

Staff Recommendation Projected Environmental Impacts

Based on Pace Projections of Annual Generation by Generation Unit and Including Power Market Purchases for 2009-2020

Environmental Report	2020 Levels	Total Reduction (from 2009)	% Reduction (from 2009)
Carbon Dioxide (metric tons)	4,616,898	1,310,655	22%
Sulfur Dioxide (metric tons)	1,545	13,370	90%
Nitrogen Oxides (metric tons)	3,077	-270	-10%
Carbon Monoxide (metric tons)	5,464	-579	-8%
Total Solid Particulates (metric tons)	987	223	18%
Volatile Organic Compounds (metric tons)	260	-97	-59%
Mercury (lbs)	201	55	21%
Water Requirements (gallons)	9,258,963,335	341,656,989	4%
Water Intensity (gallons/kWh)	0.64	0.11	-

Replace FPP with Renewables Projected Environmental Impacts

Based on Pace Projections of Annual Generation by Generation Unit and Including Power Market Purchases for 2009-2020

Environmental Report	2020 Levels	Total Reduction (from 2009)	% Reduction (from 2009)
Carbon Dioxide (metric tons)	1,861,179	4,066,874	69%
Sulfur Dioxide (metric tons)	1,717	13,199	88%
Nitrogen Oxides (metric tons)	2,314	493	18%
Carbon Monoxide (metric tons)	3,338	1,553	34%
Total Solid Particulates (metric tons)	140	1,070	88%
Volatile Organic Compounds (metric tons)	295	-132	-81%
Mercury (lbs)	74	182	71%
Water Requirements (gallons)	7,270,949,191	2,330,247,579	24%
Water Intensity (gallons/kWh)	0.50	0.25	-

Task Force Scenario #1 Projected Environmental Impacts

Based on Pace Projections of Annual Generation by Generation Unit and Including Power Market Purchases for 2009-2020

Environmental Report	2020 Levels	Total Reduction (from 2009)	% Reduction (from 2009)
Carbon Dioxide (metric tons)	1,963,972	3,964,687	67%
Sulfur Dioxide (metric tons)	1,506	13,411	90%
Nitrogen Oxides (metric tons)	1,562	1,245	44%
Carbon Monoxide (metric tons)	2,080	2,800	59%
Total Solid Particulates (metric tons)	144	1,066	88%
Volatile Organic Compounds (metric tons)	179	-16	-10%
Mercury (lbs)	79	177	69%
Water Requirements (gallons)	6,415,752,635	3,186,301,841	33%
Water Intensity (gallons/kWh)	0.46	0.29	-

Task Force Scenario #2 Projected Environmental Impacts

Based on Pace Projections of Annual Generation by Generation Unit and Including Power Market Purchases for 2009-2020

Environmental Report	2020 Levels	Total Reduction (from 2009)	% Reduction (from 2009)
Carbon Dioxide (metric tons)	4,998,148	929,233	16%
Sulfur Dioxide (metric tons)	1,540	13,374	90%
Nitrogen Oxides (metric tons)	2,916	-109	-4%
Carbon Monoxide (metric tons)	5,222	-347	-4%
Total Solid Particulates (metric tons)	1,061	149	12%
Volatile Organic Compounds (metric tons)	219	-56	-35%
Mercury (lbs)	217	38	15%
Water Requirements (gallons)	9,294,991,559	305,384,691	3%
Water Intensity (gallons/kWh)	0.67	0.07	-

Disclaimers, Assumptions and Sources

Disclaimers
Annual average emission factors will vary year-to-year depending upon load points the turbine operated at during the year.
The SO2 emission factor for FPP will vary from year-to-year depending upon the sulfur content of the fuel and the actual removal efficiency of the scrubber.
Water requirement projections differ from water consumption projections previously released with Austin Energy's Resource and Climate Protection Plan for two reasons: 1) Since reclaimed water is used to run the combined cycle units at Sand Hill such consumption was not included in AE's reporting, but is included in this analysis as a water requirement and 2) Water consumption projections previously provided by Austin Energy did not include the impacts of water usage attributed to purchased power; for purchased power projections in this analysis a natural gas plant water consumption average from an EPRI study is applied.
Assumptions
Purchased power emissions for CO, TSPs, and VOCs is a weighted average emission rate of AE's gas units.
Assume that SO2 scrubbers will have removal efficiency of 95%.
All generation units that do not burn fossil fuels or biomass are considered emission-free and do not consume water.
Reported emissions are for AE's native load and power market purchases. Actual stack emissions may vary based on off-system sales.
Sources and Related Assumptions
Emissions data for coal and natural gas units from Austin Energy internal document entitled "Unit Emission Rates," dated 11/13/07. Information is for annual average emission factors for AE's generation units for 2006-07 Fiscal Year.
Water requirement data for coal, natural gas, nuclear, and biomass units derived from EPRI study compiled for generation fuel-type power generation unit averages to demonstrate average expected water requirements since actuals are influenced by weather impacts. Water requirements for purchased power is average water usage for
Biomass emissions based on permitted routine emissions reporting for Nacogdoches Plant for SO2, NOx, CO and VOCs. Actual emissions may be lower than permitted amount. Biomass assumed to be a CO2-neutral resource.
Purchased power emissions for CO2, SO2, and NOx based on 2008 ERCOT averages reported in document entitled, "2008 EFL Workbook Rev 2.2.xls." Available online: https://www.texasrenewables.com/reports.asp .
Purchased power emissions for mercury based on ERCOT report entitled, "eGRID2006 Version 2.1 (April 2007) Year 2004 Summary Tables." Page 8, Year 2004 NERC Region Emission Rates system-wide for ERCOT.