

- Carbon capture and storage from utility scale generation plants involves removing the carbon dioxide gas from the exhaust (slipstream) of a fossil-fuel fired generation plant, compressing the gas and pumping it into deep underground storage sites.

- In 2009, AEP initiated a test carbon capture and storage project at the Mountaineer Power Plant. The pilot test project was successfully operated for over a year.

- The project successfully treated the slipstream from the equivalent of about 30 MW of the 1,300 MW plant, or about 2.3%.

- The total cost of the test project was around \$100 million, including extensive drilling and evaluating the underground storage layers.

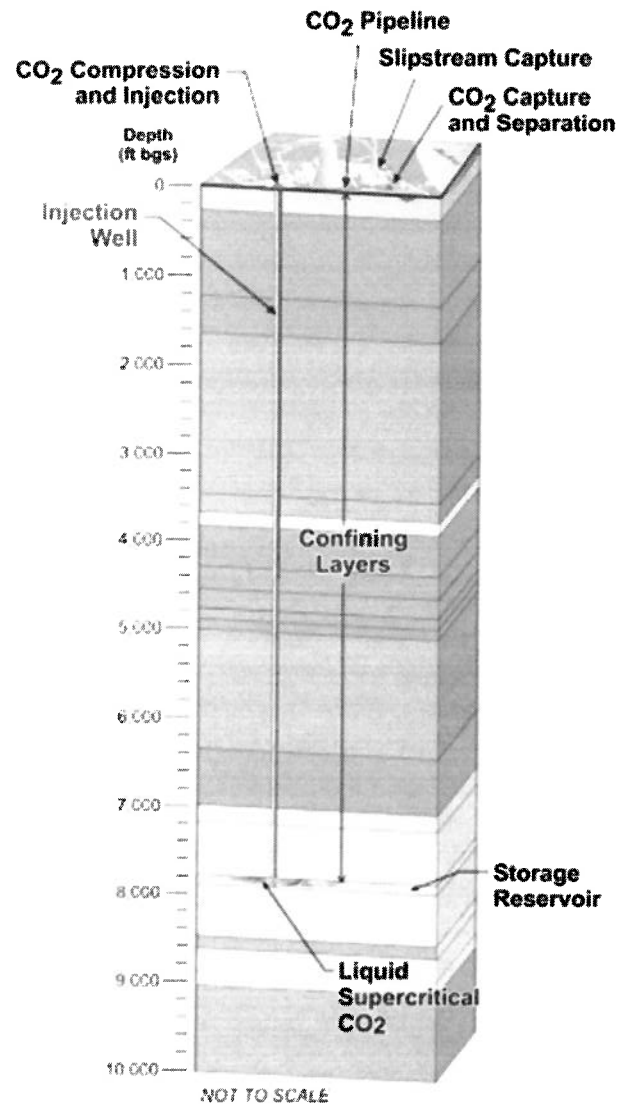
- AEP planned to upgrade to a larger demonstration project to treat an equivalent of 235 MW, or about 20% of the plant capacity.

- In 2010 the demonstration project had an estimated cost of \$700 million, with about one-half being funded by the U.S. DOE.

- The 20% demonstration project at Mountaineer did not proceed to construction and was cancelled in 2011.

- The same level of carbon capture for 235 MW today would likely cost close to \$850 million to \$1 billion to construct.

- Operating costs of a 20% demonstration project would likely add between 5 to 10% to the cost of generation at the plant.



- If the entire plant could be converted, the capital cost may be between \$3 to \$5 billion and operating costs may increase by 25% to 35%.
- If the entire amount for 1,300 MW carbon capture and storage was funded by DOE, ratepayers could then be responsible for only the increased operating costs. Those costs may be \$5 to \$7 per MWH, or about \$55 million per year.
- Carbon capture at the 1,300 MW plant could remove about 8 million tons of carbon dioxide per year. The operating costs of \$55 million to remove 8 million tons of carbon dioxide equals around \$6.87 per ton or \$6.87 per MWH.
- Adding a utility level rate of return to a \$4 billion capital investment for the carbon capture would add close to \$400 million per year, or close to \$50 per ton, or \$50 per MWH.
- That level of cost for utility customers in West Virginia is unsustainable. Therefore, federal funding of close to 100% of the capital costs is needed.
- All of these data are rough estimates and would need to be updated and verified by AEP.
- AEP would probably need government funding for initial detailed studies and estimates for capturing the CO<sub>2</sub> from 235 to 1,300 MW of the Mountaineer Plant.