

**DOCKET****00-AFC-14C****Brenner Munger - ESPR GHG Emissions**

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**Date:** 5/20/2010 10:37 AM  
**Subject:** ESPR GHG Emissions  
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**Attachments:** EI\_Segundo\_GHG\_Emissions.xls

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Enclosed is a spreadsheet calculating the GHG emissions for the existing Boilers 1, 2, and 3 at the EI Segundo Generating Station, the GHG emissions for the new gas turbines as approved by the CEC in 2005, and the GHG emissions for the proposed amended new gas turbines. The spreadsheet also shows the performance of the proposed amended new gas turbines in terms of GHG emissions/MW-hr. If you have any questions, please let me know.

El Segundo Generating Station Greenhouse Gas Emission Calculations for Existing Units 1, 2, & 3 and New Units 5 & 7

Natural Gas HHV (Btu/scf)\* = 1,027.7

Fuel Use	Boiler #1	Boiler #2 <sup>1</sup>	Boiler #3 <sup>2</sup>	Amended Project Gas Turbine #5 <sup>3</sup>	Amended Project Gas Turbine #7 <sup>3</sup>	CEC-Approved Gas Turbine #5 <sup>4</sup>	CEC-Approved Gas Turbine #7 <sup>4</sup>
Nat. Gas (million ft <sup>3</sup> )	3,744	3,618	2,995	11,211.50	11,211.50	21,275.63	21,275.63

Greenhouse Gas Emission Calculations												
Equipment	Annual											
	Global Warming Potential Factor <sup>1</sup> for CO <sub>2</sub>	Global Warming Potential Factor <sup>1</sup> for CH <sub>4</sub>	Global Warming Potential Factor <sup>1</sup> as CO <sub>2</sub>	CO <sub>2</sub> Emission Rate (kg/MMBtu)	CH <sub>4</sub> Emission Factor <sup>6</sup> (kg/MMBtu)	N <sub>2</sub> O Emission Factor <sup>6</sup> (kg/MMBtu)	CO <sub>2</sub> Emission Rate (kg/year)	CH <sub>4</sub> Emission Rate (kg/year)	N <sub>2</sub> O Emission Rate (kg/year)	Global Warming Potential CH <sub>4</sub> Emiss. as CO <sub>2</sub> (MT/year) <sup>8</sup>	Global Warming Potential N <sub>2</sub> O Emiss. as CO <sub>2</sub> (MT/year)	Global Warming Potential Total as CO <sub>2</sub> (MT/year)
Unit 1	1	23	310	2,03E+08	7.96E+04	1.19E+05	2.03E+05	7.96E+01	1.19E+02	2.04E+05		
Unit 2	1	23	310	1.97E+08	7.70E+04	1.15E+05	1.97E+05	7.70E+01	1.15E+02	1.97E+05		
Unit 3	1	23	310	1.63E+08	6.37E+04	9.54E+04	1.63E+05	6.37E+01	9.54E+01	1.63E+05		
Unit 5 - Amended Project	1	23	310	6.09E+08	2.39E+05	6.09E+05	6.09E+05	2.39E+02	3.57E+02	6.10E+05		
Unit 7 - Amended Project	1	23	310	6.09E+08	2.39E+05	6.09E+05	6.09E+05	2.39E+02	3.57E+02	6.10E+05		
Unit 5 - CEC Approved	1	23	310	1.16E+09	4.53E+05	1.16E+06	4.53E+05	1.16E+06	6.78E+02	1.16E+06		
Unit 7 - CEC Approved	1	23	310	1.16E+09	4.53E+05	1.16E+06	4.53E+05	1.16E+06	6.78E+02	1.16E+06		
											<b>Total =</b>	<b>5.63E+05</b>
											<b>Total =</b>	<b>1.22E+06</b>
											<b>Total =</b>	<b>2.31E+06</b>

Equipment	Maximum Annual Oper <sup>9</sup> (hours/year)	Maximum Net Output <sup>10</sup> (MW)	Maximum Power Production (MW-hr/year)	Total CO <sub>2</sub> Emissions (MT/year)	Total GHG Emissions (MT/year)	CO <sub>2</sub> Performance (MTCO <sub>2</sub> /MW-hr)	Total GHG Performance (MTGHG/MW-hr)
Unit 5 - Amended Project	5456	280	1,527,680	6.09E+05	6.10E+05	0.399	0.399
Unit 7 - Amended Project	5456	280	1,527,680	6.09E+05	6.10E+05	0.399	0.399

Notes:

- Maximum annual fuel use during period from 2000 to 2001 (October 17, 2001 PDOC issued by the SCAQMD for the ESPR Project, Engineering Evaluation, Appendix A, page 56 of 71).
- Maximum annual fuel use during period from 2007 to 2009 (January 14, 2010 letter from El Segundo Energy Center LLC to the SCAQMD, Attachment A).
- Maximum annual fuel use shown in March 31, 2010 addendum to DOC issued by the SCAQMD for the ESPR Project, Engineering Evaluation, page 26 of 42.
- Based on operating 8760 hrs/year \* 2,496 MMBtu/hr \* (1/1027.7 Btu/scf). Annual operating hours from September 2002 Final Staff Report for the ESPR Project, Air Quality Table 12. Maximum heat input from February 2005 Commission Decision for the ESPR Project, Equipment Description for Conditions AQ-2 through AQ-27. Natural gas heating value (HHV) from March 31, 2010 addendum to DOC issued by the SCAQMD for the ESPR Project, Engineering Evaluation, Table 5, page 6 of 42.
- CARB Final Emission Factors for Mandatory Reporting Program, December 2, 2008, carbon dioxide emission factors stationary source combustion table
- CARB Final Emission Factors for Mandatory Reporting Program, December 2, 2008, CH<sub>4</sub> and N<sub>2</sub>O emission factors stationary source combustion table
- California Climate Action Registry, Appendix to the General Reporting Protocol: Power/Utility Reporting Protocol, Version 3.0, April 2008, Table C.1.
- MT/year stands for metric tonnes per year.
- Maximum annual operating hours use shown in March 31, 2010 addendum to DOC issued by the SCAQMD for the ESPR Project, Engineering Evaluation, page 26 of 42.
- Maximum net power output per GT train (560 MW/2) shown in March 31, 2010 addendum to DOC issued by the SCAQMD for the ESPR Project, Engineering Evaluation, Table 5, page 6 of 42.
- March 31, 2010 addendum to DOC issued by the SCAQMD for the ESPR Project, Engineering Evaluation, Table 5, page 6 of 42.