

Attachment B

**Self-Generation Incentive Program
Waste Heat, Minimum System Efficiency Emissions Spreadsheet**

2005 SGIP Rev 0

Applicant:		Date:	
Host Customer:		Application No.:	

Instructions: This spreadsheet calculates the operating system efficiency, system efficiency and emissions eligibility of generation systems applying to the Self-Generating Incentive Program for incentives. Applicants must provide documentation supporting all inputs including but not limited to system capacity, fuel consumption, waste heat recovery rate, baseline emissions, operating schedule, equivalent full load operating hours and thermal load. See the 2011 SGIP Handbook for details of eligibility and documentation requirements. All yellow cells must be completed by Applicant/Host Customer.

Rated Net Generating Capacity =	255 kW	Full load net continuous rated capacity of the packaged prime mover/generator at ISO conditions.
Ancillary Generating System Loads =	5 kW	Any ancillary equipment loads necessary for the operation of the generator (e.g., fuel compressors, intercooler chillers, etc.) not accounted for in the Rated Net Generating Capacity.
Fuel Consumption Rate (LHV) =	2,967,000 Btu/hr	Provided by manufacturer or calculated from rated capacity and generator efficiency or heat rate specifications. Based on lower heating value of fuel.
Fuel Consumption Rate (HHV) =	3,263,700 Btu/hr	Provided by manufacturer or calculated from rated capacity and generator efficiency or heat rate specifications. Based on higher heating value of fuel.
Waste Heat Recovery Rate =	1,470,000 Btu/hr	Recoverable heat as specified by manufacturer of generator or waste heat recovery unit at full load conditions. This is not total waste heat of the unit. The value provided should be supported by Generating System specifications (if packaged unit), Waste Heat Recovery System specifications, or engineering analysis of recoverable waste heat.
Generator Emissions =	0.074 lbs/MWh	NOx emissions specifications for the proposed generating system as configured, including emissions controls, for the Host Customer Site at rated conditions. The value provided should be supported by factory testing, other installation source tests or engineering calculations.
Fuel Type =	Non-Renewable	Non-Renewable fuels are any fossil based fuels such as natural gas. Renewable fuels include landfill and digester gas. Waste gas are fuels strictly defined as natural gas that is generated as a byproduct of petroleum production operations and is not eligible for delivery to the utility pipeline system.
Fuel Cell ?	<input type="checkbox"/> Yes	Is the proposed generator a fuel cell?
Feed-in Tariff Qualified?	<input checked="" type="checkbox"/> Yes	Is the proposed generator qualified for the Feed-in Tariff?

Month	Std Hours Per Month (hrs)	Generator Equivalent Full Load Hours per Month (hrs)	Capacity Factor	Generator Electric Output per Month (kWh)	Facility Electrical Load (kWh)	Recovered Waste Heat per Month (Btu)	Thermal Load per Month (Btu)	Thermal Load Coincidence Factor	Useful thermal energy output (Btu)	Fuel Input (LHV Btu)	Fuel Input (HHV Btu)	Gross GHG Generated (kg CO2)	GHG Savings from Heat Recovery (kg CO2)	Net GHG Emissions (kg CO2)
Jan	744	710	95%	177,500	300,000	1,043,700,000	1,290,024,000	0.81	1,043,700,000	2,106,570,000	2,317,227,000	122,859	69,171	53,688
Feb	672	640	95%	160,000	300,000	940,800,000	1,128,312,000	0.83	940,800,000	1,898,880,000	2,088,768,000	110,746	62,352	48,395
Mar	744	710	95%	177,500	300,000	1,043,700,000	1,117,080,000	0.93	1,043,700,000	2,106,570,000	2,317,227,000	122,859	69,171	53,688
Apr	720	710	99%	177,500	300,000	1,043,700,000	1,068,048,000	0.98	1,043,700,000	2,106,570,000	2,317,227,000	122,859	69,171	53,688
May	744	690	93%	172,500	300,000	1,014,300,000	1,026,864,000	0.99	1,014,300,000	2,047,230,000	2,251,953,000	119,399	67,223	52,176
Jun	720	690	96%	172,500	300,000	1,014,300,000	1,024,992,000	0.99	1,014,300,000	2,047,230,000	2,251,953,000	119,399	67,223	52,176
Jul	744	655	88%	163,750	300,000	962,850,000	972,792,000	0.99	962,850,000	1,943,385,000	2,137,723,500	113,342	63,813	49,529
Aug	744	655	88%	163,750	300,000	962,850,000	974,016,000	0.99	962,850,000	1,943,385,000	2,137,723,500	113,342	63,813	49,529
Sep	720	690	96%	172,500	300,000	1,014,300,000	1,197,936,000	0.85	1,014,300,000	2,047,230,000	2,251,953,000	119,399	67,223	52,176
Oct	744	710	95%	177,500	300,000	1,043,700,000	1,259,280,000	0.83	1,043,700,000	2,106,570,000	2,317,227,000	122,859	69,171	53,688
Nov	720	700	97%	175,000	300,000	1,029,000,000	1,281,024,000	0.80	1,029,000,000	2,076,900,000	2,284,590,000	121,129	68,197	52,932
Dec	744	710	95%	177,500	300,000	1,043,700,000	1,312,056,000	0.80	1,043,700,000	2,106,570,000	2,317,227,000	122,859	69,171	53,688
Annual Total	8,760	8,270	94%	2,067,500	3,600,000	12,156,900,000	13,652,424,000		12,156,900,000	24,537,090,000	26,990,799,000	1,431,052	805,699	625,354

Minimum Operating Efficiency Eligibility = PASS			
P.U. Code 216.6 (a) =	63.3% ≥ 5%	TRUE	Public Utilities Code 216.6(a) & 18CFR Part 292
P.U. Code 216.6 (b) =	53.5% ≥ 42.5%	TRUE	Public Utilities Code 216.6(b) & 18CFR Part 292
Minimum Electric Efficiency =	26.7% ≥ 40%	FALSE	Public Utilities Code 353.2 and 379.6
NOx Emissions Eligibility = PASS			
AB 1685 Total Efficiency =	71.7% ≥ 60%	TRUE	Public Utilities Code 353.2 and 379.6
NOx Emissions w/o CHP Credits =	0.074 ≤ 0.07 lb/MWh	FALSE	Public Utilities Code 353.2 and 379.6
NOx Emissions w/ CHP Credits =	0.027 ≤ 0.07 lb/MWh	TRUE	Public Utilities Code 379.6 and Calif. ARB, Guidance for the Permitting of Electric Generation Technologies, Appendix D: Quantifying CHP Benefits, July 2002.
GHG Emissions Eligibility = PASS			
GHG Emissions (kg CO2/MWh) =	302 < 379	TRUE	CPUC Decision 11-09-015
Coincidence of Thermal Load = PASS			
Max Thermal Load Coincidence Factor =	0.99 ≤ 1.0	TRUE	CPUC Decision 11-09-015
Electrical Export Eligible = PASS			
Electrical Export Factor =	0.57 ≤ 1.25	TRUE	CPUC Decision 11-09-015

**Self-Generation Incentive Program
Minimum Operating Efficiency Spreadsheet**

Residential CHP Version

Applicant: **ESCO** Date: **January 1, 2011**
 Host Customer: **Residential Customer** Application No.: **XX-XXX**

Instructions:

This spreadsheet determines if a proposed generating system meets the Minimum Operating Efficiency eligibility requirement of the Self-Generation Incentive Program for **Residential customers**. Applicants must provide documentation supporting all inputs including but not limited to system capacity, fuel consumption, waste heat recovery rate, operating schedule, equivalent full load operating hours and thermal load. See the 2011 SGIP Handbook for details of eligibility and documentation requirements. All yellow cells must be completed by Applicant/Host Customer.

Rated Net Generating Capacity =	5 kW	Full load net continuous rated capacity of the packaged prime mover/generator at ISO conditions.
Ancillary Generating System Loads =	0 kW	Any ancillary equipment loads necessary for the operation of the generator (e.g., fuel compressors, intercooler chillers, etc.) not accounted for in the Rated Net Generating Capacity.
Fuel Consumption Rate (LHV) =	42,844 Btu/hr	Provided by manufacturer or calculated from rated capacity and generator efficiency or heat rate specifications. Based on lower heating value of fuel.
Fuel Consumption Rate (HHV) =	47,511 Btu/hr	Provided by manufacturer or calculated from rated capacity and generator efficiency or heat rate specifications. Based on higher heating value of fuel.
Waste Heat Recovery Rate =	22,000 Btu/hr	Recoverable heat as specified by manufacturer of generator or waste heat recovery unit at full load conditions. This is not total waste heat of the unit. The value provided should be supported by Generating System specifications (if packaged unit), Waste Heat Recovery System specifications, or engineering analysis of recoverable waste heat.
Generator Emissions =	0.074 lbs/MWh	NOx emissions specifications for the proposed generating system as configured, including emissions controls, for the Host Customer Site at rated conditions. The value provided should be supported by factory testing, other installation source tests or engineering calculations.
Fuel Type =	Non-Renewable	Non-Renewable fuels are any fossil based fuels such as natural gas. Renewable fuels include landfill and digester gas. Waste gas are fuels strictly defined as natural gas that is generated as a byproduct of petroleum production operations and is not eligible for delivery to the utility pipeline system.
Fuel Cell ?	<input checked="" type="checkbox"/> Yes	Is the proposed generator a fuel cell?
Feed-in Tariff Qualified?	<input checked="" type="checkbox"/> Yes	Is the proposed generator qualified for the Feed-in Tariff?

Zip Code of Residence = **94027** Weather Zone = **5** Electric Utility = **PG&E**

Dwelling Living Area = **7,800 sqft** City = **ATHERTON** Gas Utility = **PG&E**

Applicable Thermal Loads

Check the residential thermal load(s) to be included

Residential Space Heating Residential Type = **Single Family** Vintage = **1992-present** Vintage # = **5**
Pool Heating Enter Energy Smart Pools Net Load Data into "Pool Heating" Worksheet
Domestic Hot Water Household Size = **2 Persons**

Month	Std Hours Per Month (hrs)	Generator Equivalent Full Load Hours per Month (hrs)	Capacity Factor	Generator Electric Output per Month (kWh)	Facility Electrical Load (kWh)	Recovered Waste Heat per Month (Btu)	Thermal Load per Month (Btu)	Thermal Load Coincidence Factor	Useful thermal energy output (Btu)	Fuel Input (LHV Btu)	Fuel Input (HHV Btu)	Gross GHG Generated (kg CO2)	GHG Savings from Heat Recovery (kg CO2)	Net GHG Emissions (kg CO2)
Jan	744	744	100%	3,720	3,164	16,368,000	73,000,000	0.2	16,368,000	31,875,936	35,348,184	1,874	1,085	789
Feb	672	672	100%	3,360	3,209	14,784,000	61,000,000	0.2	14,784,000	28,791,168	31,927,392	1,693	980	713
Mar	744	744	100%	3,720	5,000	16,368,000	59,000,000	0.3	16,368,000	31,875,936	35,348,184	1,874	1,085	789
Apr	720	720	100%	3,600	4,520	15,840,000	59,000,000	0.3	15,840,000	30,847,680	34,207,920	1,814	1,050	764
May	744	744	100%	3,720	3,721	16,368,000	46,000,000	0.4	16,368,000	31,875,936	35,348,184	1,874	1,085	789
Jun	720	720	100%	3,600	3,599	15,840,000	33,000,000	0.5	15,840,000	30,847,680	34,207,920	1,814	1,050	764
Jul	744	744	100%	3,720	2,808	16,368,000	19,000,000	0.9	16,368,000	31,875,936	35,348,184	1,874	1,085	789
Aug	744	744	100%	3,720	2,852	16,368,000	23,000,000	0.7	16,368,000	31,875,936	35,348,184	1,874	1,085	789
Sep	720	720	100%	3,600	2,764	15,840,000	29,000,000	0.5	15,840,000	30,847,680	34,207,920	1,814	1,050	764
Oct	744	744	100%	3,720	2,540	16,368,000	45,000,000	0.4	16,368,000	31,875,936	35,348,184	1,874	1,085	789
Nov	720	720	100%	3,600	2,852	15,840,000	60,000,000	0.3	15,840,000	30,847,680	34,207,920	1,814	1,050	764
Dec	744	350	47%	1,750	3,120	7,700,000	74,000,000	0.1	7,700,000	14,995,400	16,628,850	882	510	371
Annual Total	8,760	8,366	96%	41,830	40,149	184,052,000	581,000,000		184,052,000	358,432,904	397,477,026	21,074	12,198	8,876

Minimum Operating Efficiency Eligibility = PASS

P.U. Code 216.6 (a) = 56.3% ≥ 5% TRUE Public Utilities Code 216.6(a) & 18CFR Part 292
 P.U. Code 216.6 (b) = 65.5% ≥ 42.5% TRUE Public Utilities Code 216.6(b) & 18CFR Part 292
 Minimum Electric Efficiency = 35.9% ≥ 40% FALSE Public Utilities Code 353.2 and 379.6

NOx Emissions Eligibility = EXEMPT

AB 1685 Total Efficiency = 82.2% ≥ 60% TRUE Public Utilities Code 353.2 and 379.6
 NOx Emissions w/o CHP Credits = 0.074 ≤ 0.07 lb/MWh FALSE Public Utilities Code 353.2 and 379.6
 NOx Emissions w/ CHP Credits = 0.032 ≤ 0.07 lb/MWh TRUE Public Utilities Code 379.6 and Calif. ARB, Guidance for the Permitting of Electric Generation Technologies, Appendix D: Quantifying CHP Benefits,

GHG Emissions Eligibility = PASS

GHG Emissions (kg CO2/MWh) = 212 < 379 TRUE CPUC Decision 11-09-015

Coincidence of Thermal Load = PASS

Max Thermal Load Coincidence = 0.86 ≤ 1.0 TRUE CPUC Decision 11-09-015

Electrical Export Eligible = PASS

Electrical Export Factor = 1.04 ≤ 1.25 TRUE CPUC Decision 11-09-015