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DATE: March 1, 2016
TO: Hannibal Courier – Post
FROM: Robert W. Stevenson, P.E.
Re: Wind Energy in Missouri

The last time I looked, the state of Missouri got 80% of its electricity from coal. The other 20% comes from natural gas and nuclear power plants. The investor owned utilities (IOUs), the Co-ops, and three large municipal electric utilities own and operate all the coal fired power plants in the state. Several of the other municipal utilities own pieces of coal fired plants in other states. Hannibal is included in that list with our participation in the Prairie State Energy Campus.

My point is that, as a state, we are very heavily invested in coal fired electricity production. Enter the Federal Government and the EPA who are actively trying to shut down coal fired power plants wherever they are. Missouri could be heavily punished for our high dependence on coal and we have few options to get energy from other sources.

Wind energy is an option that we may have someday. Wind generators have to be sited where the wind blows. For better economy, the harder and more consistently the wind blows the better. High land values and low wind speeds limit where wind generators can be sited. The reality is that wind generators must be built away from population centers, on cheaper land, where the wind blows the hardest.

Wind resources in Missouri are not that great. There are a few modest generator sites in the extreme northwest part of the state and that is about it. There are also a few sites in southern Iowa. Connecting sites where the wind blows to sites where the loads are requires high voltage transmission lines to move the power from one site to another. This is a great weakness of a wind based electric system.

The high voltage transmission system as we know it today was greatly expanded in the 1970s and 1980s as power plants and loads were interconnected using the concept of power pools where one power plant would back up another in case of emergency. This resulted at the time in great savings of fuel as we were also able to dispatch power plants starting with the most efficient first, and relegating the least efficient to only back-up status. With the addition of wind generators into the power pools, the transmission system is no longer adequate because it cannot physically connect the wind generators into the system efficiently due to the spread out nature of wind farms. Nationally, the transmission system needs to be redesigned and greatly expanded again to accommodate the new wind farms.

That will not be accomplished easily. Farmers and landowners are naturally opposed. But, consider Ameren UE, our neighboring IOU. They own a large portion of the transmission system in Missouri. They receive revenue for moving electrons on their wires much like an airline receives revenue for moving passengers in their planes. IOUs receive payments when their power lines are fully loaded and premium payments when there is more power to move than their lines can accommodate. Ameren UE is therefore incentivized to keep their lines fully loaded or even overloaded, and not build new ones, thus working against the deployment of new lines to accommodate the wind generators. This seems to be a perverse incentive, but it is real and it hampers our ability to utilize what little wind we have in the state. The Clean Line Energy project is an innovative, if controversial, effort to overcome these obstacles. More next week.

For more information regarding the Clean Line Energy Project or to read past articles on this subject, visit our website at www.hannibalbpw.org.

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