Jeffery Keffer
President and Chief Executive Officer
Longview Power, LLC

Chairwoman Capito and Senator Manchin, I want to start by thanking both of you for bringing the Senate Committee on Energy and Natural Resources to Morgantown today to talk about such an important topic to our State of West Virginia. I also want to thank Chairwoman Murkowski and Ranking Member Cantwell for supporting this hearing.

My name is Jeffery Keffer and I am the President and CEO of Longview Power, LLC in Maidsville, West Virginia. I want to take a minute to thank both of you for the time you have spent at the Longview Power Plant meeting our employees and touring our industry-leading facility. At the conclusion of this testimony I hope you will take back to the Senate one idea – the Longview is the future of clean coal-generating power in America and is a model for how to efficiently produce power from coal with very low emissions. We are always willing to share the Longview story and would be happy to do so with any of your colleagues if you would like.

Longview is a 778 Megawatt (MW) gross, 700 MW net, coal fired power plant. That means we produce enough electricity for about 700,000 homes. As you know, Longview started operating in late 2011 while the average age of the PJM fleet is 45 years old. The plant cost $2.1 billion to build and last year we invested another $120 million to make the plant highly reliable. Affiliated mines supply Longview's coal by conveyor.

All these factors combine to make Longview the lowest cost coal-fired generator in PJM and the most efficient as measured by the lowest heat rate of any coal plant in North America. Longview's low cost and high efficiency operations come with exceptionally low emissions and minimal wastewater discharge. In fact the plant has zero wastewater discharge to surface waters.

Longview is able to achieve these milestones through its state-of-the-art technology, including advanced combustion technology. Amec Foster Wheeler supplied Longview with a first-of-a-kind once-thru, low-mass flux vertical tube Advanced Supercritical Boiler. It was designed for high efficiency and modified for reliability. In 2015, Longview replaced over 1,000 boiler tubes to repair initial design and materials issues. Improvements to the fuel and air controls now provide best-in-class combustion control, including minimal slagging, better emissions control, and improved reliability. The overall design enables best in class performance over a wide range of fuels.

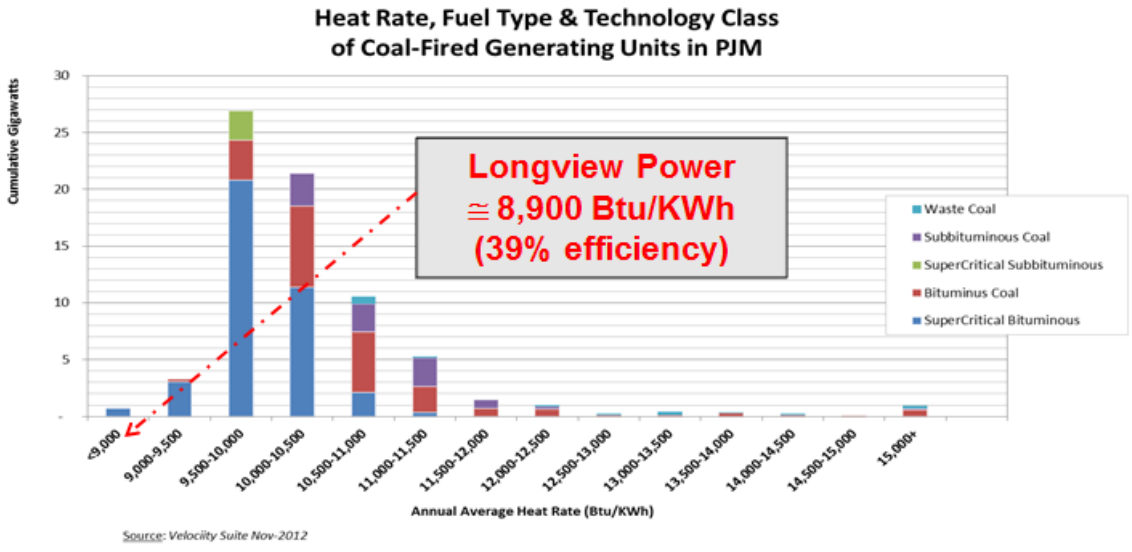
Longview's combustion controls and advanced emission technology effectively and reliably removes all targeted pollutants including nitrogen oxide (NOx) without adversely affecting efficiency. The Air Quality Control Systems (AQCS), provided by

Amec Foster Wheeler, achieves this through acid mist reduction, up to 99 percent particulate matter (PM) removal, sulfur dioxide (SO_2) removal through a Wet Flue Gas Desulfurization System (FGD), and mercury removal, making the plant fully MATS compliant. As a result, Longview is best in class in controlling pollutants and HAPS with these systems.

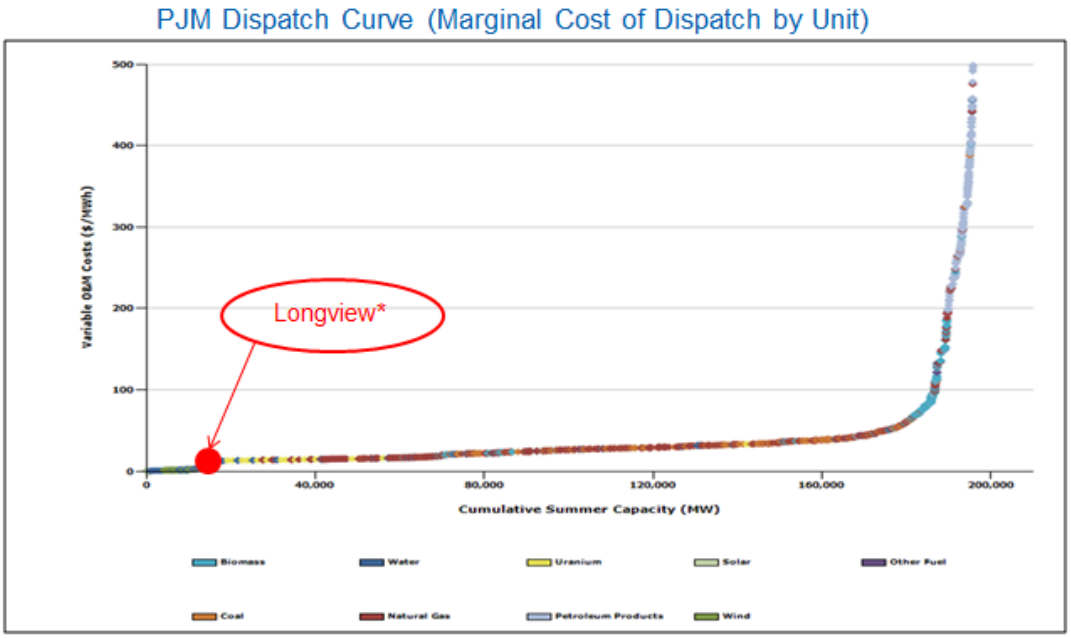
High efficiency with reliable cycling capability is achieved through the Siemens HMNN 770 MW Turbine System and Siemens Model # SGen6-300W Generator. This combination of modern design allows for fast ramping and up to 99% operating efficiency. The generator, repaired to "like new" conditions in 2015, also contains unique hydrogen inner cooling and water-cooled stator winding. This equipment has been incorporated into many new coal fired plants around the globe including in Germany.

Coal is not the only fuel required for a coal-fired power plant. Secondary fuel is required for startup and for significant load changes. At Longview, natural gas from a local gas distribution company is used when available. However, the local gas company has limited transportation capacity and must serve residential and key industrial users which, at times particularly during cold weather, take priority. Longview addressed this potential limitation by installing the world's largest mobile LNG facility. This unique system provides Longview with full "inside-the-fence" startup reliability during peak winter seasons allowing Longview to meet PJM capacity performance requirements. We have also demonstrated that Longview is capable of co-firing up to 20 percent natural gas without additional cost.

As the graph of heat rate, fuel type and technology class of coal-fired generating units in PJM shows, Longview is the most efficient coal-fired unit in North America. Longview's annual average heat rate at less than 8,900 Btu/KWh is exceptional and much lower than other coal plants. In fact, coal plants have not achieved this level of performance until Longview.

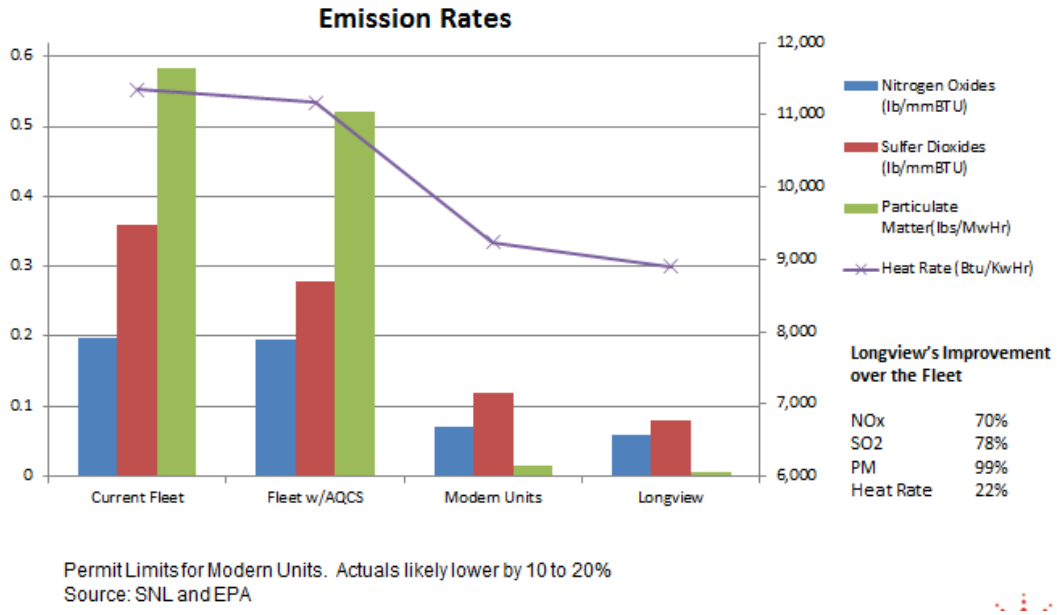


The plant's best-in-class heat rate or efficiency, low-cost fuel source and other project efficiencies combine to produce the lowest cost of dispatch, or delivery of electricity, of any coal-fired plant in the PJM Interconnection. Longview reliably provides low-cost, clean coal electricity to PJM, as shown here.



Longview data based on consolidated marginal cost of production of Longview and Mepco (Utility Plant data from SNL)
Longview marginal cost close to the cost of non-dispatchable, subsidized renewables

In conjunction with its low cost, Longview's actual emissions are well below its permitted limits. As Modern Highly Efficient Plants have very low emissions, Longview's nitrogen oxide, sulfur dioxide and particular matter emissions are significantly better than industry average emissions.



Through full integration with its fuel source and byproducts disposal, Longview produces low cost electricity while minimizing environmental and community impacts. Longview's competitive position is driven in part by fuel supplied by Mepco, its affiliate coal company, from mine mouth to the plant by a 4.5 mile conveyor. Longview also minimizes water requirements to less than 5,700 gpm on average and maximizes reuse of this water in its plant processes, so it only discharges about 30 gpm for treatment at an AMD treatment facility operated by Mepco. Longview recycles as much of its ash as it can sell, and Mepco's environmentally compliant beneficial reuse facility provides a long-term solution for ash and gypsum byproducts disposal for Longview. Of note, Mepco owns and operates two underground and one surface mine, and produces 3.6 million tons of coal per year for both Longview and Fort Martin.

Longview continuously achieves best in class results. In December 2015, Longview completed its 21-day reliability test, resulting in 99.5 percent Equivalent Availability Factor (EAF). The plant has continued to produce highly reliable service, averaging 98 percent EAF and 94% Capacity Factor (CF) since the reliability repairs were completed, while its sister units, or other new supercritical plants, average 66.9% C F. Longview's heat rate since reliability repairs completion is averaging less than 8,900 Btu / KWh. Even while making these repairs, Longview's 2015 annual heat rate was better than that of 2014, and was better than the number 1 ultra-critical plant's heat rate. As previously mentioned, Longview's emissions are well under permit limits, and its CO_2 emissions are 20 percent below all other coal-fired plants. Since November 2015 the plant has easily operated at its 700 MW net capacity and often exceeded that level for peak demand periods. Longview proves that modern, clean coal plants can achieve high availability and reliability with very low emissions.

While achieving best-in-class results, Longview also provides beneficial economic and community impacts. Longview and Mepco together employ over 600 workers, providing well-paying jobs with combined annual payroll and benefits of approximately $72 million. The plant utilizes locally sourced coal and limestone. Longview and Mepco purchase over $105 million per year of goods and services from local and regional vendors. They collectively contribute almost $8 million in annual PILOT and local tax payments, and support a number of local and regional initiatives to enhance the environment and support the communities in which we reside and operate. As you can see, Longview is a major economic driver in northern West Virginia and southwestern Pennsylvania.

So, why are we not building modern, high efficiency, very low emissions coal plants like Longview?

Longview is demonstrating the future of coal fired electrical generation. The improvements in coal combustion technology that Longview implemented and completed in 2015 are working. Longview proves that replacing the existing coal fleet, which largely consists of 40+ year old plants, with modern highly efficient advanced coal plants, would greatly improve plants' efficiency and lower conventional and CO2 emissions. These modern, highly efficient advanced coal plants could incorporate proven design improvements and use higher btu, or energy dense, fuel from Appalachia. West Virginia, and coal-dependent states across the nation, could facilitate the siting of mine mouth plants to reduce environmental and community impacts. With higher efficiency and targeted siting would come lower cost electricity. Modern advanced coal plants could also be designed to co-fire natural gas, further increasing efficiency and lowering cost to compete with gas-fired plants. This could also help to reduce CO_2 to levels that would help achieve the Clean Power Plan goals, as demonstrated in Germany and Japan.

Instead of retraining miners and workers, we can keep them working at skilled, well-paying jobs they already know well. For example, to construct Longview, we employed thousands of construction workers for 5 years, peaking at over 4,000 construction workers. On a day-to-day basis, Longview currently employs over 100 highly skilled workers and Mepco employs over 500 miners and support staff. In fact, 98 percent of Longview and Mepco employees are paid middle class or better salaries. To construct a typical, similar-sized natural gas-fired combined cycle power plant, it would employ less than 30 percent of the construction workers and only about 28 plant operators. Similarly, for renewables such as solar and wind, the typical utility size facility employs 100 to 200 construction workers over 8 to 12 months, and a few maintenance workers during operations. By building modern, advanced highly efficient and low emissions coal fired plants, we will keep thousands employed in middle class jobs, maintain the stability of our electrical generation and delivery system, and provide the low cost reliable electric power necessary to support residences and manufacturing in the USA.

Again, I ask, why are we not building modern, high efficiency, very low emissions coal plants like Longview?

Longview demonstrates what modern clean coal-fired plant design and operation can be for producing low cost, reliable electricity now, with very low emissions and full environmental compliance. Longview should be the future of coal – low cost, very clean and highly reliable.

In conclusion, I want to thank both of you and the Committee for tackling this crucial topic to West Virginia. As you look to the future of energy policy, I commend the Longview story to you for your consideration as an example of a power plant that works efficiently, effectively, and cleanly.