

## Testimony to Multi-Pollutant Regulation development committee meeting, 23 May 2006

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**Credentials:** I have 30 years experience in research on electric and gas utility programs and regulation, with two books and over 50 professional publications in this area. My research has been funded by Federal and State Agencies, scientific organizations, and electric utilities. My current and recent research concerns electric vehicles, large scale renewable energy such as offshore wind power, climate change, and energy efficiency. I am Associate Professor and Senior Policy Scientist at the University of Delaware. I draw on this experience but today I represent no party other than myself.

**Objective:** I am not commenting on questions of cleanup of existing plants, only on construction of new fossil plants, which, if accompanied by closure of old plants, is one approach that may be proposed for reducing emission of criteria pollutants.

**Motivation for comment:** In the past three years, the scientific evidence on the severity and threat of climate change has become clear and has revealed more impact than previously recognized.

**Threat:** If present trends in emissions continue, by about 2050 we will commit to -.4 pH change in surface ocean acidity with consequent loss of coral reefs worldwide, loss of approximately 25% of terrestrial species and a comparable but less-well-quantified proportion of oceanic species. In this time period we also commit to melting of the great planetary ice masses of the arctic, Greenland, and the West Antarctic Ice Sheet, resulting in a loss of about half of Delaware's land area to the sea. Planetary ice masses take hundreds of years to melt, but sometime between 2040 and 2090 we have committed to melting them, with no way to turn back. The effects on human health and mortality have been quantified only for one of the most vulnerable areas, sub-Saharan Africa—there, a new Christian Aid report estimates that disease directly attributable to climate change will kill 182 million people by 2100. Although many in the power industry may not be familiar with these effects, they are well-documented and (other than the African mortality figure) supported by multiple studies published in the peer-reviewed scientific literature. My personal observation is that most citizens, and most elected officials, who become acquainted with these findings find continuation of our present course untenable.

**Political and economic inference:** Most industrialized countries are making substantial adjustments in planning of economic activities involving carbon emissions. The United States is not doing so at the federal level, but many states are doing so. A reasonable observer might expect the United States to take similar action, whether due to increased public awareness, change of leadership, and/or pressure from allies. Whether or not the

United States does, states under extreme threat of climate change, such as Delaware, might be expected to take such steps in the near term.

Impact on power planning: The time horizon for irreversible “tipping points” is such that any CO<sub>2</sub>-producing power plants being built or planned today are unlikely to be able to continue production, at least not under their current economic and regulatory conditions. This will imply higher power costs than are projected under current conditions, or possible closure of plants prior to the end of their service lifetime. On the other hand, Delaware has large renewable resources in solar PV, which is not currently economically competitive with central station power, and in efficiency and offshore wind, which are competitive with thermal plants. Delaware’s offshore wind resource (to 50 m depth), in particular, is substantially greater than all power requirements of the state. All of these non-CO<sub>2</sub> producing resources create more permanent jobs per MWh produced than do thermal plants, and eliminate concerns for future fuel increases and power interruptions.

Recommendation: Any new thermal plants in Delaware should be built with full carbon sequestration. If plant is built with partial or no carbon sequestration, even if it has the “capability” for carbon sequestration, risks and future costs of carbon taxes, sequestration requirements, and/or forced premature plant closure should be borne entirely by the plant owner, not by the ratepayers or the state. No long-term power purchase agreements should be signed for fossil plants without full sequestration in place; failing that, the power contract should explicitly prohibit the plant operator from passing on these future carbon costs and risks to either the ratepayers or the state.

For further information on offshore wind: [www.ocean.udel.edu/windpower](http://www.ocean.udel.edu/windpower)