	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2		**This data collection exercise is intended to capture comprehensive greenhouse gas emission data consistent with existing and evolving GHG protocols. Some of the emission factors are slightly different from previous years. The purchased electricity factor may be quite different. This data collection is separate and supplemental to the Energy and Greenhouse Gas Metrics effort, and is designed to estimate the company's greenhouse gas "footprint" and the results will be reported externally.**														
3																
4		**The data required is covered in three worksheets / tabs: Electricity and Natural Gas, Fuels, and Direct Emissions:**														
5		**Electricity and Natural Gas:**														
6		The Electricity and Natural Gas values are already included for sites tracked in Avista for 2007. Please review and confirm. If there are discrepancies, please call or email me. Other sites will need to enter this data directly from site billing records.														
7		Natural Gas values are to be reported in **MMBTU**. One MMBTU = 10 Therms, Therms x 0.1 = MMBTU. Electricity is reported in **kWHrs** only.														
8		**Fuels:**														
9		The fuel values need to be entered in gallons (except coal, which, as far as we know, no one still uses). On-road diesel is taxed. Off-road is not taxed. Residual oil includes #5 or #6 oil. If you use some other heavy distillate, (e.g. PS-300) please add a note telling me what it is, and how much was used. If you have biodiesel, please note how much and what the concentration is (B5, B20, B100, etc.)														
10		Jet fuel totals are for the quantity used by Boeing - not including the quantity supplied to customers. For Puget Sound and Long Beach, this would be the total used in pre-delivery flights. For our modification / repair sites, this would be the quantity used in testing by Boeing before returning the aircraft to the customer. If you have a flight test organization operating at your site, contact them for the data. Company aircraft need to be identified and their fuel reported separately from the product aircraft.														
11		Motor gasoline includes all gasoline, all grades dispensed at the site. If you have records for gasoline purchased off-site for company vehicles, please inlcude and let me know how these records are obtained.														
12		Aviation gasoline is not the same as Motor gasoline. If you use Av. Gas (primarily in helicopters) please keep the totals separated.														
13		Propane is entered in **gallons** - not cubic ft or lbs.														
14		Any other fuels (e.g. LPG, CNG) should be included separately in the yellow note box.														
15		**Direct Emissions:**														
16		Direct emissions are the losses from laboratory operations, refrigeration and air conditioning equipment, chemical recharge or other uses of greenhouse gas chemicals. The list of reportable chemicals is included. Please note that some compounds, particularly refrigerants and fire extinguishing chemicals are mixtures containing one or more of the HFC or PFC materials. Please report the fraction of the listed chemical in these mixtures in pounds.														
17		Dry ice use, if quantities are available, should be included with a note on how much CO2 is used in this form, in order to be able to separate fire extinguishing CO2 and lab uses from the dry ice used for chilling or paint removal.														

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
18		Any other information you believe is important in compiling a comprehensive inventory should be noted in the yellow comment boxes.														
19		**Summary:**														
20		A fourth tab is included with a compilation of various totals that may be reportable in various venues. Absent a universally defined format for reporting greenhouse gas emissions, some of the more common summary forms are included here for your information.														
21		**Factors:**														
22		The Climate Registry draft Reporting Protocol due to be finalized this spring. If you have any questions about these, please feel free to contact me.														
23																
24		Dave Moore														
25		david.w.moore@boeing.com														
26		253-773-1194														

Electricity and Natural Gas - Confirm Values

Enter data only into Yellow areas. Gray areas are protected calculations

Electricity is entered kWHrs. Natural Gas in MMBTU.

				Site Data			**Data Confirm**			**Emiss**
							Electricity	Natural Gas		
	Year	State	eGRID Subregion	City	Site	Contact	kWh	MMBTU	CO_2 lbs/MWHr	CH_4 lbs/MWh
	2005	WA	WECC Northwest	Renton	Renton	Scott Fishkin	85,855,782	338,016	921.100	0.022
	2006	WA	WECC Northwest	Renton	Renton	Scott Fishkin	89,373,144	364,672	921.100	0.022
	2007	WA	WECC Northwest	Renton	Renton		84,726,000	344,243	921.100	0.022

Any revisions to kWHrs or MMBTU ?

1.

Site	eGRID 2006 Subregion	eGRID 2006 Subregion Name	(lbs CO_2/MWh)	(lbs CH_4/MWh)	(lbs N_2O/MWh)	CO_2 lbs / kWHr	CO_2 Metric tons / kWHr	CH_4 Metric tons / kWHr	N_2O Metric tons / kWHr

ions Calculations

Electricity					Natural Gas				Electricity + Nat. Gas		
N_2O lbs/MWh	Metric Tonnes CO_2	Metric Tonnes CH_4	Metric Tonnes N_2O	Metric Tonnes CO_2 equiv	Metric Tonnes CO_2	Metric Tonnes CH_4	Metric Tonnes N_4O	Metric Tonnes CO_2 equiv	Metric Tonnes CO_2	Metric Tonnes CO_2 equivalent	Year
0.014	35,871	0.86	0.55	36,058	17951	1.61	0.03	#####	53,822	54,053	2005
0.014	37,341	0.89	0.57	37,536	19367	1.73	0.03	#####	56,708	56,949	2006
0.014	35,399	0.85	0.54	35,584	18282	1.64	0.03	#####	53,681	53,910	2007

	A	B	C	D	E	F	G	H	I	J
21		AKGD	ASCC Alaska Grid	1,257.19	0.0266	0.0064	**1.257190**	**0.0005703**	**1.2066E-08**	**2.903E-09**
22		AKMS	ASCC Miscellaneous	480.1	0.0239	0.0044	**0.480100**	**0.0002178**	**1.0841E-08**	**1.9958E-09**
23	Houston San Antonio	ERCT	ERCOT All	1,420.56	0.021	0.015	**1.420560**	**0.0006444**	**9.5255E-09**	**6.804E-09**
24		FRCC	FRCC All	1,327.66	0.054	0.016	**1.327660**	**0.0006022**	**2.4494E-08**	**7.2576E-09**
25		HIMS	HICC Miscellaneous	1,456.17	0.101	0.018	**1.456170**	**0.0006605**	**4.5813E-08**	**8.1647E-09**
26		HIOA	HICC Oahu	1,728.12	0.0911	0.0212	**1.728120**	**0.0007839**	**4.1323E-08**	**9.6163E-09**
27		MROE	MRO East	1,858.72	0.041	0.03	**1.858720**	**0.0008431**	**1.8597E-08**	**1.3608E-08**
28		MROW	MRO West	1,813.81	0.028	0.029	**1.813810**	**0.0008227**	**1.2701E-08**	**1.3154E-08**
29		NYLI	NPCC Long Island	1,412.20	0.102	0.016	**1.412200**	**0.0006406**	**4.6267E-08**	**7.2576E-09**
30		NEWE	NPCC New England	908.9	0.08	0.015	**0.908900**	**0.0004123**	**3.6288E-08**	**6.804E-09**
31		NYCW	NPCC NYC/Westchester	922.22	0.038	0.006	**0.922220**	**0.0004183**	**1.7237E-08**	**2.7216E-09**
32		NYUP	NPCC Upstate NY	819.68	0.024	0.011	**0.819680**	**0.0003718**	**1.0886E-08**	**4.9896E-09**
33	Philadelphia	RFCE	RFC East	1,095.53	0.028	0.017	**1.095530**	**0.0004969**	**1.2701E-08**	**7.7111E-09**
34		RFCM	RFC Michigan	1,641.41	0.035	0.025	**1.641410**	**0.0007445**	**1.5876E-08**	**1.134E-08**
35	Chicago	RFCW	RFC West	1,556.39	0.02	0.024	**1.556390**	**0.0007060**	**9.0719E-09**	**1.0886E-08**
36	St. Louis LC	SRMW	SERC Midwest	1,844.34	0.021	0.029	**1.844340**	**0.0008366**	**9.5255E-09**	**1.3154E-08**
37	Don't Use for St. Louis	SRMV	SERC Mississippi Valley	1,135.46	0.042	0.013	**1.135460**	**0.0005150**	**1.9051E-08**	**5.8968E-09**
38	Eglin AFB Macon	SRSO	SERC South	1,490.37	0.04	0.025	**1.490370**	**0.0006760**	**1.8144E-08**	**1.134E-08**
39	Huntsville	SRTV	SERC Tennessee Valley	1,494.89	0.023	0.024	**1.494890**	**0.0006781**	**1.0433E-08**	**1.0886E-08**
40		SRVC	SERC Virginia/Carolina	1,146.39	0.029	0.019	**1.146390**	**0.0005200**	**1.3154E-08**	**8.6183E-09**
41	Wichita	SPNO	SPP North	1,971.42	0.024	0.03	**1.971420**	**0.0008942**	**1.0886E-08**	**1.3608E-08**
42		SPSO	SPP South	1,761.14	0.03	0.023	**1.761140**	**0.0007988**	**1.3608E-08**	**1.0433E-08**
43	All California	CAMX	WECC California	878.71	0.036	0.008	**0.878710**	**0.0003986**	**1.6329E-08**	**3.6288E-09**
44	Washington Oregon	NWPP	WECC Northwest	921.1	0.022	0.014	**0.921100**	**0.0004178**	**9.9791E-09**	**6.3504E-09**
45		RMPA	WECC Rockies	2,035.81	0.024	0.03	**2.035810**	**0.0009234**	**1.0886E-08**	**1.3608E-08**
46	Mesa	AZNM	WECC Southwest	1,254.02	0.018	0.015	**1.254020**	**0.0005688**	**8.1647E-09**	**6.804E-09**

	K	L	M	N	O	P	Q	R	S	T	U	V	W
21													
22													
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24													
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46													

Fuels - Data Input

Enter data only into Yellow areas. Gray areas are protected calculations

Liquid fuels are entered in Gallons.

Site Data

				SITE DATA		On-Road Diesel	Off-Road Diesel	Residual Fuel Oil (#5, #6)	Coal	Jet A / Jet Fuel	Motor Gasoline	Aviation Gasoline
Year	State	City	Site		Contact	Gallons	Gallons	Gallons	Short tons	Gallons	Gallons	Gallons
2005	WA	Renton	Renton		Sean Caldwell	**141,368**	**9,724**			**866,859**	**80,220**	
2006	WA	Renton	Renton		Sean Caldwell	**145,486**	**9,561**	**12,000**		**1,273,368**	**85,035**	
2007	WA	Renton	Renton			**103,911**	**28,107**	**16,312**			**84,251**	

Notes: **Any other fuels, biodiesel, etc.?**

1.

	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1															
2															
3															
4															
5															
6															
7	Propane	#2 On-Road Diesel			#2 Off-Road Diesel			#6 Residual Oil			Coal			Jet Fuel	
8	Gallons	lbs CO2 /gallon	Metric Tonnes CO2	Metric Tonnes CO2 equiv	lbs CO2 / gallon	Metric Tonnes CO2	Metric Tonnes CO2 equiv	lbs CO2 / gallon	Metric Tonnes CO2	Metric Tonnes CO2 equiv	lbs CO2 / Short Ton	Metric Tonnes CO2	Metric Tonnes CO2 equiv	lbs CO2 / Gallon	Metric Tonnes CO2
9		22.38	1434.89	1442.66	22.38	98.69	99.23	26.01	0.00	0.00	4483.7	0.00	0.00	21.10	8295.84
10	1,017	22.38	1476.69	1484.69	22.38	97.04	97.57	26.01	141.60	142.31	4483.7	0.00	0.00	21.10	#######
11		22.38	1054.70	1060.42	22.38	285.28	286.83	26.01	192.48	193.45	4483.7	0.00	0.00	21.10	0.00
12															
13															
14															
15															
16															

	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO
1														
2														
3														
4														
5														
6														
7		Motor Gas			Aviation Gas			Propane			Fuels Total		Year	
8	Metric Tonnes CO2 equiv	lbs CO2 / Gallon	Metric Tonnes CO2	Metric Tonnes CO2 equiv	lbs CO2 / Gallon	Metric Tonnes CO2	Metric Tonnes CO2 equiv	lbs CO2 / Gal	Metric Tonnes CO2	Metric Tonnes CO2 equiv	Metric Tonnes CO_2	Metric Tonnes CO_2 equivalents		
9	8342.27	19.42	706.74	710.72	18.34	0.00	0.00	12.65	0.00	0.00	10536.16	10594.88	2005	
10	#######	19.42	749.16	753.38	18.34	0.00	0.00	12.65	5.84	5.84	14656.46	14738.13	2006	
11	0.00	19.42	742.25	746.43	18.34	0.00	0.00	12.65	0.00	0.00	2274.71	2287.13	2007	
12														
13														
14														
15														
16														

	A	B	C	D	E	F	G	H	I	J	K	L
17												
18												
19												
20	**State**											
21	AR											
22	AL											
23	AZ											
24	CA											
25	CO											
26	CT											
27	FL											
28	GA											
29	IL											
30	KS											
31	MO											
32	OH											
33	OK											
34	OR											
35	PA											
36	TN											
37	TX											
38	UT											
39	WA											

	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
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39														

Cell: J10
Comment: dwm4024:
Sean says 1264605. Vanessa says 1273368.

	A	B	C	D	E	F	G	H	I	J
1	**Direct / Fugitive Emissions - Data Input**								**Notes:**	**Any other**
2	**Enter data only into Yellow areas. Gray areas are protected calculations**									
3	***Direct emissions are input in lbs.***								1.	
4										
5	**Data Entry Area - Direct Chemical Emissions**									**GWP A**
6					**GWP**	**2005**	**2006**	**2007**		**2005**
7		**CO_2**	124-38-9	**Carbon Dioxide**	**1**	**0**	**209**	**117**		0
8		**CH_4**	74-82-8	**Methane**	**21**	**0**	**236**	**0**		0
9		**N_2O**	10024-97-2	**Nitrous Oxide**	**310**	**0**	**0**			0
10		**SF_6**	2551-62-4	**Sulfur hexafluoride**	**23,900**	**0**	**0**			0
11		**HFCs**				**2005**	**2006**	**2007**		
12	Name	Formula	CAS	Common Name	GWP	**lbs**	**lbs**	**lbs**		
13	HFC-23	CHF_3	75-46-7	Trifluoromethane	**11,700**	**0**	**44**	**20**		0
14	HFC-32	CH_2F_2	75-10-5	Difluoromethane (Methylene fluoride)	**650**	**0**	**0**			0
15	HFC-41	CH_3F	593-53-3	Fluoromethane (Methyl fluoride)	**150**	**0**	**0**			0
16	HFC-43-10mee	$C_5H_2F_{10}$	138495-42-8	1,1,1,2,3,4,4,5,5,5-decafluoropentane	**1,300**					0
17	HFC-125	C_2HF_5	354-33-6	Pentafluoroethane	**2,800**	**0**	**24**	**11**		0
18	HFC-134	CHF2CHF2	359-35-3	1,1,2,2-Tetrafluoroethane	**1,000**	**0**	**0**			0
19	HFC-134a	CH2FCF3	811-97-2	1,1,1,2-Tetrafluoroethane	**1,300**	**0**	**4,924**	**3,441**		0
20	HFC-143	CH2FCHF2	430-66-0	1,1,2-Trifluoroethane	**300**	**0**	**0**			0

	K	L	M	N	O	P	Q	R	S	T	U
1	**direct release we should know about ?**										
2											
3											
4											
5	**ljusted ($CO_{2equiv.}$) lbs**										
6	**2006**	**2007**									
7	209	117									
8	4,947	0									
9	0	0									
10	0	0									
11											
12											
13	508,950	234,000									
14	0	0									
15	0	0									
16	0	0									
17	68,376	29,568									
18	0	0									
19	6,401,616	4,473,235									
20	0	0									

	A	B	C	D	E	F	G	H	I	J
21	HFC-143a	CH3CF3	420-46-2	1,1,1-Trifluoroethane	**3,800**	**0**	**29**	**12**		0
22	HFC-152	CH2FCH2F	624-72-6	1,2-Difluoroethane	**43**	**0**	**0**			0
23	HFC-152a	CHF2CH3	75-37-6	1,1-Difluoroethane	**140**	**0**	**0**			0
24	HFC-161	CH3CH2F	353-36-6	Monofluoroethane (Ethyl fluoride)	**12**	**0**	**0**			0
25	HFC-227ea	CF3CHFCF3	431-89-0	1,1,1,2,3,3,3-Heptafluoropropane	**2,900**	**0**	**0**			0
26	HFC-236cb	CH2FCF2CF3	60598-1 1-0	1,1,1,2,2,3-Hexafluoropropane	**1,300**	**0**	**0**			0
27	HFC-236ea	CHF2CHFCF3	431-63-0	1,1,1,2,3,3-Hexafluoropropane	**1,200**	**0**	**0**			0
28	HFC-236fa	CF3CH2CF3	690-39-1	1,1,1,3,3,3-Hexafluoropropane	**6,300**	**0**	**0**			0
29	HFC-245ca	CH2FCF2CHF2	679-86-7	1,1,2,2,3-Pentafluoropropane	**560**	**0**	**0**			0
30	HFC-245fa	CHF2CH2CF3	460-73-1	1,1,1,3,3-Pentafluoropropane	**950**	**0**	**87**			0
31	HFC-365mfc	CH3CF2CH2CF3	406-58-6	1,1,1,3,3-Pentafluorobutane	**890**	**0**	**0**			0
32				**total HFCs (lbs)**		**0**	**5,108**	**3,484**		**0**
33										
34		**PFCs**				**lbs**	**lbs**	**lbs**		
35	**PFC-14**	CF4	75-73-0	Tetrafluoromethane (Carbon tetrafluoride)	**6,500**	**0**	**0**			0
36	**PFC-116**	C2F6(CF3CF3)	76-16-4	Perfluoroethane (Hexafluoroethane)	**9,200**	**0**	**0**			0
37	**PFC-218**	C3F8 (CF3CF2CF3)	76-19-7	Perfluoropropane (Octafluoropropane)	**7,000**	**0**	**0**			0
38	**PFC-318**	c-C4F8 (-(CF2)4 -)	115-25-3	Perfluorocyclobutane (Octafluorocyclobutane)	**8,700**	**0**	**0**			0
39	**PFC-3-1-10**	C4F10	355-25-9	Perfluorobutane	**7,000**	**0**	**0**			0
40	**PFC-4-1-12**	C5F12	678-26-2	Perfluoropentane (dodecafluoropentane)	**7,500**					0
41	**PFC-5-1-14**	C6F14	355-42-0	Perfluorohexane	**7,400**	**0**	**0**			0

	K	L	M	N	O	P	Q	R	S	T	U
21	109,668	47,424									
22	0	0									
23	0	0									
24	0	0									
25	0	0									
26	0	0									
27	0	0									
28	0	0									
29	0	0									
30	82,365	0									
31	0	0									
32	**7,170,975**	**#######**									
33											
34											
35	0	0									
36	0	0									
37	0	0									
38	0	0									
39	0	0									
40	0	0									
41	0	0									

	A	B	C	D	E	F	G	H	I	J
42				**total PFCs (lbs)**		**0**	**0**	**0**		**0**
43										
44										
45						**CO2 equiv. Metric tons**	**CO2 equiv. Metric tons**	**CO2 equiv.**		
46				**Carbon Dioxide**		**0**	**0.09**	**0**		
47				**Methane**		**0**	**0.11**	**0**		
48				**Nitrous oxide**		**0**	**0**	**0**		
49				**HFC**		**0**	**3,253**	**2,170**		
50				**PFC**		**0**	**0**	**0**		
51				**Sulfur hexafluoride**		**0**	**0**	**0**		
52										

	K	L	M	N	O	P	Q	R	S	T	U
42	0	0									
43											
44											
45											
46											
47											
48											
49											
50											
51											
52											

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1														
2														
3														
4														
5												**metric tons**		
6											**2005**	**2006**	**2007**	
7				Internal Greenhouse Gas Metric (CO2)							**53,822**	**56,708**	**53,681**	
8				Scope 1 CO_2 (direct emissions)							**28,487**	**34,232**	**20,673**	
9				Scope 1 $CO_{2equivalents}$ (direct emissions)							**28,590**	**37,405**	**22,784**	
10				Scope 2 CO_2 (purchased electricity)							**35,871**	**37,341**	**35,399**	
11				Scope 2 $CO_{2equivalents}$ (purchased electricity)							**36,102**	**37,583**	**35,628**	
12				Fuel CO_2							**28,487**	**34,023**	**20,556**	
13				Fuel $CO_{2\ equivalents}$							**28,489**	**34,025**	**20,558**	
14				Fugitive $CO_{2equivalents}$							**0**	**3,253**	**2,170**	
15				Four Wall CO_2							64,358	71,364	55,956	
16				Four Wall $CO_{2equivalents}$							64,589	74,859	58,355	
17														

Fuel Emissions Calculations

	Natural Gas				#2 On-Road Diesel				#2 Off-Road Diesel						
	CO2 (lb/MMBTU)	CH4 (lb/MMBTU)	N2O (lb/MMBTU)	CO2equiv (lb/MMBTU)	CO2 (lb /gallon)	CH4 (lb /gal)	N2O (lb /gallon)	CO2equiv (lb/gal)	CO2 (lb /gallon)	CH4 (lb /gal)	N2O (lb /gallon)	CO2equiv (lb/gal)	CO2 (lb /gallon)	CH4 (lb /gal)	N2O (lb /gallon)
	117.08	0.01047185	0.00020944	117.365	22.377	0.0030639	0.0001838	22.498	22.377	0.0031	0.0002	22.498	26.014	0.0033	0.0002

From "The Climate Registry, General Reporting Protocol For the Voluntary Reporting Program, Draft for Public Comment, October 29, 2007", Figure 12.2, which comes from eGRID2006, Ver 2.1 (CO_2 factors) and EPA Climate Leaders (CH_4 and N_2O) from US EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005, April 2007 (Annex 3, Table A-69).

Map No.	Site	eGRID 2006 Subregion	eGRID 2006 Subregion Name	(lbs CO_2/MWh)	(lbs CH_4/MWh)	(lbs N_2O/MWh)
1		NEWE	NPCC New England	908.9	0.08	0.015
2		NYCW	NPCC NYC/Westchester	922.22	0.038	0.006
3		NYLI	NPCC Long Island	1,412.20	0.102	0.016
4		NYUP	NPCC Upstate NY	819.68	0.024	0.011
5	Philadelphia	RFCE	RFC East	1,095.53	0.028	0.017
6		SRVC	SERC Virginia/Carolina	1,146.39	0.029	0.019
7	Huntsville	SRTV	SERC Tennessee Valley	1,494.89	0.023	0.024
8	Don't Use for St. Louis	SRMV	SERC Mississippi Valley	1,135.46	0.042	0.013
9	Eglin AFB Macon	SRSO	SERC South	1,490.37	0.04	0.025
10		FRCC	FRCC All	1,327.66	0.054	0.016
11		RFCM	RFC Michigan	1,641.41	0.035	0.025
12	Chicago	RFCW	RFC West	1,556.39	0.02	0.024
13		MROE	MRO East	1,858.72	0.041	0.03
14	St. Louis LC	SRMW	SERC Midwest	1,844.34	0.021	0.029
15		MROW	MRO West	1,813.81	0.028	0.029
16	Wichita	SPNO	SPP North	1,971.42	0.024	0.03
17		SPSO	SPP South	1,761.14	0.03	0.023
18	Houston San Antonio	ERCT	ERCOT All	1,420.56	0.021	0.015
19		RMPA	WECC Rockies	2,035.81	0.024	0.03
20	Mesa	AZNM	WECC Southwest	1,254.02	0.018	0.015
21	Washington Oregon	NWPP	WECC Northwest	921.1	0.022	0.014
22	All California	CAMX	WECC California	878.71	0.036	0.008

From "The Climate Registry, General Reporting Protocol For the Voluntary Reporting Program, Draft for Public Comment, October 29, 2007", Table 11.1:

Fuel	kg CO2 / gal	lb CO2 / gal
Motor Gasoline	8.81	19.423
Diesel Fuel No. 1 and 2	10.15	22.377
Aviation Gasoline	8.32	18.342
Jet Fuel (Jet A or A-1)	9.57	21.098
Kerosene	9.76	21.517
Residual Fuel Oil (35, 6)	11.8	26.014
Biodiesel (B100)*	9.46	20.856
Ethanol (E100)*	5.56	12.258
Liquefied Natural Gas (LNG)*	4.46	9.833
Liquefied Petroleum Gas (LPG)*	5.79	12.765
Propane	5.74	12.654
Compressed Natural Gas (CNG)*		

Greenhouse	Formula	CAS No	GWP
Carbon dioxid	CO_2	124-38-9	1
Methane	CH_4	74-82-8	21
Nitrous oxide	N_2O	10024-9	310
Sulfur hexaflu	SF_6	2551-62	23,900
Hydrofluorocarbons (HFCs)			
HFC-23 (triflu	CHF_3	75-46-7	11,700

	P	Q	R	S	T	U	V	W	X	Y	Z
1											
2	#6 Residual Oil			Coal			Jet Fuel				Moto
3	CO2equiv (lb/gal)	CO2 (lb /short ton)	CH4 (lb /short ton)	N2O (lb /short ton)	CO2equiv (lb/ short ton)	CO2 (lb /gallon)	CH4 (lb /gal)	N2O (lb /gallon)	CO2equiv (lb/gal)	CO2 (lb /gallon)	CH4 (lb /gal)
4	26.145	4,483.67	0.4855	0.0680	4514.945	21.098	0.003	0.0002	21.216	19.423	0.0028
5											
6	**From "The Climate Registry, General Reporting Protocol For the Voluntary Reporting Program, Draft for Public Comment, October 29, 2007", Table 14.2: Global Warming Potential Factors for Required Greenhouse Gases. Source IPCC Second Assessment Report published in 1995, except for chemicals for which no values were assigned. In those cases, the Third Assessment Report, 2001 values are used.**										
7	**Greenhouse Gas**	**Formula**	**CAS No.**	**GWP**							
8	**Carbon dioxide**	CO_2	124-38-9	**1**							
9	**Methane**	CH_4	74-82-8	**21**							
10	**Nitrous oxide**	N_2O	10024-97-2	**310**							
11	**Sulfur hexafluoride**	SF_6	2551-62-4	**23,900**							
12	**Hydrofluorocarbons (HFCs)**										
13	HFC-23 (trifluoromethane)	CHF_3	75-46-7	**11,700**							
14	HFC-32 (difluoromethane)	CH_2F_2	75-10-5	**650**							
15	HFC-41 (fluoromethane)	CH_3F	593-53-3	**150**							
16	HFC-43-10mee (1,1,1,2,3,4,4,5,5,5- decafluoropentane)	$C_5H_2F_{10}$	138495-42-8	**1,300**							
17	HFC-125 (pentafluoroethane)	C_2HF_5	354-33-6	**2,800**							
18	HFC-134 (1,1,2,2-tetrafluoroethane)	$C_2H_2F_4$	359-35-3	**1,000**							
19	HFC-134a (1,1,1,2-tetrafluoroethane)	$C_2H_2F_4$	811-97-2	**1,300**							
20	HFC-143 (1,1,2-trifluoroethane)	$C_2H_3F_3$	430-66-0	**300**							
21	HFC-143a (1,1,1-trifluoroethane)	$C_2H_3F_3$	420-46-2	**3,800**							
22	HFC-152 (1,2-difluoroethane)	$C_2H_4F_2$	624-72-6	**43**							
23	HFC-152a (1,1-difluoroethane)	$C_2H_4F_2$	75-37-6	**140**							
24	HFC-161 (fluoroethane)	C_2H_5F	353-36-6	**12**							
25	HFC-227ea (1,1,1,2,3,3,3- heptafluoropropane)	C_3HF_7	431-89-0	**2,900**							
26	HFC-236cb (1,1,1,2,2,3-hexafluoropropane)	$C_3H_2F_6$	60598-1 1-0	**1,300**							
27	HFC-236ea (1,1,1,2,3,3-hexafluoropropane)	$C_3H_2F_6$	431-63-0	**1,200**							
28	HFC-236fa (1,1,1,3,3,3-hexafluoropropane)	$C_3H_2F_6$	690-39-1	**6,300**							
29	HFC-245ca (1,1,2,2,3-pentafluoropropane)	$C_3H_3F_5$	679-86-7	**560**							

	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ
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2	r Gas		Aviation Gas				Propane			
3	N2O (lb /gallon)	CO2equiv (lb/gal)	CO2 (lb /gallon)	CH4 (lb /gal)	N2O (lb /gallon)	CO2equiv (lb/gal)	CO2 (lb /gallon)	CH4 (lb /gal)	N2O (lb /gallon)	CO2equiv (lb/gal)
4	0.0002	19.532	18.342	0.0027	0.0002	18.447	12.6544	0.0002	0.000004	12.660
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30	23		HIMS	HICC Miscellaneous	1,456.17	0.101	0.018		HFC-32 (diflu	CH_2F_2	75-10-5	650			
31	24		HIOA	HICC Oahu	1,728.12	0.0911	0.0212		HFC-41 (fluor	CH_3F	593-53-	150			
32	25		AKMS	ASCC Miscellaneous	480.1	0.0239	0.0044		HFC-43-10me	$C_5H_2F_{10}$	138495-	1,300			
33	26		AKGD	ASCC Alaska Grid	1,257.19	0.0266	0.0064		HFC-125 (per	C_2HF_5	354-33-	2,800			
34	US Average				1,363.00	0.0305	0.0198		HFC-134 (1,1,	$C_2H_2F_4$	359-35-	1,000			
35									HFC-134a (1,	$C_2H_2F_4$	811-97-	1,300			
36									HFC-143 (1,1,	$C_2H_3F_3$	430-66-	300			
37		Electric	SERC South	SERC					HFC-143a (1,	$C_2H_3F_3$	420-46-	3,800			
38		Alaska Misc	Miscellaneous	ASCC					HFC-152 (1,2-	$C_2H_4F_2$	624-72-	43			
39		CA - ALTE	MRO East	MRO					HFC-152a (1,	$C_2H_4F_2$	75-37-6	140			
40		CA - ALTW	MRO West	MRO					HFC-161 (fluo	C_2H_5F	353-36-	12			
41		Transmission	Midwest	SERC											
42		Municipality of	Grid	ASCC					HFC-227ea (1	C_3HF_7	431-89-	2,900			
43		Aquila Networks - MPS	SPP North	SPP											
44		Aquila Networks - WPK	SPP North	SPP					HFC-236cb (1	$C_3H_2F_6$	60598-1	1,300			
45		Arizona Public Service Company	WECC Southwest	WECC					HFC-236ea (1	$C_3H_2F_6$	431-63-	1,200			
46		Associated Electric Cooperative, Inc.	SERC Midwest	SERC					HFC-236fa (1,	$C_3H_2F_6$	690-39-	6,300			
47		Avista Corp.	WECC Northwest	WECC					HFC-245ca (1	$C_3H_3F_5$	679-86-	560			
48		Big Rivers Electric Corp.	SERC Tennessee Valley	SERC					HFC-245fa (,1	$C_3H_3F_5$	460-73-	950			
49		Board of Public Utilities	SPP North	SPP					HFC-365mfc	$C_4H_5F_5$	406-58-6	890			
50		Bonneville Power Administration	WECC Northwest	WECC											
51		California Independent System Operator	WECC California	WECC											

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30	HFC-245fa (,1,1,3,3-pentafluoropropane)	$C_3H_3F_5$	460-73-1	**950**							
31	HFC-365mfc (1,1,1,3,3-pentafluorobutane)	$C_4H_5F_5$	406-58-6	**890**							
32	**Perfluorocarbons (PFCs)**										
33	Perfluoromethane (tetrafluoromethane)	CF_4	75-73-0	**6,500**							
34	Perfluoroethane (hexafluoroethane)	C_2F_6	76-16-4	**9,200**							
35	Perfluoropropane (octafluoropropane)	C_3F_8	76-19-7	**7,000**							
36	Perfluorocyclobutane (octafluorocyclobutane)	c-C_4F_8	115-25-3	**8,700**							
37	Perfluorobutane (decafluorobutane)	C_4F_{10}	355-25-9	**7,000**							
38	Perfluoropentane (dodecafluoropentane)	C_5F_{12}	678-26-2	**7,500**							
39	Perfluorohexane (tetradecafluorohexane)	C_6F_{14}	355-42-0	**7,400**							
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52		Central Illinois Light Co	SERC Midwest	SERC											
53		Central and Southwest	SPP South	SPP					**Perfluorocarbons (PFCs)**						
54		Chugach Electric Assn Inc	ASCC Alaska Grid	ASCC					Perfluorometh	CF_4	75-73-0	6,500			
55		Cinergy Corporation	RFC West	RFC					Perfluoroethan	C_2F_6	76-16-4	9,200			
56		City Water Light & Power	RFC West	RFC					Perfluoroprop	C_3F_8	76-19-7	7,000			
57		City of Homestead	FRCC All	FRCC					Perfluorocyclo	c-C_4F_8	115-25-3	8,700			
58		City of Independence Missouri	SPP North	SPP					Perfluorobuta	C_4F_{10}	355-25-9	7,000			
59		City of Lafayette	SPP South	SPP					Perfluorohexa	C_6F_{14}	355-42-0	7,400			
60		City of Tallahassee	FRCC All	FRCC					Perfluoropent	C_5F_{12}	678-26-2	7,500			
61		Cleco Corporation, Inc.	SPP South	SPP											
62		Columbia Water & Light	SERC Midwest	SERC											
63		Dairyland Power Cooperative	MRO West	MRO											
64		Duke Power Company	SERC Virginia/Carolina	SERC											
65		ERCOT ISO	ERCOT All	ERCOT											
66		East Kentucky Power Cooperative, Inc.	SERC Tennessee Valley	SERC											
67		El Paso Electric Company	WECC Southwest	WECC											
68		Empire District Electric Co., The	SPP North	SPP											

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69		Entergy Services, Inc.	SERC Mississippi Valley	SERC											
70		First Energy Corp.	RFC West	RFC											
71		Florida Municipal Power Pool	FRCC All	FRCC											
72		Florida Power & Light	FRCC All	FRCC											
73		Florida Power Corporation	FRCC All	FRCC											
74		Gainesville Regional Utilities	FRCC All	FRCC											
75		Golden Valley Elec Assn Inc	ASCC Alaska Grid	ASCC											
76		Grand River Dam Authority	SPP South	SPP											
77		Great River Energy	MRO West	MRO											
78		Hawaii Electric Light Co., Inc	HICC Miscellaneous	HICC											
79		Hawaii Misc	HICC Miscellaneous	HICC											
80		Hawaiian Electric Co Inc	HICC Oahu	HICC											
81		Hoosier Energy	RFC West	RFC											
82		ISO New England Inc.	NPCC New England	NPCC											
83		Idaho Power Company	WECC Northwest	WECC											
84		Illinois Power Co.	SERC Midwest	SERC											
85		Imperial Irrigation District	WECC Southwest	WECC											

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86		Indianapolis Power & Light Company	RFC West	RFC											
87		JEA	FRCC All	FRCC											
88		Kansas City Power & Light, Co	SPP North	SPP											
89		LG&E Energy Transmission Services	RFC West	RFC											
90		Lincoln Electric System	MRO West	MRO											
91		Los Angeles Department of Water and Power	WECC California	WECC											
92		Louisiana Energy & Power Authority	SPP South	SPP											
93		Louisiana Generating, LLC	SERC Mississippi Valley	SERC											
94		Madison Gas and Electric Company	MRO East	MRO											
95		Maritime Area	NPCC New England	NPCC											
96		Michigan Electric Coordinated Systems	RFC Michigan	RFC											
97		Mid American Energy Company	MRO West	MRO											
98		Minnesota Power, Inc.	MRO West	MRO											
99		Muscatine Power and Water	MRO West	MRO											
100		Nebraska Public Power District	MRO West	MRO											

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101		Nevada Power Company	WECC Southwest	WECC											
102		New York Independent System Operator	NPCC NYC/Westchester	NPCC											
103		New York Independent System Operator	NPCC Long Island	NPCC											
104		New York Independent System Operator	NPCC Upstate NY	NPCC											
105		Northern Indiana Public Service Company	RFC West	RFC											
106		Northern States Power Company	MRO West	MRO											
107		Ohio Valley Electric Corporation	RFC West	RFC											
108		Oklahoma Gas and Electric	SPP South	SPP											
109		Omaha Public Power District	MRO West	MRO											
110		Otter Tail Power Company	MRO West	MRO											
111		PJM Interconnection	RFC East	RFC											
112		PJM Interconnection	RFC West	RFC											
113		PJM Interconnection	SERC Virginia/Carolina	SERC											
114		PUD No. 1 of Chelan County	WECC Northwest	WECC											

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115		PUD No. 1 of Douglas County	WECC Northwest	WECC											
116		PUD No. 2 of Grant County	WECC Northwest	WECC											
117		PacifiCorp-East	WECC Northwest	WECC											
118		PacifiCorp-West	WECC Northwest	WECC											
119		Portland General Electric Company	WECC Northwest	WECC											
120		Progress Energy Carolinas - EAST	SERC Virginia/Carolina	SERC											
121		Public Service Company of Colorado	WECC Rockies	WECC											
122		Public Service Company of New Mexico	WECC Southwest	WECC											
123		Puget Sound Energy	WECC Northwest	WECC											
124		Salt River Project	WECC Southwest	WECC											
125		Seattle Department of Lighting	WECC Northwest	WECC											
126		Seminole Electric Cooperative	FRCC All	FRCC											
127		Sierra Pacific Power Company	WECC Northwest	WECC											
128		South Carolina Electric & Gas Company	SERC Virginia/Carolina	SERC											

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129		South Carolina Public Service Authority (Santee Cooper)	SERC Virginia/Carolina	SERC											
130		South Mississippi Electric Power Association	SERC South	SERC											
131		Southeastern Power Administration - Hartwell	SERC Virginia/Carolina	SERC											
132		Southern Company Services, Inc.	SERC South	SERC											
133		Southern Illinois Power Cooperative	SERC Midwest	SERC											
134		Southern Indiana Gas & Electric Co.	RFC West	RFC											
135		Southern Minnesota Municipal Power Agency	MRO West	MRO											
136		Southwestern Power Administration	SPP South	SPP											
137		Southwestern Public Service Company	SPP South	SPP											
138		Sunflower Electric Power Corporation	SPP North	SPP											
139		Tacoma Power	WECC Northwest	WECC											

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140		Tampa Electric Company	FRCC All	FRCC											
141		Tennessee Valley Authority	SERC Tennessee Valley	SERC											
142		Tucson Electric Power Company	WECC Southwest	WECC											
143		Upper Peninsula Power Co.	MRO East	MRO											
144		Utilities Commission, City of New Smyrna Beach	FRCC All	FRCC											
145		WAPA - Colorado-Missouri	WECC Rockies	WECC											
146		WAPA - Lower Colorado	WECC Southwest	WECC											
147		WAPA - Upper Great Plains East	MRO West	MRO											
148		WAPA - Upper Great Plains West	WECC Northwest	WECC											
149		Western Farmers Electric Cooperative	SPP South	SPP											
150		Western Resources dba Westar Energy	SPP North	SPP											
151		Wisconsin Energy Corporation	RFC West	RFC											
152		Wisconsin Public Service Corporation	MRO East	MRO											
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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
154		Anaheim	City of Anahe	92806	WECC California										
155		Auburn	Puget Sound	98001	WECC Northwest										
156		BCA Seattle	Puget Sound	98101	WECC Northwest										
157		Bellevue	City of Seattle	98006	WECC Northwest										
158		DC	City of Seattle	98108	WECC Northwest										
159		DOP	Puget Sound Energy		WECC Northwest										
160		El Segundo	Southern Cal	90245	WECC California										
161		Elgin AFB	Gulf Power	32542	SERC South										
162		Environmental	City of Seattle/34016/34017		WECC Northwest										
163		Environmental	Sierra Pacific	89510	WECC Northwest										
164		Environmental	Westar Energ	67210	SPP North										
165		Everett	Snohomish C	98204	WECC Northwest										
166		Frederickson	Puget Sound	98375	WECC Northwest										
167		Houston	Constellation	77058	ERCOT All										
168		Hunt. Beach	Ameresco / S	92647	WECC California										
169		Huntsville	Huntsville Uti	35824	SERC Tenn. Valley										
170		Huntsville	Huntsville Uti	35824	SERC Tenn. Valley										
171		Kent	Puget Sound	98032	WECC Northwest										
172		Kent	Sempra Ener	98032	WECC Northwest										
173		LB-SSG	Southern Cal	90815	WECC California										
174		LC	Ameren UE/66301		SERC Midwest ?										
175		Long Beach	City of Long B	90807	WECC California										
176		Longacres	Puget Sound	98055	WECC Northwest										
177		Macon	Georgia Powe	31216	SERC South										
178		Mesa	City of Mesa,	85215	WECC Southwest										
179		N Boeing Field	Puget Sound Energy		WECC Northwest										
180		Philly	DELMARVA	19078	RFC East										
181		Plant 2	Puget Sound Energy		WECC Northwest										
182		Portland	Portland Gen	97230	WECC Northwest										
183		Realty	BP Energy Company/012130												
184		Renton	Puget Sound	98055	WECC Northwest										
185		San Antonio	CPS Energy	78226	ERCOT All										
186		Seal Beach	Southern Cal	90740	WECC California										
187		Simi Valley	Southern California Edison		WECC California										
188		South Park	City of Seattle	98108	WECC Northwest										

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189		Spares Dist. Ct	Puget Sound	98168	WECC Northwest										
190		St. Louis	Ameren UE/6	63042	SERC Midwest										
191		Thompson	Puget Sound	98018	WECC Northwest										
192		West Hills	Mept West H	91304	WECC California										
193		WHQ Chicago	Com Ed	60606	RFC West										
194		Wichita	Westar Energ	67210	SPP North										

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Cell: B4
Comment: dwm4024:
4.75g/MMBTU (from Sec. 10.4 of The Climate Registry draft Protocol) * .0022046 lb/g = 0.0104718 lbs/MMBTU

Cell: C4
Comment: dwm4024:
0.095 g/MMBTU (from Sec. 10.4 of The Climate Registry draft Protocol) * .0022046 lb/g = 0.0104718 lbs/MMBTU

Cell: F4
Comment: dwm4024:
10.02 g CH4/MMBTU * 0.1386985 (DoE factor, see link below) MMBTU/gal * 0.0022046 lb/g = 0.0030639 lb/gal

Cell: G4
Comment: dwm4024:
0.601 g N2O/MMBTU * 0.1386985 (DoE factor, see link below) MMBTU/gal * 0.0022046 lb/g = 0.0030639 lb/gal

Cell: J4
Comment: dwm4024:
10.02 g CH4/MMBTU * 0.1386985 (DoE factor, see link below) MMBTU/gal * 0.0022046 lb/g = 0.0030639 lb/gal

Cell: K4
Comment: dwm4024:
0.601 g N2O/MMBTU * 0.1386985 (DoE factor, see link below) MMBTU/gal * 0.0022046 lb/g = 0.0030639 lb/gal

Cell: N4
Comment: dwm4024:
10.02 g CH4/MMBTU * 0.1496958 (DoE factor, see link below) MMBTU/gal * 0.0022046 lb/g = 0.0030639 lb/gal

Cell: O4
Comment: dwm4024:
0.601 g N2O/MMBTU * 0.1496958 (DoE factor, see link below) MMBTU/gal * 0.0022046 lb/g = 0.0030639 lb/gal

Cell: Q4
Comment: dwm4024:
2033.781 kg/short ton * 2.2046 lb/kg = 4483.673593 lb CO2/short ton

Cell: R4
Comment: dwm4024:
10.02 g/MMBTU * 21.98 MMBTU/short ton 2.2046 lb/kg /ikg/1000g = 0.48554 lb CH4/short ton

Cell: S4
Comment: dwm4024:
10.02 g/MMBTU * 21.98 MMBTU/short ton 2.2046 lb/kg /ikg/1000g = 0.48554 lb CH4/short ton

Cell: Z4
Comment: dwm4024:
10.02 g CH4/MMBTU * 0.1250695 (DoE factor, see link below) MMBTU/gal * 0.0022046 lb/g = 0.0030639 lb/gal

Cell: AA4
Comment: dwm4024:
0.601 g N2O/MMBTU * 0.1250695 (DoE factor, see link below) MMBTU/gal * 0.0022046 lb/g = 0.0030639 lb/gal

Cell: AD4
Comment: dwm4024:
10.02 g CH4/MMBTU * 0.1201896 (DoE factor, see link below) MMBTU/gal * 0.0022046 lb/g = 0.0030639 lb/gal

Cell: AE4
Comment: dwm4024:
0.601 g N2O/MMBTU * 0.1201896 (DoE factor, see link below) MMBTU/gal * 0.0022046 lb/g = 0.0030639 lb/gal

Cell: AG4
Comment: dwm4024:
From Table 10.1: Default CO2 emission factors by Fuel Type, The Climate Registry draft Protocol, pg 54

Cell: AH4
Comment: dwm4024:
From Table 10.1: Default CO2 emission factors by Fuel Type, The Climate Registry draft Protocol, pg 54: 4.75 g/MMBTU / 10.9878 gal propane / MMBTU - 0.432298 g/gal. 0.432298 g/gal / 2204.6 g/lb = 0.000196 lb/gal

Cell: AI4
Comment: From Table 10.1: Default CO2 emission factors by Fuel Type, The Climate Registry draft Protocol, pg 54: 0.095 g/MMBTU / 10.9878 gal propane / MMBTU - 0.432298 g/gal. 0.432298 g/gal / 2204.6 g/lb = 0.000196 lb/gal