



Mr. David Berry
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Subject: **Plains & Eastern Clean Line Benefit Analysis**

Mr. Berry,

In reference to our recent analysis of the Plains & Eastern Clean Line operating in the year 2019, I'm pleased to present these results summarizing key benefits to Tennessee and Arkansas. From our detailed nodal production cost simulation of the power system, we estimate benefits to Tennessee and Arkansas for 1) production cost savings, 2) change in marginal price of energy (for TVA) and Locational Marginal Price (for Entergy), and 3) reduction in power plant emissions. I have also provided results from our simulation of the Plains & Eastern wind energy injected at the Hitchland 345kV bus in Oklahoma instead of the two Plains & Eastern terminals in Arkansas and Tennessee.

Production Cost Savings (\$ Million)

	Tennessee	Arkansas	Rest of Eastern Interconnect
Without P&E	2,025	1,612	72,192
With P&E	1,887	1,547	71,653
Savings	137	65	540

Marginal Price of Energy for TVA Demand (\$/MWh)

	On Peak	Off Peak	Average
Without P&E	37.03	32.81	34.88
With P&E	36.05	30.93	33.43
Change	-0.98	-1.89	-1.44

Locational Marginal Price for Entergy Demand (\$/MWh)

	On Peak	Off Peak	Average
Without P&E	39.08	32.38	35.66
With P&E	39.08	32.11	35.52
Change	0.00	-0.27	-0.14

Power Plant Emissions

	Type	Tennessee	Arkansas	Rest of Eastern Interconnect
Without P&E	NOX (tons)	15,074	42,241	1,024,665
Without P&E	SOX (tons)	46,963	89,323	2,061,986
Without P&E	CO2 (tons)	40,338,872	45,815,396	1,457,043,620
Without P&E	Hg (lbs)	1,205	1,284	25,908
Without P&E	Water (MGal)	11,101	12,382	401,588
With P&E	NOX (tons)	14,221	41,708	1,020,565
With P&E	SOX (tons)	45,160	88,498	2,053,537
With P&E	CO2 (tons)	37,507,368	44,711,313	1,447,600,395
With P&E	Hg (lbs)	1,114	1,264	25,826
With P&E	Water (MGal)	10,368	12,114	399,171
Reduction	NOX (tons)	853	533	4,100
Reduction	SOX (tons)	1,803	825	8,449
Reduction	CO2 (tons)	2,831,504	1,104,084	9,443,225
Reduction	Hg (lbs)	91	20	83
Reduction	Water (MGal)	734	268	2,418

From our 2019 simulation injecting all of the Plains & Eastern wind energy at the Hitchland 345 kV bus in Oklahoma in the Southwest Power Pool (SPP), we found that 3,259 GWh, or 15.5%, of the overall 21,072 GWh wind energy was curtailed. This curtailment occurred under system operation modeling only existing NERC flowgates in SPP. Additionally, curtailment among other SPP wind farms increased by 420 GWh in 2019 with the Plains & Eastern wind injected at Hitchland.

Please don't hesitate to contact me for further information regarding our analysis.

Sincerely,

Leidos Engineering, LLC



Robert A. Cleveland
 Managing Director,
 Transmission Planning & Analysis