mr. Robert P. Haynes, Esq.

FROM: Lee Ann Walling, AICP
Kevin Coyle, AICP CEP

RE: Coastal Zone Act Program response to Bloom hearing

This memo attempts to answer questions and comments raised during Diamond State Generation Partners' (Bloom Energy) Coastal Zone permit hearing on March 6, 2012. Before delving into individual issues presented during the hearing, we believe it is important to make several introductory points:

- Before determining that Bloom's Coastal Zone permit application was "preliminarily administratively complete" on February 10, 2012, we conducted meetings, phone conversations and exchanged information electronically with Bloom. The meetings included, in particular, representatives of the Division of Air Quality.

The conversations and information exchanges resulted in validation by DNREC of Bloom's emissions estimates and the additional proposal of \$20,000 to offset the loss of 9 acres of farmland. There is some debate about the appropriate value of this farmland (to be addressed later in this document). However, to our knowledge, such an offer is unique; no Coastal Zone applicant has ever been expected or has offered to offset the loss of agricultural lands. In addition, Bloom points out that its proposed use and intention to use green stormwater best management practices are a likely environmental improvement over traditional agricultural practices at the site.

- In that determination of February 10, 2012, DNREC essentially accepted Bloom's assertion that the 47 MW of "clean" energy generated at the Red Lion site represented a built-in offset, displacing dirtier (fossil fuel)

electricity generation on the PJM grid. Bloom was asked to provide more scientific backup at the March 6 hearing, and the company attempted to do so. Its presentation has been posted to the Coastal Zone program website, <http://1.usa.gov/wzHF70>.

- Bloom's "built-in" offset proposal prompted questions at the hearing. Even if an individual rejects Bloom's offset logic, the company's emissions of regulated air pollutants can be considered negligible in terms of environmental impact. There will be no emissions of particulates. Estimates for NO_x and sulfur dioxide are 1.4 and 0.02 pounds per day, respectively. Volatile organic compounds (VOCs) are 13 pounds per day and carbon monoxide emissions are 65 pounds per day, according to the Division of Air Quality. There are no emissions of Hazardous Air Pollutants (toxics or carcinogenics). Bloom clearly presents a technology with exponentially better environmental results than conventional fossil fuel generating plants.
- We also note that the offset requirements in the Coastal Zone Act regulations do not distinguish between regulated and unregulated environmental impacts. Section 9.1.1. states: "*Any application for a Coastal Zone permit for an activity or facility that will result in any negative environmental impact shall contain an offset proposal.*" For example, past Coastal Zone permits have imposed conditions relating to certain ecological impacts that are not regulated.

In addition, carbon dioxide currently may not be regulated but still presents an environmental impact. However, in accepting Bloom's "built-in" offset argument, DNREC has determined that the project's CO₂ emissions are being more than offset.

We will now address the additional issues raised at the March 6, 2012 public hearing:

Thermal energy. Mr. John Nichols asserted that the Bloom proposal does not account for the need for thermal energy, the heating and cooling of buildings, and therefore underestimates carbon dioxide emissions. The Coastal Zone Act is focused only on electricity generation as a manufacturing process. Homes and offices will need to be heated and cooled, whether with electricity provided by a coal-fired plant or by Bloom. Homes and offices are not covered by the Coastal Zone Act.

Weighted average. Mr. Nichols notes that Bloom, in comparing its emissions to other types of generation – fossil fuels, nuclear, wind – should have used a "weighted average" to determine its relative environmental benefit. Bloom clearly stated that they were including nuclear and wind generation, which do not generate SO_x and NO_x emissions, in the PJM average. If the company did use a weighted

average, Bloom would look comparatively even better since coal-fired plants comprise 50 percent of the PJM grid generation, and wind provides only a small percentage (1.3 percent in 2010).

Rare earth elements. Mr. Nichols also expressed a concern, and provided several reports, about the presence of rare earth elements in Bloom’s fuel cells – specifically, yttrium and cerium dioxide. He called yttrium a “hazardous material you are injecting into a Coastal Zone environment” and asked the company to disclose the contents of its fuel cells. If Bloom were manufacturing the fuel cells in the Coastal Zone, the program probably would require the company to disclose their contents and provide details of “the raw materials, intermediate products, byproducts and final products and their characteristics from material safety data sheets (MSDS’s),” according to Coastal Zone Act Regulation 8.2.10. In 2011, the Coastal Zone program refused to waive confidentiality for another applicant and required disclosure of raw materials.

However, the fuel cells are being manufactured elsewhere, and this Coastal Zone permit application deals with the generation of electricity. The fuel cells are encased in the Bloom energy servers.

Upon review, the Division of Air Quality agreed that the contents of the fuel cells are not hazardous; in the event of a mishap regarding these cells – a natural disaster, explosion or human error – the contents of these units will not pose a hazard.

***Note:** The most prevalent use of yttrium, according to several scientific websites, is in color television sets. Cerium dioxide is present in self-cleaning ovens.*

Natural Heritage report. Bloom submitted the report from DNREC’s Natural Heritage and Endangered Species program as an early addendum (November 17, 2011) to its Coastal Zone application. The Coastal Zone program inadvertently omitted the report from the exhibits. Bloom did not respond to the report, which did not express any serious concerns about the project.

Farmland value. Based on data obtained from the Delaware Department of Agriculture, twenty-two parcels (3,922.4 acres) in New Castle County’s portion of the Coastal Zone have had their development rights purchased for \$7,013,545.72, or \$1,788.08/acre. The land, while currently being used for agriculture, is not zoned for industry but is zoned residential Suburban (S) under the New Castle County Unified Development Code. Bloom offered \$2,118 an acre.

Sea Level Rise. A review of DNREC’s Sea Level Rise Inundation Maps (<http://www.dnrec.delaware.gov/Pages/SLRMaps.aspx>) indicate that the project site, located at 1593 River Road, New Castle, would not be adversely affected by the 0.5, 1.0, and 1.5 meter sea level rise scenarios (as described at <http://www.dnrec.delaware.gov/coastal/Documents/SeaLevelRise/Final%20and%20Signed%20DNREC%20SLR%20scenarios.pdf>).

Natural gas. The representative from the Delaware Riverkeeper Network expressed concern about using natural gas, which will be piped to the Bloom facility via Delmarva Power's distribution line. She referred to natural gas as an "extreme fossil fuel," tying it to the Marcellus shale "fracking" controversy. The Delaware General Assembly determined in 2011 that fuel cells powered by natural gas are considered a renewable source of electrical generation for purposes of meeting the state's Renewable Portfolio Standards.

Offset to Coastal Zone. Bloom's offset proposal was generally addressed in the introduction. The Coastal Zone Act regulations indicate a hierarchy of preference for offsets, although many variations to that hierarchy have been accepted since the regulations were adopted in 1999:

9.1.3 The Secretary shall give preference to offset projects that are within the Coastal Zone, that occur in the same environmental medium as the source of degradation of the environment, that occur at the same site as the proposed activity requiring a permit and that occur simultaneously with the implementation of the proposed activity needing an offset.

Bloom used National Oceanic and Atmospheric Administration (NOAA) meteorological studies to demonstrate that air pollutants wind up in Delaware's Coastal Zone from points west – Pennsylvania, Ohio, Kentucky and West Virginia. Bloom's assertion is that it is offsetting dirtier generation in places that have been sending us their particulates, NOx and other emissions. Granted, one can question whether 47MW of Bloom generation here automatically results in 47 fewer megawatts of coal generation in Ohio or somewhere else. Such a theory is almost impossible to prove or disprove beyond a doubt. However, the bottom line is Bloom's own emissions are considered minimal.