

Testimony of Paul J. Allen
At the Joint Hearing
Of the U.S. Senate Subcommittees on
Clean Air and Nuclear Safety, Environment and Public Works, and
Green Jobs and the New Economy
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Chairman Carper and Chairman Sanders, members of the subcommittees, thank you for inviting me to participate in this hearing on the subject of clean air safeguards and the jobs associated with meeting those safeguards. I am the senior vice president for corporate affairs and chief environmental officer for Constellation Energy. It is a privilege to talk with you today. I am here today to speak to our recent experience building large, comprehensive air quality control systems on coal fired power plants. I will share with you some of the dimensions of the work and the jobs involved in meeting the regulatory timeline for the project.

Let me first offer some relevant background concerning Constellation Energy.

Headquartered in Baltimore, Maryland, Constellation Energy is a national provider of electricity, natural gas, energy efficiency services, demand response and energy technology solutions. We operate a diversified portfolio of electric generating facilities amounting to approximately 12,000 megawatts of installed capacity. This includes our joint venture with EDF (Electricite de France), called Constellation Energy Nuclear Generation (CENG). CENG owns and operates five nuclear units at three locations: two units in Maryland at the Calvert Cliffs Nuclear Power Plant in Lusby, Maryland and three units in New York State, including the R.E. Ginna Nuclear Power Plant near Rochester and the Nine Mile Point Nuclear Power Plant near Oswego. Our other generating assets include coal-fired capacity, natural gas-fired capacity, wind, solar, biomass and hydroelectric generation.

Our commercial enterprise, Constellation NewEnergy, supplies energy products and solutions to more than 30,000 industrial and commercial retail electric and natural gas customers in competitive markets, as well as to residential retail customers in several states across the

country. Constellation NewEnergy is the market leader in competitive retail and wholesale electricity markets.

Constellation also owns BGE, the Baltimore Gas and Electric Company, which serves 1.2 million electric customers and 600,000 natural gas customers in central Maryland. BGE was founded in 1816 and is the oldest, continuously operating energy utility in North America.

At Constellation we believe strongly in competitive markets for energy service. We are significant participants in the organized markets of PJM, ERCOT, the New York ISO, New England ISO, MISO and the Cal ISO.

We are also active participants in environmental and sustainability policy discussions at the federal, state and local levels. We have clearly defined internal environmental policies and goals. We have a deep commitment to environmental stewardship. We are proud of the solutions we provide customers to help them meet their sustainability and stewardship goals, including a major smart-grid initiative now underway at BGE; and innovative new technologies such as “VirtuWatt,” a proprietary software and technology package, which helps Constellation’s commercial and industrial customers actively manage their energy use in real time, thereby saving them money and lowering overall peak demand.

Because of this broad involvement in so many aspects of the energy equation, Constellation Energy recognizes that the central challenge for our industry is balancing the three imperatives of energy affordability, reliability and sustainability. We believe that in solving this equation, clean air safeguards can be compatible with the other two imperatives. We know that meeting this challenge requires clear, commercially and industrially feasible rules for environmental performance. Meeting this challenge also requires significant capital investment – and many jobs are entailed in implementing those investments. To illustrate what this means, please allow me to describe our experience at the Brandon Shores power plant in Maryland, where we have constructed what we believe to be an excellent, if not state of the art, comprehensive air quality control system.

BACKGROUND

Our Brandon Shores power plant is located on a 375 acre tract along the western shore of the Patapsco River ten miles southeast of Baltimore. Unit one went into commercial service May 15, 1984; Unit two began commercial operation May 28, 1991. The plant has two 640 net megawatt pulverized coal units; a highly efficient turbine, and a central control room for the operation and control of both units and the joint Air Quality Control Systems (AQCS).

The plants can accommodate central Appalachian coal, northern Appalachian and foreign coals. The fuel arrives by barge. Fuel consumption is approximately 250 tons per hour per unit at full load. We consume approximately 3.5 million tons of coal each year and produce 6 to 8.5 million megawatts each year.

The plant was designed with closed-cycle cooling towers and the make-up water for the cooling towers is supplied from pumps with in-take suction from the discharge canal from the adjacent H.A. Wagner power plants, which are part of the overall power generation facility covered under the same Title 5 permit as the Brandon Shores units. Brandon Shores has hot side electrostatic precipitators (ESP) that remove over 99 percent of the particulates contained in the resulting flue gas, low NO_x burners with over-fired air, and Selective Catalytic Reduction (SCRs) equipment for NO_x reduction; achieving a 90 percent reduction in NO_x. Sedimentation and erosion control ponds minimize stormwater run-off. These important environmental features were installed as part of the plant long prior to the commencement of recently completed AQCS. Similarly, we employ an Environmental Management System (EMS) throughout the facility in keeping with the ISO 14001 and our own even more comprehensive environmental policy standards.

Through an innovative partnership with Separation Technologies, Incorporated (STI) and their on-site facility, we beneficially re-use 85 percent of the coal combustion fly ash in concrete.

In short, Brandon Shores was a highly efficient, well functioning, environmentally sound electric generation source before the State of Maryland passed its “Healthy Air Act” on April 6, 2006. Working with the Maryland Department of the Environment, Brandon Shores now meets

all the requirements of that law, which are perhaps the most stringent, and most plant-specific, requirements in the country.

In 2006, the Maryland Healthy Air Act targeted seven Maryland coal-fired power plants for significant emission reductions. The law aimed to reduce nitrogen oxide emissions by about 70 and 75 percent by 2009 and 2012 respectively. It aimed to reduce sulfur dioxide by about 80 and then to 85 percent by 2010 and 2013 respectively. It aimed to reduce mercury emissions by 80 percent and 90 percent by 2010 and 2013 respectively from a 2002 baseline. It also required that the State join the Northeast Regional Greenhouse Gas Initiative (RGGI), which will not be the focus of my remarks today other than to say that since this carbon dioxide-focused program is market based, it required no capital investment.

To accomplish these further reductions, Constellation constructed an additional even more comprehensive Air Quality Control System (AQCS) at the Brandon Shores plant, consisting mainly of a Flue Gas Desulfurization system – commonly called a wet scrubber, plus a Pulse Jet Fabric Filter – commonly called a bag house – with sorbent injection. I will describe these and other elements of the AQCS in a bit more detail below.

The new scrubber installation and other environmental controls have the capability to remove at least 95 percent of existing sulfur dioxide emissions, and reduce 90 percent of existing mercury emissions from the plant. The already-installed NOx controls (primarily the SCR and low NOx burners) limited NOx emissions by 90 percent.

A wet scrubber adds wet limestone into the gas stream emitted from a power plant. The limestone slurry reacts with and captures sulfur dioxide in the gas stream. The resulting by-product can be used to create gypsum board, thereby virtually removing the sulfur dioxide from the generation process. We are also exploring exciting potential applications of gypsum in agricultural settings where it appears it may have significant filtration capability and could be used to reduce nutrient loading to the Chesapeake Bay.

Construction of this scrubber entailed building a new, single 400-foot emissions stack with two flues, and capping the two existing stacks so that all flue gas must exit through the scrubber. The new stack emits visible water vapor, a result of steam in the exhaust flue gas, the by-product of the emissions “scrubbing” process. We constructed hydrated lime and powder

activated carbon (PAC) injection systems for sulfuric acid mist and mercury removal. One of the really unique features of our Scrubber project is the use of “brown water” from the neighboring Cox Creek municipal waste water treatment plant. While this capability meant a little variance from typical design, the economic and environmental benefits made sense. The tie to the treatment plant was one of several new water processing and water treatment facility projects undertaken. In addition, many hundreds of feet of new air ductwork was built and connected to massive fans, pumps and motors.

Groundbreaking for the construction phase of the project began in June 2007. Construction was completed in September of 2009 – approximately 26 months. Constellation began studies and conceptualization of this project prior to the passage of the Healthy Air Act, as we anticipated the likelihood of stricter federal air pollution standards; but actual engineering, design, contracting, procurement, planning and layout commenced while the regulations were being finalized with MDE.

The Unit One AQCS was in service in November 2009; and Unit Two was in service February 2010. The total cost was approximately \$885 million. Constellation has spent more than \$1 billion in air pollution control equipment for our portfolio of plants in Maryland.

At peak construction, 1,385 personnel were employed on site. These were skilled craft and construction workers including boilermakers, steamfitters, pipefitters, operating engineers, millwrights, ironworkers, electricians and master electricians, as well as carpenters, teamsters, and laborers. We worked closely with the Maryland and DC building trades and other unions to accomplish this job in good time and with an outstanding safety performance.

Over the course of the 26 month construction phase, we used approximately 4.3 million man hours to build the AQCS. Using 220 hours per month, 20 days per month, at 11 hours per day, this roughly equates to 1600 job years. These are the hours worked by the contract employees who built the project. It does not reflect the manufacturing jobs associated with the technologies and equipment that our team assembled. The manufacturers of the cranes and vehicles deployed on site, and the manufacturers of the many large and small components ranging from booster fans, pumps and pump motors, to ball mills, electronics, wiring, steel, concrete, and specialty tiles for the flue gas stack, employed many thousands of individuals to

make these goods and operate the companies that form the supply chain for this kind of infrastructure.

Combined with the men and women who operate our power plants, and the linemen, the engineers, the customer care and service representatives, and the internal teams who support these skilled individuals – we create the jobs that are the backbone of the “The Grid.” And, indeed, these are the jobs and careers that help form the backbone of the American economy.

It is this experience – and the empirical evidence of man-hours hired and paid, emissions measured and lowered, megawatts successfully produced and bid into the markets – that give us the confidence that we and our sister companies in the electric power industry can continue to deliver affordable electricity with the great reliability all consumers depend upon, while also meeting the air quality requirements set forth in the Clean Air Act.

Thank you for your time and attention.