2013 Entergy Corporate GHG Emissions breakdown by category - FINAL AND VERIFIED

All numbers represent CO2 equivalents (CO2e) Unhide columns I - U for additional calculations and conversions -->

Operational Emissions Category	Emissions Source Category	Corporate emissions source	Greenhouse gas	Total emissions short tons CO2e	Total emissions in metric tons CO2e	percentage of total corporate emissions	Calculation worksheet in inventory document
Direct Emission Sources	Stationary Combustion	Power generating units (includes emergency and backup generators)	CO2	36,664,946	33,261,880	65.0%	Stationary Combustion CEM
			CH4	13,850	12,564	0.0%	Stationary Combustion CEM
			N2O	96,635	87,666	0.2%	Stationary Combustion CEM
		Small stationary combustion sources (co-located at generation stations and stand alone units)	CO2e	583,657	529,484	1.0%	All small stat cbn totals
		Biomass power generation	CO2	0	0	0.0%	NA
	Mobile Combustion	Corporate fleet	CO2	57,919	52,543	0.1%	Mobile Combustion
			CH4	76	69	0.0%	Mobile Combustion
			N2O	401	364	0.0%	Mobile Combustion
		Biomass fleet	CO2	0	0	0.0%	NA
	Fugitive Emissions	Natural gas transmission and distribution	CH4	120,883	109,663	0.2%	Fugitive CH4-NG T&D
		Electricity transmission and distribution	SF6	166,497	151,044	0.3%	Fugitive SF6
		Cooling/air-conditioning (building, mobile and nuclear cooling eqpt)	HFCs	9,883	8,966	0.0%	Fugitive HFCs
	Process emissions	none applicable	NA	0	0	0.0%	NA
Total Emissions from Direct Sources				**37,714,746**	**34,214,242**	**66.9%**	
Indirect Emission Sources	Purchased Electricity	Power purchased for business operations outside Entergy service territory	CO2	24,802	22,500	0.0%	Purchased power
	T&D losses	Entergy purchased power consumed on Entergy T&D system	CO2, CH4, N2O	958,375	869,423	Note: these emissions are included within the Optional emissions	Purchased power
Total Emissions from Indirect Sources				**983,176**	**891,922**		
Optional Emissions Sources	Purchased power (controllable)	Controllable purchased power sold to customers	CO2, CH4, N2O	8,938,097	8,108,505	15.8%	Purchased power
	Purchased power (uncontrollable)	Uncontrollable purchased power sold to customers	CO2, CH4, N2O	9,738,739	8,834,836	17.3%	Purchased power
Total Emissions from Optional Sources				**18,676,836**	**16,943,341**	**33.1%**	
GHG Stabilization Commitment Total (progress toward GHG commitment)				**46,186,700**	**41,899,869**	**81.9%**	
Total Corporate emissions				**56,416,384**	**51,180,083**	**100.0%**	

Direct Emissions from fossil fuel usage at generating facilities using CEM data

2013

Generating facility and EPA Acid Rain Unit ID	EPA Acid Rain Unit ID (Entergy ID if different)	Max capacity (MW)	State	Entergy equity share of unit	Primary fuel(s)	CO2 from CEM: Total unit CO2 (1) short tons CO2	CO2 from CEM: Entergy equity share of unit CO2 emissions short tons CO2	CH4: Entergy share CH4 emissions from generation (2) short tons CO2e	N2O: Entergy share N2O emissions from generation (3) short tons CO2e	Total Facility CO2e in short tons	Total CO2e in metric tons
Acadia	CT3			100%	Natural Gas	339156	339,156	159	190		
Acadia	CT4			100%	Natural Gas	338960	338,960	159	190		
Totals							678,116	319	380	678,814	615,810
Attala	A01		MS	100%	Gas/Oil	381447	381,447	179	214		
Attala	A02		MS	100%	Gas/Oil	417299	417,299	196	234		
Totals		0					798,747	375	447	799,569	725,357
Baxter Wilson	1	550	MS	100%	Gas/Oil	334842	334,842	157	188		
Baxter Wilson	2	771	MS	100%	Gas/Oil	870167	870,167	409	487		
Totals		1321					1,205,009	566	675	1,206,250	1,094,292
Big Cajun 2[6]	2B3 (3)	257	LA	42%[6]	Coal	3976721	1,670,223	451	8,451		
Totals		257					1,670,223	451	8,451	1,679,125	1,523,277
Calcasieu Plant	GTG1		LA	100%	Natural gas	91943	105,860	50	59		
Calcasieu Plant	GTG2		LA	100%	Natural gas	104691	129,880	61	73		
Totals		0					235,740	111	132	235,982	214,080
Cecil Lynch	2	74	AR	100%	Gas/Oil	0	0	0	0		
Cecil Lynch	3	130	AR	100%	Gas/Oil	0	0	0	0		
Totals		204					0	0	0	0	0
Gerald Andrus	1	761	MS	100%	Gas/Oil	899637	899,637	423	504		
Totals		761					899,637	423	504	900,564	816,978
Harvey Couch	1	30	AR	100%	Gas/Oil	0	0	0	0		
Harvey Couch	2	131	AR	100%	Gas/Oil	0	0	0	0		
Totals		161					0	0	0	0	0
Hinds Energy Facility	H01	456	MS	100%	Gas CT	350524	350,524	165	196		
Hinds Energy Facility	H02		MS	100%	Gas CT	370463	370,463	174	207		
Totals							720,987	339	404	721,729	654,742
Hot Spring Energy Facility	CT-1	620	AR	100%	Gas CT	356482	356,482	168	200		
Hot Spring Energy Facility	CT-2		AR	100%	Gas CT	393778	393,778	185	221		
							750,261	353	420	751,033	681,326
Independence	1	472	AR	56.5%	Coal	4795695	2,709,568	732	13,710		
Independence	2	332	AR	39.37%	Coal	6160584	2,425,422	655	12,273		
Totals		804					5,134,990	1,386	25,983	5,162,359	4,683,213
Lake Catherine	1	52	AR	100%	Gas/Oil	0	0	0	0		
Lake Catherine	2	51	AR	100%	Gas/Oil	0	0	0	0		
Lake Catherine	3	106	AR	100%	Gas/Oil	12041	12,041	6	7		
Lake Catherine	4	547	AR	100%	Gas/Oil	338218	338,218	159	189		
Totals		756					350,259	165	196	350,620	318,077

Generating facility and EPA Acid Rain Unit ID	EPA Acid Rain Unit ID (Entergy ID if different)	Max capacity (MW)	State	Entergy equity share of unit	Primary fuel(s)	Total unit CO2 (1)	Entergy equity share of unit CO2 emissions	Entergy share CH4 emissions from generation (2)	Entergy share N2O emissions from generation (3)	Total Facility CO2e in short tons	Total CO2e in metric tons
Lewis Creek	1	260	TX	100%	Gas/Oil	609455	609,455	286	341		
Lewis Creek	2	260	TX	100%	Gas/Oil	405077	405,077	190	227		
Totals		520					1,014,532	477	568	1,015,577	921,316
Little Gypsy	1	244	LA	100%	Gas/Oil	154868	154,868	73	87		
Little Gypsy	2	436	LA	100%	Gas/Oil	385856	385,856	181	216		
Little Gypsy	3	573	LA	100%	Gas/Oil	552220	552,220	260	309		
Totals		1253					1,092,944	514	612	1,094,069	992,523
Louisiana 2[4]	10		LA	100%	Gas/Oil	0	0	0	0		
Louisiana 2[4]	11		LA	100%	Gas/Oil	0	0	0	0		
Louisiana 2[4]	12		LA	100%	Gas/Oil	0	0	0	0		
Totals		0					0	0	0	0	0
Michoud	1	113	LA	100%	Gas/Oil	0	0	0	0		
Michoud	2	244	LA	100%	Gas/Oil	357721	357,721	168	200		
Michoud	3	561	LA	100%	Gas/Oil	631615	631,615	297	354		
Totals		918					989,335	465	554	990,354	898,434
Ninemile Point	1	74	LA	100%	Gas/Oil	2333	2,333	1	1		
Ninemile Point	2	107	LA	100%	Gas/Oil	0	0	0	0		
Ninemile Point	3	135	LA	100%	Gas/Oil	123930	123,930	58	69		
Ninemile Point	4	748	LA	100%	Gas/Oil	1296707	1,296,707	609	726		
Ninemile Point	5	763	LA	100%	Gas/Oil	1432163	1,432,163	673	802		
Totals		1827					2,855,133	1,342	1,599	2,858,073	2,592,800
Ouachita Power	CTGEN1		LA	100%	Natural gas	233061	233,061	110	131		
Ouachita Power	CTGEN2		LA	100%	Natural gas	179237	179,237	84	100		
Ouachita Power	CTGEN3		LA	100%	Natural gas	157890	157,890	74	88		
Totals		0					570,188	268	319	570,775	517,799
Perryville	1-1		LA	100%	Gas/Oil	348071	348,071	164	195		
Perryville	1-2		LA	100%	Gas/Oil	393746	393,746	185	220		
Perryville	2-1		LA	100%	Gas/Oil	9602	9,602	5	5		
Totals		0					751,419	353	421	752,193	682,378
Rhode Island State Energy Ctr[5]	RISEP1		RI	100%	Natural gas	423042	423,042	199	237		
Rhode Island State Energy Ctr[5]	RISEP2		RI	100%	Natural gas	417810	417,810	196	234		
Totals							840,852	395	471	841,718	763,593
R S Cogen[5]	RS-5		LA	50%	Natural gas	876997	438,498	206	246		
R S Cogen[5]	RS-6	425	LA	50%	Natural gas	900175	450,087	212	252		
Totals		425					888,586	418	498	889,501	806,942
R S Nelson	3	146	LA	100%	Gas/Oil	82754	82,754	39	46		
R S Nelson	4	500	LA	100%	Gas/Oil	1000253	1,000,253	470	560		
R S Nelson[7]	6	385	LA	80.9%	Coal	3666812	2,966,451	801	15,010		
Totals		1031					4,049,457	1,310	15,617	4,066,384	3,688,962
Rex Brown	3		MS	100%	Gas/Oil	3888	3,888	2	2		
Rex Brown	4		MS	100%	Gas/Oil	102074	102,074	48	57		

Generating facility and EPA Acid Rain Unit ID	EPA Acid Rain Unit ID (Entergy ID if different)	Max capacity (MW)	State	Entergy equity share of unit	Primary fuel(s)	Total unit CO2 (1)	Entergy equity share of unit CO2 emissions	Entergy share CH4 emissions from generation (2)	Entergy share N2O emissions from generation (3)	Total Facility CO2e in short tons	Total CO2e in metric tons
Totals		0					105,962	50	59	106,071	96,226
Robert E Ritchie	1	356	AR	100%	Gas/Oil	0	0	0	0		
Robert E Ritchie	2	544	AR	100%	Natural gas	0	0	0	0		
Totals		900					0	0	0	0	0
Sabine	1	230	TX	100%	Gas/Oil	368504	368,504	173	206		
Sabine	2	230	TX	100%	Gas/Oil	365962	365,962	172	205		
Sabine	3	420	TX	100%	Gas/Oil	595308	595,308	280	333		
Sabine	4	530	TX	100%	Gas/Oil	1036520	1,036,520	487	580		
Sabine	5	480	TX	100%	Gas/Oil	401380	401,380	189	225		
Totals		1890					2,767,675	1,301	1,550	2,770,526	2,513,379
Sterlington	10	224	LA	100%	Gas/Oil	0	0	0	0		
Sterlington	7AB	102	LA	100%	Gas/Oil	4952	4,952	2	3		
Sterlington	7C	101	LA	100%	Gas/Oil	5245	5,245	2	3		
Totals		427					10,196	5	6	10,207	9,259
Waterford	1	411	LA	100%	Gas/Oil	368482	368,482	173	206		
Waterford	2	411	LA	100%	Gas/Oil	360750	360,750	170	202		
Waterford	4		LA	100%	Gas/Oil	1259	1,259	1	1		
Totals		822					730,491	343	408	731,242	663,372
White Bluff	1	465	AR	57%	Coal	6308388	3,595,781	971	18,195		
White Bluff	2	481	AR	57%	Coal	6218310	3,544,437	957	17,935		
Totals		946					7,140,218	1,928	36,130	7,178,275	6,512,021
Willow Glen	1	172	LA	100%	Gas/Oil	38351	38,351	18	21		
Willow Glen	2	224	LA	100%	Gas/Oil	73642	73,642	35	41		
Willow Glen	3	522	LA	100%	Gas/Oil	0	0	0	0		
Willow Glen	4	568	LA	100%	Gas/Oil	302000	302,000	142	169		
Willow Glen	5	559	LA	100%	Gas/Oil	0	0	0	0		
Totals		2045					413,993	195	232	414,419	375,955
Totals						**51,729,055**	**36,664,946**	**13,850**	**96,635**	36,775,431	33,362,110

(1) CEM data reported to EPA Acid Rain program - can be verified at EPA's Clean Air Market's Database located at http://camddataandmaps.epa.gov/gdm/index.cfm?fuseaction=emissions.wizard&EQW_datasetSelection=

(2) Emissions factor derived from CH4 (in CO2e) as percentage of emissions from CO2 for a specific fuel type. See "Emissions and Conversion Factors" for EPA emissions factors for specific fuels; emissions factor for natural gas used for all dual-fuel units as this represents the larger fuel input

(3) Emissions factor derived from N2O (in CO2e) as percentage of emissions from CO2 for a specific fuel type. See "Emissions and Conversion Factors" for EPA emissions factors for specific fuels; emissions factor for natural gas used for all dual-fuel units as this represents the larger fuel input

(4) Emissions from Louisiana Station Plant 1 (Units 1A, 2A, 3A, 4A, 5A) are not included in the inventory; these units exist for the sole use of Exxon under a long term lease agreement.

(5) Emission data obtained directly from the EPA's Database located at http://ampd.epa.gov/ampd/

(6) While Entergy owns 42% of Big Cajun 2 Unit 3, our actual consumption of the MWhs generated from this facility varies from 42% to 45%. CO2 emission number shown is based on actual consumption of MWhs received from Fossil Operations.

(7) During 2012, EWC (EAM Nelson Holdings, LLC) acquired 10.9% of this unit. Therefore, Entergy's overall ownership share of this unit increased to 80.9%

Small combustion sources at all generation stations

Small stationary combustion sources were initially calculated for all known equipment co-located at generating stations using parameters (such as max energy input/hour) developed in internal emissions compliance documents and assumed equipment capacity factors. These emissions totals were calculated in 2005 and are assumed to be conservative (high) estimates of emissions. These estimates were used in inventories 2000-2010, i.e. new emissions totals have not been calculated for each year.

In 2013, Entergy reported 2012 GHG (CO2e) emissions from small sources co-located at Fossil plants in compliance with the EPA Mandatory Reporting Rule. These updated values have been substituted for the older, 2005 calculations in order to be consistent with mandatory GHG reporting. Nuclear and Thermal estimates continue to rely on the 2005 calculations unless otherwise noted.

Plant	Capacity (total MW of all units)	CO2e Emissions reported under Mandatory Reporting Rule (short tons of all gases in 2012) [obtained from Fossil Operations unless otherwise noted]	CO2e Emissions reported under Mandatory Reporting Rule (metric tons of all gases in 2012) [obtained from Fossil Operations unless otherwise noted]	
Fossil fuel generating stations				**Other small plants**
Buras	19	1,514.8	1,374.2	Charity boiler capacity 52.9 total MMBtu 1,390,212 total 81,362
A.B. Paterson	159	0.0	0.0	3 boilers
Acadia	578	0.0	0.0	
Attala	455	0.0	0.0	
Baxter Wilson	1321	93,202.5	84,553.3	
Big Cajun	247	0.0	0.0	
Calcasieu	310	0.0	0.0	
Cecil Lynch	210	8.5	7.7	
Delta	207	0.0	0.0	
Gerald Andrus	761	20,907.0	18,966.8	
Hamilton Moses	144	0.0	0.0	
Harvey Couch	161	0.0	0.0	
Hinds Energy Facility		265.1	240.5	
Hot Spring Energy Facility		7.5	6.8	
Independence	804	6.1	5.6	(49.93% ownership share)
Lake Catherine	756	0.0	0.0	
Lewis Creek	520	0.0	0.0	
Little Gypsy	1253	3,218.4	2,919.7	
Louisiana Station	354	167.0	151.5	
Mablevale	56	2,489.6	2,258.6	
Michoud	918	18,763.0	17,021.8	
Monroe	73	0.0	0.0	
Natchez	73	0.0	0.0	
Ninemile Point	1827	0.0	0.0	
Ouachita	770	23.5	21.3	
Perryville	691	0.0	0.0	
Rex Brown	354	92.4	83.8	
RISEC	583	0.0	0.0	
Robert Ritchie	900	0.0	0.0	
RS Cogen	213	0.0	0.0	
RS Nelson	1031	31,939.4	28,975.4	(91.4% ownership share)
Sabine	1890	39,403.4	35,746.8	
Sterlington	386	0.0	0.0	
Waterford 1&2	822	58.3	52.9	
White Bluff	946	206.6	187.4	(57% ownership share)
Willow Glen	1752	212,452.2	192,736.6	
Fossil fuel totals	21,544	424,725.2	385,310.7	

		Plant total small sources CO2e (short tons using 2005 estimate calculations)
Nuclear generating stations		
Vermont Yankee	510	2,278
Pilgrim	670	14,818
James Fitzpatrick	825	3,490
River Bend	966	687
Indian Point 2	970	18,558
Indian Point 3	980	80
Palisades [1]	811	7,757
Waterford 3	1075	7,042
Grand Gulf	1210	11,131
Arkansas Nuclear 1&2	1694	11,728
Nuclear totals	9,711	77,569
All small source totals	31,255	**583,657**

Direct Emissions from fossil fuel usage for company mobile fleet ("Mobile Combustion")

Note: The information below was collected and results calculated based on 2012 data.

Beginning in 2013, the GWP for N2O and CH4 was modified based on the EPA final rule effective 1/1/14.

Fuel Description	Fuel Code	Units consumed (gal)	Assumptions/Comments
Diesel	**D**	3,025,289	Based on 2012 Entergy data provided by Nick Greb / Bob Irving, it is assumed that totals for all bi-fuel categories are split at a 90/10 ratio between constituent fuel types and are calculated as such. Bi-fuels are separated below into its constituent fuel type category and emissions calculated. CNG is measured in Gallons of Gasoline Equivalency or GGE. One gallon of CNG or GGE has the same energy value as a gallon of gasoline. "Unknown" split evenly (50/50) between diesel and gasoline.
Gasoline	**G**	1,433,883	
BiFuel-Gasoline/Ethanol	**S**	348,393	
BiFuel-Gasoline/CNG	**A**	16,357	
BiFuel-Gasoline/LPG	**B**	1,011	
BiFuel-Diesel/Electricity	**F**	20,646	
Propane	**P**	22	
CNG	**C**	116	
LPG	**L**	80	
BiFuel-Gasoline/Electricity	**H**	1678	
Unknown	-	77,856	
Jet fuel (4 aircraft count)		539,031	Total 2012 Fuel Purchase - from Roger Burns
Total gallons consumed		**5,464,362**	

Total units of each fuel type

				CO2 using EPA Climate Leaders Efs		CO2 using WRI/WBCSD Protocol Efs	
Fuel	Total units consumed (GALLONS) - from inputs above	conversion to energy content (MMBtu/gallon)	Total MMBtu consumed	Emissions Factor (lbs CO2/MMBtu)	Total CO2 Emissions (short tons)	Emissions Factor (kg CO2/Gallon)	Total CO2 Emissions (short tons)
Diesel	3,082,798	0.1387	427,584	159.68	34,138	10.15	34,491
Gasoline	1,803,506	0.1251	225,619	156.44	17,648	8.81	17,514
Ethanol (E85)	34,839	0.0843	2,937	149.59	220	5.56	214
CNG	1,752	0.1251	219	116.41	13	See note	13
LPG	181	0.092	17	138.76	1	5.79	1
Propane	22	0.092	2	138.32	0	5.79	0
Jet fuel	539,031	0.135	72,769	154.72	5,629	9.57	5,686
Totals	5,462,129		729,147		**57,649**		**57,919**

Note: Emissions from Ethanol are considered "biogenic" emissions are do not contribute to net CO2 additions to the atmosphere. They are include with fossil fuel CO2 because it is de minimus.

Regarding CNG, no SCF measurement is available; used the EPA CL number as a proxy.

Direct Emissions of N2O and CH4 from mobile fleet ("Mobile Combustion")

The calculation below uses conservative N2O and CH4 emissions factors to estimate these emissions from mobile sources.
The emissions factors are from EPA Climate Leaders Guidance for construction vehicles.

N2O from mobile sources					
N2O	gallons consumed	g N2O/gal fuel	total kg N2O	short tons	CO2e short tons
gasoline	1,803,506	0.22	396.77	0.446	132.78
diesel	3,082,798	0.26	801.53	0.900	268.23
total					**401.02**

CH4 from mobile sources					
CH4	gallons consumed	g CH4 /gal fuel	total kg CH4	short tons	CO2e short tons
gasoline	1,803,506	0.50	901.75	1.013	25.32
diesel	3,082,798	0.58	1,788.02	2.008	50.20
total					**75.52**

total N2O and CH4 CO2e	**476.53**

Total Estimated Emissions from Mobile Sources (short tons CO2e)	**58,396**

Direct Emissions from Fugitive CH4 from natural gas T&D operations

The calculation below uses CY2011 pipeline type data to estimate emissions from fugutive natural gas, as data for specific pipeline types was readily available. Miles of pipe have been converted to kilometers (km) as GRI provides emissions factor for km.

Data for number of services is from the DOT Natural Gas Distribution Annuals database for 2011.

Data for meters is the average for Residential and Commercial/Industrial/Governmental from 2011.

Entergy natural gas operations do not inlcude compressor stations; gas venting is minimized and not inlcuded in the calculations.

Beginning in 2013, the GWP for methane was raised to 25 due to an EPA final rule effective 1/1/14.

2004

Pipeline type	Miles of pipe	Conversion to km (1.609 km/mi.)	Emissions factor (metric ton CH4/km/year)	Total metric tons CH4	Total short tons CH4	Total short tons CO2e
Transmission pipe -ENO						
Bare Steel (unprotected mains)	0	0.00	0.0777	0	0	0
Coated Steel (protected mains)	35.6	57.28	0.0043	0.24	0	7
Plastic	0	0.00	0.0064	0	0	0
sub-total	35.6	57.28		0	0	7
Main pipe - ENO						
Steel (protected, coated)	868	1,396.61	0.0365	51	56	1,405
Steel (protected, bare)	0	0.00	0.0365	0	0	0
Steel (unprotected)	0	0.00	1.3111	0	0	0
Cast iron	217	349.15	2.8409	992	1,093	22,961
Plastic	593	954.14	0.1953	186	205	5,136
sub-total	1,678	2,699.90		1,230	1,356	29,501
Main pipe - EGSI						
Steel (protected, coated)	802	1,290.42	0.0365	47	52	1,298
Steel (protected, bare)	0	0.00	0.0365	0	0	0
Steel (unprotected)	0	0.00	1.3111	0	0	0
Cast iron	25	40.23	2.8409	114	126	3,149
Plastic	894	1,438.45	0.1953	281	310	7,742
sub-total	1,721	2,769.09		2,850	3,142	12,190
Services	# of services	no conversion	Emissions factor (metric ton CH4/service/year)	Total metric tons CH4	Total short tons CH4	Total short tons CO2e
Services - ENO						
Cathodically protected (coated steel)	35,406		0.0034	120	133	3,317
Unprotected (coated steel)	32,611		0.0326	1,062	1,171	29,270
Plastic	34,783		0.0002	6	7	173
sub-total	102,800	0.00				32,760
Services - EGSI						
Cathodically protected (coated steel)	44,337		0.0034	151	166	4,154
Unprotected (coated steel)	0		0.0326	0	0	0
Plastic	48,586		0.0002	9	10	241
sub-total	92,923	0.00				4,395

Total CO2e from pipeline system: 78,853

Customer meters	# meters	Emissions factor (metric ton CH4/meter/year)	Total metric tons CH4	Total short tons CH4	Total short tons CO2e
Meters - ENO					
Residential meters	138,560	0.00265	367.18	404.75	10,118.67
Commercial meters (1)	7,463	0.00092	6.87	7.57	189.21
Meters - EGSI					
Residential meters	95,397	0.00265	252.80	278.66	6,966.59
Commercial meters (1)	5,524	0.00092	5.08	5.60	140.05
sub-total	246,944			697	17,415

Spindletop Storage

Storage facilities	# storage facilities	Emissions factor (metric ton CH4/station-yr)	Total metric tons CH4	Total short tons CH4	Total short tons CO2e	
fugitive emissions from storage facilities	1	6.754E+02	675.4	745.0	18,624	See note 3
vented emissions from storage facilities	1	217.3	217.3	239.7	5,992	See note 4
sub-total					**24,616**	

Totals for fugitive natural gas: **120,883** short tons CO2e

GENERAL NOTES:

- Source for emissions factors by equipment type is the Gas Research Institute (GRI), which provides factors in metric only.

- Fugitive and oxidized CO2 are known sources of GHG emissions from a natural gas T&D system; however these were not calculated as they are determined to be de minimus compared to CH4 from this source.

SPECIFIC NOTES:

(1) Compressors are assumed to be for natural gas transmission, not storage.
(2) general emissions factor used for vented gas; GRI provides emissions factors for specific equipment venting.
(3) EF from API Table 6-1, (American Petroleum Institute, Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Gas Industry.
(4) EF from GRI

Direct emissions of escaped SF6 in electricity T&D system ("Fugitive emissions")

Note: The information below was collected and results calculated based on 2013 inventory turnover data. Basically, as Entergy orders SF6, it is assumed that the ordered amount is required to replace SF6 that has been emitted.

2013 fugitive SF6 emissions estimate		
SF6 Emissions (lbs.) (1)	**Global Warming Potential (GWP) (2)**	Total CO2 Equivalent Emissions (short tons)
14,605	22,800	**166,497**

1) Assumes 115 lbs per cylinder
2) SF6 GWP from the November 29, 2013 EPA Final Rule (78 Fed. Reg. 71904), effective January 1, 2014.

Direct Emissions of Fugitive HFCs in all utility cooling and A/C equipment

This sheet contains calculations for all sources of fugitive HFCs. HFCs from all sources are considered de minimus (i.e. insignificant in the Entergy corporate total). The activity data required to provide the highest level of accuracy is difficult and impractical to obtain for such a small source. Instead, emissions factors have been created based on national averages for a number of variables to provide a rough estimate of these emissions. The methodology behind these emissions factors is found below.

These CO2e totals are calculated using data, provided in 2005 (for calendar year 2004), that does not change significantly between inventory years. These same data and emissions totals are used each year.

2010 Update - Facilities indicates that there is no significant change to these numbers; therefore, these numbers will continue to be carried forward each year.

2013 Update - carried historical data forward; however, updated the GWP consistent with an EPA final rule that became effective on 1/1/14.

From all Entergy air-conditioned spaces			
	square footage air-conditioned	EF: fugitive HFCs (short tons CO2e/sq ft) *	Facility fugitive HFC (short tons CO2e)
Entergy owned space	2,578,000	**0.00092**	2,372
Entergy capital lease space	830,000	**0.00092**	764
Generation plant space	2,000,000	**0.00092**	1,840
Total Fugitive HFCs	5,408,000		4,975

Generation plant space assumes 50,000 sq. ft. per plant; 38 plants assumed; rounded to 2 million sq. ft.

From Nuclear facility			
	lbs HFC charged to equipment	EF: fugitive HFCs as CO2e (GWP=1300)	Facility fugitive HFC (short tons CO2e)
	0	1300	0

Entergy nuclear facilities **do not** use HFCs for cooling

From all Entergy-owned vehicles			
	Total CO2 from mobile sources (short tons)	EF: HFC as % of CO2 emissions **	Facility fugitive HFC (short tons CO2e)
Vehicular A/C	58,396	3.50%	2,044

Total CO2 from all mobile source fuels are included

From Entergy-owned district cooling operations			
	total charge of equipment	conservative loss factor	fugitive emissions (short tons CO2e)
NORMC (medical center) centrifugal ch	14,000	15.00%	1,365
USP (Union Station) centrifugal chillers	15,370	15.00%	1,499
			2,864

NORMC chillers have 14,000 lbs charge total
USP has 3 chillers rated at 1933 tons each; assumed 2.65 lbs. (1.2 kg) HFCs per ton cooling
Loss factor is conservative; fewer annual fugitive gas is likely

Total fugitive HFC emissions **9,883** short tons CO2e

*** Calculation for estimating fugitive HFC emissions from building space using A/C**

The calculation used in calculating the emissions factor for metric tons of CO2e fugitive HFC.	Average cooling capacity of chiller (ft2/ton of cooling capacity)	HFCs in chiller (kg HFC/tons of cooling)	Annual HFC loss factor (percent)	Total Annual HFC losses (MT HFC/1000 ft2)	Total Annual HFC losses (MT CO2e)/1000 ft2	Total Annual HFC losses (**MT CO2e**)/ ft2	Total Annual HFC losses (**short tons** CO2e)/ ft2
	280	1.2	15%	0.000642857	0.92	0.00092	**0.00101**
	Source: ASHRAE (http://www.themcdermottgroup.com/Newsworthy/HVAC%20Issues/Rule%20of%20Thumb%20Sizing.htm) Note that this is a conservative estimate - a reasonably designed building should be more like 400.	Source: http://www.usgbc.org/LEED/tsac/energy.asp	Source: EPA Climate Leaders Gudance, January 2004. Note: This estimate is the source of the greatest uncertainty in the calculation, since the range is 2-15%, and the average is probably more like 5%.		This is the emissions factor that is applied to the square footage of air-conditioned space. This EF includes the global warming potential for HFC 134a (1,430).	Emissions factor for MT CO2e per ft2.	Emissions factor for short tons CO2e per ft2; conversion factor 1.1023

Calculation to estimate HFCs from mobile A/C as percentage of CO2 emissions from mobile sources using national averages for equipment leakage and miles/gallon

HFC Emissions Estimate				**CO2 Emissions Estimate**				**Emissions factor**
Vehicle type	HFC capacity (kg HFC)	annual leakage rate (percentage)	CO2 emissions (kg CO2e/yr-veh); GWP=1430	Miles per gallon	Miles per year	Emission factor (kg CO2/gal)	CO2 Emissions (kg CO2/yr-veh)	Emissions factor: HFC emissions (CO2e) to CO2 (as %)
Car	0.8	20%	228.8	20	15,000	8.87	6,653	**3.4%**
light truck	1.2	20%	343.2	15	15,000	8.87	8,870	**3.9%**

Power purchased to serve utility customers

Controllable power purchases

Code	Plant description		State	2013 Total Entergy purchased from plant (MWh)	2013 Unit/Plant-Specific Emission Factor (lbs CO2/MWh) [from eGRID 9th Edition (v1.0 - 2010 data) unless otherwise noted]	2013 CO2 emissions from puchased power (short tons) [using eGRID Unit-Specific Factors (when available)]	Comments/Notes
[redacted]	[redacted]		AR	2726	952.52	1,298.3	[redacted]
			AR	534	2,276.19	607.7	
			AR	8502	983.52	4,180.9	
			LA	17592	4.35	38.3	
			LA	42965	1,548.87	33,273.6	
			MS	35220	960.99	16,923.0	
			LA	24319	1,603.85	19,502.0	
			LA	912325	2,156.11	983,536.5	
			TX	27241	990.70	13,493.8	
			LA	2180498	704.00	767,535.2	
			MS	340516	860.16	146,449.1	
			MS	14789	1,424.67	10,534.7	
			TX	1489969	936.76	697,871.7	
			TX	15314	1,029.82	7,885.3	
			AR	3775	1,026.81	1,938.1	
			TX	12482	1,470.75	9,179.0	
			LA	117251	663.46	38,895.7	
			TX	1654754	926.58	766,630.8	
			TX	17471	1,482.71	12,952.2	
			AR	33387	2,276.19	37,997.6	
			LA	2716192	896.22	1,217,152.8	
			AR	70957	653.35	23,179.9	
			AR	1868	2,640.82	2,466.5	
			LA	156465	1,029.82	80,565.4	
			LA	4055	1,115.18	2,261.0	
			AR	3729536	922.59	1,720,416.3	
			TX	4836	733.49	1,773.6	
			MS	33683	1,423.75	23,978.1	
			AL	794	2,070.25	821.9	
			AR	27626	1,031.48	14,247.8	
			LA	1780198	2,521.45	2,244,340.1	
			TX	20189	725.20	7,320.5	

Entergy Unit/Plant Emission Factor Calculation

[Source - EPA Clean Air Markets]

WHITE BLUFF PLANT EMISSION FACTOR (2013)

Gross generation (MWh)	11006724
CO2 Emissions (tons)	12526697.5
2013 Emission Rate	**2276.19**

Totals	15,498,028		8,909,247.6	**Total DU Power Purchases (from Generation Acctg)**	**34,343,378**
CH4 emissions from controlled purchases (SERC MS Valley eGRID 9th Edition factor*)	0.02066		lbs/MWh		4,002
N2O emissions from controlled purchases (SERC MS Valley eGRID 9th Edition factor*)	0.01076		lbs/MWh		24,847

* - some units may be in different control areas or eGRID subregions; however, impact to the overall GHG inventory is expected to be negligible.

Total CO2e from Controllable Purchases **8,938,097** short tons

Non-controllable - system power purchases

			Total Entergy uncontrolled power purchases (MWh)	CO2 emissions (short tons CO2e)
CO2 emissions from non-controllable purchases (SERC MS Valley eGRID Version 9 factor)	1029.82	lbs/MWh	18,845,350	9,703,659
CH4 emissions from non-controllable purchases (SERC MS Valley eGRID Version 9 factor)	0.02066	lbs/MWh		4,867
N2O emissions from non-controllable purchases (SERC MS Valley eGRID Version 9 factor)	0.01076	lbs/MWh		30,214
				9,738,739

* - some units may be in different control areas or eGRID subregions; however, impact to the overall GHG inventory is expected to be negligible.

Compare totals

	2009				
	total emissions tons CO2	% of total	total pchsd power MWh	% of total	intensity (tons/MWh)
Controllable	8,938,097	47.86%	15,498,028	45.13%	0.577
Non-controllable	9,738,739	52.14%	18,845,350	54.87%	0.517
	18,676,836		34,343,378		

Indirect Emissions associated with purchased power	Total pchsd power MWh	Loss factor %	Total power lost MWh	emissions factor lbs GHG/MWh	Total CO2e - losses short tons
CO2 emissions from T&D losses of purchased power on Entergy system	34,343,378	5.4%	1,854,542	1029.82	954,922
CH4 emissions from T&D losses of purchased power on Entergy system				0.02066	479
N2O emissions from T&D losses of purchased power on Entergy system				0.01076	2,973
Total CO2e from losses from purchased power					**958,375**

T&D Loss factor calculation using 2004/Q4		
	Energy losses (1)	Total power (2)
	1,859,155	35,922,997
	1,203,122	17,331,394
	2,440,212	48,539,917
	473,629	9,073,068
	2,058,894	38,393,526
	8,035,012	149,260,902
loss factor		**5.4%**

(1) data from FERC form 1 lines 18 and 27
(2) data from FERC form 1 lines 9,10, and 16

Grid Power purchased for EWC plants/operations (non-Entergy power)

Plant and associated facilities	2013 Electricity Usage (kwh)	eGRID Subregion	eGRID Version 9 Emission Factor (lb CO2/MWh)	Estimated Emissions (short tons CO2e)
Indian Point Energy Center (IPEC)	33,150,807	NYUP	545.79	9,047
James A. Fitzpatrick (JAF)	8,616,933	NYUP	545.79	2,352
Pilgrim (PIL)	17,070,611	NEWE	722.07	6,163
Vermont Yankee (VY)	4,258,349	NEWE	722.07	1,537
Palisades (PAL)[1]	7,000,000	RFCM	1629.38	5,703
TOTAL	**70,096,700**			**24,802**

(1) - conservatively estimated using the average of similar sized plants (JAF and VY)

EPA Climate Leaders Emissions Factors for Fossil Fuel and Biomass Combustion

The emissions factors below have been updated from the EPA Climate Leaders GHG inventory Protocol, October 2004 and with any other EPA Final Rules.

				CO2 Emissions -- kg			**CO2 Emissions -- lbs**			**CH4 Emissions**				**N20 Emissions**			
Fuel type	Heating Value (HHV): custom heating values should be used if available	Carbon content coefficient (kg C/MMBtu) (based on HHV)	Fraction oxidized	EPA emission factor (kg CO2/MMBtu (HHV)*	EPA emission factor (kg CO2/mass or volume unit)	EPA emission factor (kg CO2/mass or volume unit)	EPA emission factor (lbs CO2/MMBtu (HHV)*	EPA emission factor (lbs CO2/mass or volume unit)	EPA emission factor (lbs CO2/mass or volume unit)	EPA emission factor (g CH4/MMBtu)	EPA emission factor (kg **CO2e**/MMBtu) GWP=25	EPA emission factor (lbs **CO2e**/MMBtu)	CH4 (**CO2e**) emissions factor (**lbs** CO2e CH4/**lb** CO2)	EPA emission factor (g N20/MMBtu)	EPA emission factor (kg **CO2e**/MMBtu) GWP=298	EPA emission factor (lbs **CO2e**/MMBtu)	N2O (**CO2e**) emissions (**lbs** CO2e N2O/**lb** CO2)
Liquid fossil	**MMBtu/bbl**				kg CO2/gallon	kg CO2/bbl		lbs CO2/gallon	lbs CO2/bbl								
Gasoline / petrol	5.253	19.34	0.99	70.95	8.79	369.18	156.44	19.38	814.04								
Kerosene	5.670	19.72	0.99	71.58	9.66	405.88	157.84	21.31	894.97	Note: CH4/N2O emissions factors for all mobile sources are dependent on many variables; for mobile sources consult the EPA Guidance Protocol							
Jet Fuel	5.670	19.33	0.99	70.17	9.47	397.74	154.72	20.88	877.02								
Aviation gasoline	5.048	18.87	0.99	68.50	8.23	345.66	151.04	18.15	762.18								
Distillate fuel (# 1,2,4, diesel)	5.825	19.95	0.99	72.42	10.08	423.36	159.68	22.23	933.51	1.8 (ind)	0.045	0.099	0.0006	.54 (ind)	0.16092	0.355	0.0022
										2.7 (elect gen)	0.068	0.149	0.0009	.54 (elect gen)	0.16092	0.355	0.0022
Residual fuel oil (#5,6)	6.287	21.49	0.99	78.01	11.68	490.44	172.01	25.75	1,081.42	1.8 (ind)	0.045	0.099	0.0006	1.8 (ind)	0.16092	0.355	0.0021
										2.7 (elect gen)	0.068	0.149	0.0009	2.7 (elect gen)	0.16092	0.355	0.0021
LPG	3.861	17.25	0.99	62.62	5.65	237.45	138.07	12.47	523.58								
Propane	3.824	17.2	0.99	62.44	5.71	239.90	137.67	12.59	528.98								
Ethane	2.916	16.25	0.99	58.99	4.12	172.91	130.07	9.08	381.27								
n-Butane	4.326	17.72	0.99	64.32	6.66	279.80	141.83	14.69	616.96	Note: CH4/N2O emissions factors for all mobile sources are dependent on many variables; for mobile sources consult the EPA Guidance Protocol							
Isobutane	4.162	17.75	0.99	64.43	6.42	269.52	142.07	14.15	594.29								
E85	ee EPA Guidance					0.00	0.00		0.00								
CNG	1,027	14.47	0.995	52.79	.054 /cf			.12 /cf									
LNG					5.91 /gal			13.01 /gal									
Petroleum coke	6.024	27.85	0.99	101.10	609.00		0.00	0.00									
Gaseous fossil	**MMBtu/mcf**				cu. ft.			cu. ft.									
Natural gas (dry)	1.027	14.47	0.995	52.79	0.0542		116.41	0.1195		4.75 (ind)	0.119	0.262	0.00225	0.095 (ind)	0.028	0.062	0.0005
										0.95 (elect gen)	0.025	0.055	0.00047	0.095 (elect gen)	0.030	0.066	0.0006
Solid fossil	**MMBtu/short ton**				short ton			short ton									
Anthracite	25.09	28.26	0.99	102.58	2,573.83		226.20	5,675.30		10.0 (ind)	0.250	0.551	0.00265	1.4 (ind)	0.42	0.92	0.0044
										1.0 (elect gen)	0.025	0.055	0.00027	1.4 (elect gen)	0.48	1.05	0.0051
Bituminous coal	24.93	25.49	0.99	92.53	2,306.74		204.03	5,086.36				% of "unspecified coal"				% of "unspecified coal"	
Sub-bituminous coal	17.25	26.48	0.99	96.12	1,658.11		211.95	3,656.13		Use the CH4/N2O emissions factors above for all coal types							
Lignite	14.21	26.3	0.99	95.47	1,356.61		210.51	2,991.33									
Coke	24.80	27.85	0.99	101.10	2,507.17		222.92	5,528.31									
Unspecified (elec gen)	20.63	25.98	0.99	94.31	1,945.56		207.95	4,289.96									
Unspecified (indus)	23.03	25.75	0.99	93.47	2,151.84		206.11	4,744.81									
Biofuels																	
Wood and wood waste	15.38 MMBtu /short	25.6	0.995	92.93	1,429.23 /short		204.91	3,135.2 /short		30.1 (ind/elect gen)	0.753	1.659	0.0081	4.01 (ind/elect gen)	1.19	2.63	0.0129
Landfill gas (50/50)	502.5 Btu/cu ft.	14.2	0.995	51.81	.0260 /cf		114.24	.05733 /cf		Note: CH4 and N2O factors for wood are significant. All fossil fuels are less than 1% compared to the factors for CO2.							
Biodiesel					9.29 /gal			20.48 /gal	860.35 /gal	EPA Guidance Protocol							
Ethanol (100)	3.539 MMBtu/bbl	17.99	0.99	65.30	5.5 /gal		143.99	12.13 /gal	509.46 /bbl								

Note: it is assumed the combustion of biomass and biofuels does not contribute to net CO2 emissions. As a result, Partners are required to list biomass CO2 emissions in terms of total gas but the emissions are not included in the overall CO2-equivalent emissions corporate inventory.

Conversion Factors used in this inventory

Mass			
1 pound (lb)	453.6 grams (g)	0.4536 kilograms (kg)	0.0004536 metric tons (tonne)
1 kilogram (kg)	2.205 pounds (lb)		.0011023 short tons
1 short ton (ton)	2'000 pounds (lb)	907.2 kilograms (kg)	.9072 metric tons
1 metric ton	2'205 pounds (lb)	1'000 kilograms (kg)	1.1023 short tons (tons)
Volume			
1 cubic foot (ft^3)	7.4805 US gallons (gal)	0.1781 barrel (bbl)	
1 cubic foot (ft^3)	28.32 liters (L)	0.02832 cubic meters (m^3)	
1 US gallon (gal)	0.0238 barrel (bbl)	3.785 liters (L)	0.003785 cubic meters (m^3)
1 barrel (bbl)	42 US gallons (gal)	158.99 liters (L)	0.1589 cubic meters (m^3)
1 litre (L)	0.001 cubic meters (m^3)	0.2642 US gallons (gal)	
1 cubic meter (m^3)	6.2897 barrels (bbl)	264.2 US gallons (gal)	1'000 liters (L)
Energy			
1 kilowatt hour (kWh)	3412 Btu (btu)	3'600 kilojoules (KJ)	
1 megajoule (MJ)	0.001 gigajoules (GJ)		
1 gigajoule (GJ)	0.9478 million Btu (million btu)	277.8 kilowatt hours (kWh)	
1 Btu (btu)	1'055 joules (J)		
1 million Btu (million btu)	1.055 gigajoules (GJ)	293 kilowatt hours (kWh)	
1 therm (therm)	100'000 btu	0.1055 gigajoules (GJ)	29.3 kilowatt hours (kWh)
Other			
kilo	1'000		
mega	1'000'000		
giga	1'000'000'000		
tera	1'000'000'000'000		
1 psi	14.5037 bar		
1 kgf / cm^3 (tech atm)	1.0197 bar		
1 atmosphere (atm)	0.9869 bar	101.325 kilo pascals	14.696 pounds per square inch (psia)
1 mile (statue)	1.609 kilometers		
1 metric ton CH_4	21 metric tons CO_2 equivalent		
1metric ton N_2O	310 metric tons CO_2 equivalent		
1 metric ton carbon	3.664 metric tons CO_2		

Global Warming Potentials and Atmospheric Lifetimes (years)		
Gas Atmospheric Lifetime GWP[a]		
Greenhouse Gas	**Atmospheric Lifetime**	**Global Warming Potential**
Carbon dioxide (CO2)	50-200	1
Methane (CH4)[b,c]	12 +/- 3	25
Nitrous oxide (N2O)[c]	120	298
HFC-23[c]	264	14,800
HFC-125[c]	32.6	3,500
HFC-134a[c]	14.6	1,100
HFC-143a[c]	48.3	4,470
HFC-152a[c]	1.5	124
HFC-227ea[c]	36.5	3,220
HFC-236fa[c]	209	9,810
HFC-4310mee[c]	17.1	1,640
CF4	50,000	6,500
C2F6	10,000	9,200
C4F10	2,600	7,00
C6F14	3,200	7,400
SF6[c]	3,200	22,800

Source: Unless otherwise noted by note 'c' below, IPCC 1996; Second Assessment Report (SAR). Although the GWPs have been updated by the IPCC in the Third Assessment Report (TAR), estimates of emissions presented in the US Inventory will continue to use the GWPs from the Second Assessment Report.

a 100 year time horizon

b The methane GWP includes the direct effects and those indirect effects due to the production of tropospheric ozone and stratospheric water vapor.

c Effective January 1, 2014, the Environmental Protection Agency, through issuance of a final rule, raised the GWP for methane and several classes of hydrofluorocarbons, while lowering the GWP for both nitrous oxide and sulfur hexafluoride.

The indirect effect due to the production of CO2 is not included.

Color key to calculations in the Entergy GHG Inventory

The colored heading cells in each worksheet of this GHG inventory enable inventory managers and users update and understand the role of each step of the calculation process.

Yellow	Specific fuel or gas calculated	This heading identifies the fuel and emissions being calculated below it.
Red	Annual activity data input	This is an input cell for company activity or usage data related to this emissions source for a given facility, source or even corporate-wide. Examples of input data are gallons of gasoline, lbs of CO2 (provided as CEM data), or square footage of building space occupied by the company. This activity data is currently identified in the units provided during the completion of PNM's GHG inventory for years 2001-2003. For some de minimus emissions sources (such as fugitive HFCs from building space
Orange	Calculation constant	This cell contain as constant (coefficient) such as a conversion factor or unit measurement and does not to be changed annually unless there is a change to an emissions factor, input units or facility status.
Green	Calculation conversion subtotal	This figure is calculated automatically and is a subtotal or unit conversion resulting from a spreadsheet calculation such as MMBtu converted from mcf or gallons. This cell contains an emissions or conversion factor in its formula.
Blue	Emissions source total	This figure is calculated automatically and is a total of CO2e (CO2-equivalent) for a given emissions source (e.g. a facility or equipment type) and the sum of individual sources is carried into the annual corporate emissions table. This cell contains an emissions or conversion factor in its formula.
123.45	Emissions source total	Bolded cells contain a figure for total emissions in CO2e for that source and are carried to the corporate emissions totals sheet for emissions source comparison.